Building Computational Fluency

Grades 5 & 6

BRIDGES BREAKOUT

Excerpts From Bridges in Mathematics

BOBCF56

Building Computational Fluency, Grades 5 & 6
A Math Learning Center Publication

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illustrated by Tyson Smith

Bridges Breakout Units

- Building Computational Fluency, Grade 4
- Building Computational Fluency, Grade 3
- Building Computational Fluency, Grade 2
- Building Computational Fluency, Grade 1
- Bridge Design & Construction: Data Collection & Analysis
- Bugs Across the Curriculum
- Crossing the Pond: A Probability Game
- Exploring Money: Adding, Counting, Sorting and Patterning
- Exploring Time: Hours, Minutes and Paper Clocks
- Frogs Across the Curriculum
- Geometry: Pattern Blocks, Polydrons and Paper Quilts (Grade 1)
- Geometry: Shapes, Symmetry, Area and Number (Grade 2)
- Math Buckets: Sorting and Patterning
- Math with a Sock: Probability and Fractions
- My Little Farm: Money, Place Value and Mapping
- Penguins: Measuring, Sorting, Computation and More
- Sea Creatures Across the Curriculum

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Building Computational Fluency, Grades 5 & 6

Introduction

Section 1 Assessments

Unless otherwise indicated on the blackline, run a class set.

Section 2: Support Activites

Follow copy instructions on blacklines to run as needed.

Section 3 Fact Fluency Supplement

Follow copy instructions on blacklines to run as needed.

Building Computational Fluency, Grades 5 & 6 Overview

Building Computational Fluency, Grades 5 & 6 is a supplement designed to provide you with powerful and flexible tools to assess and support students in developing key computational skills and concepts. Organized into three sections, this supplement enables you to assess some or all of your students on computational skills throughout the school year and provide support to students who need extra help in key areas, including:

- place value understandings
- rounding
- multiplication and division facts through 12's
- multi-digit addition and subtraction
- multi-digit multiplication and division
- fraction and decimal sense
- adding and subtracting fractions and decimals

In Section 1, you'll find a set of assessments designed to be administered at key points throughout the school year. These assessments serve as a useful complement to any fifth grade math program, and may also be very helpful to sixth grade teachers seeking to diagnose specific skill deficits among students working below grade level. They also provide tools to check students' proficiency with basic multiplication and division facts on a regular basis. In Section 2, you'll find a collection of Support Activities designed to help students who indicate needs in the specific areas assessed. The games in this section are based around visual models and strategies, and help students develop deep conceptual understandings as well as proficiency. They can be used as instructional resources with your entire group, or as tools to remediate targeted students. Section 3 is a Fact Fluency Supplement that provides the kind of systematic, strategy-based practice students need to master basic multiplication and division facts. The worksheets and practice games in this section are designed to be tailored to the needs of individuals, and can be used with selected students or with your entire class. Each section is described in more detail below.

Section 1 Assessments

The six assessments in this collection are designed to help you gauge how your students are doing with key computational skills throughout the year. Assessment 1 is intended for use during the first few weeks of school. Depending on your district expectations, this assessment may be useful in determining whether your incoming fifth graders are working at, above, or below grade

level. Middle school teachers may also find the assessment helpful in identifying gaps in basic computational skills among their incoming sixth graders.

Building Computational Fluency Blackline A 1.1

NAME _____ DATE _____

Assessment 1 page 1 of 5

1 Solve these multiplication facts.

3 × 12	5 × 3	9 × 9	5 × 7	8 × 5	6 × 7	8 × 3
8 × 9	6 × 3	12 × 8	7 × 7	12 × 5	9 × 3	7 × 8
5 × 4	7 × 3	11 × 12	6 × 6	8 × 6	4 × 6	9 × 4
4 × 8	9 × 8	7 × 4	8 × 8	9 × 7	6 × 9	11 × 11
11 × 10	5 × 5	12 × 9	12 × 12	5 × 6	10 × 10	12 × 7
12 × 6	12 × 4	11 × 4	9 × 5	8 × 7		

2 Make a sketch to show what this expression means. 6 × 4	**3** Make a sketch to show what this expression means. 28 ÷ 7

Building Computational Fluency Blackline A 1.2

NAME _____ DATE _____

Assessment 1 page 2 of 5

4 Solve these division facts.

7)21	8)24	6)30	5)40	4)16	4)36	9)27
10)50	4)32	7)14	2)18	5)45	5)25	8)48
8)64	6)36	6)18	4)40	7)28	7)49	5)35

Solve each equation below and show your work. If you use Base Ten Grid Paper, attach it to this sheet.

5 2,639 + 3,743 =	**6** 5,573 – 3,239 =
7 7 × 32 =	**8** 108 ÷ 4 =
9 25 × 13 =	**10** $\frac{3}{8} + \frac{1}{8} =$

The first 2 pages of Assessment 1

Even if many of your students perform very well on Assessment 1, you may find that some of them need more practice with multiplication and division facts. Toward that end, a second assessment (Assessment 2: Quick Facts) which allows students to choose their own learning targets and track their own progress toward fact mastery has been included in the set. Teachers often introduce the "Quick Facts" assessment in September and continue to administer it weekly or even twice a week until the majority of their students are fluent with multiplication and division facts. An extensive set of worksheets and games is featured in the third section of Building Computational Fluency to provide the systematic practice students will need to progress through and eventually test out of Assessment 2.

Assessments 3, 4, 5, and 6 are quarterly checkups designed for use at the end of each grading period to support teachers in conferencing with parents and reporting on students' progress. Each of these assessments offers another look at students' proficiency with basic facts and host of other key math skills typically taught in the fall, winter, and early as well as late spring of the fifth

grade year. These assessments may also be useful to resource room teachers and others working with below-grade-level sixth graders.

All the assessments described above include instructions to the teacher, answer keys, assessment blacklines, and class checklists. Although use of the class checklists is optional, they allow teachers to easily spot strengths and weaknesses in individual students and in the class as a whole. The class checklists include suggested point values for each item so that teachers can score the assessments if they choose to do so.

Assessment 1 Class Checklist page 1 of 2

Student name													
1 completes X out of 40 multiplication facts correctly in 2 minutes	36–40: 4 pts*. 32–25: 3 pts. 28–31: 2 pts. 24–27: 1 pt. 23 or fewer: 0 pts.												
2 creates sketch that demonstrates understanding of process of multiplication	1												
3 creates sketch that demonstrates understanding of process of division	1												
4 completes X out of 21 division facts correctly	19–21: 4 pts. 17 or 18: 3 pts. 15 or 16: 2 pts. 13 or 14: 1 pt. 12 or fewer: 0 pts.												
5a adds 4-digit numbers with regrouping (2,639 + 3,743)	1												
5b shows work	1												
6a subtracts 4-digit numbers with regrouping (5,573 – 3,239)	1												
6b shows work	1												
7a multiplies 2-digit number by 1-digit number (7 × 32)	1												
7b shows work	1												
8a divides 3-digit number by 1-digit number (108 ÷ 4)	1												
8b shows work	1												
9a multiplies 2-digit number by 2-digit number (25 × 13)	1												
9b shows work	1												

* The total possible number of points for each problem is shown.

Building Computational Fluency Blackline A.1.8 Run enough copies to record the results for all students in your class.

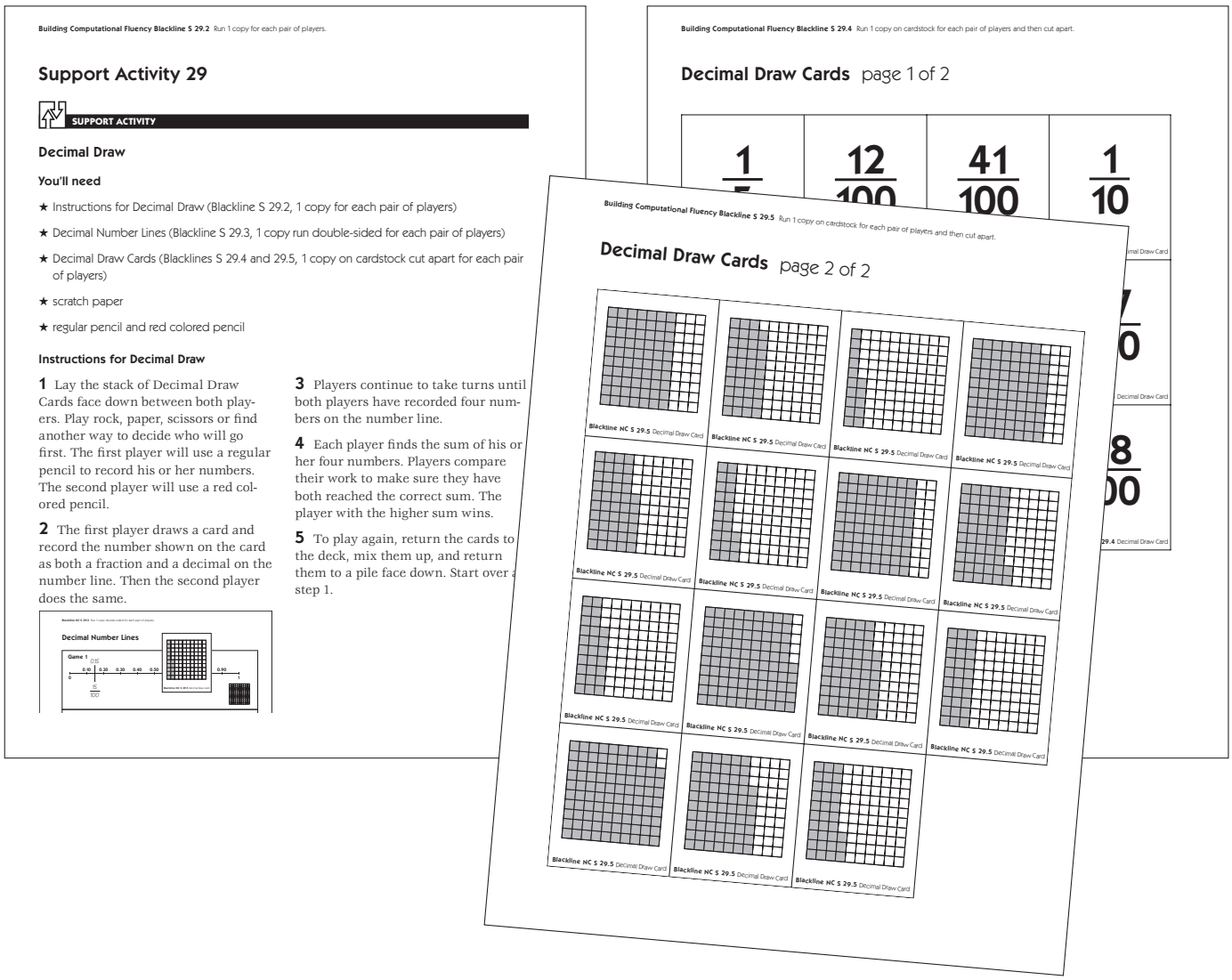
Assessment 1 Class Checklist page 2 of 2

Student name													
10a adds fractions with like denominators ($^{5}/_{8}$ + $^{1}/_{8}$)	1												
10b shows work	1												
11 identifies multiples of 2	1												
12 identifies multiples of 2 and 3	1												
13a lists all factors of 24	1												
13b explains thinking	1												
14a identifies odd and even numbers correctly	1												
14b explains thinking	1												
15 reads and interprets a bar graph	1												
16 transfers information from a tally chart to a circle graph	1												
17 identifies likely outcomes of a probability experiment	1												
18 matches fractions and decimals with base ten models	4												
19 matches decimals and common fractions	4												
20 locates fractions and decimals along a number line	6												
Total score	**45**												

Building Computational Fluency Blackline A.1.9 Run enough copies to record the results for all students in your class.

Section 2 Support Activities

In the second section of this packet, you'll find a set of 37 partner or small group games specifically designed to support the skills tested in the assessments described above. These games provide engaging practice with skills including basic multiplication and division concepts and strategies, multi-digit computation (addition, subtraction, multiplication, and division), rounding, money, time, decimals, and fractions. Most of these games are based around visual models such as base ten pieces and arrays, and are intended to help students develop conceptual understanding as well as proficiency.



Building Computational Fluency Blackline S 29.2 Run 1 copy for each pair of players.

Support Activity 29

SUPPORT ACTIVITY

Decimal Draw

You'll need

★ Instructions for Decimal Draw (Blackline S 29.2, 1 copy for each pair of players)

★ Decimal Number Lines (Blackline S 29.3, 1 copy run double-sided for each pair of players)

★ Decimal Draw Cards (Blacklines S 29.4 and 29.5, 1 copy on cardstock cut apart for each pair of players)

★ scratch paper

★ regular pencil and red colored pencil

Instructions for Decimal Draw

1 Lay the stack of Decimal Draw Cards face down between both players. Play rock, paper, scissors or find another way to decide who will go first. The first player will use a regular pencil to record his or her numbers. The second player will use a red colored pencil.

2 The first player draws a card and record the number shown on the card as both a fraction and a decimal on the number line. Then the second player does the same.

3 Players continue to take turns until both players have recorded four numbers on the number line.

4 Each player finds the sum of his or her four numbers. Players compare their work to make sure they have both reached the correct sum. The player with the higher sum wins.

5 To play again, return the cards to the deck, mix them up, and return them to a pile face down. Start over at step 1.

Decimal Number Lines

Building Computational Fluency Blackline S 29.4 Run 1 copy on cardstock for each pair of players and then cut apart.

Decimal Draw Cards page 1 of 2

Building Computational Fluency Blackline S 29.5 Run 1 copy on cardstock for each pair of players and then cut apart.

Decimal Draw Cards page 2 of 2

Excerpts from Support Activity 29, Decimal Draw

Although the Support Activities have been designed to complement the assessments in this packet, you can use them as a set of additional instruction resources for your classroom even if you choose not to conduct the assessments. The activities can be used by educational assistants, parent volun-

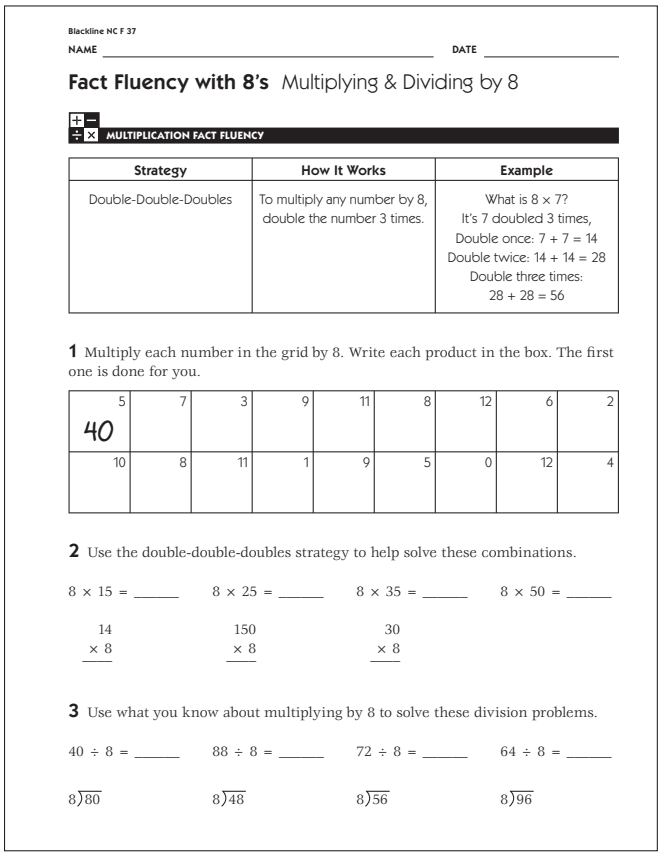
teers, resource or title teachers, as well as classroom teachers, and many of them also make effective homework assignments.

Each activity includes:

- instructional considerations
- playing instructions
- blacklines for game components if needed (spinners, gameboards, and/or cards)
- record sheet blacklines if needed

Section 3 Fact Fluency Supplement

The Fact Fluency Supplement is designed to be used in conjunction with the second assessment described above (Assessment 2: Quick Facts), but also stands alone as systematic and dynamic set of practice sheets for fifth and sixth graders who haven't yet mastered their multiplication and division facts. This 82-page supplement includes worksheets, games, and flashcards for each multiplier from 2 to 12, as well as three different ranges of facts: 2–6, 4–9, and 6–12. Based around such fact strategies as doubles (2's), double-doubles (4's), and half decade facts (5's) these activities build on one another and provide the kind of practice students need to learn and retain basic multiplication and division facts.



Blackline NC F 37

NAME _____ DATE _____

Fact Fluency with 8's Multiplying & Dividing by 8

MULTIPLICATION FACT FLUENCY

Strategy	How It Works	Example
Double-Double-Doubles	To multiply any number by 8, double the number 3 times.	What is 8 × 7? It's 7 doubled 3 times, Double once: 7 + 7 = 14 Double twice: 14 + 14 = 28 Double three times: 28 + 28 = 56

1 Multiply each number in the grid by 8. Write each product in the box. The first one is done for you.

5 40	7	3	9	11	8	12	6	2
10	8	11	1	9	5	0	12	4

2 Use the double-double-doubles strategy to help solve these combinations.

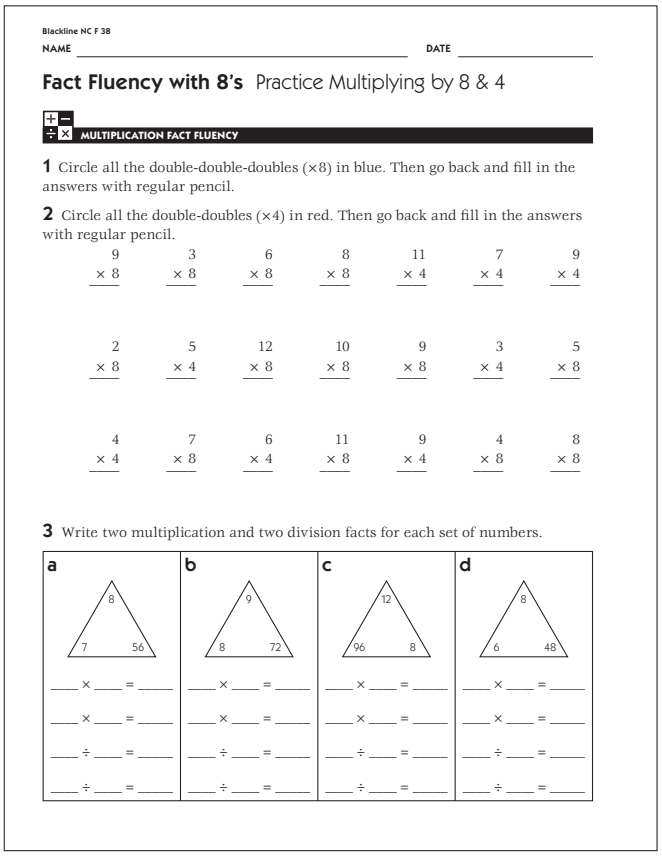
8 × 15 = _____ 8 × 25 = _____ 8 × 35 = _____ 8 × 50 = _____

14 × 8 150 × 8 30 × 8

3 Use what you know about multiplying by 8 to solve these division problems.

40 ÷ 8 = _____ 88 ÷ 8 = _____ 72 ÷ 8 = _____ 64 ÷ 8 = _____

8)80 8)48 8)56 8)96



Blackline NC F 38

NAME _____ DATE _____

Fact Fluency with 8's Practice Multiplying by 8 & 4

MULTIPLICATION FACT FLUENCY

1 Circle all the double-double-doubles (×8) in blue. Then go back and fill in the answers with regular pencil.

2 Circle all the double-doubles (×4) in red. Then go back and fill in the answers with regular pencil.

9 × 8	3 × 8	6 × 8	8 × 8	11 × 4	7 × 4	9 × 4
2 × 8	5 × 4	12 × 8	10 × 8	9 × 8	3 × 4	5 × 8
4 × 4	7 × 8	6 × 4	11 × 8	9 × 4	4 × 8	8 × 8

3 Write two multiplication and two division facts for each set of numbers.

a	b	c	d
8, 7, 56	9, 8, 72	12, 96, 8	8, 6, 48
___ × ___ = ___	___ × ___ = ___	___ × ___ = ___	___ × ___ = ___
___ × ___ = ___	___ × ___ = ___	___ × ___ = ___	___ × ___ = ___
___ ÷ ___ = ___	___ ÷ ___ = ___	___ ÷ ___ = ___	___ ÷ ___ = ___
___ ÷ ___ = ___	___ ÷ ___ = ___	___ ÷ ___ = ___	___ ÷ ___ = ___

Building Computational Fluency Blackline F 76

NAME _____ DATE _____

Fact Fluency with 6's–12's Secret Path Problems, Set 1

MULTIPLICATION FACT FLUENCY

- Find a path through all of the numbers in each set by multiplying or dividing to get from one number to the next.
- You have to use each number just one time.
- You can move only 1 space at a time. You can move over, up, down, or diagonally.
- Every path has a start point and an end point. Circle them both.
- You can also go backwards. Try to start at the end point and go back to the start point.

example

9 × 4 takes you to 36.

× ÷ 9

30 6 4

6 × 5 takes you to 30. 5 6 36 36 ÷ 6 takes you to 6.

Try this one. The start and end points have been marked for you.

× ÷ 9

72 8 6

12 6 48

Find your own start and end points, as well as a path through the numbers.

1

× ÷ 4

7 6 9

42 6 36

2

× ÷ 6

9 12 72

54 9 8

3

× ÷ 12

96 8 6

8 9 72

4

× ÷ 4

36 9 3

6 6 27

5

× ÷ 120

12 12 5

10 6 60

6

× ÷ 8

48 5 40

12 4 10

Building Computational Fluency Blackline F 78

NAME _____ DATE _____

Fact Fluency with 6's–12's Division Capture

MULTIPLICATION FACT FLUENCY

You'll need

★ a partner

★ 2 pencils or markers in different colors

★ paperclip and pencil to use as a spinner

Instructions for Division Capture 6's–12's

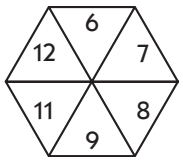
1 Take turns spinning the spinner. The player who gets the higher number goes first.

2 Take turns spinning the spinner. Use the number you spin to complete one of the division problems below. Be sure to use your own color pencil.

3 If the box you need is already filled, you lose your turn.

4 Try to capture 3 or 4 boxes in a row: across, up and down, or diagonally. Keep playing until the gameboard is filled or neither player can use the number he or she spins 3 times in a row.

5 Then circle the places on the grid where you got 3 or 4 in a row and add up your scores.



42 ÷ ☐ = 7	81 ÷ ☐ = 9	96 ÷ ☐ = 12	121 ÷ ☐ = 11
63 ÷ ☐ = 7	54 ÷ ☐ = 9	49 ÷ ☐ = 7	72 ÷ ☐ = 8
54 ÷ ☐ = 6	56 ÷ ☐ = 8	72 ÷ ☐ = 6	72 ÷ ☐ = 12
63 ÷ ☐ = 9	108 ÷ ☐ = 9	64 ÷ ☐ = 8	132 ÷ ☐ = 12
144 ÷ ☐ = 12	84 ÷ ☐ = 12	88 ÷ ☐ = 8	56 ÷ ☐ = 7

Scoring	Player 1 Points	Player 2 Points
3 in a Row—1 point 4 in a Row—2 points		

Assessment 1

ASSESSMENT

Overview

This assessment is designed to help gauge students' key math skills early in the school year. You'll find support suggestions on page 8.

Timing

Early in the school year or at any other time that's appropriate for your students

You'll need

- ★ Assessment 1, pages 1–5 (pages 11–15, class set)
- ★ Base Ten Grid Paper (page 16)
- ★ Assessment 1 Class Checklist (optional, pages 18 and 19, run as needed)
- ★ manipulatives such as base ten pieces and tile for students who want to use them (Use page 17 to make your own base ten pieces and cut out one-inch squares of construction paper if you don't have these materials.)

Skills & Concepts

- ★ demonstrating fluency with multiplication and division facts
- ★ adding and subtracting 4-digit numbers with regrouping
- ★ multiplying and dividing a 3-digit number by a 1-digit number
- ★ multiplying a 2-digit number by a 2-digit number
- ★ adding fractions with common denominators
- ★ finding factors and multiples
- ★ identifying odd and even numbers
- ★ reading and interpreting bar graphs, pictographs, and circle graphs
- ★ expressing the probability of an outcome as a fraction
- ★ recognizing equivalent forms of common fractions and decimals to hundredths
- ★ locating common fractions and decimals to hundredths on a number line

Conducting Assessment 1

You can administer this 5-page skills assessment during a single math period or break it out over 2 (or more) days, depending on your schedule and the needs of your students. Make base ten pieces, colored tile, and Base Ten Grid Paper available for students who wish to use them.

Conduct the first item, a set of 40 multiplication facts, as a timed test, allowing 2 minutes for students to complete as many of the 40 facts as they can. Before they begin, stress that this is a check-in designed to help you and them get a sense of which facts they still need to work on. It is only by timing students that we can get a sense of how fluent they are with their facts. After the two minutes are up, give them as much time as they need to complete the remaining problems on the first two pages. Emphasize that they'll need to show

Assessment 1 (cont.)

their work for problems 2, 3, and 5–10. (You'll find the answer key for this assessment on page 10.)

Pages 3–5 of Assessment 1 may be given to students the following day unless you choose to administer all 5 pages in one period. There is no need to time this portion of the assessment, though you'll want to move things along at a relatively brisk pace so that students who have little or no access to some of the problems aren't stuck struggling over them for too long. (You may even want to invite them to write "I don't know yet" under the problems they truly feel they have no way of approaching at this time.)

Using Information from Assessment 1

You can use the Assessment 1 Class Checklist on pages 18 and 19 to compile the assessment results for your class to get an overview of students' strengths and areas of need. The checklist features suggested point values for each item so that you can score the assessments, although it is not necessary to score students' papers to get a clear sense of which topics are comfortable for them and which are more challenging.

Depending on your district expectations, you might need to offer additional support for students who complete fewer than 24, or 60%, of the basic multiplication facts within the 2-minute period allotted. (Students who are able to complete 40 facts correctly in 2 minutes are working at a rate of 3 seconds per fact, which is generally deemed to indicate fluency.) Students who are not able to complete at least half of the division problems on the second page correctly may also need additional support, as might students who have not yet developed efficient methods for adding and subtracting 4-digit numbers or multiplying 2-digit by 1-digit numbers. Information about how to offer such support is provided below.

SUPPORT ACTIVITIES

The first 8 games listed on the chart below deal with multi-digit addition and subtraction, both of which require remediation early in the school year if any of your students are having difficulty. The others listed below address basic multiplication and division. See Assessment 2 on pages 21–26 and the Fact Fluency Supplement Blacklines (F 1–F 81) for more basic facts support.

Assessment 1 (cont.)

SUPPORT ACTIVITES		
Activity	**Name**	**Skills**
Activity 1	Make 100	Understanding 2- and 3-digit addition and subtraction
Activity 2	Race to 100 & Back	Understanding 2- and 3-digit addition and subtraction
Activity 3	More or Less Addition	2- and 3-digit addition
Activity 4	More or Less Addition Big Time	Multi-digit addition
Activity 5	Count Down 400	2- and 3-digit subtraction
Activity 6	More or Less Subtraction	2- and 3-digit subtraction
Activity 7	More or Less Subtraction Big Time	Multi-digit subtraction
Activity 8	Larger Numbers on a Line	Multi-digit subtraction
Activity 9	Array Challenge	Understanding multiplication
Activity 10	Multiplication Challenge	Understanding multiplication
Activity 11	Spinning Around Multiplication	Multiplication strategies through 6 × 6
Activity 12	Spinning for Arrays	Multiplication facts to 8 × 10
Activity 13	Product Bingo	Multiplication facts to 9 × 9
Activity 14	What's Missing? Bingo	Basic Multiplication & Division Facts

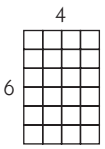
Assessment 1 Answer Key

ANSWER KEY

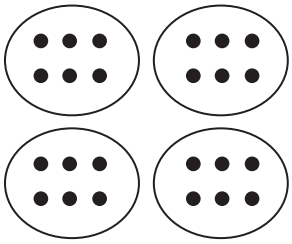
Pages 11–15

1 36, 15, 81, 35, 40, 42, 24
72, 18, 96, 49, 60, 27, 56
20, 21, 132, 36, 48, 24, 36
32, 72, 28, 64, 63, 54, 121
110, 25, 108, 144, 30, 100, 84
72, 48, 44, 45, 56

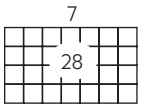
2 Students' sketches will vary. Examples:
example 1:



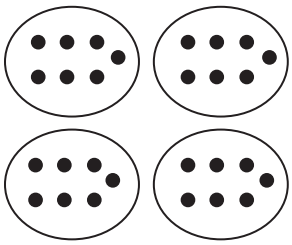
example 2:



3 Students' sketches will vary. Examples:
example 1:



example 2:



4 3, 3, 5, 8, 4, 9, 3
5, 8, 2, 9, 9, 5, 6
8, 6, 3, 10, 4, 7, 7

5 6,382

6 2,334

7 224

8 27

9 325

10 $^4/_8$ or $^1/_2$

11 346, 752, 3120

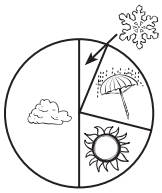
12 12, 36

13 **a** 1, 24, 2, 12, 3, 8, 4, 6
b Students' responses will vary. Example:
I know I got them all because I started at 1 and went up to 6 and then they started repeating again.

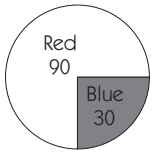
14 **a** odd: 623, 6059, 50017
even: 508, 5516, 5692
b Students' explanations will vary. Example:
Numbers are even if the last number in them is even.

15 Mr. Gahringer, Ms. Macintosh, and Ms. Russell (34 + 24 + 20 = 78) or Ms. Carruth, Ms. O'Donnell, and Ms. Macintosh (28 + 26 + 24 = 78)

16



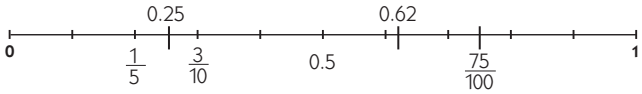
17



18 **a** $^1/_2$
b 0.36
c $^3/_4$
d $^8/_{10}$

19 **a** 0.50
b 0.8
c $^{36}/_{100}$
d 0.75

20



NAME _____ DATE _____

Assessment 1 page 1 of 5

1 Solve these multiplication facts.

3 × 12	5 × 3	9 × 9	5 × 7	8 × 5	6 × 7	8 × 3
8 × 9	6 × 3	12 × 8	7 × 7	12 × 5	9 × 3	7 × 8
5 × 4	7 × 3	11 × 12	6 × 6	8 × 6	4 × 6	9 × 4
4 × 8	9 × 8	7 × 4	8 × 8	9 × 7	6 × 9	11 × 11
11 × 10	5 × 5	12 × 9	12 × 12	5 × 6	10 × 10	12 × 7
12 × 6	12 × 4	11 × 4	9 × 5	8 × 7		

2 Make a sketch to show what this expression means. 6×4	**3** Make a sketch to show what this expression means. $28 \div 7$

NAME _____ DATE _____

Assessment 1 page 2 of 5

4 Solve these division facts.

$7\overline{)21}$	$8\overline{)24}$	$6\overline{)30}$	$5\overline{)40}$	$4\overline{)16}$	$4\overline{)36}$	$9\overline{)27}$
$10\overline{)50}$	$4\overline{)32}$	$7\overline{)14}$	$2\overline{)18}$	$5\overline{)45}$	$5\overline{)25}$	$8\overline{)48}$
$8\overline{)64}$	$6\overline{)36}$	$6\overline{)18}$	$4\overline{)40}$	$7\overline{)28}$	$7\overline{)49}$	$5\overline{)35}$

Solve each equation below and show your work. If you use Base Ten Grid Paper, attach it to this sheet.

5 2,639 + 3,743 =	**6** 5,573 – 3,239 =
7 7 × 32 =	**8** 108 ÷ 4 =
9 25 × 13 =	**10** $\frac{3}{8} + \frac{1}{8} =$

NAME _____ DATE _____

Assessment 1 page 3 of 5

11 Circle the numbers that are multiples of 2.

346 247 752 4,441 3,120

12 Circle the numbers that are multiples of 2 *and* 3.

12 16 21 32 36

13a List all the factors of 24.

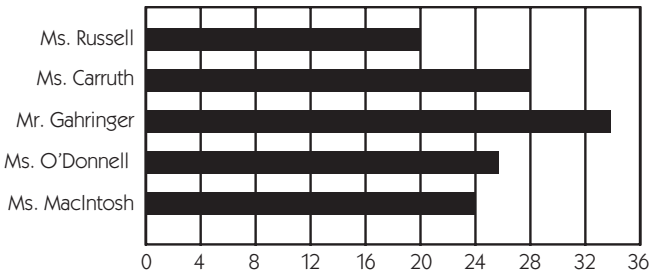
b How do you know you listed all of them?

14a Draw a line under each odd number. Circle each even number.

623 6,059 508 5,516 5,692 50,017

b Explain how you know when a number is odd and when it is even.

15 Here is a graph of the number of students in 5 different 5th grade classrooms. Which 3 classes have a total of 78 students in all?

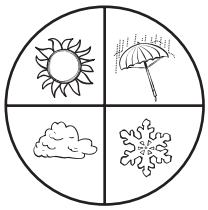


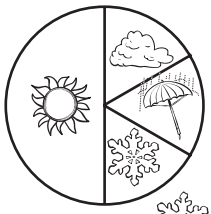
NAME _____ DATE _____

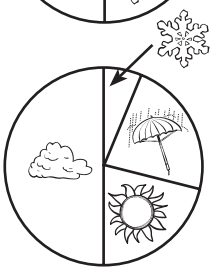
Assessment 1 page 4 of 5

16 Mr. Olivera's class has been keeping track of the weather for many months with this tally chart. Choose the circle graph that best shows this information.

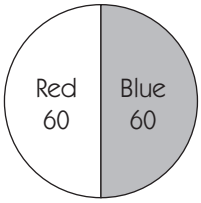
Weather Condition	Number of Days
Sunny	𝍸 𝍸 𝍸 𝍸 𝍸 𝍸
Cloudy	𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸
Rainy	𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 III
Snowy	𝍸 𝍸

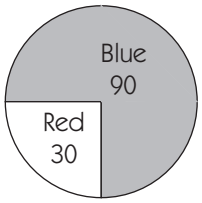
○ 

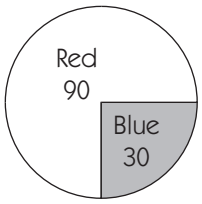
○ 

○ 

17 There are 9 red tile in a bag and 3 blue tile. The students take 120 samples from the bag. Each time, they pull a tile out of the bag without looking. Then they put it back in the bag and shake it up before they take the next sample. Which circle graph below comes closest to showing the results of this experiment?

○ 

○ 

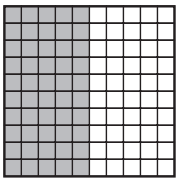
○ 

NAME _____ DATE _____

Assessment 1 page 5 of 5

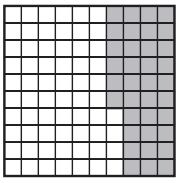
18 Match each grid to the fraction or decimal that tells how much is shaded in if the biggest square is 1. Write the correct letter in each box.

a



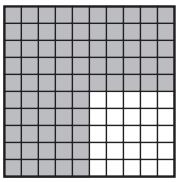
☐ $\frac{8}{10}$

b



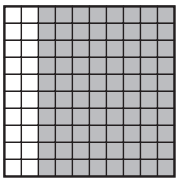
☐ $\frac{1}{2}$

c



☐ 0.36

d



☐ $\frac{3}{4}$

19 Match each number on the left to a number on the right that describes the same quantity. Write the correct letter in each box.

a $\frac{1}{2}$ ☐ $\frac{36}{100}$

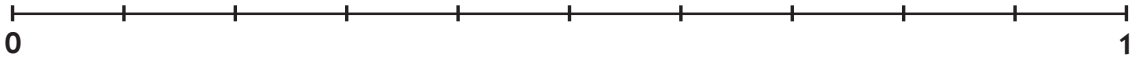
b $\frac{8}{10}$ ☐ 0.8

c 0.36 ☐ 0.50

d $\frac{3}{4}$ ☐ 0.75

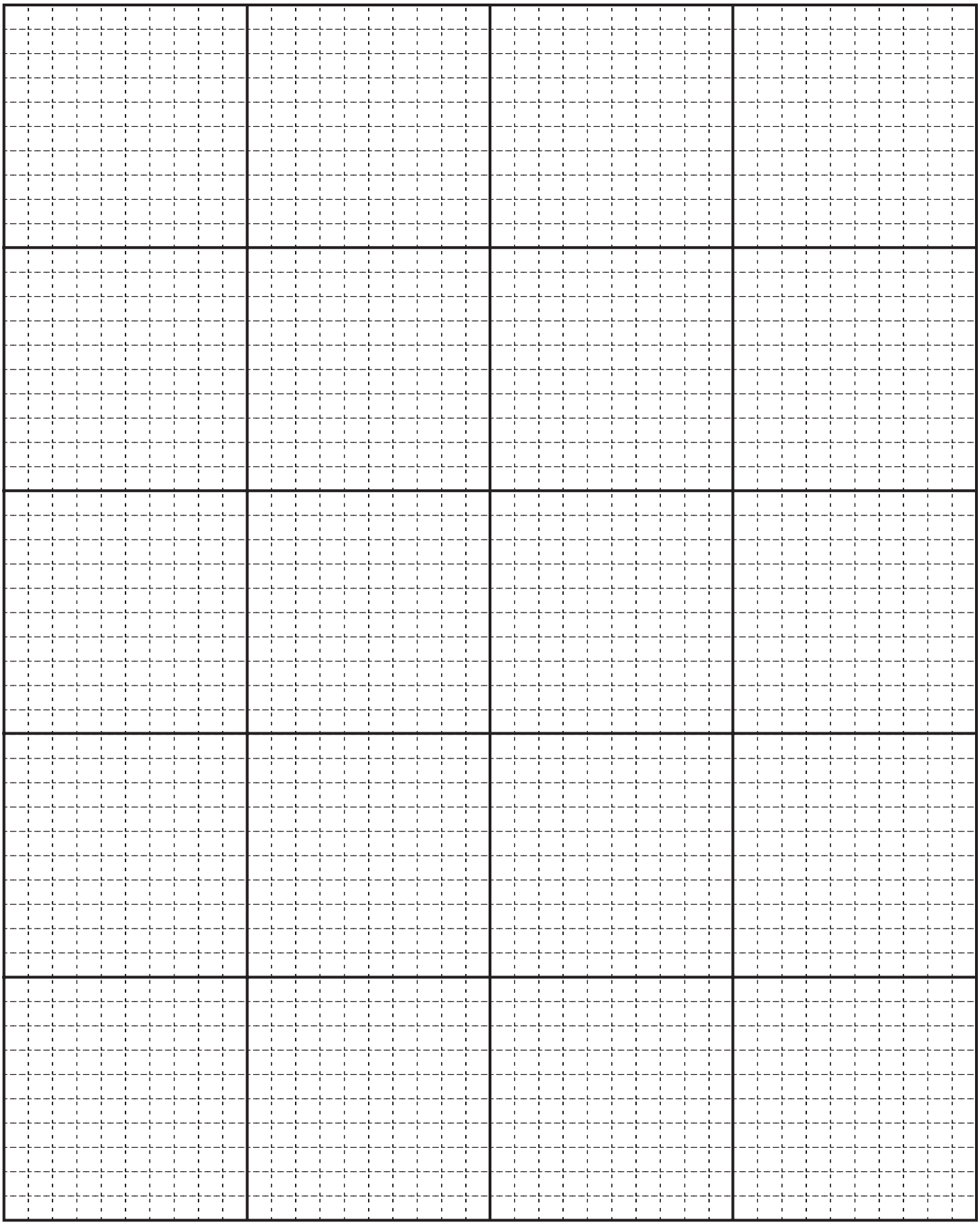
20 Mark and write these 6 numbers where they belong on the number line.

0.62 0.25 $\frac{3}{10}$ 0.5 $\frac{75}{100}$ $\frac{1}{5}$

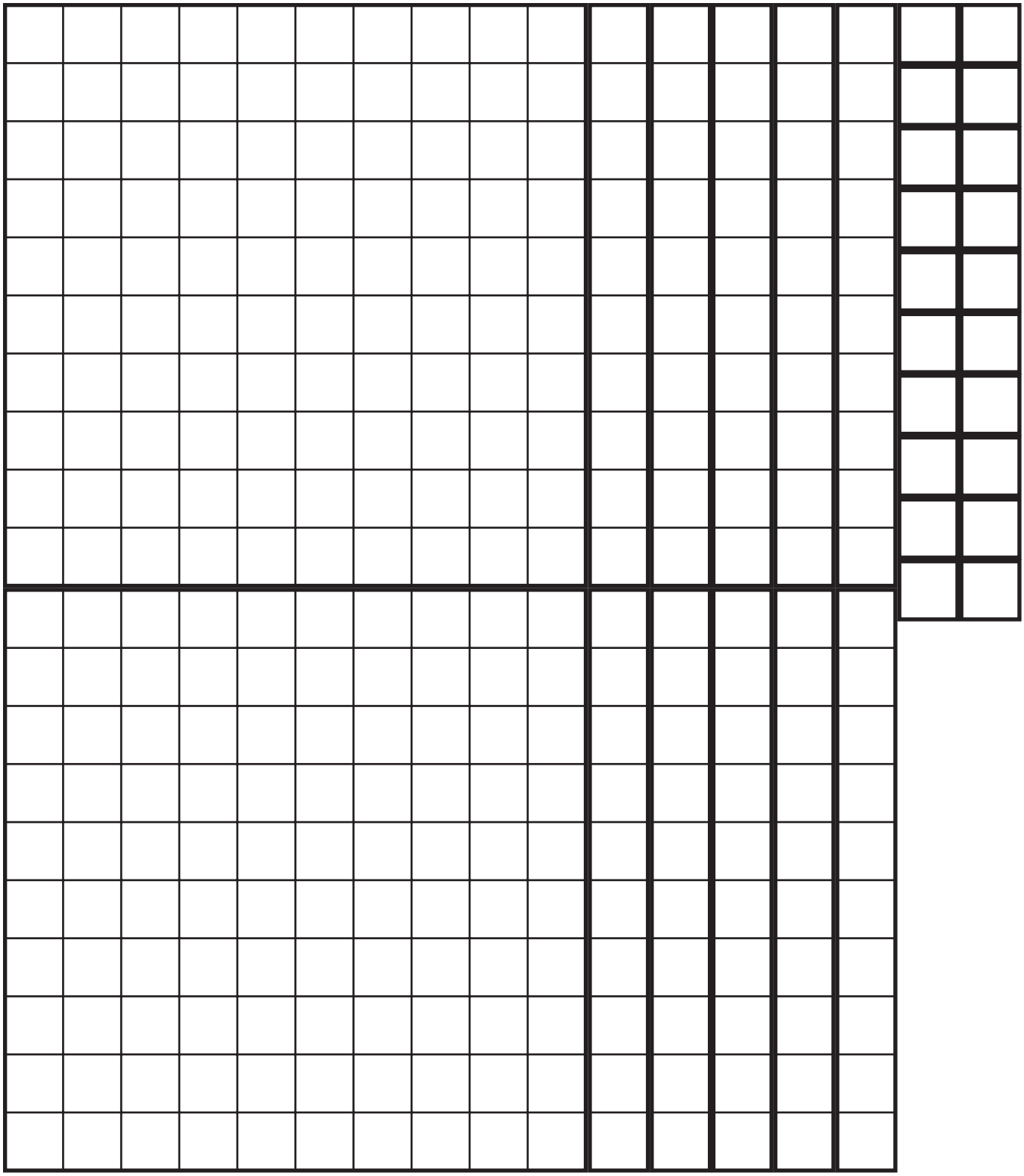


NAME _____ **DATE** _____

Base Ten Grid Paper



Base Ten Pieces



Assessment 1 Class Checklist page 1 of 2

Student name														
1 completes X out of 40 multiplication facts correctly in 2 minutes	36–40: 4 pts*. 32–25: 3 pts. 28–31: 2 pts. 24–27: 1 pt. 23 or fewer: 0 pts.													
2 creates sketch that demonstrates understanding of process of multiplication	1													
3 creates sketch that demonstrates understanding of process of division	1													
4 completes X out of 21 division facts correctly	19–21: 4 pts. 17 or 18: 3 pts. 15 or 16: 2 pts. 13 or 14: 1 pt. 12 or fewer: 0 pts.													
5a adds 4-digit numbers with regrouping (2,639 + 3,743)	1													
5b shows work	1													
6a subtracts 4-digit numbers with regrouping (5,573 – 3,239)	1													
6b shows work	1													
7a multiplies 2-digit number by 1-digit number (7 × 32)	1													
7b shows work	1													
8a divides 3-digit number by 1-digit number (108 ÷ 4)	1													
8b shows work	1													
9a multiplies 2-digit number by 2-digit number (25 × 13)	1													
9b shows work	1													

* The total possible number of points for each problem is shown.

Assessment 1 Class Checklist page 2 of 2

Student name														
10a adds fractions with like denominators ($^3/_8 + {}^1/_8$)	1													
10b shows work	1													
11 identifies multiples of 2	1													
12 identifies multiples of 2 and 3	1													
13a lists all factors of 24	1													
13b explains thinking	1													
14a identifies odd and even numbers correctly	1													
14b explains thinking	1													
15 reads and interprets a bar graph	1													
16 transfers information from a tally chart to a circle graph	1													
17 identifies likely outcomes of a probability experiment	1													
18 matches fractions and decimals with base ten models	4													
19 matches decimals and common fractions	4													
20 locates fractions and decimals along a number line	6													
Total score	**45**													

Assessment 2 Quick Facts

ASSESSMENT

Overview

Even if most students did well on Assessment 1, it's likely that some still need more work with basic multiplication and division facts through 12 × 12. To help them master their facts, you can use the Fact Fluency Supplement described on Blackline F. The practice sheets in the Fact Fluency Supplement can be used during designated seatwork times during the week or assigned as homework. To assess students' growing fluency with the facts, you may want to administer the Quick Facts exercise described below periodically with some or all of your students. To do so, you'll need to allot two or even three blocks of about 10 minutes per week to the exercise, which is a timed assessment designed to help assess fluency with groups of facts and with mixed facts. Together with the Fact Fluency Supplement, Quick Facts provides a systematic way for students to choose their own learning targets, practice the facts they've selected, and track their own progress toward fact mastery.

Frequency

One day or more per week (optional)

Skills & Concepts

- ★ fluently using multiplication facts through 12 × 12
- ★ developing efficient strategies for solving basic division facts
- ★ relating multiplication and division

You'll need

- ★ Multiplication Table (page 27, class set)
- ★ Multiplication Facts Class Checklist (page 28, 1 or 2 copies)
- ★ Quick Facts Tracking Sheet (page 29 class set and 1 copy on a transparency)
- ★ Quick Facts Worksheet Forms A–C (pages 30–32, see Advance Preparation and run 1 copy of Form A on a transparency)
- ★ Quick Facts Worksheet, 2–6 (page 33, see Advance Preparation)
- ★ Quick Facts Worksheet, 4–9 (page 34, see Advance Preparation)
- ★ Quick Facts Worksheet, 6–12 (page 35, see Advance Preparation)

Advance Preparation There are three versions of the Quick Facts Worksheet for single multipliers (Forms A, B, and C). They are identical except that the order of the multipliers is different on each sheet to provide variety and prevent students from getting used to doing the facts in a particular order. Run several class sets of each form, perhaps each on a different color copy paper, mix them, and distribute them at random each time you conduct Quick Facts with your class after introducing the routine. As students master their facts for single multipliers, you'll need to do the same for the mixed facts worksheets (pages 33–35).

Assessment 2 Quick Facts (cont.)

A Note about Timed Testing *By limiting the time students have to complete a set of multiplication facts, teachers and students can see which facts come quickly and which don't. It is only through such timed checkups that teachers can see whether students have the speed that is an essential component of computational fluency. These timed exercises are formative assessments designed to help you decide how to tailor practice and support for each student using the Fact Fluency Supplement, Support Activities, and any other materials you have on hand.*

Timed checkups should be used for information purposes only, and we recommend that you don't grade students on this work. We also do not advocate using timed drills for instructional purposes. Daily timed drill with random collections of problems is not productive to the development of computational fluency. Such practice tends to create undue feelings of pressure, and promote negativity toward math among students who feel they cannot compete with their peers or work fast enough. Systematic practice of fact strategies, on the other hand, coupled with an assessment procedure in which students designate their own targets, promotes feelings of competence and mastery.

Introducing the Quick Facts Routine

It will take 15–20 minutes to introduce Quick Facts for the first time, and about 10 minutes to conduct the routine thereafter. To begin, display the Quick Facts Worksheet overhead and explain that students will start a routine today that will help them track their own progress as they continue to develop fluency with multiplication and division facts through the year. Give students a minute or two to examine the sheet and pair-share any observations and/or questions, and then call for whole group sharing.

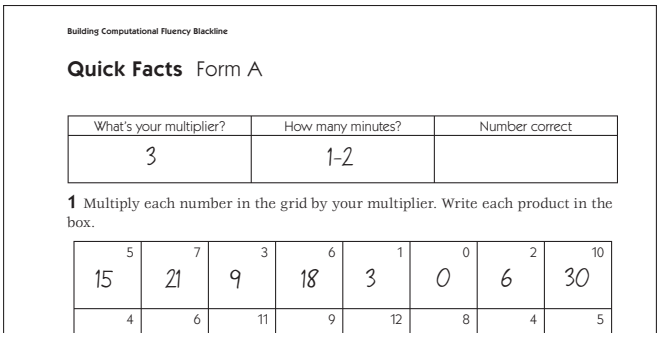
Distribute copies of the Quick Facts Worksheet and explain that everyone will use the multiplier 3 today to become acquainted with the routine. Let them know that they will have up to 4 minutes to multiply the numbers in the boxes by 3 and record the products in the boxes. Model the recording process by filling in 3 as the multiplier on the overhead, and then multiplying the top row of numbers by 3 with input from the class.

Explain that you'll keep track of the time while they work. First, you'll write 0–1 on the whiteboard. Then, after they have been working for a minute, you'll write 1–2 on the board. After 2 minutes have passed, you'll write 2–3. After 3 minutes have passed, you'll write 3–4, and after 4 minutes have passed, you'll call time. As soon as they have finished the 40 multiplication facts, they will turn their paper over, look up at the board, and record the last range of minutes you recorded. If, for instance, they turn their paper over,

Assessment 2 Quick Facts (cont.)

look up, and see 1–2, they'll write 1–2 on the back of their paper to indicate that they completed the work in 1–2 minutes.

Let them know that everyone will remain silent for the entire 4 minutes, even if many of them finish before the time is up, so that they can concentrate without distraction. Then use your overhead to show students where to record the amount of time it took to complete the facts once the timing is over.



Building Computational Fluency Blackline

Quick Facts Form A

What's your multiplier?	How many minutes?	Number correct
3	1-2	

1 Multiply each number in the grid by your multiplier. Write each product in the box.

5	7	3	6	1	0	2	10
15	21	9	18	3	0	6	30
4	6	11	9	12	8	4	5

Reassure students that this exercise is designed to help them see which facts come quickly for them and which facts they need to practice. Assure them that they will not be graded on this work. Ask students to write their names and the date on their own papers, and enter the number 3 in the multiplier box. Then turn off the overhead, give the signal to start, and keep track of the time that has passed as students work. After 4 minutes, ask them to stop, even if they're not finished. Remind students to transfer the number of minutes it took them to complete the 40 facts from the back of the sheet to the appropriate box at the top of the sheet.

Next, ask students to trade papers and correct each other's work as a class, using the overhead to provide the answers one row at a time. Remind students to respect one another's feelings during this process; depending on your classroom community, you may want students to correct their own papers instead. Have them circle any incorrect answers, count the number correct, enter the number correct at the top of the page, and return the sheets to their owners.

While students are returning and reviewing their papers, distribute a copy of the Quick Facts Tracking Sheet to each student. Use the corresponding overhead to review the directions at the top of the Tracking Sheet. Then give students time to record their results. Students who did not complete at least 38 of the 40 facts in 2 minutes or less will need to practice the times-3 facts before the next Quick Facts exercise. Students who did complete at least 38 facts correctly in 2 minutes or less need to choose a new target multiplier.

Assessment 2 Quick Facts (cont.)

Building Computational Fluency Blackline

NAME Shanti DATE 9/15

Quick Facts Form A

What's your multiplier?	How many minutes?	Number correct
3	1-2	39

1 Multiply each number in the grid by your multiplier. Write each product in the box.

5 15	7 21	3 9	6 18	1 3	0 0	2 6	10 30
4 12	6 18	11 33	9 27	12 34	8 24	4 12	5 15
6 18	10 30	2 6	7 21	8 24	1 3	9 27	3 9
9 27	7 21	12 36	2 6	11 33	0 0	8 24	10 30
11 33	12 36	3 9	4 12	7 21	6 18	5 15	9 27

2 Choose 10 *different* products from above (except 0) and record them in the boxes below. Then divide each by your multiplier.

Building Computational Fluency Blackline

NAME Shanti

Quick Facts Tracking Sheet

When you get back your Quick Facts Worksheet from last time:

- Record the date you completed the sheet, the time it took you, and the number of facts you got correct.
- If it took you more than 2 minutes or you got fewer than 38 facts correct, write "no" in the last box in the row and use that same multiplier or set of multipliers again.
- If you completed 38 or more facts correctly in 2 minutes or less, write "yes" the last box in the row and choose another multiplier or set of multipliers.

Cross out each number as you master the facts for that multiplier or range of multipliers. Then circle your next target.

2 ~~3~~ 4 5 6 7 8 9 10 11 12 2–6 4–9 6–12

Multiplier or Range of Multipliers	Date	Time	Number Correct	Mastered? (at least 38 correct in 2 mins. or less)
3	9/15	1-2 min	39	Yes

Note *When students have the opportunity to select a new multiplier, encourage them to choose carefully, thinking about which facts they really need work on. They don't necessarily need to do them in order, and we find that students are much more motivated to memorize their facts when they set their own targets. (Let them skip the 2, 5, and 10 facts entirely if they already know them, and advise them to save the 7 facts for last: they are easier to master after fluency has been gained with the other multipliers.) After students have developed fluency with all the individual multipliers, they'll need to demonstrate proficiency with facts in the 2–6, 4–9, and 6–12 ranges.*

If some students completed most or all of the multiplication facts on the Baseline Assessment correctly in 2 minutes or less and also demonstrated ease with the division facts on that assessment, you may want to let them "test out" of Quick Facts by selecting the 6–12 range as their target for the following week.

Conclude the introduction by showing students how to complete the division section at the bottom of the page, using the transparency to model the process. Read the instructions out loud and then write 10 different products from the grid in the dividend boxes. Then record a 3 as the divisor on each line. After you have set up 10 division facts, work with students' help to enter the quotients along the top row, and then have students fill in their own sheets, entering the dividends in any order they choose. This section reinforces the connection between multiplication and division and is not timed because we believe the division facts are best learned in the context of the related multiplication facts.

Assessment 2 Quick Facts (cont.)

2 Choose 10 *different* products from above (except 0) and record them in the boxes below. Then divide each by your multiplier.

5	2	4	6	3
3)15	3)6	3)12	3)18	3)9
3)24	3)21	3)27	3)30	3)36

As students finish, collect their papers to look over later. You can use the Multiplication Facts Class Checklist to track students' progress. Before the next Quick Facts exercise, give students time to practice their target group of facts using the appropriate materials from the Fact Fluency Supplement described below and on Blackline F.

Continuing with Quick Facts through the Fall and Beyond

The Quick Facts routine will go much more quickly after you have done it a few times with students. Each time, you'll need a new class set of the Quick Facts Worksheet. As students begin working with ranges of facts, rather than single multipliers, you'll need to make copies of the Quick Facts Worksheet for each of three ranges of facts: 2–6, 4–9, and 6–12.

Have students keep their Quick Facts Tracking Sheets in their math binders or another safe place where they can find and retrieve them quickly. Try to return students' worksheets within a day or two so they can identify their learning targets and have plenty of time to practice before the next Quick Facts session.

FACT FLUENCY

The Fact Fluency Supplement provides the practice students need to become fluent with their multiplication and related division facts. You can assess their fluency using the Quick Facts routine, or you can use the supplement on its own if you choose not to use Quick Facts. The supplement contains a 6-page section for each multiplier from 2 through 12. For each multiplier, you'll find: 2 worksheets, 2 games, and a set of flashcards suitable for use at home or school. These materials are formatted in the same way for every multiplier, and each set refers to a strategy for multiplying by that number. You'll find a guide to the strategies in the introduction to the Fact Fluency Supplement on Blackline F. The supplement also includes 3 worksheets and a game for each of three ranges of facts (2–6, 4–9, and 6–12).

Assessment 2 Quick Facts (cont.)

Blackline NC F 39

NAME _____ DATE _____

Fact Fluency with 8's Missing Number Capture 8's & 4's

MULTIPLICATION FACT FLUENCY

You'll need

★ a partner

★ 2 pencils or markers in different colors

★ paperclip and pencil to use as a spinner

Instructions for Missing Number Capture 8's & 4's

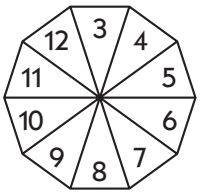
1 Take turns spinning the spinner. The player who gets the higher number goes first.

2 Take turns spinner the spinner. Use the number you spin to complete one of the problems below. Be sure to use your own color pencil.

3 If the box you need is already filled, you lose your turn.

4 Try to capture 3 or 4 boxes in a row: across, up and down, or diagonally. Keep playing until the gameboard is filled or neither player can use the number he or she spins 3 times in a row.

5 Then circle the places on the grid where you got 3 or 4 in a row and add up your scores.



□ 4)12	□ 4)40	4 × □ = 48	□ × 8 = 64	□ 4)28	**Scoring** 3 in a Row—1 point 4 in a Row—2 points	
□ 8)48	□ 4)16	8 × □ = 24	□ 4)44	8 × □ = 72		
8 × □ = 96	□ 4)32	□ 8)80	□ × 4 = 24	□ 8)32	**Player 1 Points**	**Player 2 Points**
8 × □ = 56	□ 4)20	□ 4)36	□ 8)40	□ 8)88		

Blackline NC F 40

NAME _____ DATE _____

Fact Fluency with 8's Flashcard Bingo 8's

MULTIPLICATIN FACT FLUENCY

You'll need

★ a partner

★ one set of 8's flashcards and your flashcard pocket

★ marker or crayon for each player

Instructions for Flashcard Bingo 8's

1 Mix up one set of flashcards and arrange them so that the multiplication side is facing up on all of them. Put them in the flashcard pocket.

2 Take turns pulling 1 card. Each time, both players color the product on their board or mark it with an x.

3 The first player to get two rows of 4 going horizontally, vertically, or diagonally, wins.

4 Play the game a second time using the division side of your cards.

Game 1 ×

Player 1			
96	40	72	48
64	88	16	72
48	8	56	80
56	32	24	64

Player 2			
24	16	8	40
40	88	72	16
32	96	80	8
56	64	48	32

Game 2 ÷

Player 1			
12	4	8	12
9	11	3	7
1	6	11	10
5	10	9	2

Player 2			
7	4	3	6
12	6	8	11
10	7	5	9
5	2	1	8

NAME _____ DATE _____

Multiplication Table

As you learn each set of multiplication facts, shade them in lightly with a new color so you can see what you have left to learn. The ×1 facts have been shaded in for you.

×	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

Multiplication Facts Class Checklist

Use the table below to keep track of which students have mastered the multiplication facts for each multiplier or set of multipliers.

Student Names	2	3	4	5	6	7	8	9	10	11	12	2–6	4–9	6–12

NAME _____

Quick Facts Tracking Sheet

When you get back your Quick Facts Worksheet from last time:

- Record the date you completed the sheet, the time it took you, and the number of facts you got correct.
- If it took you more than 2 minutes or you got fewer than 38 facts correct, write "no" in the last box in the row and use that same multiplier or set of multipliers again.
- If you completed 38 or more facts correctly in 2 minutes or less, write "yes" the last box in the row and choose another multiplier or set of multipliers.

Cross out each number as you master the facts for that multiplier or range of multipliers. Then circle your next target.

2 3 4 5 6 7 8 9 10 11 12 2–6 4–9 6–12

Multiplier *or* Range of Multipliers	Date	Time	Number Correct	Mastered? (at least 38 correct in 2 mins. or less)

NAME _____ **DATE** _____

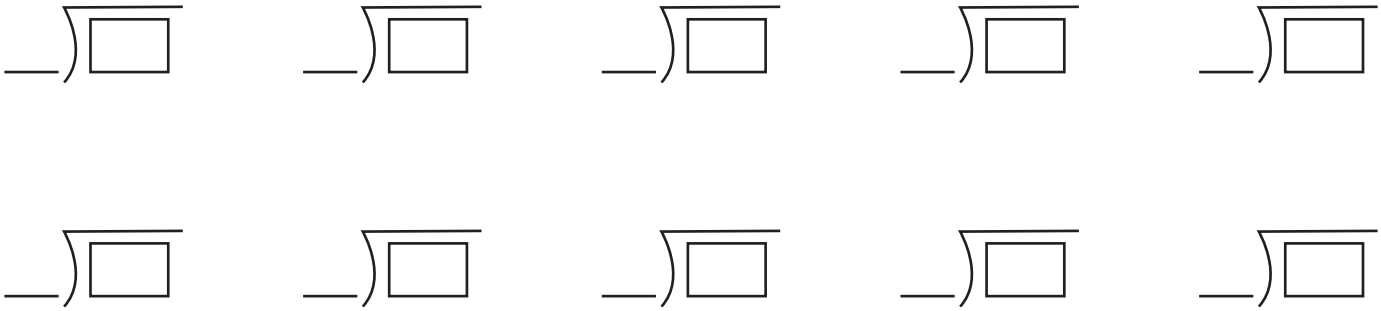
Quick Facts Worksheet Form A

What's your multiplier?	How many minutes?	Number correct

1 Multiply each number in the grid by your multiplier. Write each product in the box.

5	7	3	6	1	0	2	10
4	6	11	9	12	8	4	5
6	10	2	7	8	1	9	3
9	7	12	2	11	0	8	10
11	12	3	4	7	6	5	9

2 Choose 10 *different* products from above (except 0) and record them in the boxes below. Then divide each by your multiplier.



NAME _____ DATE _____

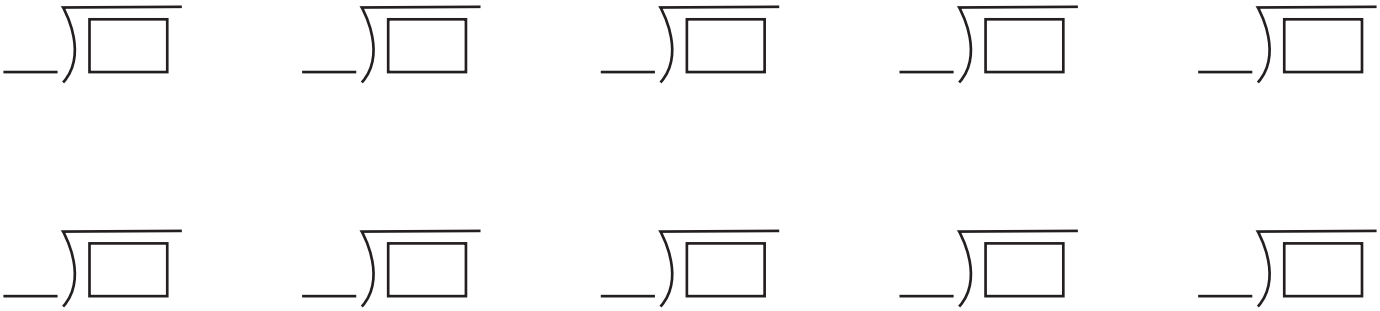
Quick Facts Worksheet Form B

What's your multiplier?	How many minutes?	Number correct

1 Multiply each number in the grid by your multiplier. Write each product in the box.

6	4	11	9	5	8	4	12
7	5	3	6	10	0	2	1
12	11	3	4	9	6	5	7
7	9	12	2	10	0	8	11
10	6	2	7	3	1	9	8

2 Choose 10 *different* products from above (except 0) and record them in the boxes below. Then divide each by your multiplier.



NAME _____ DATE _____

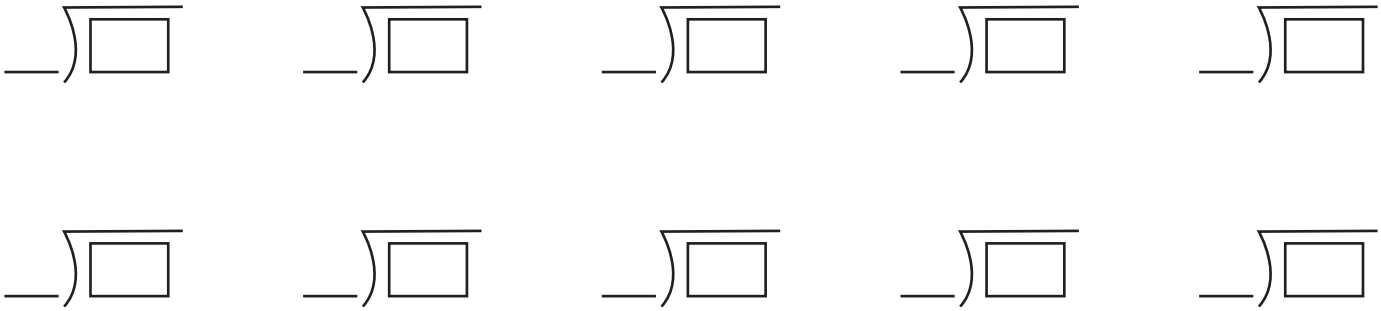
Quick Facts Worksheet Form C

What's your multiplier?	How many minutes?	Number correct

1 Multiply each number in the grid by your multiplier. Write each product in the box.

10	6	2	3	0	1	9	8
12	11	6	9	4	6	5	7
7	5	3	10	3	0	2	1
4	9	12	8	2	7	8	11
6	7	11	5	9	10	4	12

2 Choose 10 *different* products from above (except 0) and record them in the boxes below. Then divide each by your multiplier.



NAME _____ DATE _____

Quick Facts Worksheet, 2–6

How many minutes?	Number correct

1 Solve these multiplication facts.

4 × 4	3 × 3	8 × 4	11 × 5	8 × 3	8 × 2	7 × 2
5 × 5	12 × 4	4 × 3	9 × 3	9 × 2	6 × 2	7 × 3
12 × 3	12 × 2	3 × 2	9 × 4	5 × 2	6 × 3	9 × 6
6 × 5	11 × 6	12 × 6	7 × 5	6 × 6	8 × 5	7 × 6
5 × 4	6 × 4	11 × 4	7 × 4	8 × 6	9 × 5	12 × 5
11 × 3	10 × 3	11 × 2	4 × 2	5 × 3		

2 Use what you know about multiplication to solve these related division problems.

$2\overline{)14}$	$4\overline{)24}$	$6\overline{)36}$	$4\overline{)28}$	$6\overline{)54}$	$4\overline{)32}$	$3\overline{)27}$
$6\overline{)42}$	$2\overline{)16}$	$3\overline{)21}$	$2\overline{)18}$	$6\overline{)48}$	$3\overline{)24}$	$4\overline{)36}$

NAME _____ DATE _____

Quick Facts Worksheet, 4–9

How many minutes?	Number correct

1 Solve these multiplication facts.

4 × 4	8 × 8	7 × 6	10 × 4	7 × 8	12 × 9	5 × 5
6 × 6	5 × 4	12 × 7	11 × 6	11 × 9	6 × 5	6 × 8
12 × 6	7 × 6	6 × 4	9 × 8	7 × 5	9 × 4	7 × 7
11 × 8	10 × 5	8 × 6	7 × 4	9 × 9	8 × 7	11 × 4
11 × 7	12 × 8	8 × 5	9 × 6	8 × 4	9 × 7	12 × 5
12 × 4	10 × 6	11 × 5	9 × 5	10 × 8		

2 Use what you know about multiplication to solve these related division problems.

4)32	7)63	6)48	7)42	4)28	5)60	4)36
8)64	9)81	6)72	5)45	7)84	6)54	7)49

NAME _____ DATE _____

Quick Facts Worksheet, 6–12

How many minutes?	Number correct

1 Solve these multiplication facts.

6 × 6	5 × 6	5 × 9	12 × 11	6 × 8	12 × 10	8 × 6
4 × 8	12 × 7	9 × 9	5 × 8	9 × 7	6 × 9	4 × 9
7 × 12	11 × 10	8 × 8	5 × 7	11 × 12	9 × 6	9 × 8
12 × 9	11 × 7	12 × 12	7 × 7	8 × 9	9 × 12	11 × 6
8 × 12	7 × 9	11 × 8	8 × 7	6 × 7	7 × 8	11 × 9
12 × 6	12 × 8	7 × 6	4 × 7	11 × 11		

2 Use what you know about multiplication to solve these related division problems.

7)49	9)63	9)81	6)48	9)54	6)72	8)56
8)72	9)108	8)64	8)96	7)42	6)54	7)84

Assessment 3

ASSESSMENT

Overview
This assessment can be used to test key math skills toward the end of the first reporting period.

Timing
Toward the end of your first reporting period (late October/early November)

You'll need
- ★ Assessment 3, pages 1–5 (pages 41–45)
- ★ Assessment 3 Class Checklist (optional, pages 46 and 47, 2 or 3 copies as needed)
- ★ wooden centimeter cubes
- ★ half-class set of geoboards and geobands
- ★ half-class set of base ten pieces (Use page 17 to make your own if needed.)
- ★ rulers

Skills & Concepts
- ★ demonstrating fluency with multiplication and division facts
- ★ identifying odd and even numbers
- ★ rounding to the nearest hundred and thousand
- ★ identifying factors of a number
- ★ finding the range, mode, and median of a data set
- ★ measuring length in standard units
- ★ adding and subtracting 3- and 4-digit numbers with regrouping
- ★ multiplying and dividing a 2-digit number by a 1-digit number
- ★ multiplying a 2-digit number by a 2-digit number
- ★ finding the mean (average) of 3 numbers
- ★ identifying rotations and reflections
- ★ identifying reflective and rotational symmetry in 2-D shapes
- ★ finding the area of polygons
- ★ identifying similar shapes

Conducting Assessment 3

You can administer this 5-page skills assessment during a single math period or break it out over 2 or more days, depending on your schedule and the needs of your students. All students will need a ruler to complete item 8 on page 2; make centimeter cubes, geoboards and geobands, and base ten pieces available for students who wish to use them on pages 2–5.

Begin by giving students two minutes to complete as many of the 40 multiplication facts on the first page as they can. By limiting their time, you can get a clear picture of students' current fluency with basic multiplication facts.

Assessment 3 (cont.)

Before they begin, reassure them that this is a check-in designed to help them and you see which facts they need to work on. When they are done, give them as much time as is needed to complete the rest of pages 1–3. Let them know that they will score points for showing their work as well as getting the correct answers for both parts of Problem 10.

Unless you choose to administer all 5 pages in one period, give students time the following day to complete pages 4 and 5. Before they begin, let them know that they will earn points both for correct answers and for showing their work on problems problems 11a–11d. Let students know that they should do their best to solve each problem, but that they can write "I don't know yet" if they encounter problems that they don't feel they can solve at this time.

If some students use a traditional algorithm for problems 11a–11d, you might want to talk with them briefly at a later time to see if they understand the steps they took to complete the problem. You might begin by asking them to describe how they solved the problem. If they are unable to identify the place value of the numbers they are manipulating, they may not have a clear sense of how the procedure works.

Note *You will find answers to all problems in the Answer Key, on page 40.*

Using Information from Assessment 3

You can use the Assessment 3 Class Checklist (pages 46 and 47) to compile assessment results and get an overview of students' strengths and the areas in which they'll need more work. The checklist also includes suggested point values for each item. You can use these point values to score student work. You can also revise the suggested point values to better fit your needs or choose not to score students' work at all.

Support

Many of the skills and concepts on this checkup will probably receive continued attention during your regular math instruction. However, you may find that some students need a considerable amount of support with basic multiplication and division facts, rounding, column addition, 1-digit by 2-digit multiplication, and/or averaging. If so, you can use any of the Support Games (listed by skill on Blackline S), as well as the Fact Fluency Supplement. However, you'll find the Support Games listed directly below particularly relevant to the skills just tested.

Assessment 3 (cont.)

SUPPORT ACTIVITES		
ACTIVITY	**NAME**	**SKILLS**
Activity 15	Round & Add Tens	Rounding to the nearest 10, column addition
Activity 16	Round & Add Hundreds	Rounding to the nearest 100, column addition
Activity 17	Round & Add Thousands	Rounding to the nearest 1,000, column addition
Activity 18	Spin & Multiply	1-digit by 2-digit multiplication
Activity 19	Moolah on My Mind	1-digit by 2-digit multiplication
Activity 20	More or Less Multiplication	1-digit by 2-digit multiplication
Activity 21	Find the Average	Finding the mean of 2 to 5 numbers

Assessment 3 Answer Key

ANSWER KEY

Pages 41–45

1 36, 15, 81, 35, 40, 42, 24
72, 18, 96, 49, 60, 27, 56
20, 21, 132, 36, 48, 24, 36
32, 72, 28, 64, 63, 54, 121
110, 25, 108, 144, 30, 100, 84
72, 48, 44, 45

2 3, 3, 5, 4, 9, 4, 3
12, 8, 2, 6, 9, 7, 4
4, 6, 2, 10, 4, 9, 7

3 **a** 441 567 6,023 5,772 7,020 10,245
b Responses will vary. Example:
I know if a number is odd or even by looking at the number in the ones place. If it's even or 0, the whole number is even. If it's odd, the whole number is odd.

4 500

5 4,000

6 **a** 1, 48, 2, 24, 3, 16, 4, 12, 6, 8
b Responses will vary. Example:
I know I listed all the factors because I started at 1 and went all the way to 6. When I got to 8, they started repeating, so I knew I was done.

7 13, 12, 11

8 4 inches

9 2 feet

10 **a** 2,257 people (1,289 + 968 = 2,257)
Students' strategies will vary.
b 153 more tickets (502 – 349 = 153)
Students' strategies will vary.

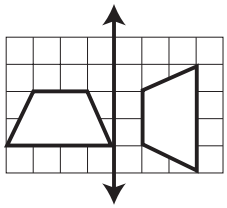
11 **a** 272, Students' strategies will vary. Example:
$8 \times 34 = 8 \times 30 + 8 \times 4 = 240 + 32 = 272$
b 14, Students' strategies will vary. Example:
I know 56 ÷ 8 is 7, so 56 ÷ 4 is 14, twice as much.
c 156, Students' strategies will vary. Example:
$12 \times 13 = 10 \times 13 + 2 \times 13 = 130 + 26 = 156$
d 217, Students' strategies will vary. Example:

$$\begin{array}{r} {}^{1}\,{}^{1}\,{}^{3}\,{}^{1} \\ \cancel{2}{,}\cancel{0}\cancel{4}\cancel{6} \\ -\ 1{,}829 \\ \hline 217 \end{array}$$

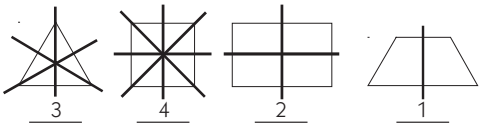
12 14, Students' strategies will vary. Example:
$11 + 13 + 18 = 42$
$42 \div 3 = 14$

13 rotation

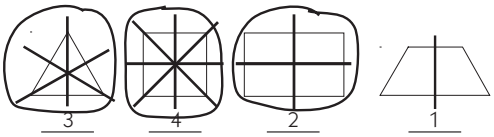
14



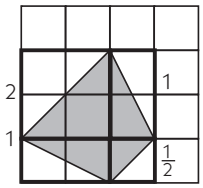
15 **a**



b



16 **a** 6 square units
b 4.5 square units, Students' strategies will vary. Example:



Each triangle part is half of the rectangle it's in. So I put the area of each triangle on the grid. Altogether it's 4.5.

17

NAME _____ DATE _____

Assessment 3 page 1 of 5

1 Solve these multiplication facts.

3 × 12	5 × 3	9 × 9	5 × 7	8 × 5	6 × 7	8 × 3
8 × 9	6 × 3	12 × 8	7 × 7	12 × 5	9 × 3	7 × 8
5 × 4	7 × 3	11 × 12	6 × 6	8 × 6	4 × 6	9 × 4
4 × 8	9 × 8	7 × 4	8 × 8	9 × 7	6 × 9	11 × 11
11 × 10	5 × 5	12 × 9	12 × 12	5 × 6	10 × 10	12 × 7
12 × 6	12 × 4	11 × 4	9 × 5			

2 Solve these division facts.

7)21	8)24	3)15	5)20	2)18	4)16	9)27
1)12	4)32	7)14	3)18	5)45	3)21	8)32
9)36	6)36	6)12	4)40	7)28	3)27	5)35

NAME _____ DATE _____

Assessment 3 page 2 of 5

3a Draw a line under each odd number. Draw a circle around each even number.

441 567 6,023 5,772 7,020 10,245

b How do you know when a number is odd and when it's even?

4 Which number below is equal to 458 rounded to the nearer hundred?

400 ◯ 450 ◯ 460 ◯ 500 ◯

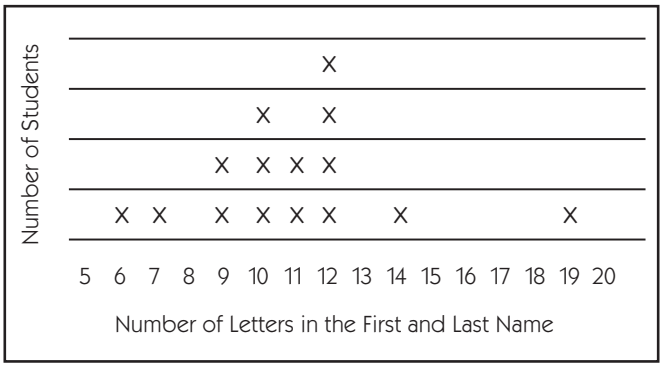
5 Which number below is equal to 3,658 rounded to the nearer thousand?

4,000 ◯ 3,000 ◯ 3,600 ◯ 3,700 ◯

6a List all the factors of 48.

b How do you know you've listed all of them?

7 In October, Mrs. O'Donnell's students collected data about their names. Here are their results after the first week. What is the range, the mode, and the median of their data so far?



Range = ___ Mode = ___ Median = ___

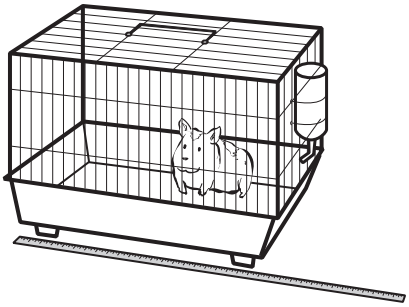
8 Use a ruler to help with this problem. What is the length of the line below to the nearest inch?

2 inches ◯ 3 inches ◯ 4 inches ◯ 10 inches ◯

NAME _____ DATE _____

Assessment 3 page 3 of 5

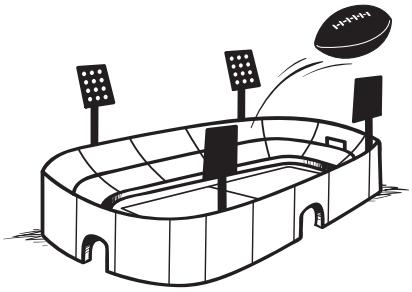
9 Grady is measuring the length of his hamster cage with a yardstick. About how long is the cage?



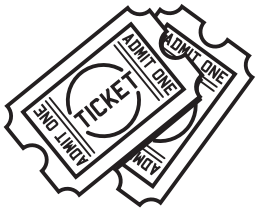
○ 1 foot ○ 2 feet ○ 1 yard ○ 2 yards

10 Solve each problem below. Show your work for each one.

a Tonight is the big football game at the university. People started to arrive at 6:30 for the game. By 6:45, there were 1,289 people in the stands, and by 7:00, 968 more people had joined them. How many people were in the stands altogether at 7:00?



b Mrs. Jackson's fifth grade class sold 502 tickets to the carnival. Mr. Perez's class sold 349 tickets. How many more tickets did Mrs. Jackson's class sell than Mr. Perez's class?



NAME _____ DATE _____

Assessment 3 page 4 of 5

11 Solve each problem below. Show your work for each one.

a $8 \times 34 =$

b $56 \div 4 =$

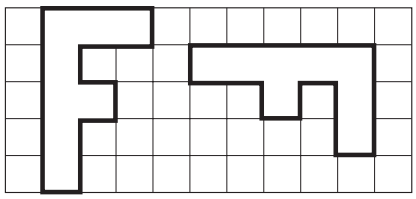
c $12 \times 13 =$

d
$$\begin{array}{r} 2{,}046 \\ -\ 1{,}829 \\ \hline \end{array}$$

---

12 Sarah scored 11, 13, and 18 points in a game. What is her mean (average) score?

13 Which transformation is shown in this picture?

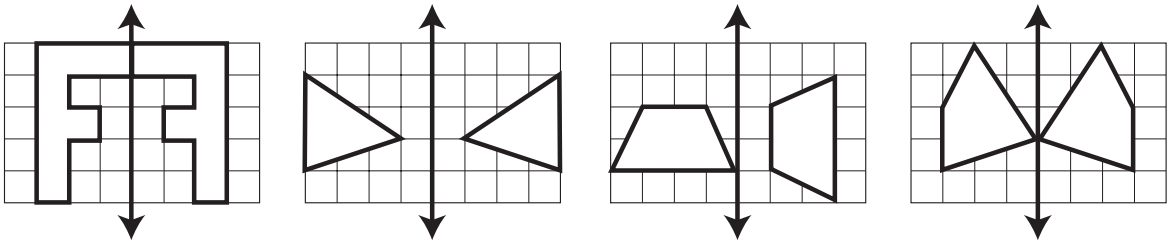


reflection ○ translation ○ rotation ○ can't tell ○

NAME _____ DATE _____

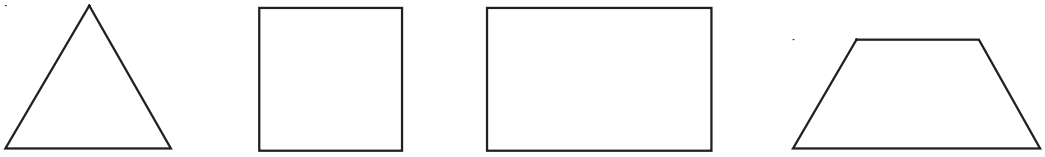
Assessment 3 page 5 of 5

14 Which pair of figures does *not* show a reflection?



○ ○ ○ ○

15a Draw the lines of symmetry for each figure below. Then write how many lines of symmetry each shape has in the space below it.

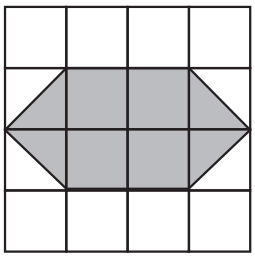


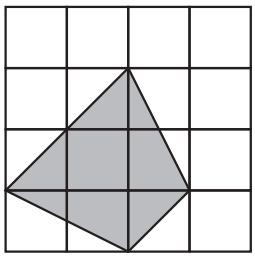
_____ _____ _____ _____

b Circle the shapes that have rotational symmetry as well.

16 Find the area of each shape below.

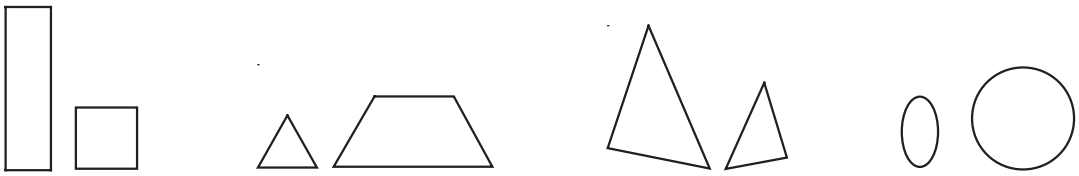
= 1 square unit





a _____ square units **b** _____ square units

17 Fill in the bubble under the pair of shapes that is similar.



○ ○ ○ ○

Assessment 3 Class Checklist page 1 of 2

Student name														
1 completes x out of 40 multiplication facts correctly in 2 minutes	36–40: 4 pts*. 32–25: 3 pts. 28–31: 2 pts. 24–27: 1 pt. 23 or fewer: 0 pts.													
2 completes x out of 21 division facts correctly	19–21: 4 pts. 17–18: 3 pts. 15/16: 2 pts. 13/14: 1 pt. 12 or fewer: 0 pts.													
3a identifies odd and even numbers correctly	1													
3b explains how to identify numbers as odd or even	1													
4 rounds 458 to the nearest hundred	1													
5 rounds 3,658 to the nearest thousand	1													
6a lists all the factors of 48	1													
6b explains thinking	1													
7 finds the range, mode, and median of a data set	3 (1 pt. for each correct value)													
8 measures to the nearest inch	1													
9 understands and applies the fact that there are 3 feet in a yard	1													
10a adds 4-digit numbers with regrouping (1,289 + 968 = 2,257)	2 pts. (1 for correct answer, 1 for showing work)													
10b subtracts 3-digit numbers with regrouping (502 – 349 = 153)	2 pts. (1 for correct answer, 1 for showing work).													

* The total possible number of points for each problem is shown.

Assessment 3 Class Checklist page 2 of 2

Student name														
11a multiplies 2-digit number by 1-digit number (8 × 34 = 272)	2 pts. (1 for correct answer, 1 for showing work)													
11b divides 2-digit number by 1-digit number (56 ÷ 4 = 14)	2 pts. (1 for correct answer, 1 for showing work)													
11c multiplies 2-digit number by 2-digit number (12 × 13 = 156)	2 pts. (1 for correct answer, 1 for showing work)													
11d subtracts 4-digit numbers with regrouping (2046 – 1829 = 217)	2 pts. (1 for correct answer, 1 for showing work)													
12 finds the mean (average) of 3 numbers	2 pts. (1 for correct answer, 1 for showing work)													
13 identifies a rotation	1													
14 identifies a reflection	1													
15 identifies line and rotational symmetry	7 pts. total: 1 for each shape correctly labeled with its lines of symmetry and 1 for each shape correctly identified as having rotational symmetry													
16 finds the areas of 2 polygons	2													
17 identifies similar shapes	1													
Total score	**45**													

Assessment 4

ASSESSMENT

Overview

This assessment can be used to test key math skills toward the end of the second reporting period.

Timing

Toward the end of your second reporting period (late January/early February)

You'll need

- ★ Assessment 4, pages 1–6 (pages 53–58)
- ★ Base Ten Grid Paper (Page 59, about a class set)
- ★ Assessment 4 Class Checklist, pages 1 and 2 (pages 60 and 61, 2 or 3 copies, optional)
- ★ class set of rulers marked with centimeters
- ★ base ten pieces (Use page 17 to make your own base ten pieces if needed.)
- ★ wooden centimeter cubes

Skills & Concepts

- ★ demonstrating fluency with multiplication and division facts
- ★ rounding to the nearest hundred, thousand, and tenth
- ★ adding and subtracting 4-digit numbers with regrouping
- ★ multiplying a 2-digit number by a 2-digit number
- ★ dividing a 3-digit number by a 1-digit number
- ★ finding the mean (average) of 3 numbers
- ★ reading and interpreting a bar graph, line plot, and line graph
- ★ identifying the range, mode, and median of a data set
- ★ converting ounces to cups and quarts
- ★ measuring length in centimeters
- ★ finding the perimeter and area of a rectangle
- ★ finding the volume of a rectangular solid
- ★ recognizing equivalent forms of common fractions and decimals

Conducting Assessment 4

You can administer this 6-page skills assessment during a single math period or break it out over 2 or more days, depending on your schedule and the needs of your students. All students will need a centimeter ruler to find the perimeter of the rectangle on page 4; make base ten pieces, centimeter cubes, and Base Ten Grid Paper (page 59) available to students who wish to use them at any time during the assessment.

Assessment 4 (cont.)

Before students begin, reassure them that problem 1 is a check-in meant to help them and you see which multiplication facts they need to work on. Also, let students know that they will earn points both for correct answers and for showing their work on problems 6 through 10. Although they should do their best to solve each problem, they can write I don't know yet if they encounter problems that they don't feel they can solve at this time. Then give students two minutes to complete as many of the 40 multiplication facts on the first page as they can. By limiting the time, you can get a clear picture of their current fluency with basic multiplication facts. When they are done, give them as much time as is needed to complete the rest of pages 1–3.

The following day, give students the entire workout to complete pages 4–6. Before they begin, let them know that they will earn points both for correct answers and for showing their work on problems 14 through 16.

Note *Answers to all problems are in the Answer Key, on page X52.*

Using Information from Assessment 4

You can use the Assessment 4 Class Checklist (pages 60 and 61) to compile assessment results and get an overview of students' strengths and the areas in which they'll need more work. The checklist also includes suggested point values for each item. You can use these point values to score student work. You can also revise the suggested point values to better fit your needs or choose not to score students' work at all.

Support

Many of the skills and concepts on this checkup will probably receive continued attention during your regular math instruction. However, you may find that some students still need a considerable amount of support with multiplication and division facts, multi-digit addition or subtraction, averaging, rounding, early decimal understandings, or perimeter and area. If so, you can use any of the Support Games (listed by skill on Blackline S), as well as the Fact Fluency Supplement. However, you'll find the Support Games listed directly below particularly relevant to the skills just tested. These activities are designed for use by resource room teachers, instructional assistants, and/or parents.

Assessment 4 (cont.)

SUPPORT ACTIVITES		
ACTIVITY	NAME	SKILLS
Activity 22	Round It to the Nearest Tenth	Rounding to the nearest tenth
Activity 23	Decimal More or Less	Modeling and comparing decimals to hundredths
Activity 24	Perimeter Showdown	Calculating perimeter and area of rectangles

Assessment 4 Answer Keys

ANSWER KEY

Pages 53–58

1 36, 15, 81, 35, 40, 42, 24
72, 18, 96, 49, 60, 27, 56
20, 21, 132, 36, 48, 24, 36
32, 72, 28, 64, 63, 54, 121
110, 25, 108, 144, 30, 100, 84
72, 48, 44, 45

2 4, 8, 9, 7, 6, 8, 9
5, 7, 7, 7, 9, 8, 7
4, 6, 12, 6, 8, 12, 7

3 653

4 $0.70

5 5,000

6 12,665

7 2,185

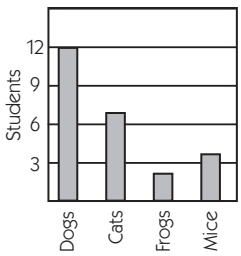
8 360 cookies, Strategies will vary. Example:
24 is like 2 × 12
15 × 2 = 30
30 × 12 = 360

9 38 flowers in each pot, Strategies will vary. Example:
152 ÷ 4 is like 152 cut in half and then cut in half again.
152 ÷ 2 = 76
76 ÷ 2 = 38

10 38° F, Strategies will vary. Example:
I tried to even the numbers out.

32 + 7 = 39	*39 – 1 = 38*
43 – 7 = 36	*36 + 1 + 1 = 38*
39	*39 – 1 = 38*

11



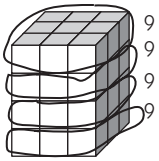
12 Range = 5, Mode = 10, Median = 12

13 **a** 7 days
b 25°
c There were three days when it was about 35°. That's about 3° away from freezing.

14 **a** 48 ounces, Strategies will vary. Example:
juice—12
water—12 × 3 = 36
36 + 12 = 48 ounces altogether
b 6 cups, Strategies will vary. Example:
There are 8 ounces in a cup, so 48 ÷ 8 = 6 cups.
c 1.5 quarts, Strategies will vary. Example:
There are 4 cups in a quart.
So 6 cups is 1 quart plus 2 more cups. 2 cups is a half quart. So it's 1 1/2 quarts.

15 **a** 20 cm, Equations will vary. Example:
(2 × 4 cm) + (2 × 6 cm) = 20 cm
b 24 sq. cm, Equations will vary. Example:
4 cm × 6 cm = 24 sq. cm

16 **a** Strategies will vary. Example:



I can see 9 cubes in each layer, and there are 4 layers. 4 × 9 = 36 cm³
b 36 cm³

17 **a** 0.25
b 1/4

NAME _____ DATE _____

Assessment 4 page 1 of 6

1 Solve these multiplication facts.

3 × 12	5 × 3	9 × 9	5 × 7	8 × 5	6 × 7	8 × 3
8 × 9	6 × 3	12 × 8	7 × 7	12 × 5	9 × 3	7 × 8
5 × 4	7 × 3	11 × 12	6 × 6	8 × 6	4 × 6	9 × 4
4 × 8	9 × 8	7 × 4	8 × 8	9 × 7	6 × 9	11 × 11
11 × 10	5 × 5	12 × 9	12 × 12	5 × 6	10 × 10	12 × 7
12 × 6	12 × 4	11 × 4	9 × 5			

2 Solve these division facts.

7)28	8)64	3)27	5)35	4)24	4)32	9)81
8)40	6)42	7)49	3)21	5)45	6)48	8)56
9)36	6)36	4)48	9)54	7)56	3)36	9)63

NAME _____ DATE _____

Assessment 4 page 2 of 6

3 The number of students at King School is 700 when rounded to the nearest 100 and 650 when rounded to the nearest 10. Which of these numbers tells how many students there are at King School?

648 ○ 653 ○ 665 ○ 684 ○

4 Michelle has $0.68 in her pocket. What is $0.68 rounded to the nearest tenth?

$0.60 ○ $0.80 ○ $0.70 ○ $1.00 ○

5 There are 5,280 feet in a mile. What is that number rounded to the nearest thousand feet?

4,500 ○ 5,000 ○ 5,500 ○ 6,000 ○

Read and solve each problem. Show your work for each one.

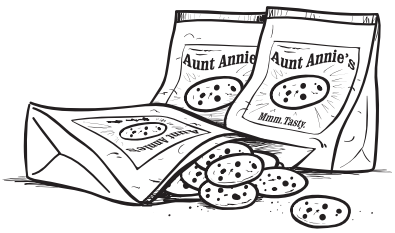
6

$$\begin{array}{r} 4{,}834 \\ 2{,}756 \\ 3{,}999 \\ +\ 1{,}076 \\ \hline \end{array}$$

7

$$\begin{array}{r} 5{,}028 \\ -\ 2{,}843 \\ \hline \end{array}$$

8 The store was having a big sale on cookies so Mr. James bought 15 bags for his scout troop. There were 24 cookies in each bag. How many cookies did he buy in all?



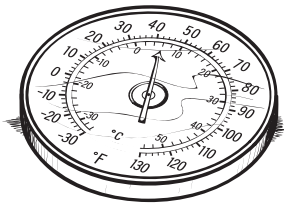
NAME _____ DATE _____

Assessment 4 page 3 of 6

Read and solve each problem. Show your work for each one.

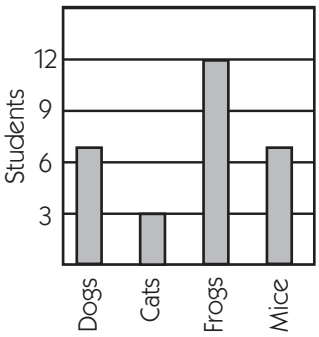
9 Mr. Cardozo's fifth graders are planting flowers in pots to sell at the school carnival. If they have 152 flowers and they want to put 4 flowers in every pot, how many flower pots will they need?

10 The students in Mrs. Weaver's fifth grade took three temperature readings on January 3. At 9:00 a.m., it was 32ºF. At noon, it was 39ºF. At 2:30 p.m., it was 43ºF. What was the average (mean) of these three temperatures?

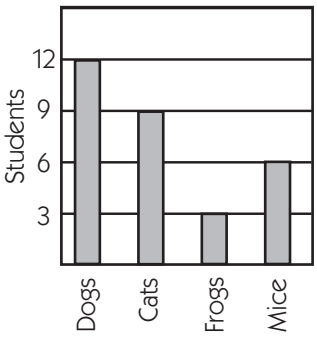


11 The kids in Mrs. Carr's fifth grade made a tally chart to show how many students in their class own different kinds of pets. Which of the bar graphs shows the same information as the tally chart?

Pets	Number of Students
Dogs	~~||||~~ ~~||||~~ ||
Cats	~~||||~~ ||
Frogs	||
Mice	||||



○



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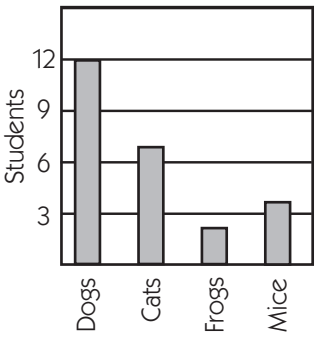
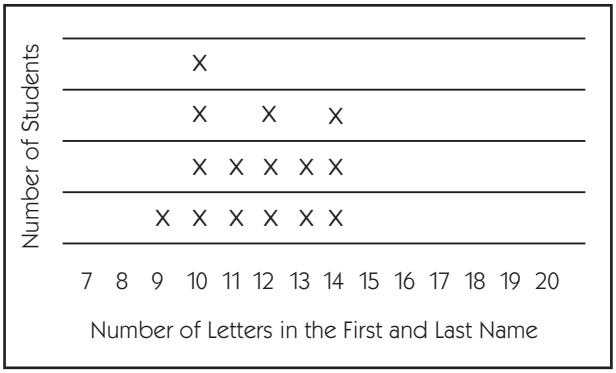


○

NAME _____ DATE _____

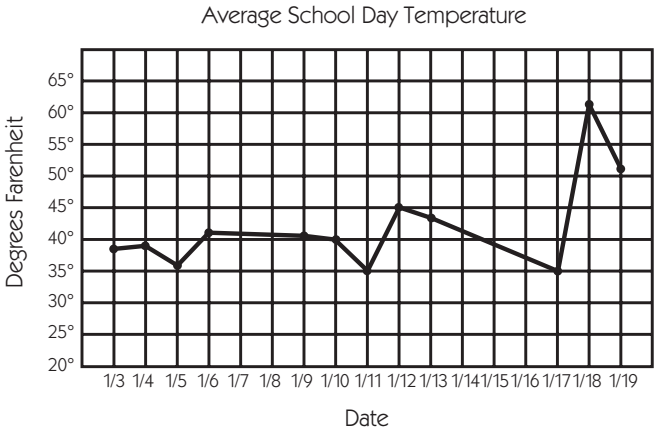
Assessment 4 page 4 of 6

12 In October, Mrs. Ferguson's students collected data about their names. Here are their results after the first week. What is the range, mode, and median of their data so far?



Range _____ Mode _____ Median _____

13 In January, Mr. Fisher's students decided to read their outdoor thermometer every school day at 2:00. Below is a graph of their readings so far. Use the information to answer questions a, b, and c below.



a On how many days was the temperature 40° or higher at 2 p.m.?

2 days ○ 5 days ○ 7 days ○ 3 days ○

b *About* how much difference is there between the highest and lowest temperatures recorded by Mr. Fisher's class?

25° ○ 10° ○ 20° ○ 50° ○

c Water freezes at 32° F. How close did it ever get to freezing at 2 p.m. during the days these students collected their data?

NAME _____ DATE _____

Assessment 4 page 5 of 6

14a Daya is making orange juice. The instructions say to empty the can of juice concentrate into a pitcher and then add 3 more canfuls of water. If the can holds 12 ounces, how many ounces of orange juice will Daya have when she's finished? Show your work.

b How many cups of juice will that be? Show your work.

c How many quarts of juice will that be? Show your work.

15 Use your centimeter ruler to help answer questions a and b. Write an equation to show how you got the answers and be sure to label your answers with the correct units.

a What is the perimeter of this rectangle? _____

b What is the area of this rectangle? _____

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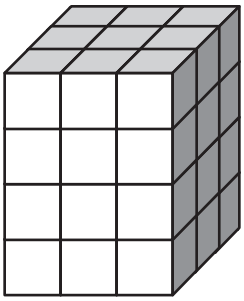
Assessment 4 page 6 of 6

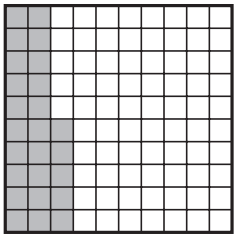
16 What is the volume of this building made with centimeter cubes?



a Use labeled sketches, numbers, and/or words to show how you found the volume of the building.

b The volume of this building is _____ cubic centimeters.

17a Which decimal number represents the shaded part of this square?



Area = 1

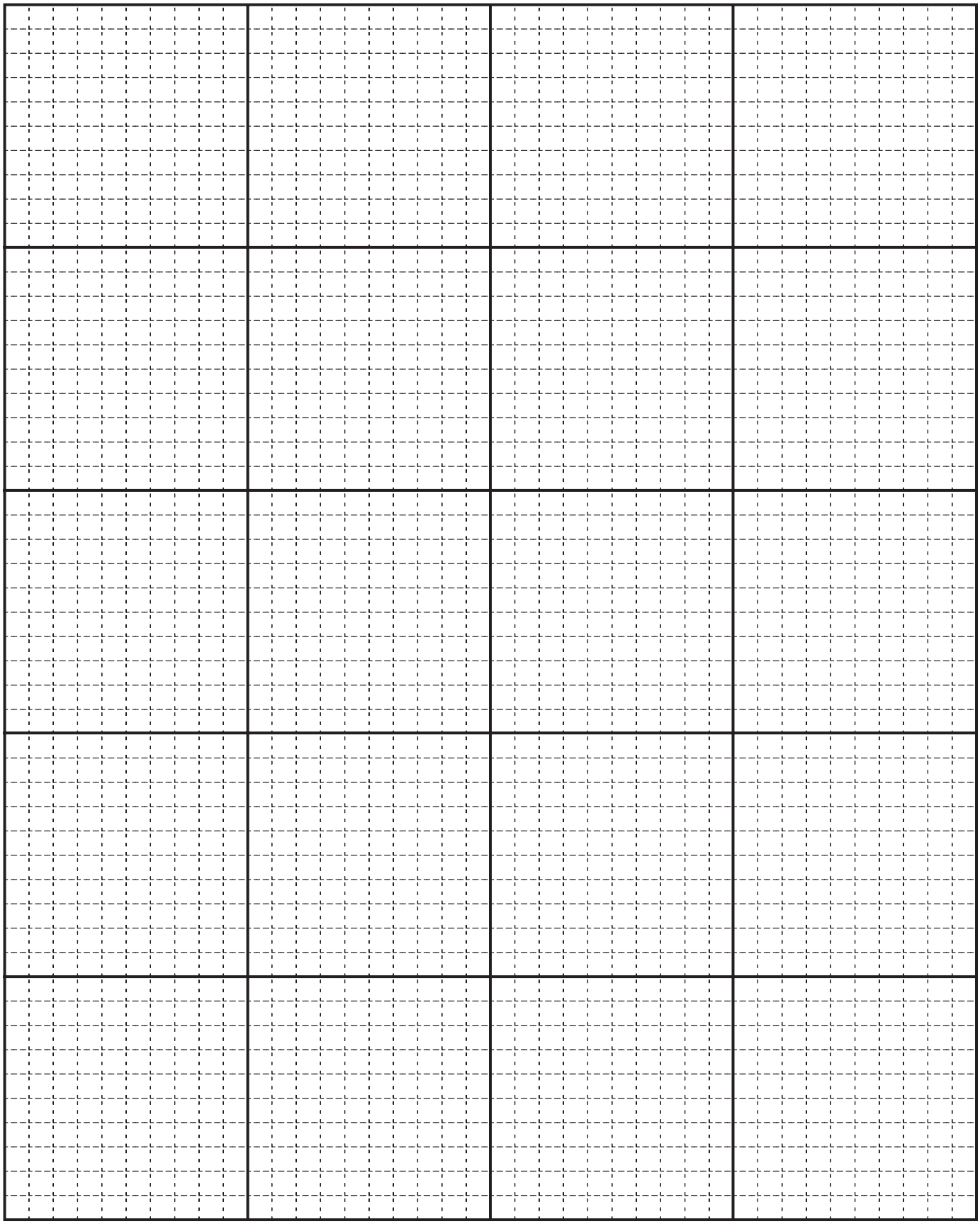
0.10 ○ 0.15 ○ 0.25 ○ 0.35 ○

b Which fraction represents the shaded area of this square?

$\frac{2}{10}$ ○ $\frac{1}{4}$ ○ $\frac{1}{3}$ ○ $\frac{1}{5}$ ○

NAME _____ DATE _____

Base Ten Grid Paper



Assessment 4 Class Checklist page 1 of 2

Student name													
1 completes x out of 40 multiplication facts correctly in 2 minutes	36–40: 4 pts.* 32–25: 3 pts. 28–31: 2 pts. 24–27: 1 pt. 23 or fewer: 0 pts.												
2 completes X out of 21 division facts correctly	19–21: 4 pts. 17–18: 3 pts. 15 or 16: 2 pts. 13 or14: 1 pt. 12 or fewer: 0 pts.												
3 rounds 653 to the nearest 100 and the nearest 10	1												
4 rounds $0.68 to the nearest tenth	1												
5 rounds 5,280 to the nearest thousand	1												
6 adds 4-digit numbers with regrouping (4,834 + 2,756 + 3,999 + 1,076 = 12,665)	2 pts. (1 for correct answer, 1 for showing work)												
7 subtracts 4-digit numbers with regrouping (5,028 – 2,843 = 2,185)	2 pts. (1 for correct answer, 1 for showing work)												
8 multiplies 2-digit number by 2-digit number (15 × 34 = 510)	2 pts. (1 for correct answer, 1 for showing work)												
9 divides 3-digit number by 1-digit number (152 ÷ 4 = 38)	2 pts. (1 for correct answer, 1 for showing work)												
10 finds the mean (average) of 3 temperatures	2 pts. (1 for correct answer, 1 for showing work)												

* The total possible number of points for each problem is shown.

Assessment 4 Class Checklist page 2 of 2

Student name													
11 reads a tally chart and bar graph accurately	1												
12 finds the range, mode, and median of a set of data displayed on a line plot	3 pts. (1 for each value)												
13 reads and interprets a line graph	3 pts. (1 for each correct response)												
14 converts ounces to cups and cups to quarts	3 pts. (1 for correct answer)												
15 measures the side lengths of a rectangle in centimeters and uses the information to determine the perimeter and area of the rectangle	3 pts. (1 for side lengths, 1 for perimeter, and 1 for area)												
16 determines the volume of a rectangular solid	2 pts. (1 for correct answer, 1 for showing work)												
17a identifies the shaded area of a base ten mat as a decimal	1												
17b identifies the shaded area of a base ten mat as a fraction	1												
Total Score	**38**												

Assessment 5

ASSESSMENT

Overview

This assessment can be used to test key math skills towards the end of the third reporting period.

Timing

Toward the end of your third reporting period (late March/early April)l

You'll need

- ★ Assessment 5, pages 1–7 (pages 67–73)
- ★ Base Ten Grid Paper (page 74, available as needed)
- ★ Assessment 5 Class Checklist (optional, pages 75 and 76, 2 or 3 copies as needed)
- ★ class set of centimeter rulers
- ★ base ten pieces for those students who wish to use them (Run page on cardstock and cut apart to make your own base ten pieces if needed.)

Skills & Concepts

- ★ demonstrating fluency with multiplication and division facts
- ★ locating decimals on a number line
- ★ rounding to the nearest tenth and the nearest whole number
- ★ recognizing, comparing, and ordering fractions and decimals
- ★ recognizing equivalent fractions and decimals
- ★ multiplying pairs of 2-digit numbers
- ★ dividing a 3-digit number by a 1-digit number
- ★ adding and subtracting decimals and fractions with like denominators
- ★ reading a thermometer
- ★ finding the mean (average) of 3 numbers
- ★ identifying the range, mode, and median of a data set
- ★ determining elapsed time
- ★ measuring length in centimeters
- ★ using a map scale
- ★ identifying a quadrilateral
- ★ locating points on a coordinate grid
- ★ finding the area of a right triangle
- ★ constructing a similar shape

Conducting Assessment 5

You can administer this 7-page skills assessment during a single math period or break it out over 2 or more days, depending on your schedule and the needs of your students. All students will need a centimeter ruler to find the perimeter of the rectangle on page 4. Be sure to make base ten pieces and Base Ten Grid Paper available for students who wish to use them at any time during the assessment.

Plan to conduct the first item on page 1, a set of 40 multiplication facts, as a timed test, and give students 2 minutes to complete as many of the 40 facts as they can in that time. The 2-minute timing is designed to get a reading on students' fluency with basic multiplication facts. It will be important to stress that this is another check-in, designed to help them (and you) see what they need to still need to work on. The remaining problems on the first 4 pages are designed to provide you with windows into students' current skills and understandings in the areas of rounding and computation with decimals and whole numbers. There's no need to time any of these items.

Unless you choose to administer all 7 pages in one period, give students time the following day to complete pages 5–7. Give them as much time as is needed to complete the rest of the assessment.

Note *You will find answers to all problems in the Answer Key, on page 66.*

Using Information from Assessment 5

A checklist is provided for you to compile the class set of assessment results in order to get an overview of students' strengths, as well as the areas in which they'll need more work. The checklist (page 75 and 76) includes suggestions for scoring each item; whether you choose to score the assessment this way, or at all, is up to you.

Support Activities

Students' work on the checkup may indicate that some need continued support with specific skills and concepts. You can have select students use specific support activities with a resource room teacher, instructional assistant, and/or parent to improve specific skills and strengthen conceptual understandings. You may find the activities listed below particularly helpful with skills featured on this checkup although you can certainly use any in the entire collection.

SUPPORT ACTIVITIES		
Activity	**Name**	**Skills**
Activity 25	An Hour or Bust to the Minute	Telling time to the minute
Activity 26	Get Me to the Bus on Time	Calculating elapsed time
Activity 27	Fraction Race	Modeling, comparing, adding and subtracting common fractions with physical models
Activity 28	Fraction Bingo	Understanding and modeling common fractions
Activity 29	Decimal Draw	Modeling, recognizing, ordering, and placing decimals along a number line
Activity 30	Money, Fraction & Decimal Showdown	Reading, ordering, and comparing common fractions and decimals
Activity 31	Spin & Multiply Big Time	2-digit by 2-digit multiplication
Activity 32	Divide 'Em Up	Dividing 2- and 3-digit numbers by 1-digit numbers

Assessment 5 Answer Key

ANSWER KEY

Pages 67–73

1 81, 40, 36, 24, 15, 35, 42
96, 49, 72, 18, 56, 60, 27
132, 48, 20, 24, 21, 36, 36
28, 64, 32, 54, 63, 64, 121
108, 144, 110, 25, 84, 100, 30
99, 45, 44, 48, 72

2 5, 8, 4, 7, 9, 8, 6
7, 9, 2, 7, 7, 4, 7
5, 6, 4, 6, 3, 8, 7

3 1.8

4 0.5

5 $17.00

6 $^1/_5$, $^1/_4$, $^1/_3$, $^1/_2$

7 **a** Fractions will vary. The possibilities include: $^6/_{10}$, $^{60}/_{100}$, $^3/_5$, $^{12}/_{20}$, $^{30}/_{50}$, and $^{15}/_{25}$.

b 0.6 and 0.60

8 0.4

9 621, Strategies will vary.

10 24, Strategies will vary.

11 $368.55, Strategies will vary.

12 $71.47, Strategies will vary.

13 $2.01, Strategies will vary.

14 0.27 inches, Strategies will vary.

15 $^3/_5$, Strategies will vary.

16 $^1/_3$, Strategies will vary.

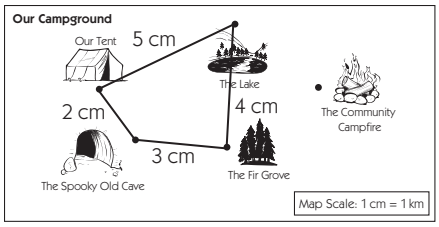
17 Range = 7, Mode = 11, and Median = 12

18 56°, 64°, and 60°. The mean is 60°. Strategies will vary.

19 1 hour and 20 minutes, Strategies will vary.

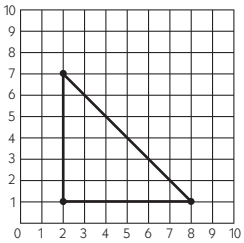
20 45 minutes, Strategies will vary.

21 **a** 14 km



21 **b** quadrilateral

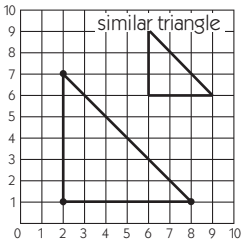
22 **a**



b 18 sq. units

c Students' explanations will vary. Example:
I can see that this triangle is half of a 6 × 6 square. 6 × 6 = 36, and half of 36 is 18 square units.

d Similar triangles will vary. Example:



NAME _____ DATE _____

Assessment 5 page 1 of 7

1 Solve these multiplication facts.

9 × 9	8 × 5	3 × 12	8 × 3	5 × 3	5 × 7	6 × 7
12 × 8	7 × 7	8 × 9	6 × 3	7 × 8	12 × 5	9 × 3
11 × 12	8 × 6	5 × 4	4 × 6	7 × 3	6 × 6	9 × 4
7 × 4	8 × 8	4 × 8	6 × 9	9 × 7	8 × 8	11 × 11
12 × 9	12 × 12	11 × 10	5 × 5	12 × 7	10 × 10	5 × 6
11 × 9	9 × 5	11 × 4	12 × 4	12 × 6		

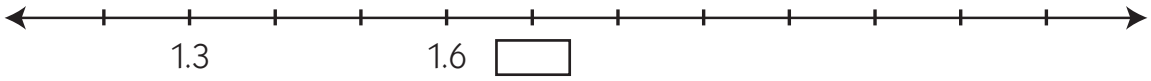
2 Solve these division facts.

11)55	8)64	7)28	5)35	9)81	4)32	4)24
7)49	5)45	12)24	8)56	6)42	12)48	3)21
10)50	6)36	9)36	9)54	12)36	7)56	9)63

NAME _____ DATE _____

Assessment 5 page 2 of 7

3 Which number belongs in the box on the number line?



1.7 ○ 1.8 ○ 1.9 ○ 2.0 ○

---

4 What is 0.47 rounded to the nearest tenth?

0.4 ○ 0.08 ○ 0.5 ○ 0.8 ○

5 What is the price of this backpack rounded to the nearest dollar?

○ $16.00 ○ $16.50 ○ $20.00 ○ $17.00

6 Which list shows the fractions in order from least to greatest?

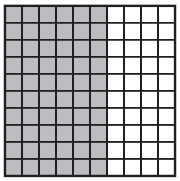
○ $\frac{1}{5}$ $\frac{1}{4}$ $\frac{1}{3}$ $\frac{1}{2}$

○ $\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{4}$ $\frac{1}{5}$

○ $\frac{1}{5}$ $\frac{1}{3}$ $\frac{1}{2}$ $\frac{1}{4}$

○ $\frac{1}{3}$ $\frac{1}{4}$ $\frac{1}{5}$ $\frac{1}{2}$

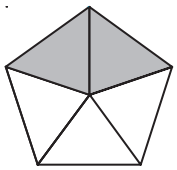
7 Write 2 fractions and 2 decimal numbers to show what part of this square is shaded in.



a Fractions _____, _____

b Decimals _____, _____

8 What is the decimal number that is equal to the part of this pentagon that is shaded in?



0.2 ○ 0.4 ○ 0.25 ○ 2.5 ○

NAME _____ DATE _____

Assessment 5 page 3 of 7

Read and solve each problem. Show your work for each one.

9 $\begin{array}{r} 27 \\ \times\ 23 \\ \hline \end{array}$	**10** $5\overline{)120}$
11 $\begin{array}{r} \$143.38 \\ +\ \$225.17 \\ \hline \end{array}$	**12** $\begin{array}{r} \$51.30 \\ -\ \$20.17 \\ \hline \end{array}$

NAME _____ DATE _____

Assessment 5 page 4 of 7

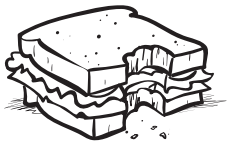
Read and solve each problem. Show your work for each one.

13 Maria bought a pen, a pencil, and a notebook from the Student Store. The pencil cost $0.17, the pen cost $0.59, and the notebook cost $1.25 How much did she pay in all?

14 In Portland, it rained 1.09 inches on Thursday and 1.36 inches on Friday. How much more did it rain on Friday than Thursday?

15 $\frac{2}{5} + \frac{1}{5}$

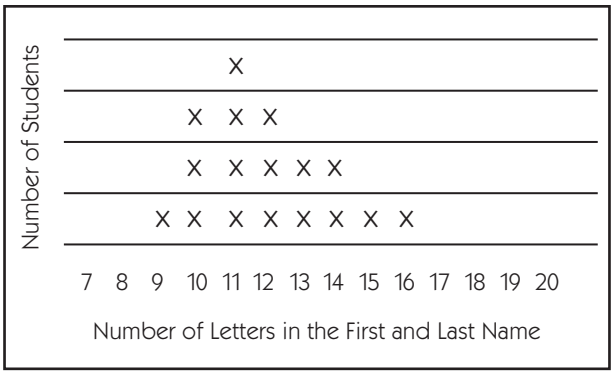
16 Dan ate $\frac{1}{3}$ of his sandwich for snack and $\frac{1}{3}$ for lunch. How much does he still have left?



NAME _____ DATE _____

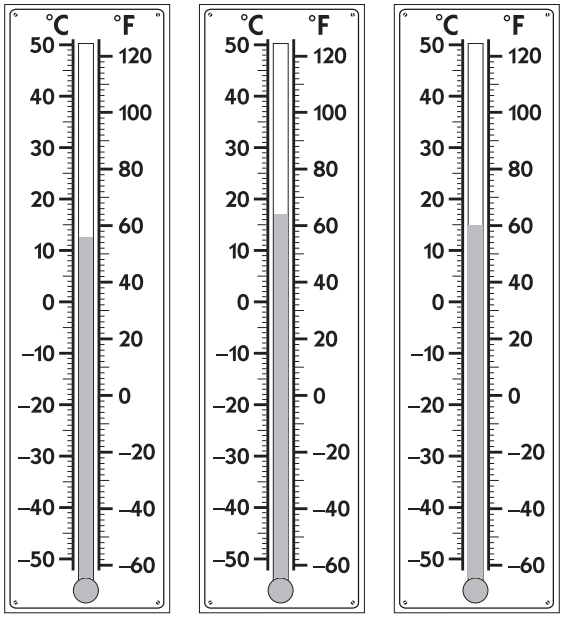
Assessment 5 page 5 of 7

17 In October, Mr. Deerwater's students collected data about their names. Here are their results after the first week. What is the range, the mode, and the median of their data so far?



Range = ___ Mode = ___ Median = ___

18 List the temperatures shown on these 3 thermometers and then find the mean. Show your work.



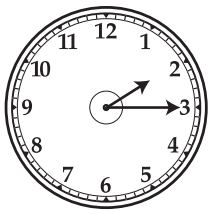
9:00 AM temperature _____

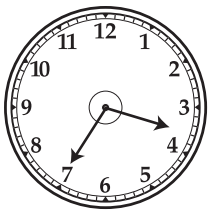
12:00 noon temparature _____

3:00 PM temperature _____

Mean (average): _____

19 Mark watched a movie with his sister. The first clock shows when the movie started and the second clock shows when it ended. How long did the movie last?

Movie started: 

Movie ended: 

1 hour and 15 minutes	1 hour and 20 minutes	1 hour and 35 minutes	2 hours and 15 minutes
○	○	○	○

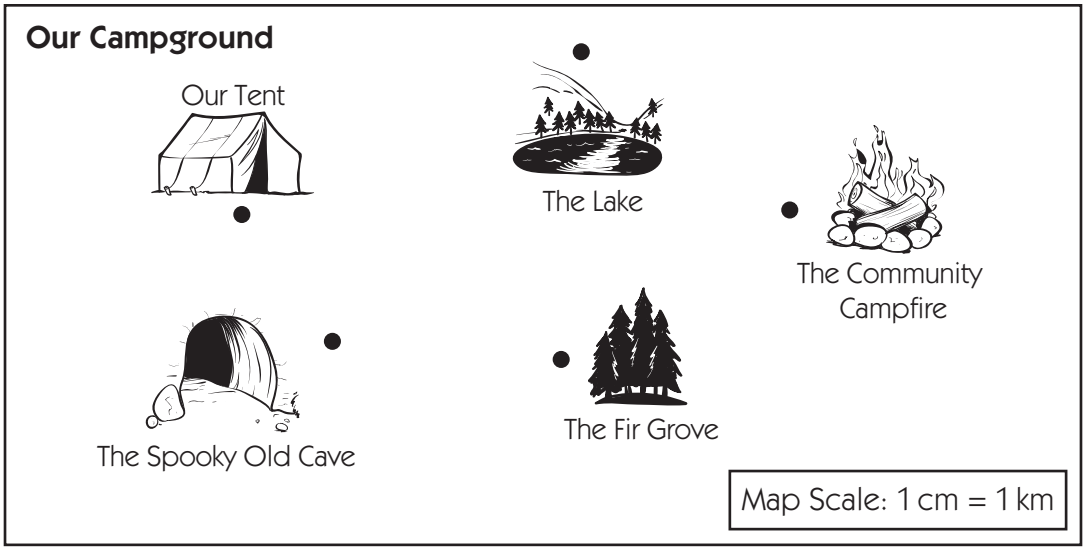
NAME _____ DATE _____

Assessment 5 page 6 of 7

20 Sarah's s mom said she could spend an hour and a half at the park with her friend Mattie. If she played on the swings for 45 minutes, how much time did she have left at the park? Use labeled sketches, numbers, and/or words to explain how you got the answer.

1 hour and 15 minutes ○ 1 hour ○ 45 minutes ○ 30 minutes ○

21 Gabe's family went camping over Spring Break. Here's a map of their campsite. Gabe and his little sister took a hike from their tent to the lake to the Fir Grove to the Spooky Old Cave, and back to their tent to get ready to leave.



They walked directly from one place to the next, and the paths they followed were all straight lines. Use the centimeter side of your ruler to draw and label their path with distances. Then answer the questions below.

a How far did Gabe and his sister hike? _____

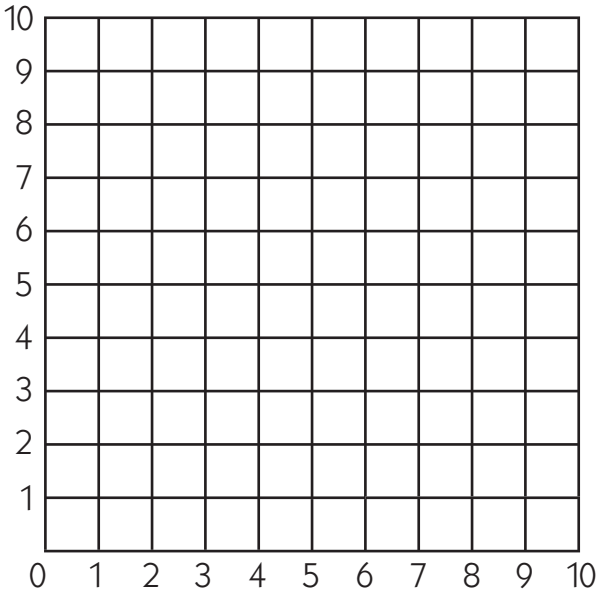
b What shape was their path? _____

NAME _____ DATE _____

Assessment 5 page 7 of 7

22a Find and mark the following points on this grid:

(2, 1) (2,7) (8,1)



b Use your ruler to connect the points in the order you marked them. Connect the last point to the first point. What is the area of this shape if each small square on the grid has an area of 1?

c Use labeled sketches, numbers, and/or words to explain how you got your answer.

d Draw a *similar* figure somewhere on the grid.

NAME _____ **DATE** _____

Base Ten Grid Paper

Assessment 5 Class Checklist page 1 of 2

Student name and date													
1 completes x out of 40 multiplication facts correctly in 2 minutes	36–40: 4 pts.* 32–25: 3 pts. 28–31: 2 pts. 24–27: 1 pt. 23 or fewer: 0 pts.												
2 completes x out of 21 division facts correctly	19–21: 4 pts. 17 or 18: 3 pts. 15 or 16: 2 pts. 13 or 14: 1 pt. 12 or fewer: 0 pts.												
3 locates 1.8 on a number line	1												
4 rounds 0.47 to the nearest tenth (0.5)	1												
5 rounds $16.79 to the nearest dollar/whole number ($17.00)	1												
6 orders 4 unit fractions from least to greatest ($\frac{1}{5}$, $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$)	1												
7a writes 2 fractions to show what part of a 100-grid has been shaded ($\frac{6}{10}$, $\frac{60}{100}$, $\frac{3}{5}$, $\frac{12}{20}$)	1												
7b writes 2 decimals to show what part of a 100-grid has been shaded (0.60, 0.6)	1												
8 identifies 0.4 as equal to $\frac{2}{5}$	1												
9 multiplies 23 x 27 = 621	2												
10 divides 120 ÷ 5 = 24	2												
11 adds $143.38 + $225.17 = $368.55	2												
12 subtracts $51.30 – $20.17 = $31.13	2												
13 solves a story problem that requires adding $0.17 + $0.59 + $1.25 = $2.01	2												
14 solves a story problem that requires subtracting 1.36 – 1.09 = 0.27	2												
15 adds fractions with like denominators ($\frac{2}{5} + \frac{1}{5} = \frac{3}{5}$)	2												
16 adds and subtracts fractions with like denominators ($1 - \frac{2}{3} = \frac{1}{3}$)	2												

* The total possible number of points for each problem is shown.

Assessment 5 Class Checklist page 2 of 2

Student name and date													
17 finds the range, mode, and median of a set of data displayed on a line plot	3*												
18 reads 3 temperatures and finds the mean of 56, 64, and 60 is 60	5												
19 determines elapsed time on analog clocks (2:15 to 3:35 is 1 hour and 20 minutes)	1												
20 subtracts one amount of time from another (90 min. –45 min. = 45 min.)	2												
21a determines the perimeter of an irregular quadrilateral (5 + 4 + 3 + 2 = 14 cm)	1												
21b identifies shape as a quadrilateral or irregular quadrilateral	1												
22a locates three points on a coordinate grid	1												
22b finds the area of a right triangle	1												
22c explains strategy for finding the area of a right triangle	1												
22d draws a similar right triangle	1												
Total Points Scored	**48**												

* The total possible number of points for each problem is shown.

Assessment 6

ASSESSMENT

Overview

This assessment can be used to test key math skills towards the end of the school year.

Timing

Toward the end of the school year (late May/early June)

You'll need

- ★ Assessment 6, pages 1–5 (pages 81–85)
- ★ Base Ten Grid Paper (page 86, about a half-class set)
- ★ Assessment 6 Class Checklist (optional, pages 87 and 88, 2 or 3 copies as needed)

Skills & Concepts

- ★ demonstrating fluency with multiplication and division facts
- ★ using the terms multiple, factor, sum, and digits with understanding
- ★ identifying prime and composite numbers
- ★ recognizing, comparing, and ordering fractions and decimals
- ★ recognizing equivalent fractions and decimals
- ★ generating equivalent improper fractions and mixed numbers
- ★ adding fractions with like and unlike denominators
- ★ multiplying a 2-digit number by a 3-digit number
- ★ dividing a 3-digit number by a 1-digit number
- ★ adding fractions with unlike denominators
- ★ reading numbers into the billions
- ★ reading and interpreting a pictograph
- ★ identifying the mode, median, and mean of a data set
- ★ identifying likely outcomes
- ★ finding the volume and surface area of a rectangular solid
- ★ applying the knowledge that the sum of angles in any triangle is 180°
- ★ sketching the results of reflecting and rotating figures

Assessment 6 (cont.)

Conducting Assessment 6

You can administer this 5-page skills assessment during a single math period or break it out over 2 or more days, depending on your schedule and the needs of your students. Make Base Ten Grid Paper available to students who wish to use it at any time during the assessment.

Give students 2 minutes to complete as many of the 40 facts on the first page as they can. The 2-minute timing is designed to let you get a reading on students' fluency with basic multiplication facts. Stress that this is another check-in, designed to help them (and you) see what they still need to work on over the summer. Then give them as much time as they need to complete the remaining problems on pages 1 through 3.

Unless you choose to administer all 5 pages in one period, give students time the following day to complete pages 4–5. Give them as much time as is needed to complete the rest of the assessment.

Note *You will find answers to all problems in the Answer Key, on page 80.*

Using Information from Assessment 6

You can complete the class checklist (pages 87 and 88) to see the class set of results. The checklist also includes suggestions for scoring each item; you may decide to score the assessment differently.

Support Activities

After reviewing students' results on this final checkup, you can assign Support Activities as needed for children to work on at home over the summer. The activities listed below are particularly relevant to the skills just assessed. You might also make Support Activities available to teachers who are working with some of your students in the context of summer school or other special summer programs. We recommend creating a packet for each student that contains the instructional considerations, instructions, and materials for those Support Activities that target skills they need to improve. That way, you can simply provide summer school personnel or parents with the student's packet, along with a note about the skills with which the student needs practice. The game instructions and materials may be enough to provide most parents with what they need to help their children, but you may find it appropriate to send home the instructional considerations sheets as well in some cases.

Assessment 6 (cont.)

SUPPORT ACTIVITIES		
ACTIVITY	**NAME**	**SKILLS**
Activity 33	Fractions, Decimals & Dollars	Relating decimals to fractions; adding and subtracting decimals
Activity 34	Decimal Race to Three	Relating decimals to fractions; modeling, comparing, and adding decimals
Activity 35	Pick Two Decimal Addition	Adding decimals
Activity 36	Multiplication Madness	2-digit by 2-digit multiplication
Activity 37	Remainder Roundup	Dividing 2- and 3-digit numbers by 1- and 2-digit numbers with and without remainders

Assessment 6 Answer Key

ANSWER KEY

Pages 81–85

1 81, 40, 36, 24, 15, 35, 42
96, 49, 72, 18, 56, 60, 27
132, 48, 20, 24, 21, 36, 36
28, 64, 32, 54, 63, 64, 121
108, 144, 110, 25, 84, 100, 30
99, 45, 44, 48, 72

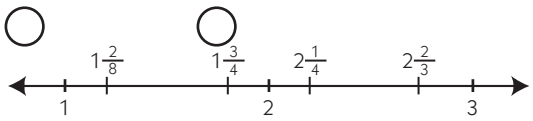
2 5, 8, 4, 7, 9, 8, 6
7, 9, 2, 7, 7, 4, 7
5, 6, 4, 9, 3, 8, 7

3 15

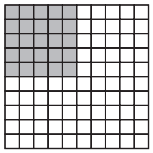
4 1, 36, 2, 18, 3, 12, 4, 9, 6

5 13 <u>21</u> <u>45</u> <u>49</u> 67 <u>1,248</u>

6



7 **a** Students may arrange the 25 shaded squares in a variety of ways. Example:



b $^1/_4$, $^{25}/_{100}$
0.25

8 2 $^3/_4$ cups, Strategies will vary. Example:
$^1/_2$ = $^2/_4$ and 2 $^1/_4$ + $^2/_4$ = 2 $^3/_4$

9 1 $^2/_8$ = $^{10}/_8$, 2 $^2/_3$ = $^8/_3$, and 1 $^3/_4$ = $^7/_4$

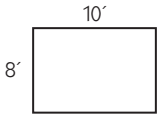
10 1 $^4/_9$

11 3.4

12 6.68, 6.98, 7.19, 7.49, 7.71

13 5,893,000,000 km

14 $54.00, Strategies will vary. Example:



(2 × 8) + (2 × 10) = 36´
36 × $1.50 is the same as (36 × $1.00) + (36 × $0.50)
$36.00 + $18.00 = $54.00

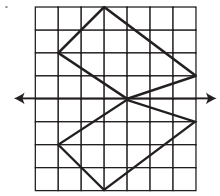
15 **a** From top to bottom, the totals are 30, 60, 30, 42, and 48.
b 30
c 42
d 42, Strategies will vary. Example:
30 + 60 + 30 = 120
42 + 48 = 90
120 + 90 = 210
200 ÷ 5 = 40
10 ÷ 5 = 2
So 210 ÷ 5 = 42

16 4 Red, 4 Blue, 4 Green

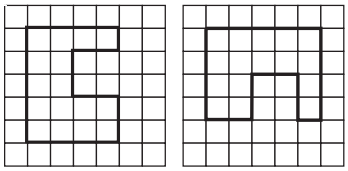
17 **a** 36 cm^3, Strategies will vary. Example:
There are 12 cubes in each layer and 3 layers.
3 × 12 = 36 cm^3
b 66 cm^2, Strategies will vary. Example:
(12 × 4) + (9 × 2) = 48 + 18
48 + 18 = 66 cm^2

18 60 degrees, Strategies will vary. Example:
The angles on a triangle always add up to 180º. Since it's a right triangle, you know that the unmarked angle is 90º.
180º – 90º – 30º = 60º

19



20



NAME _____ DATE _____

Assessment 6 page 1 of 5

1 Solve these multiplication facts.

9 × 9	8 × 5	3 × 12	8 × 3	5 × 3	5 × 7	6 × 7
12 × 8	7 × 7	8 × 9	6 × 3	7 × 8	12 × 5	9 × 3
11 × 12	8 × 6	5 × 4	4 × 6	7 × 3	6 × 6	9 × 4
7 × 4	8 × 8	4 × 8	6 × 9	9 × 7	8 × 8	11 × 11
12 × 9	12 × 12	11 × 10	5 × 5	12 × 7	10 × 10	5 × 6
11 × 9	9 × 5	11 × 4	12 × 4	12 × 6		

2 Solve these division facts.

11)55	8)64	7)28	5)35	9)81	4)32	4)24
7)49	5)45	12)24	8)56	6)42	12)48	3)21
10)50	6)36	9)36	9)54	12)36	7)56	9)63

NAME _____ DATE _____

Assessment 6 page 2 of 5

3 Here are 3 clues about a secret number:

- It is a multiple of 5.
- It is a factor of 30.
- The sum of the digits is 6.

Fill in the bubble to show which of these is the secret number.

15 ○ 24 ○ 6 ○ 10 ○

4 List all the factors of 36.

5 Draw a circle around the prime numbers and draw a line under the composite numbers.

13 21 45 49 67 1,248

6 Lori is making fruit punch for her scout meeting. She needs:

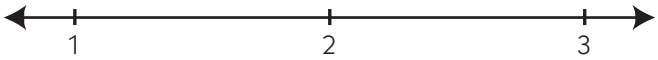
$2\frac{1}{4}$ cups of orange juice

$1\frac{2}{8}$ cups of pineapple juice

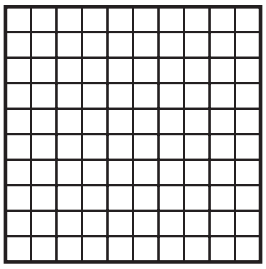
$2\frac{2}{3}$ cups of cranberry juice

$1\frac{3}{4}$ cups of soda pop

Mark and label where these numbers belong on the number line below.



7a Shade in one-fourth of this grid.



b Write 2 fractions and 1 decimal that tell what part of the square you just shaded.

Fractions _____, _____

Decimal _____

8 Lori tasted the fruit punch after it was done and decided to add another half cup of orange juice. Add the two numbers below to find out how much orange juice she used in all. Show your work.

$2\frac{1}{4} + \frac{1}{2} = \square$ cups of orange juice

9 Lori's sister says that $2\frac{1}{4}$ is the same as $\frac{9}{4}$. Change each of the other mixed numbers in Lori's recipe to improper fractions.

$1\frac{2}{8} =$ $2\frac{2}{3} =$ $1\frac{3}{4} =$

NAME _____ DATE _____

Assessment 6 page 3 of 5

10 Cody and Alicia are painting the back fence. They have 2 gallons of white paint. Cody used $\frac{5}{9}$ of a gallon and Alicia used $\frac{8}{9}$ of a gallon. When they added the fractions, they found out that they'd used $\frac{13}{9}$ of a gallon in all. Which of these mixed numbers is equal to $\frac{13}{9}$?

$1\frac{2}{9}$ ○ $2\frac{1}{8}$ ○ $1\frac{1}{4}$ ○ $1\frac{4}{9}$ ○

11 Which number is between $3\frac{1}{4}$ and $3\frac{1}{2}$?

3.4 ○ 3.2 ○ 3.1 ○ 3.6 ○

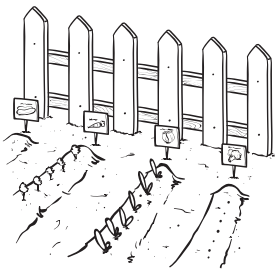
12 Write these numbers in order on the lines below: 7.71 6.68 7.49 7.19 6.98

____ ____ ____ ____ ____

13 Pluto is five billion, eight-hundred ninety-three million kilometers from the sun. Which of these numbers shows that amount?

5,800,930,000 km ○ 5,893,000,000 km ○ 5,000,000,893 km ○ 5,809,300,000 km ○

14 Delsey and her mom are going to put up a fence around their garden to keep the deer out. The fencing they're going to use costs $1.50 a foot. The garden is 8 feet wide and 10 feet long. How much will it cost to put a fence all the way around the garden? Show your work in the space below.



It will cost _____ to put a fence all the way around the garden.

NAME _____ DATE _____

Assessment 6 page 4 of 5

15a The fifth graders at King School collected empty soda pop cans to earn money for some special projects. Fill in the box at the end of each row to show how many cans each class collected. Then use the information on the graph to answer the questions below.

Cans Collected by the 5th Graders at King School		
Class	Cans Collected	Total for Each Class
Mrs. Garcia's Class		
Mr. Wong's Class		
Mrs. Freeman's Class		
Ms. Ruttle's Class		
Mr. Yee's Class		

Key  = 6 cans

b What is the mode for the cans collected by the fifth grades? _____

c What is the median number of cans collected by the fifth grades? _____

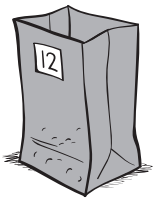
d What is the mean (average) number of cans collected by the fifth grades? Use numbers, words or labeled sketches to show your work.

The mean (average) number of cans collected by the fifth grades is _____.

NAME _____ DATE _____

Assessment 6 page 5 of 5

16 Von's teacher gave him a bag with 12 marbles in it. Von shook the bag, pulled out a marble, and made a tally mark to show what color he got. Then he put the marble back in the bag. He did this 24 times. Here are his results:

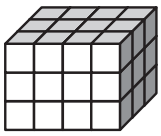


Red Blue Green

Mark the choice below that shows what was probably in the bag.

- ◯ 4 Red, 4 Blue, 4 Green
- ◯ 6 Red, 3 Blue, 3 Green
- ◯ 8 Red, 3 Blue, 1 Green
- ◯ 5 Red, 4 Blue, 3 Purple

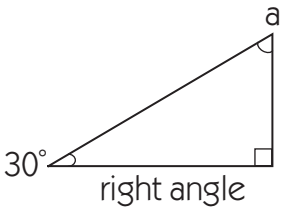
17 Jin built this figure with centimeter cubes. Find the volume and the area of the figure. Use numbers, words, and/or labeled sketches to show how you got your answers. Be sure to label both answers with the correct units.



a Volume =

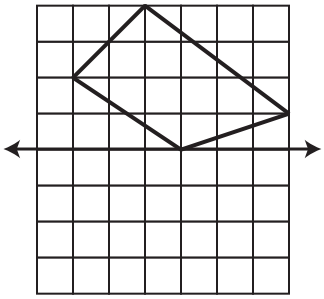
b Surface Area =

18 What is the measure of angle a? Use numbers, words, and/or a labeled sketch to tell how you figured it out.

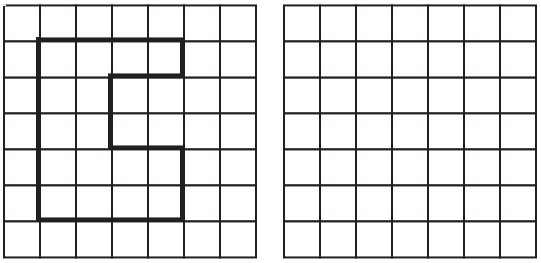


∠ a =

19 Reflect this figure over the dark line in the center of the grid.



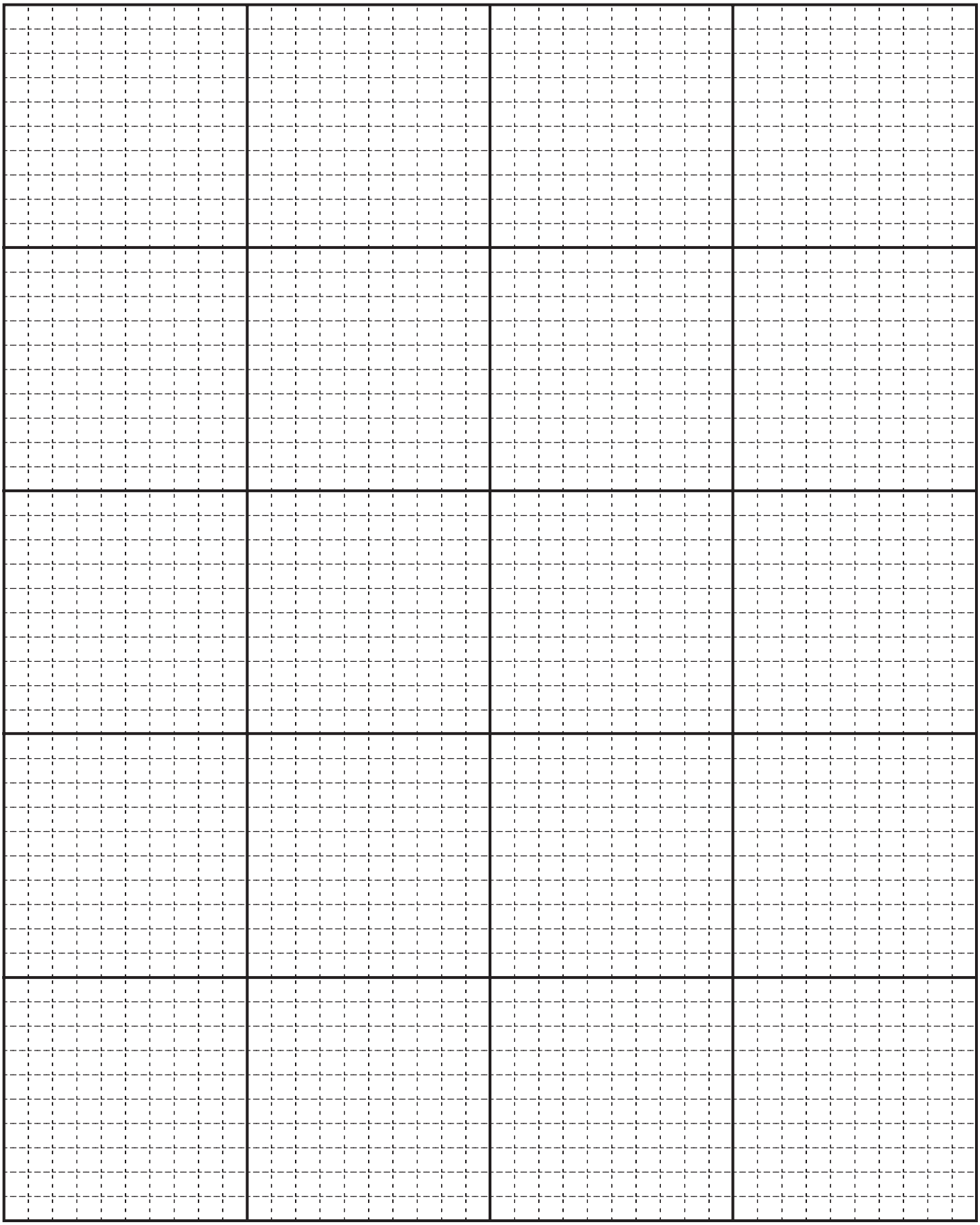
20 Rotate the figure on Grid A 90° clockwise onto Grid B.



Grid A Grid B

NAME _____ **DATE** _____

Base Ten Grid Paper



Assessment 6 Class Checklist page 1 of 2

Student name and date													
1 completes x out of 40 multiplication facts correctly in 2 minutes	36–40: 4 pts.* 32–25: 3 pts. 28–31: 2 pts. 24–27: 1 pt. 23 or fewer: 0 pts.												
2 completes X out of 21 division facts correctly	19–21: 4 pts. 17 or 18: 3 pts. 15 or 16: 2 pts. 13 or 14: 1 pt. 12 or fewer: 0 pts.												
3 identifies a secret number based on clues that include multiple, factor, sum, and digits	1												
4 lists the factors of 36	2 pts. (1 for listing at least 2 pairs of factors; 2 for listing all of them)												
5 identifies prime and composite numbers	3 pts. (½ for each correct answer)												
6 places 4 mixed numbers along a number line	2 pts. (½ for each correct answer)												
7a shades in one-fourth of a grid	½												
7b writes 2 fractions and 1 decimal to represent one-fourth	1 ½ (½ for each correct answer)												
8 adds a mixed number and a fraction	2 pts. (1 for correct answer, 1 for showing work)												
9 converts mixed numbers to improper fractions	1 ½ pts. (½ for each correct answer)												
10 selects a mixed number equivalent to an improper fraction	1												
11 identifies a decimal between 3 ¼ and 3 ½	1												
12 places 5 decimal numbers in correct order	1												

* The total possible number of points for each problem is shown.

Assessment 6 Class Checklist page 2 of 2

Student name and date													
13 identifies the number that represents five billion, eight-hundred ninety-three million	1												
14 finds the perimeter of a rectangle and multiplies $1.50 by 36	2 pts. (1 for correct answer, 1 for showing work)												
15a reads a pictograph to find the number of cans collected by 5 different classes	2 ½ pts. (½ for each correct answer)												
15b finds the mode of a data set	1												
15c finds the median of a data set	1												
15d finds the mean of a data set	2 pts. (1 for correct answer, 1 for showing work)												
16 identifies the most likely number of each tile color based on experimental data	1												
17a finds the volume of a rectangular solid	2 pts. (1 for correct answer, 1 for showing work)												
17b finds the surface area of a rectangular solid	2 pts. (1 for correct answer, 1 for showing work												
18 uses the properties of a triangle to determine the measure of one of the angles	2 pts. (1 for correct answer, 1 for showing work)												
19 sketches the results of reflecting a figure	1												
20 sketches the results of rotating a figure 90° clockwise	1												
Total Score	**43**												

support activities

Support Activities

There are 37 activities in this collection. Most are games designed to be played by partners or small groups, although some can be adapted for use with an entire class at once. The Support Activities are listed by skill in the table below, and are intended to supplement any intermediate math program. Most involve the use of visual models and strategies, and are meant to help students develop conceptual understandings as they gain increased fluency. As you look through the collection, you may find some games you want to use to help teach key computational skills to your whole class. Some teachers also run the game components on cardstock and laminate them to make a durable set of "learning stations" available for use by students during free time or to check out for home use.

ADDING & SUBTRACTING MULTI-DIGIT NUMBERS		
Activity	**Name**	**Support Blackline Numbers**
Support Activity 1	Make 100	1.1–1.7
Support Activity 2	Race to 100 & Back	2.1–2.7
Support Activity 3	More or Less Addition	3.1–3.7
Support Activity 4	More or Less Addition Big Time	4.1–4.6
Support Activity 5	Count Down 400	5.1–5.4
Support Activity 6	More or Less Subtraction	6.1–6.5
Support Activity 7	More or Less Subtraction Big Time	7.1–7.4
Support Activity 8	Larger Numbers on a Line	8.1–8.4
Support Activity 15	Round & Add Tens	15.1–15.5
Support Activity 16	Round & Add Hundreds	16.1–16.5
Support Activity 17	Round & Add Thousands	17.1–17.6

BASIC MULTIPLICATION FACTS		
Activity	**Name**	**Support Blackline Numbers**
Support Activity 9	Array Challenge	9.1–9.5
Support Activity 10	Multiplication Challenge	10.1–10.5
Support Activity 11	Spinning Around Multiplication	11.1–11.5
Support Activity 12	Spinning for Arrays	12.1–12.7
Support Activity 13	Product Bingo	13.1–13.4

BASIC MULTIPLICATION & DIVISION FACTS		
Activity	**Name**	**Support Blackline Numbers**
Support Activity 14	What's Missing Bingo	14.1–14.8

MULTIPLYING 1-DIGIT BY 2-DIGIT NUMBERS		
Activity	**Name**	**Support Blackline Numbers**
Support Activity 18	Spin & Multiply	18.1–18.4
Support Activity 19	Moolah on My Mind	19.1–19.7
Support Activity 20	More or Less Multiplication	20.1–20.7

Support Activities (cont.)

MULTIPLYING 2-DIGIT BY 2-DIGIT NUMBERS		
Activity	**Name**	**Support Blackline Numbers**
Support Activity 31	Spin & Multiply Big Time	31.1–31.4
Support Activity 36	Multiplication Tic-Tac-Toe	36.1–36.11

DIVIDING 2- & 3-DIGIT NUMBERS BY 1- & 2-DIGIT NUMBERS		
Activity	**Name**	**Support Blackline Numbers**
Support Activity 32	Divide 'Em Up	32.1–32.4
Support Activity 37	Remainder Roundup	37.1–37.7

FRACTIONS		
Activity	**Name**	**Support Blackline Numbers**
Support Activity 27	Fraction Race	27.1–27.7
Support Activity 28	Fraction Bingo	28.1–28.6

FRACTION & DECIMAL RELATIONSHIPS		
Activity	**Name**	**Support Blackline Numbers**
Support Activity 30	Money, Fraction & Decimal Showdown	30.1–30.7
Support Activity 33	Fractions, Decimals & Dollars	33.1–33.5
Support Activity 34	Decimal Race to Three	34.1–34.5

DECIMALS		
Activity	**Name**	**Support Blackline Numbers**
Support Activity 22	Round & Add Tenths	22.1–22.6
Support Activity 23	Decimal More or Less	23.1–23.5
Support Activity 29	Decimal Draw	29.1–29.5
Support Activity 35	Decimal Pick Two	35.1–35.7

ELAPSED TIME		
Activity	**Name**	**Support Blackline Numbers**
Support Activity 25	An Hour or Bust to the Minute	25.1–25.3
Support Activity 26	Get Me to the Bus on Time	26.1–26.6

AVERAGING		
Activity	**Name**	**Support Blackline Numbers**
Support Activity 21	Find the Average	21.1–21.4

PERIMETER & AREA OF RECTANGLES		
Activity	**Name**	**Support Blackline Numbers**
Support Activity 24	Perimeter Showdown	24.1–24.5

Support Activities (cont.)

If you plan to use the activities for remediation rather than instructional purposes, you'll find that they're most effective when used with targeted students by an educational assistant, parent volunteer, or title/resource teacher. Based on students' performance on the Building Computational Fluency assessments, you'll be able to determine which individuals would benefit from a particular Support Activity and can assign them to work with an adult on that activity. You can also send specific activities home with students for extra practice with their families. In order to prepare the Support Activities for use by other adults, we recommend creating a packet that contains the instructional considerations, game instructions, and materials. That way, you can provide an instructional assistant or volunteer with the packet and ask him or her to conduct specific activities with individuals or small groups in need of help in one or more areas.

While you can run game cards on cardstock, you'll find that paper copies of the game components work nearly as well with intermediate students, who can cut out their own playing cards and use a paper-clip and pencil arrangement for a spinner arrow. Because these games have been designed for use at home as well as school, very few of them involve concrete manipulatives. Those that do include blacklines for making the manipulatives (i.e., base 10 pieces or money value pieces), and you may want to run these sheets on cardstock.

Support Activity 1 ★ Instructional Considerations

SUPPORT ACTIVITY

Make 100

Overview

Players take turns drawing cards that show 2-digit numbers in base ten pieces. Each player can take up to 3 turns and keeps a running total of their numbers on a grid. At the end of the game, the player closest to 100 (either over or under) wins.

Skills & Concepts

★ using models, words, and numbers to demonstrate the meaning of addition and subtraction

★ adding and subtracting 2-digit numbers with and without regrouping using models and strategies

You'll need

★ Instructions for Make 100 (Blacklines S 1.2 and S 1.3, 1 copy of each run back-to-back)

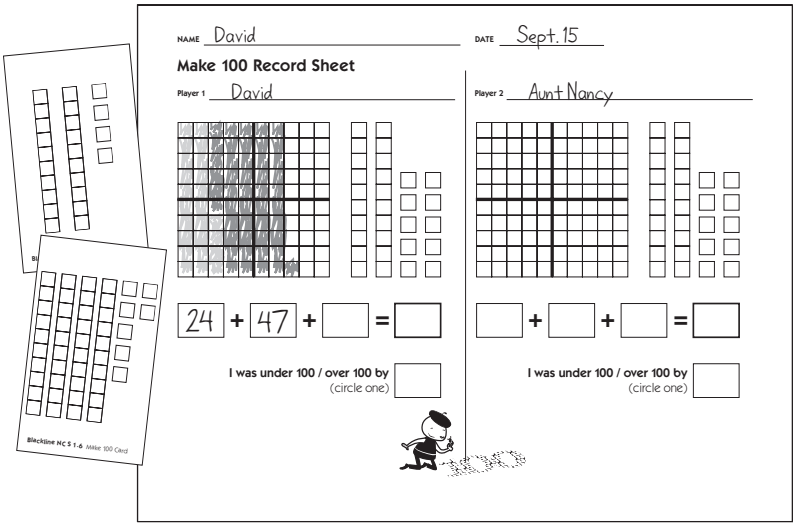
★ Make 100 Record Sheet (Blackline S 1.4, 2 copies run back-to-back per player)

★ Make 100 Cards, pages 1–3 (Blacklines S 1.5–1.7, 1 copy run on cardstock and cut out for each pair of players)

★ crayons

In Make 100, students add 2-digit numbers and use a visual model to find the difference between 100 and other numbers. Students are also encouraged to use estimation skills when they choose whether or not to take a third card.

Although there are many different ways to color in the amounts, many students find it easier to fill in the 10's first and then the 1's. Remind students to fill in the Number Chart completely before they use the 10's and 1's on the side so they can see their total in relationship to 100.



Support Activity 1

SUPPORT ACTIVITY

Make 100

You'll need

★ Instructions for Make 100 (Blacklines S 1.2 and S 1.3, 1 copy of each run back-to-back)

★ Make 100 Record Sheet (Blackline S 1.4, 2 copies run back-to-back per player)

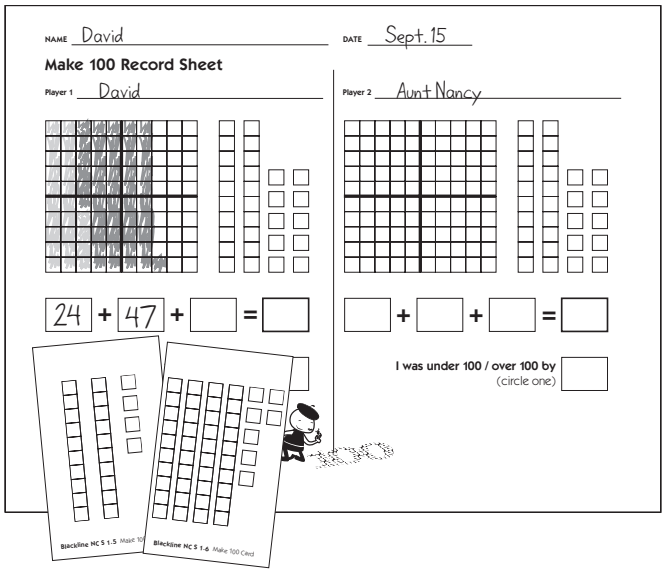
★ Make 100 Cards, pages 1–3 (Blacklines S 1.5–1.7, 1 copy run on cardstock and cut out for each pair of players)

★ crayons

Instructions for Make 100

1 Mix up the Make 100 Cards and place them in a pile, face down. Write your name and your partner's name at the top of a record sheet. The goal of Make 100 is to be the player who gets closest to 100. You can stay under 100 or go over 100.

2 Take 2 cards and turn them face up. Both players record the two numbers in the boxes below the Number Chart and color in the amounts on the chart. Use a different color for each amount.



3 The other player takes 2 cards. Both players record the numbers in the boxes and color in the amounts on their Number Charts.

4 Both players decide whether or not to draw a third card. If you're close to

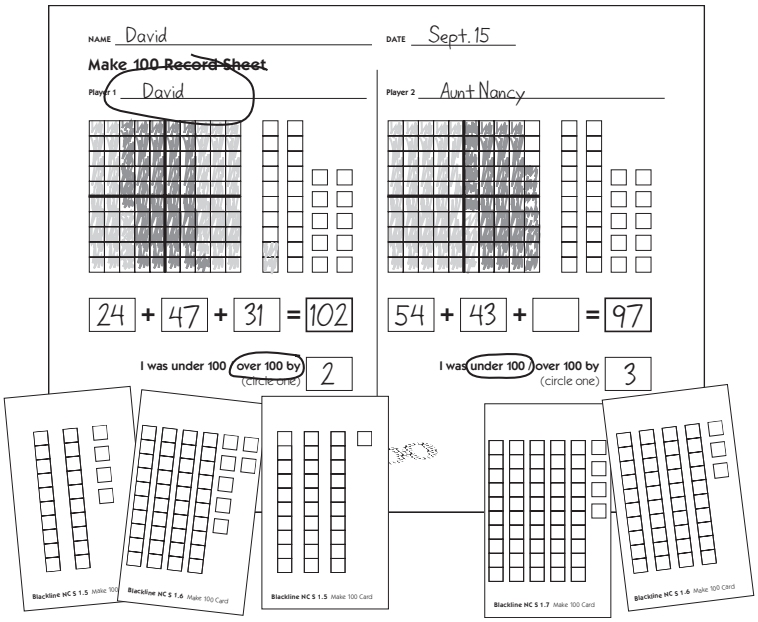
(Continued on back.)

Support Activity 1 (cont.)

100, you may choose not to draw another card. If you're still far away from 100, you might take a chance and draw a third card. Each player may draw no more than 3 cards.

5 If you draw a third card, write the number below the Number Chart and then color in that amount in a new color on the Number Chart. Be sure to color in the entire grid before you use the 10's and 1's on the right. Those are there in case you go over 100.

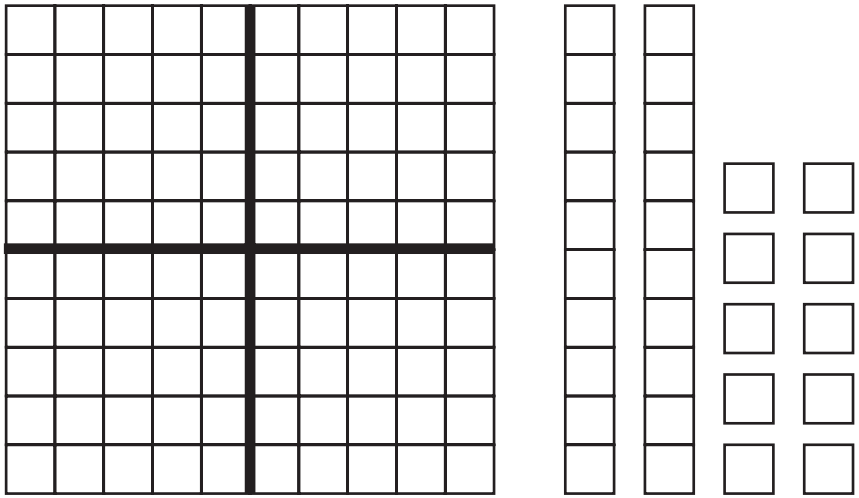
6 Add up the totals and compare to see who came closest to 100. Circle the winner, turn the record sheet over, and play again.



NAME _____ DATE _____

Make 100 Record Sheet

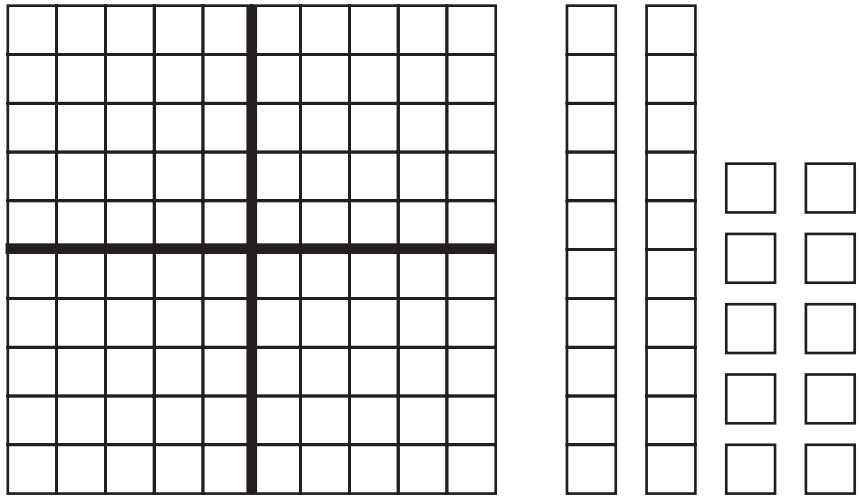
Player 1 _____



☐ + ☐ + ☐ = ☐

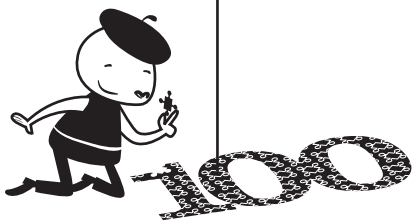
I was under 100 / over 100 by ☐
(circle one)

Player 2 _____

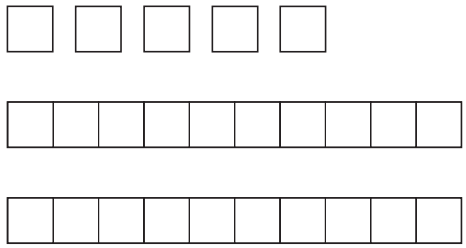


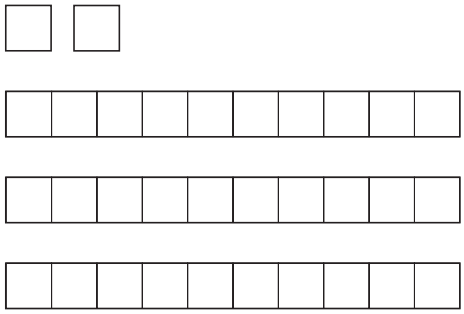
☐ + ☐ + ☐ = ☐

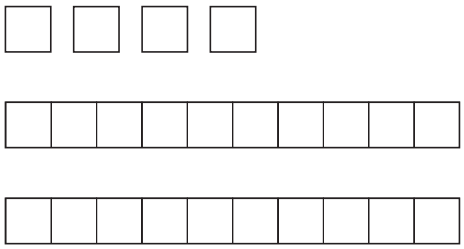
I was under 100 / over 100 by ☐
(circle one)

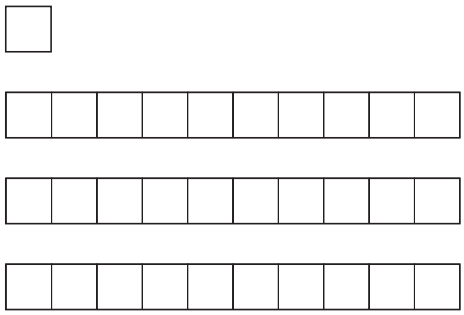


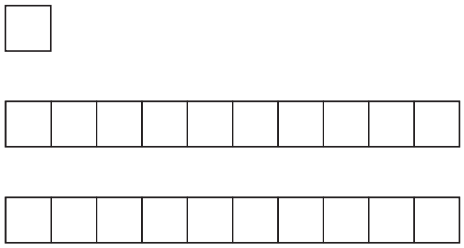
Make 100 Cards page 1 of 3

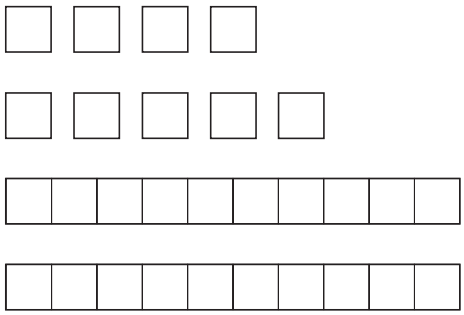


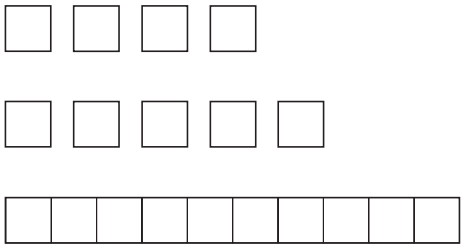


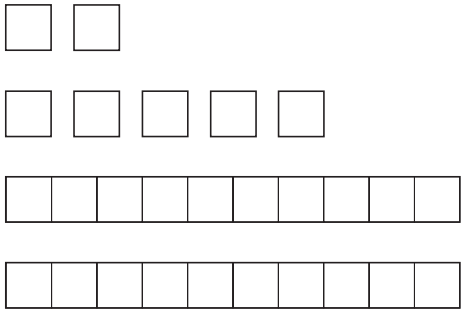




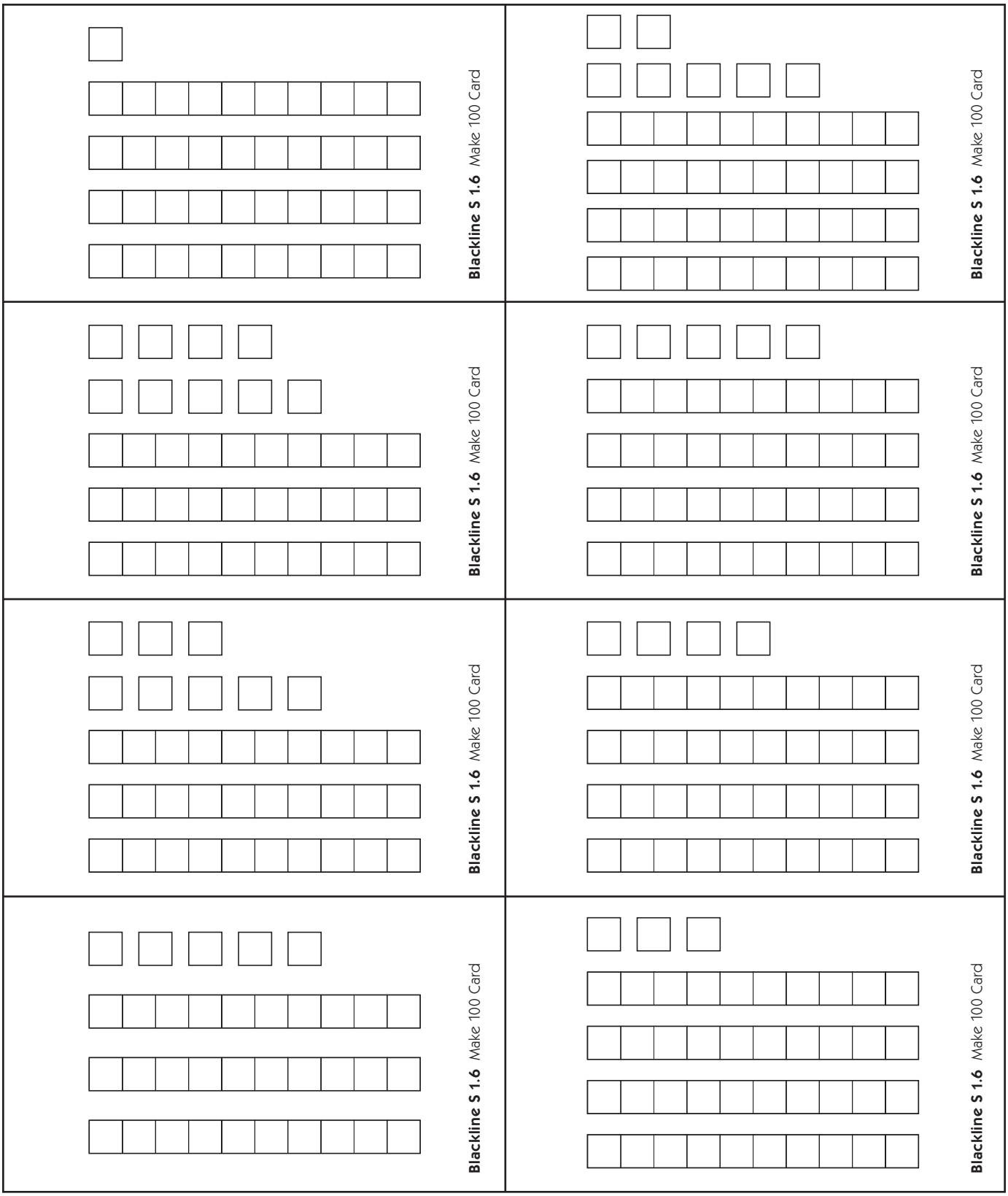




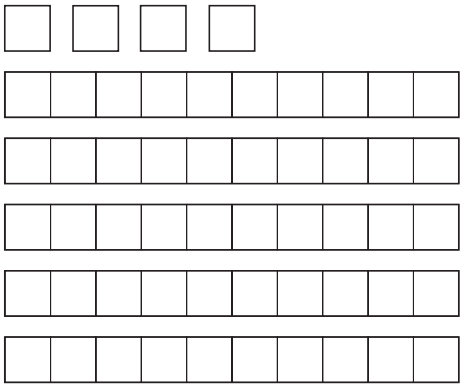




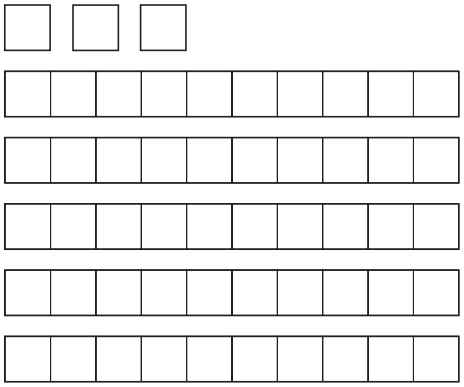
Make 100 Cards page 2 of 3



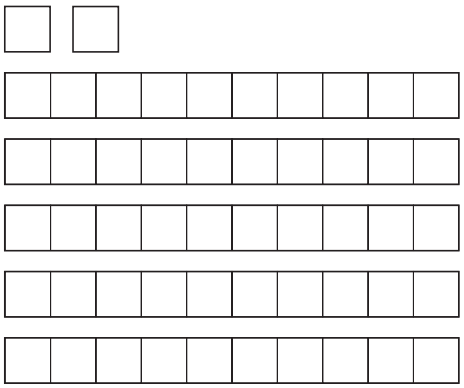
Make 100 Cards page 3 of 3



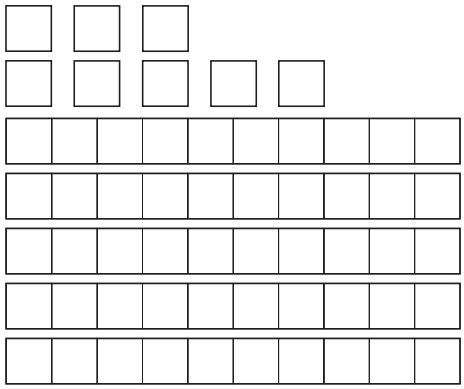
Blackline S 1.7 Make 100 Card



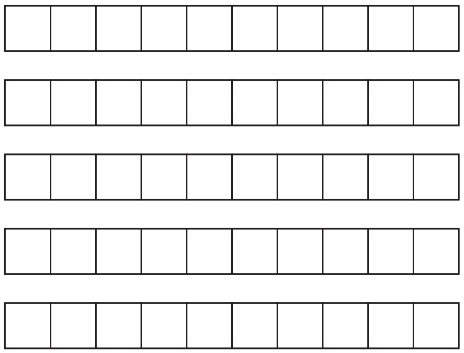
Blackline S 1.7 Make 100 Card



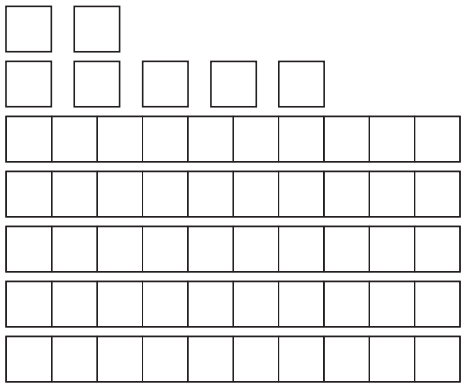
Blackline S 1.7 Make 100 Card



Blackline S 1.7 Make 100 Card



Blackline S 1.7 Make 100 Card



Blackline S 1.7 Make 100 Card

Support Activity 2 ★ Instructional Considerations

SUPPORT ACTIVITY

Race to 100 & Back

Overview

Players take turns spinning two single-digit numbers, adding them, and then adding the sum to their running total. When a player reaches 100 or more, he or she begins subtracting each sum from the total until one player reaches 0. The first player to reach 0 wins.

Skills & Concepts

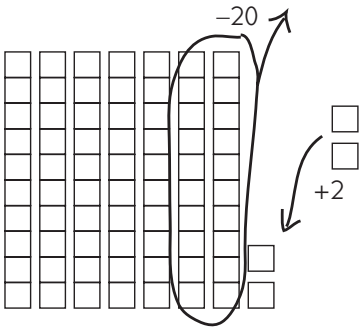
- ★ using models, words, and numbers to demonstrate the meaning of addition and subtraction
- ★ adding and subtracting 2-digit numbers with and without regrouping using models and strategies

You'll need

- ★ Instructions for Race to 100 & Back (Blacklines S 2.3 and S 2.4, 1 copy of each run back-to-back)
- ★ Race to 100 & Back Spinner (Blackline S 2.5, 1 copy for every 2 pairs of players, cut in half)
- ★ 1 set of base ten pieces for each pair of players (Use Blackline S 2.6 to make base ten pieces if needed.)
- ★ pencil and paperclip for use as a spinner

Most fourth graders who are experiencing difficulty with multi-digit computation will find addition with regrouping easier than subtraction with regrouping, even when they are working with base ten pieces. By using the base ten pieces, however, they are far more likely to develop a real understanding of both operations than if they continue to struggle with the computations at an abstract level. When students are asked to remove 18 from a collection of 62, for instance, many will take 10 away but ponder how to get 8 more from the remaining 52. With some encouragement, a student might trade 1 ten for 10 ones and then remove 8 of them, leaving 4 tens and 4 ones altogether. Another student might simply remove a ten and then put 2 ones back into the collection, in effect making the trade and subtracting at the same time.

As you play this game with students, encourage them to explain their strategies and reasoning as they use the pieces to complete the computations. Do not press students to use symbolic recording or teach them the traditional algorithm for regrouping. Simply invite students to show and tell you what they are thinking, at which point you may show them the symbolic notation that goes along with their strategy as shown below.



Mr. Ruiz *So I notice that you took away 2 tens and then put 2 ones back in. Can you tell me what you were thinking?*

(Continued on back.)

Support Activity 2 Instructional Considerations (cont.)

Kathryn *Well, I know 18 is like 10 plus 8. So first I took 1 ten away from 62.*

Mr. Ruiz *Ah, I see. I'll write what I'm hearing you say in numbers. Okay, you said 18 is like 10 and 8. So I'll write 18 equals 10 plus 8. And then you took that 10 away from 62, so I'll write 62 minus 10 equals 52.*

$$18 = 10 + 8 \qquad 62 - 10 = 52$$

Okay, then what did you do next and why? I'll keep writing these equations to show what I hear you saying.

Kathryn *Well, then I needed to take away 8 more. I couldn't do that, because all I had was 52. So I took away 10. That was 2 too many, so I put 2 ones back in.*

$$52 - 10 = 42 \qquad 42 + 2 = 44$$

Support Activity 2

SUPPORT ACTIVITY

Race to 100 & Back

You'll need

★ Instructions for Race to 100 & Back (Blacklines S 2.3 and S 2.4, 1 copy of each run back-to-back)

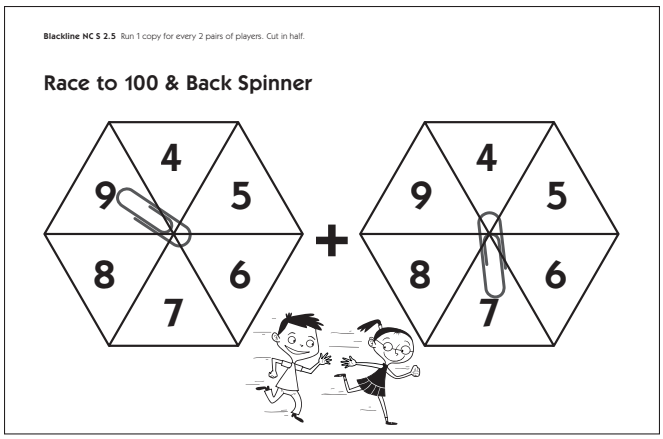
★ Race to 100 & Back Spinner (Blackline S 2.5, 1 copy for every 2 pairs of players, cut in half)

★ 1 set of base ten pieces for each pair of players (Use Blackline S 2.6 to make base ten pieces if needed.)

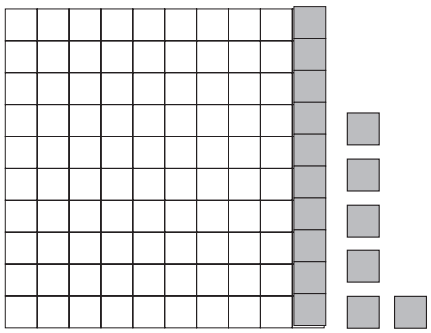
★ pencil and paperclip for use as a spinner

Instructions for Race to 100 & Back

1 You and your partner each need 1 hundred, 10 tens, and 20 ones from the set of base ten pieces. You'll share a pair of spinners and will use a pencil and paperclip as a spinner.



2 Take turns spinning the spinners, adding the 2 numbers, and getting that collection of base ten pieces from your set. Each time you collect ten or more ones, trade them in for another ten, and set the ten on top of the hundred piece. Keep the ones off to the side.

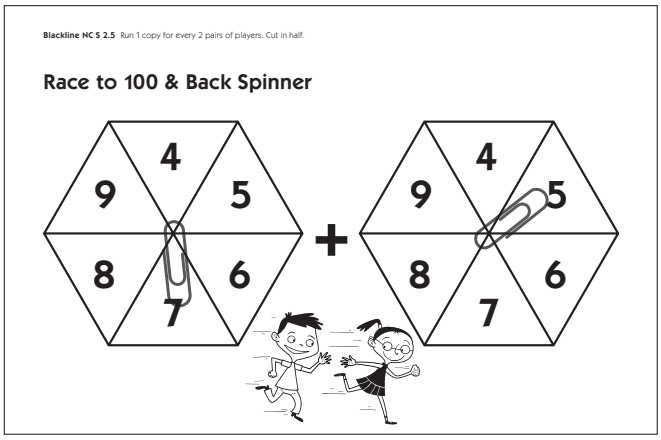


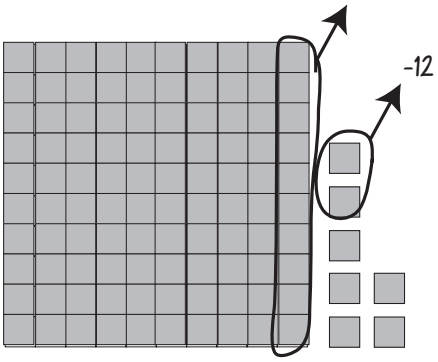
I got 9 plus 7. That's a fast nine. I know it's 16. So that's 1 ten and 6 ones. I'll put this ten on the hundred, and then I'll put these 6 over to the side, because when I get more ones, I can trade them in for another ten.

(Continued on back.)

Support Activity 2 (cont.)

3 Continue taking turns spinning and adding to your collections. When you or your partner reaches 100 or goes over 100, you'll get to start subtracting each sum from your collection. For example, if you had 94 and your partner had 87 and you spun the sum 13, you would collect 1 ten and 3 ones for a total of 107. The next time you had a turn, you would start subtracting each sum from your collection, but your partner will have to keep adding until she gets up to 100. When she does, or when she goes over 100, she can begin subtracting pieces too.

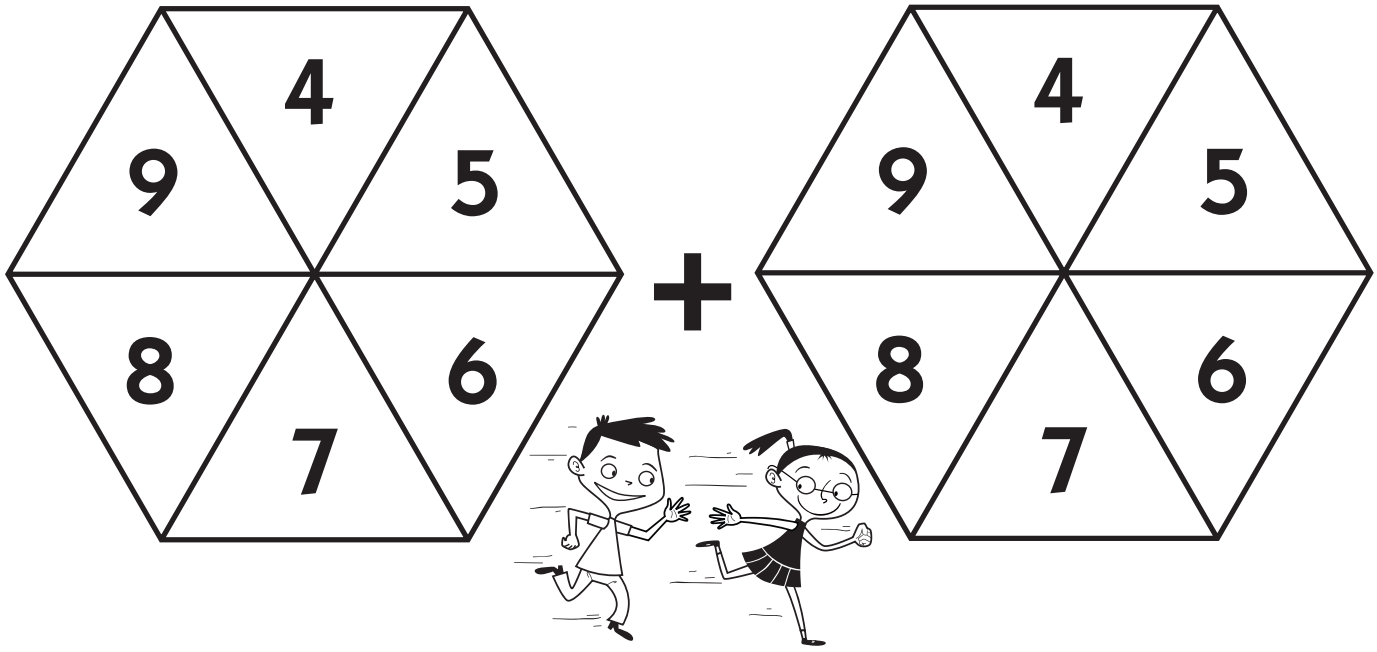




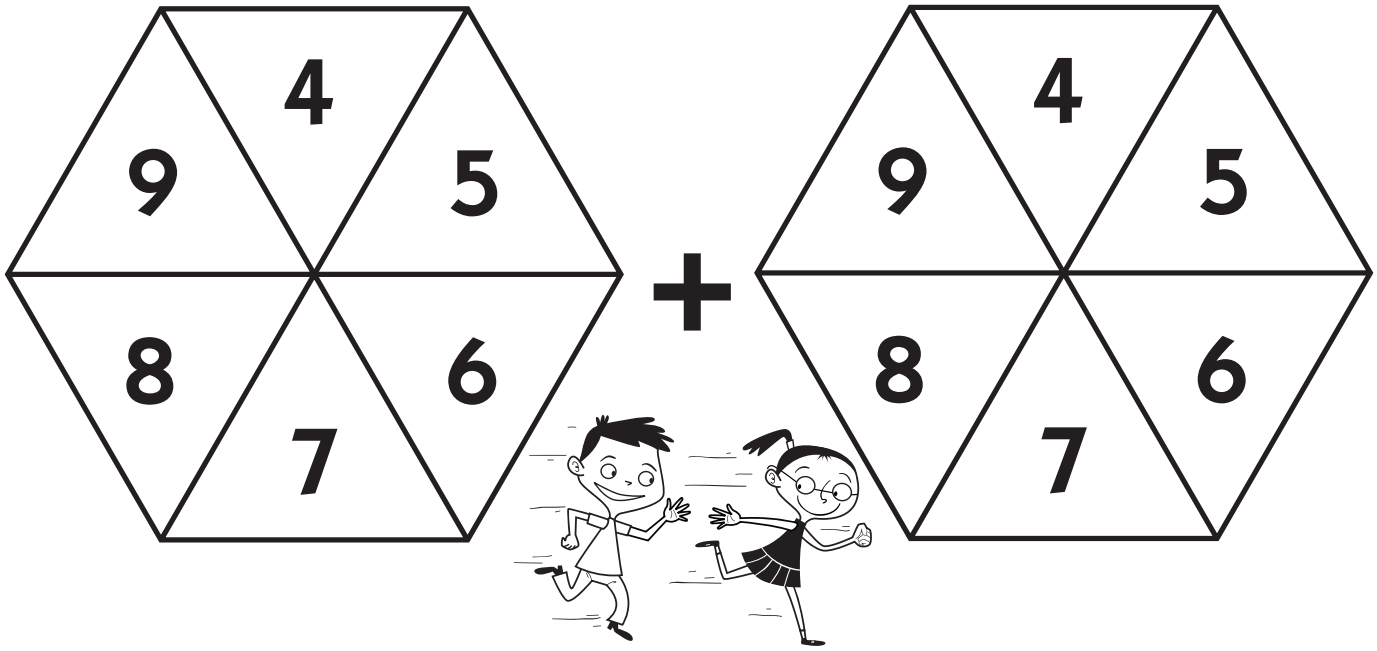
Now that I'm over 100, I can subtract. So I'll take away 12 by taking off a 1 and then 2 ones.

4 Continue playing until you get to 9 or fewer units. At that time, use just one spinner to get to 0. The first player to get exactly to 0 wins the game.

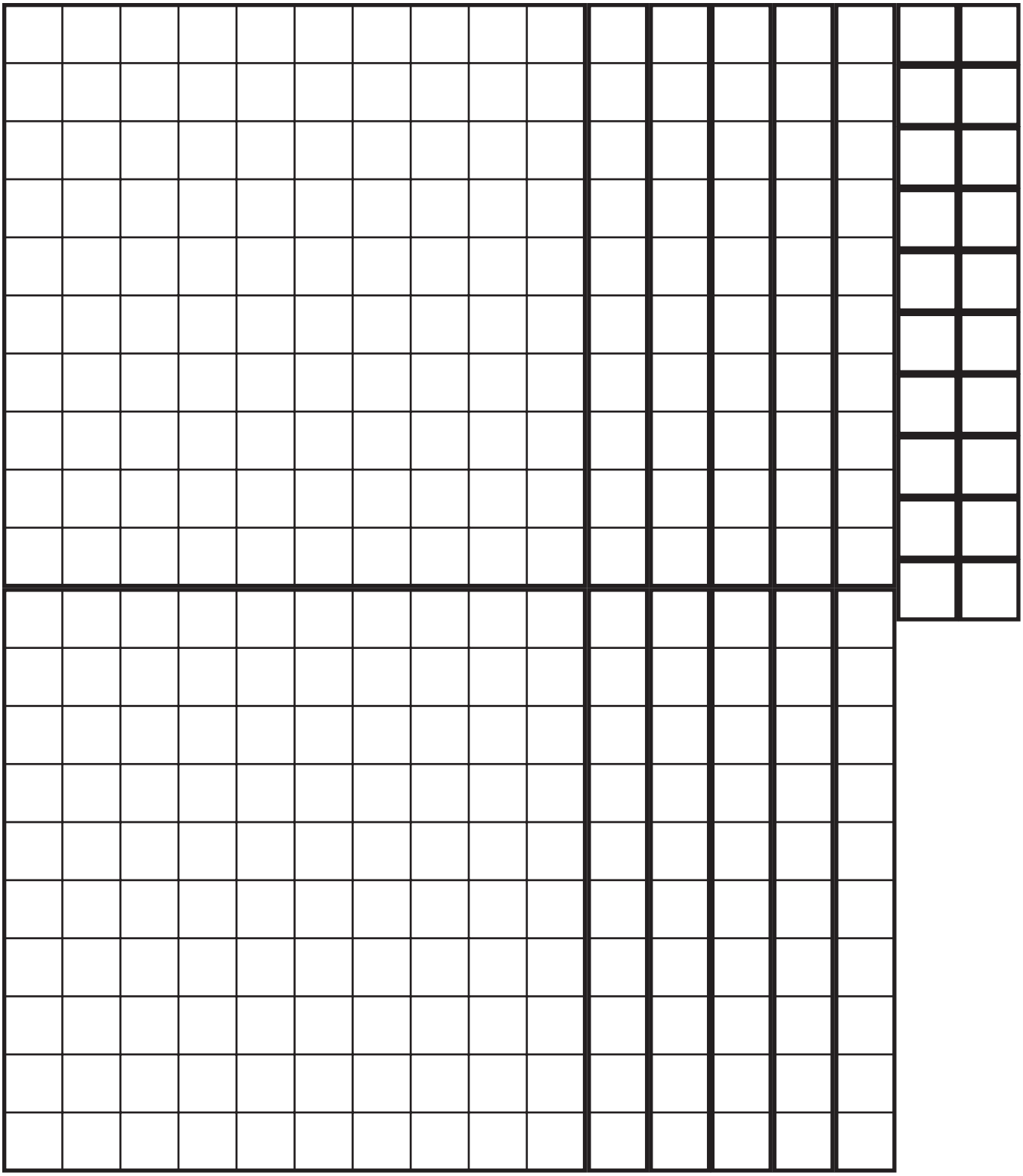
Race to 100 & Back Spinner



Race to 100 & Back Spinner



Base Ten Pieces



Support Activity 3 ★ Instructional Considerations

SUPPORT ACTIVITY

More or Less Addition

Overview

Players begin by spinning a more or less spinner to determine whether they will play for the largest or smallest sum. Then they take turns spinning single-digit numbers, which they arrange to create two double-digit numbers. When both players have a pair of double-digit numbers, they each find their own sums. If they were playing for more, the player with the largest sum wins. If they were playing for less, the player with the smaller sum wins.

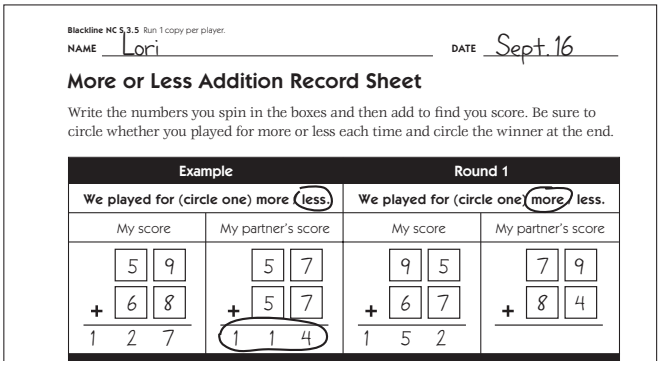
Skills & Concepts

- ★ reading, writing, ordering, modeling, comparing, and identify place value of digits in whole numbers to 300
- ★ adding and subtracting up to 4-digit numbers with and without regrouping using models and a variety of efficient paper/pencil and mental strategies

You'll need

- ★ Instructions for More or Less Addition (Blacklines S 3.3 and S 3.4, 1 copy of each run back-to-back)
- ★ More or Less Addition Record Sheet (Blackline S 3.5, 1 copy per player)
- ★ More or Less Addition/Subtraction Spinner 1 or 2 (Blackline S 3.6 or 3.7, 1 copy for every 2 pairs of players, cut in half, Spinner 1 contains numbers 1–6 and Spinner 2 contains numbers 4–9. Select the spinner based on students' readiness level.)
- ★ a few sets of base ten pieces for each pair of players (Use Blackline S 2.6 to make base ten pieces if needed.)
- ★ a pencil and paperclip to use as a spinner

If students are struggling to place their numbers, encourage them to build or sketch the different possibilities with base ten pieces. If they are struggling to find the sum of their numbers, encourage them to use the base ten pieces also. The visual support will help many students complete computations involving regrouping.



Blackline NC S.3.5 Run 1 copy per player.

NAME Lori DATE Sept. 16

More or Less Addition Record Sheet

Write the numbers you spin in the boxes and then add to find you score. Be sure to circle whether you played for more or less each time and circle the winner at the end.

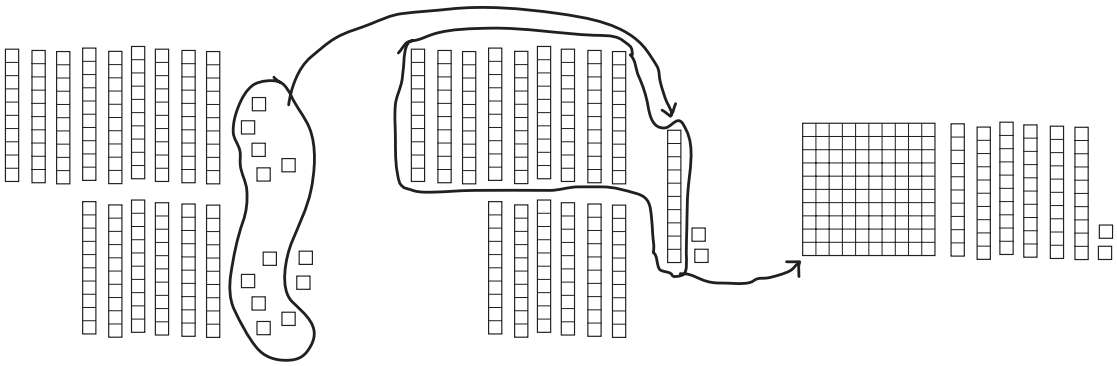
Example		Round 1	
We played for (circle one) more (less.)		We played for (circle one) (more) less.	
My score	My partner's score	My score	My partner's score
59 + 68 = 127	57 + 57 = (114)	95 + 67 = 152	79 + 84 =

Miss Ruttle *Lori, I see your numbers here, but I'm wondering how you found the total. Can you show me what you did with base ten pieces?*

Lori *I started with the 5 and 7 and added them together. That's 12. Here, I can make a strip for the 10. Then I added the 9 and 6, and that was … hey wait, now it's 10 and 6 because I added that strip. Hmm. So it's 16 tens. That's 162.*

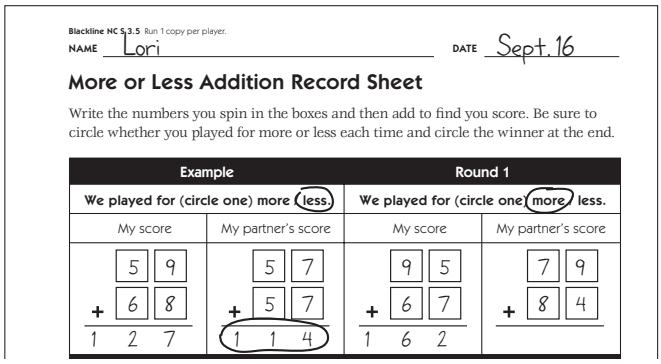
(Continued on back.)

Support Activity 3 Instructional Considerations (cont.)



Miss Ruttle *That's different from what you wrote: 152. Why did you get a different answer this time?*

Lori *I think I wrote the 2 for the 12 and forgot about the 10. So I got 152 instead of 162.*



Blackline NC S.3.5 Run 1 copy per player.

NAME Lori DATE Sept. 16

More or Less Addition Record Sheet

Write the numbers you spin in the boxes and then add to find you score. Be sure to circle whether you played for more or less each time and circle the winner at the end.

Example		Round 1	
We played for (circle one) more (less.)		We played for (circle one) (more) less.	
My score	My partner's score	My score	My partner's score
59 + 68 = 127	57 + 57 = (114)	95 + 67 = 162	79 + 84 =

If you find that students are really struggling, either with the strategizing involved in the game or with the place value concepts, go back and play Support Activity 2, More or Less Place Value, with them instead.

Support Activity 3

SUPPORT ACTIVITY

More or Less Addition

You'll need

★ Instructions for More or Less Addition (Blacklines S 3.3 and S 3.4, 1 copy of each run back-to-back)

★ More or Less Addition Record Sheet (Blackline S 3.5, 1 copy per player)

★ More or Less Addition/Subtraction Spinner 1 or 2 (Blackline S 3.6 or 3.7, 1 copy for every 2 pairs of players, cut in half, Spinner 1 contains numbers 1–6 and Spinner 2 contains numbers 4–9. Select the spinner based on students' readiness level.)

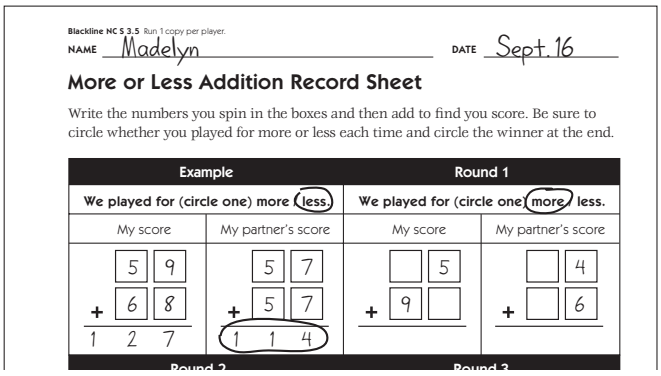
★ a few sets of base ten pieces for each pair of players (Use Blackline S 2.6 to make base ten pieces if needed.)

★ a pencil and paperclip to use as a spinner

More or Less Addition

1 Write your name and the date at the top of the record sheet. Spin the more or less spinner to see whether you are playing for the largest or smallest total. Circle more or less on your record sheet for this round to show what you are playing for.

2 Take turns with your partner spinning the numbered spinner. Each time, decide whether you will put the number in the ones place or the tens place of the top or bottom number. You can build your numbers with base ten pieces as you go.

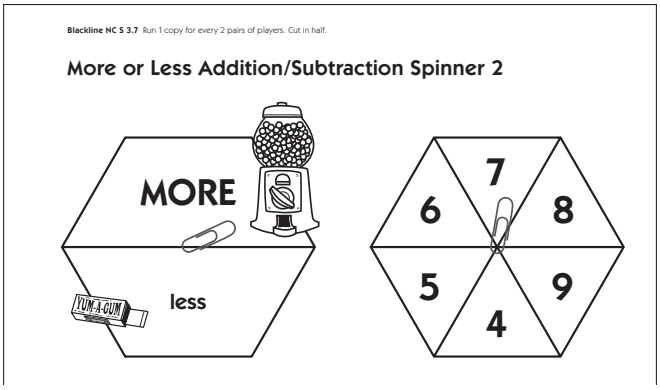

Blackline NC S 3.5 Run 1 copy per player.

NAME Madelyn DATE Sept. 16

More or Less Addition Record Sheet

Write the numbers you spin in the boxes and then add to find you score. Be sure to circle whether you played for more or less each time and circle the winner at the end.

Example		Round 1	
We played for (circle one) more (less)		We played for (circle one) (more) less.	
My score	My partner's score	My score	My partner's score
59 + 68 = 127	57 + 57 = (114)	5 + 9 =	4 + 6 =
Round 2		Round 3	



I spun a 7. I think I could still get an 8 or a 9 next time, so I'm going to put the 7 in the ones place, because I can still go higher for the tens place.

(Continued on back.)

Support Activity 3 (cont.)

3 After you have both taken 4 turns each, add your numbers and see whose total is higher and whose is lower. You can use the base ten pieces to add your numbers if you want to. The player with the lower total wins if you were playing for less. If you were playing for more, the player with the higher total wins. Circle the winner on your record sheet.

Blackline NC S 3.5 Run 1 copy per player.

NAME Madelyn DATE Sept. 16

More or Less Addition Record Sheet

Write the numbers you spin in the boxes and then add to find you score. Be sure to circle whether you played for more or less each time and circle the winner at the end.

Example		Round 1	
We played for (circle one) more (less).		We played for (circle one) (more) less.	
My score	My partner's score	My score	My partner's score
59 + 68 = 127	57 + 57 = 114	65 + 97 = 162	84 + 56 = 140

Well, I didn't get a higher number for the tens place, but my total is still higher, so I win this round.

4 Play 4 more rounds. Circle whether you were playing for more or less in each round, and circle the winning total each time.

NAME _____ **DATE** _____

More or Less Addition Record Sheet

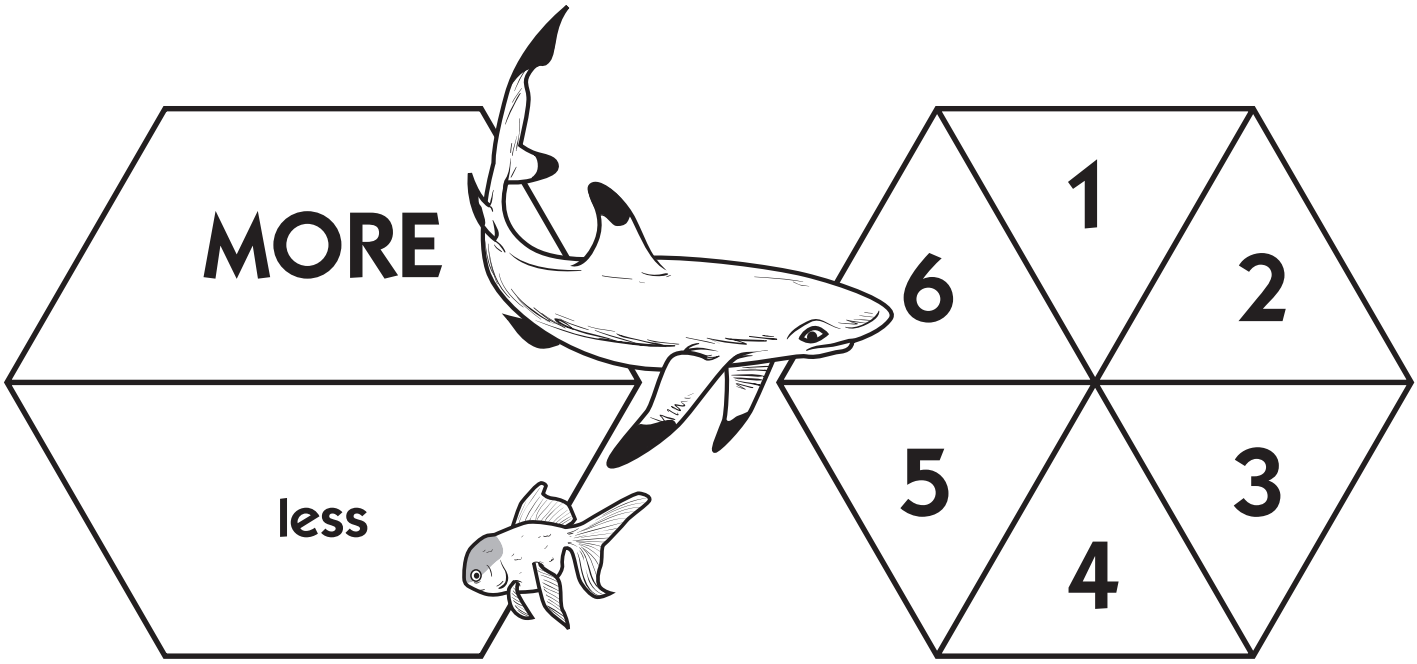
Write the numbers you spin in the boxes and then add to find you score. Be sure to circle whether you played for more or less each time and circle the winner at the end.

Example		Round 1	
We played for (circle one) more / less.		**We played for (circle one) more / less.**	
My score	My partner's score	My score	My partner's score
59 + 68 = 127	57 + 57 = 114	+ =	+ =

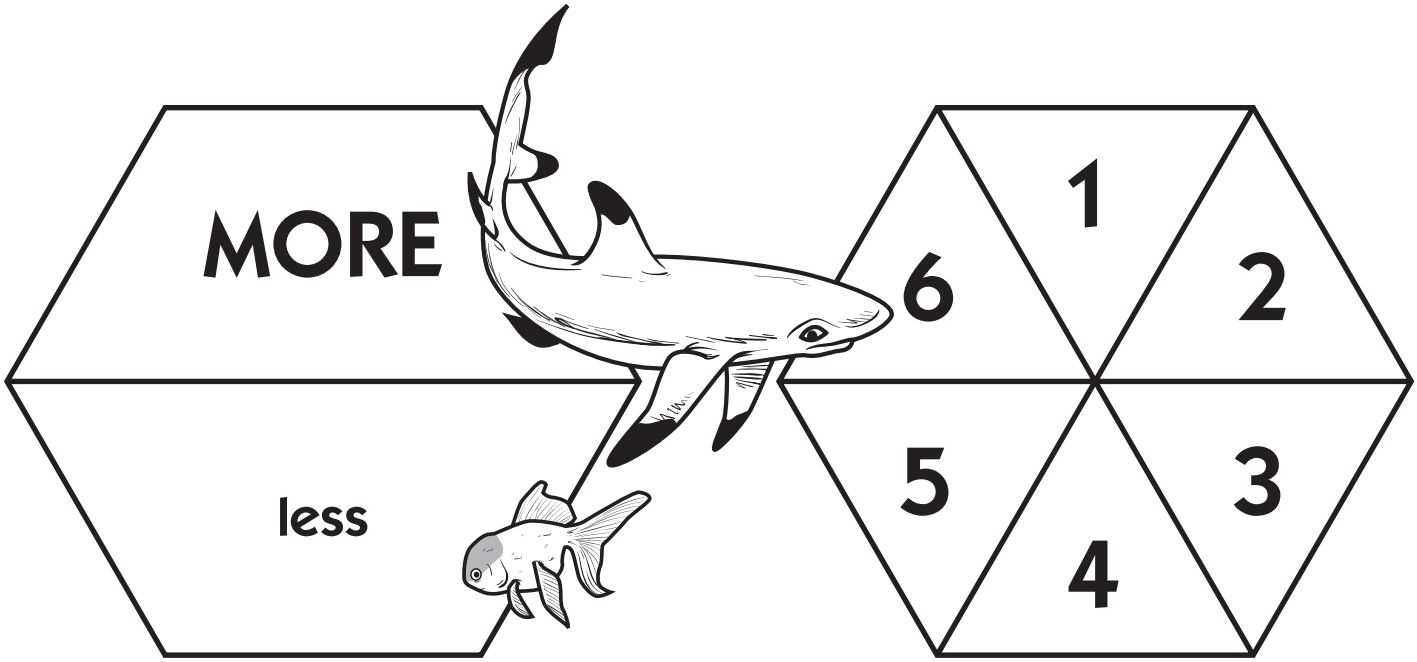
Round 2		Round 3	
We played for (circle one) more / less.		**We played for (circle one) more / less.**	
My score	My partner's score	My score	My partner's score
+ =	+ =	+ =	+ =

Round 4		Round 5	
We played for (circle one) more / less.		**We played for (circle one) more / less.**	
My score	My partner's score	My score	My partner's score
+ =	+ =	+ =	+ =

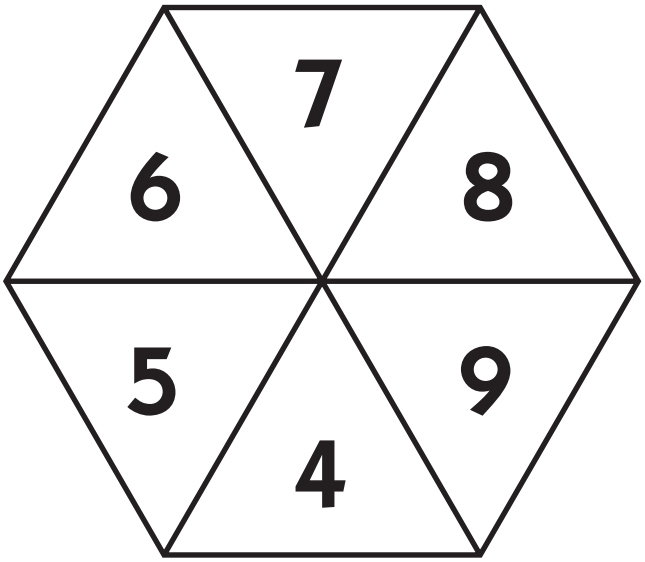
More or Less Addition/Subtraction Spinner 1



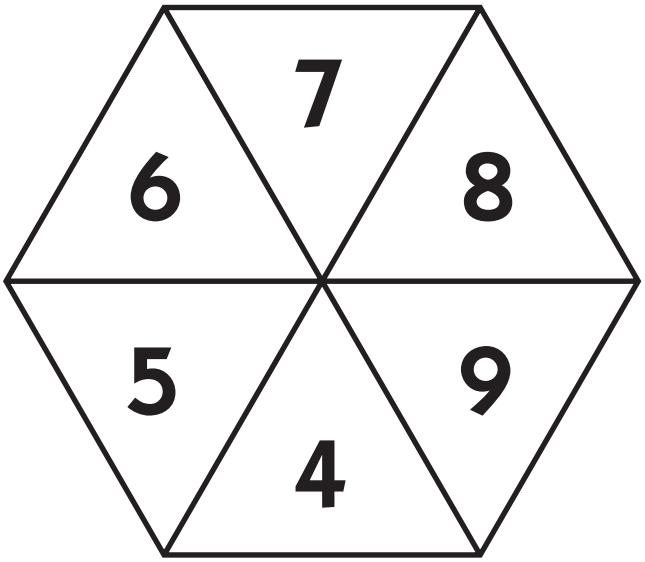
More or Less Addition/Subtraction Spinner 1



More or Less Addition/Subtraction Spinner 2



More or Less Addition/Subtraction Spinner 2



Support Activity 4 ★ Instructional Considerations

SUPPORT ACTIVITY

More or Less Addition Big Time

Overview

Players begin by spinning a more or less spinner to determine whether they will play for the largest or smallest sum. Then they take turns spinning single-digit numbers, which they arrange to create two three-digit numbers. When both players have a pair of triple-digit numbers, they each find their own sums. If they were playing for more, the player with the largest sum wins. If they were playing for less, the player with the smaller sum wins.

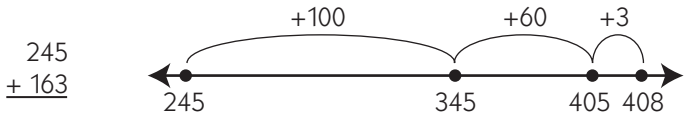
Skills & Concepts

- ★ reading, writing, ordering, modeling, comparing, and identify place value of digits in whole numbers to 1000
- ★ adding and subtracting up to 4-digit numbers with and without regrouping using models and a variety of efficient paper/pencil and mental strategies

You'll need

- ★ Instructions for More or Less Addition Big Time (Blacklines S 4.2 and S 4.3, 1 copy of each run back-to-back)
- ★ More or Less Addition Big Time Record Sheet (Blackline S 4.4, 1 copy per player)
- ★ More or Less Addition/Subtraction Big Time Spinner 1 or 2 (Blacklines S 4.5 or 4.6, 1 copy for every 2 pairs of players, cut in half. Spinner 1 contains numbers 1–6 and Spinner 2 contains numbers 4–9. Select the spinner based on students' readiness level.)
- ★ a pencil and paperclip to use as a spinner
- ★ scratch paper

Encourage students to use whatever computational methods make the most sense to them, but do press them to move toward more efficient methods. For example, can they work with the ones, tens, and hundreds places separately and then combine the sums? Can they use landmark numbers to help? Some students may find it helpful to work with an open number line as shown below.



245 + 163 = 408

Using an open number line, students can begin with either addend and then add the other addend, chunk by chunk, to arrive at the sum. If students are not already familiar with this method, they will probably need you to model it for them a few times.

Support Activity 4

SUPPORT ACTIVITY

More or Less Addition Big Time

You'll need

★ Instructions for More or Less Addition Big Time (Blacklines S 4.2 and S 4.3, 1 copy of each run back-to-back)

★ More or Less Addition Big Time Record Sheet (Blackline S 4.4, 1 copy per player)

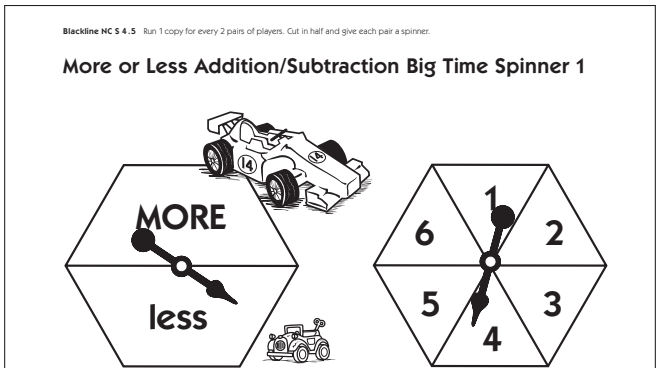
★ More or Less Addition/Subtraction Big Time Spinner 1 or 2 (Blacklines S 4.5 or 4.6, 1 copy for every 2 pairs of players, cut in half. Spinner 1 contains numbers 1–6 and Spinner 2 contains numbers 4–9. Select the spinner based on students' readiness level.)

★ a pencil and paperclip to use as a spinner

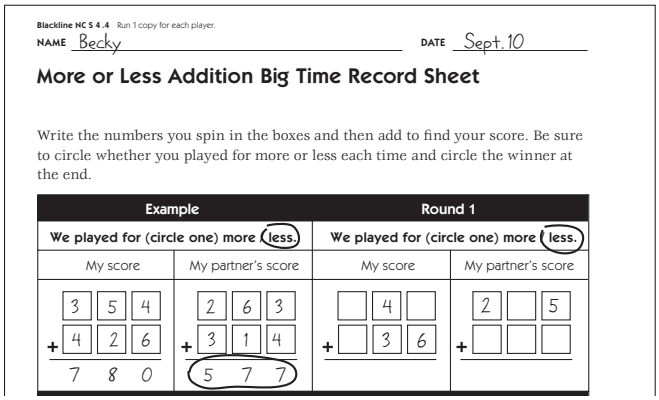
★ scratch paper

Instructions for More or Less Addition Big Time

1 Write your name and date on the record sheet. Spin the more or less spinner to see if you are playing for the largest or smallest sum. Circle more or less to show what you are playing for.



2 Take turns spinning the numbered spinner. Each time, decide whether you will put the number in the ones, tens, or hundreds place of the top or bottom number.



I spun a 4. I'll put it in the tens place, because it's kind of a middle number. I think I can get lower numbers for my hundreds places.

3 After you have both taken 6 turns each, add your numbers and see

(Continued on back.)

Support Activity 4 (cont.)

whose total is higher and whose is lower. The player with the lower total wins if you were playing for less. If you were playing for more, the player with the higher total wins. Circle the winner on your record sheet.

4 Play 4 more rounds. Circle whether you were playing for more or less in each round, and circle the winning total each time.

NAME _____ **DATE** _____

More or Less Addition Big Time Record Sheet

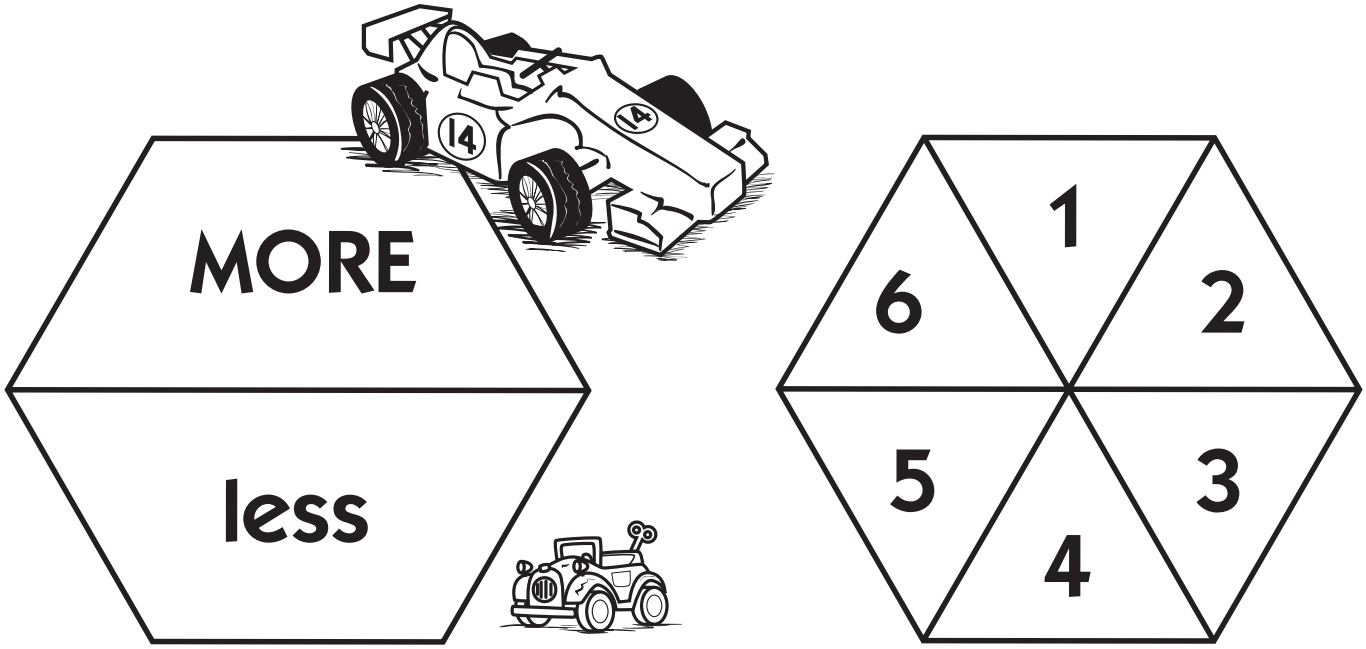
Write the numbers you spin in the boxes and then add to find your score. Be sure to circle whether you played for more or less each time and circle the winner at the end.

Example		Round 1	
We played for (circle one) more / less.		**We played for (circle one) more / less.**	
My score	My partner's score	My score	My partner's score
3 5 4 + 4 2 6 7 8 0	2 6 3 + 3 1 4 5 7 7	+	+

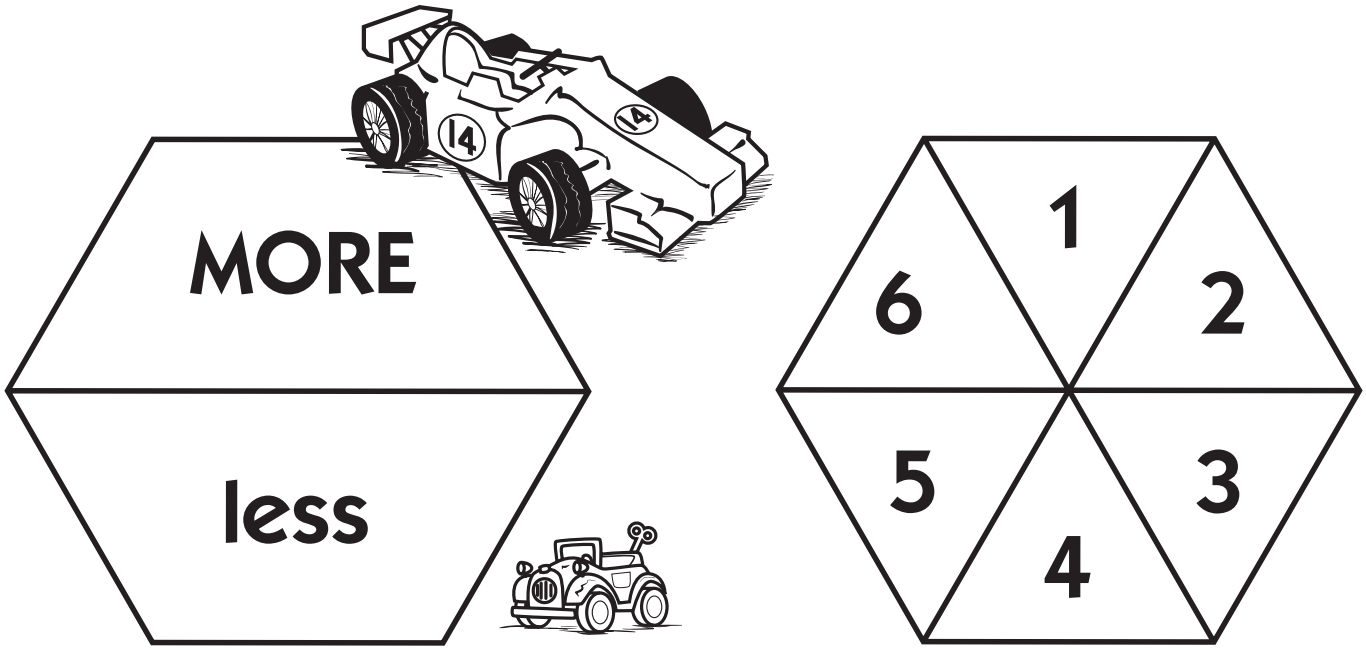
Round 2		Round 3	
We played for (circle one) more / less.		**We played for (circle one) more / less.**	
My score	My partner's score	My score	My partner's score
+	+	+	+

Round 4		Round 5	
We played for (circle one) more / less.		**We played for (circle one) more / less.**	
My score	My partner's score	My score	My partner's score
+	+	+	+

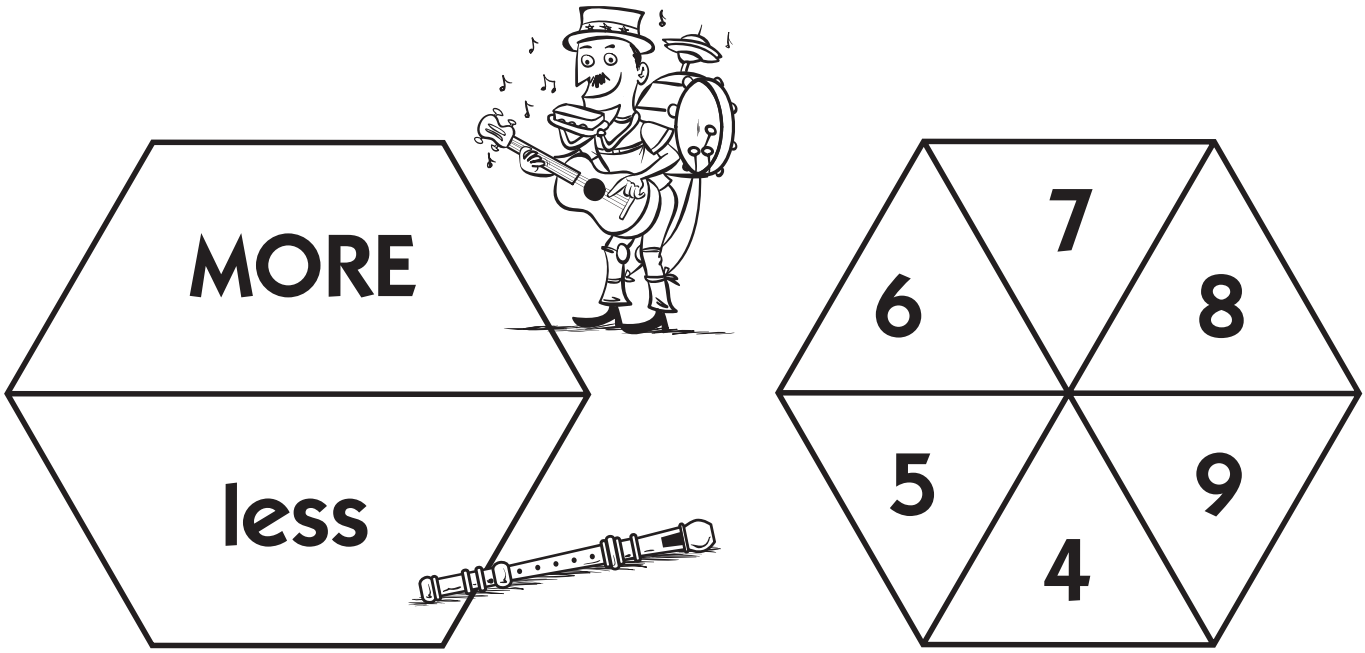
More or Less Addition/Subtraction Big Time Spinner 1



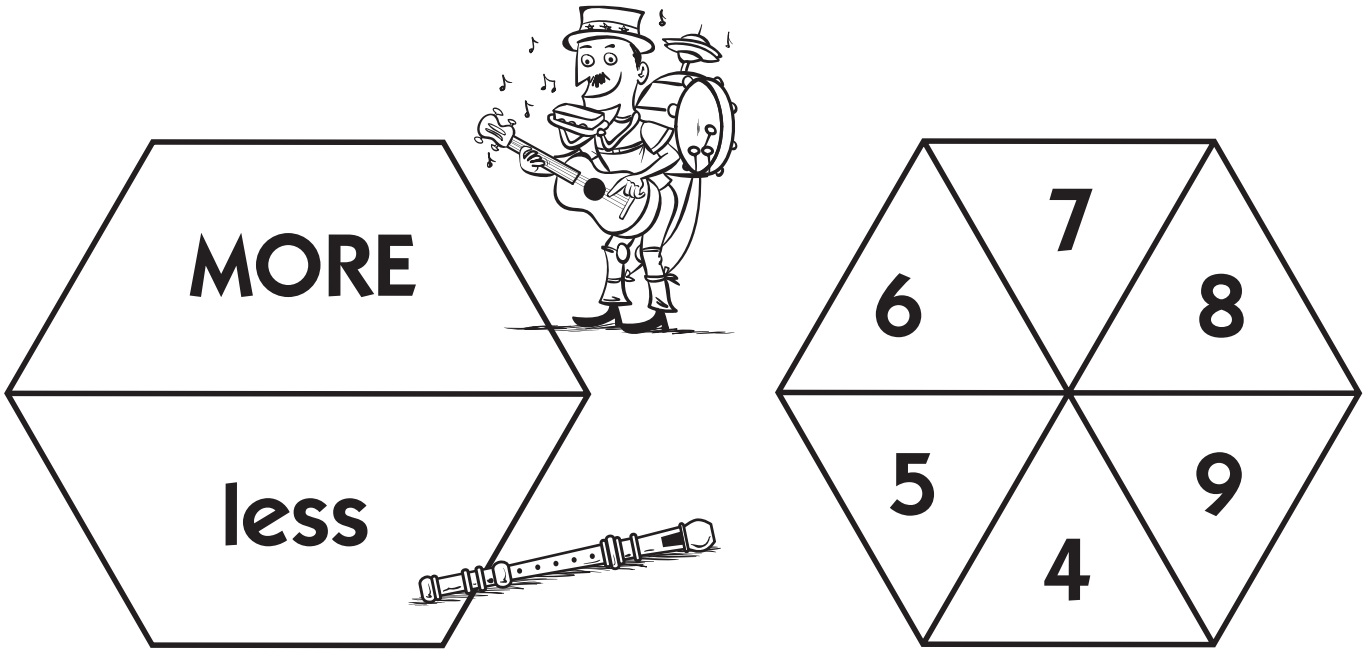
More or Less Addition/Subtraction Big Time Spinner 1



More or Less Addition/Subtraction Big Time Spinner 2



More or Less Addition/Subtraction Big Time Spinner 2



Support Activity 5 ★ Instructional Considerations

SUPPORT ACTIVITY

Count Down 400

Overview

Players take turns spinning two single-digit numbers, assigning a place value to each number, and then subtracting the resulting 2-digit number from their running total, which begins at 400 and decreases throughout the game. After 4 turns, the player closest to 0 wins.

Skills & Concepts

★ subtracting with and without regrouping using models and a variety of efficient paper/pencil and mental strategies

★ using estimation strategies to solve problems

You'll need

★ Instructions for Count Down 400 (Blackline S 5.2)

★ Count Down 400 Record Sheet (Blackline S 5.3, 1 copy per player)

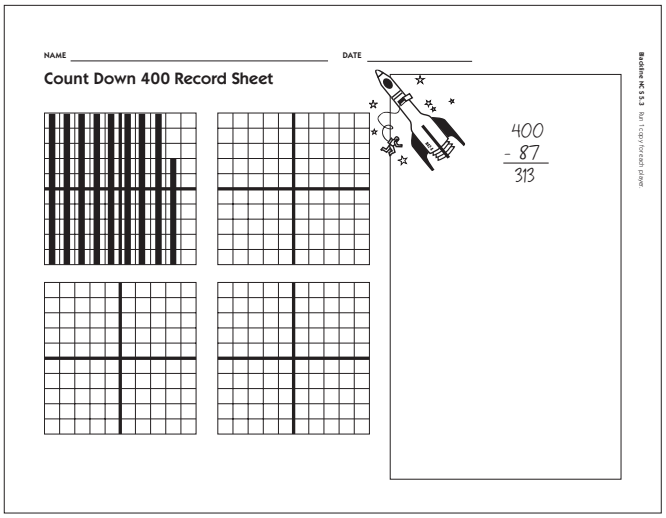
★ Count Down 400 Spinner (Blackline S 5.4, 1 copy for every 2 pairs of players, cut in half)

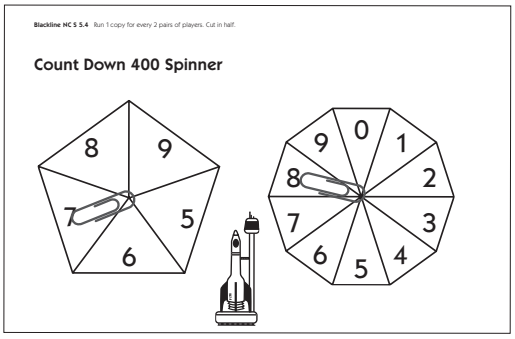
★ base ten pieces (optional) (Use Blackline S 2.6 to make your own base ten pieces if needed.)

★ pencil and paperclip to use as a spinner (1 set for each pair of players)

★ colored pencils or crayons in 4 colors

Before students actually compute the difference between 400 and the number they spun, remind them to estimate a reasonable answer and explain their thinking. They can use base ten pieces or any paper/pencil or mental math strategies they prefer to compute the difference. Then, ask them to check their thinking using the grids on the record sheets.





Support Activity 5

SUPPORT ACTIVITY

Count Down 400

You'll need

★ Instructions for Count Down 400 (Blackline S 5.2)

★ Count Down 400 Record Sheet (Blackline S 5.3, 1 copy per player)

★ Count Down 400 Spinner (Blackline S 5.4, 1 copy for every 2 pairs of players, cut in half)

★ base ten pieces (optional) (Use Blackline S 2.6 to make your own base ten pieces if needed.)

★ pencil and paperclip to use as a spinner (1 set for each pair of players)

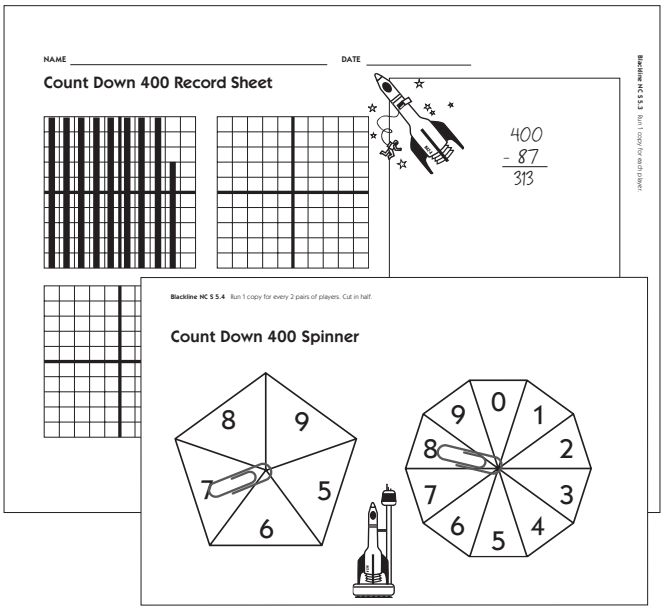
★ colored pencils or crayons in 4 colors

Instructions for Count Down 400

1 You and your partner will each get your own record sheets. You'll share a spinner.

2 Spin both spinners and arrange the 2 numbers to make the largest 2-digit number you can. Estimate how much you'll have left when you subtract that number from 400.

3 Subtract your number from 400. Sketch the amount you subtracted on the grids and record an equation to show what is left.

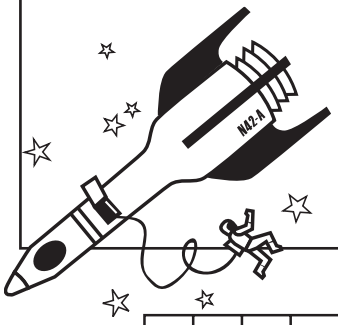


4 Now it's your partner's turn. Share your computation strategies and double-check each other's work. Use the base ten pieces if you'd like. Record each turn in a different color crayon or pencil on the grids.

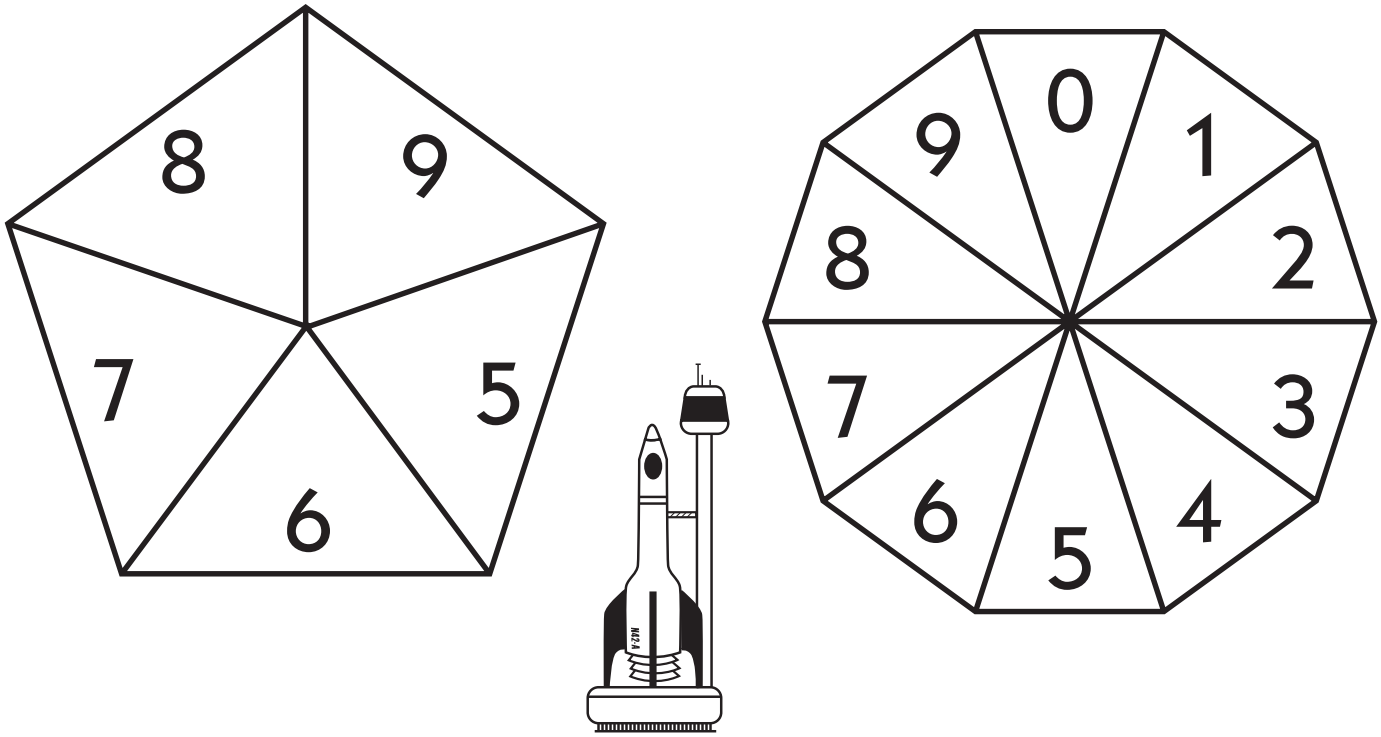
5 After 4 turns each, compare how much you both have left on your grids. Estimate and then compute the difference. Share your thinking. The player who is closest to 0 after 4 turns wins the game.

NAME _____ DATE _____

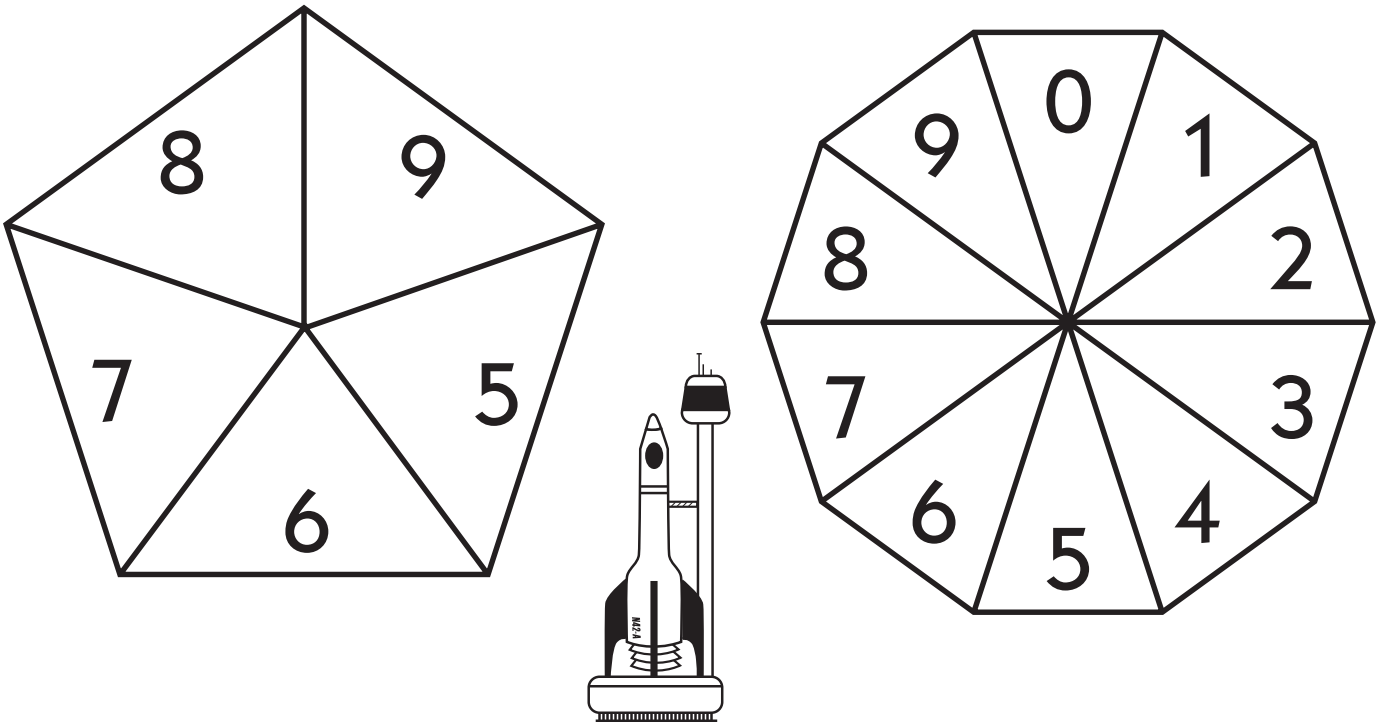
Count Down 400 Record Sheet



Count Down 400 Spinner



Count Down 400 Spinner



Support Activity 6 ★ Instructional Considerations

SUPPORT ACTIVITY

More or Less Subtraction

Overview

Players begin by spinning a more or less spinner to determine whether they will play for the largest or smallest difference. Then they take turns spinning single-digit numbers, which they arrange to create two double-digit numbers. When both players have a pair of double-digit numbers, they each find their own differences. If they were playing for more, the player with the largest difference wins. If they were playing for less, the player with the smaller difference wins.

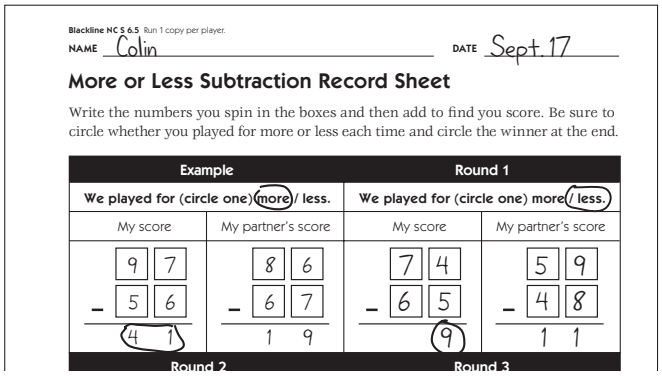
Skills & Concepts

- ★ reading, writing, ordering, modeling, comparing, and identify place value of digits in whole numbers to 100
- ★ subtracting 2-digit numbers with and without regrouping using models and a variety of efficient paper/pencil and mental strategies

You'll need

- ★ Instructions for More or Less Subtraction (Blacklines NC S 6.3 and S 6.4, 1 copy of each run back-to-back)
- ★ More or Less Subtraction Record Sheet (Blackline S 6.5, 1 copy per player)
- ★ More or Less Addition/Subtraction Spinner 1 or 2 (Blackline S 4,5 or 4.6, 1 copy for each every 2 pairs of players, cut in half, Spinner 1 contains numbers 1–6 and Spinner 2 contains numbers 4–9. Select the spinner based on students' readiness level.)
- ★ a few sets of base ten pieces for each pair of players (Use Blackline S 2.6 to make base ten pieces if needed.)
- ★ a pencil and paperclip to use as a spinner

The strategies involved in More or Less Subtraction are quite a bit more complex than in More or Less Addition. In More or Less Addition, students simply tried to get the largest numbers in the tens place if playing for more, and the smallest numbers in the tens place if playing for less. In More or Less Subtraction, however, it is the difference between the numbers, and not the numbers themselves, that students must consider. For example, it is quite possible to have relatively large numbers and still get the smallest difference, as shown below.



Blackline NC S 6.5 Run 1 copy per player.

NAME Colin DATE Sept. 17

More or Less Subtraction Record Sheet

Write the numbers you spin in the boxes and then add to find you score. Be sure to circle whether you played for more or less each time and circle the winner at the end.

Example		Round 1	
We played for (circle one) more / less.		We played for (circle one) more / less.	
My score	My partner's score	My score	My partner's score
97 − 56 = 41	86 − 67 = 19	74 − 65 = 9	59 − 48 = 11
Round 2		Round 3	

Colin *Wow! I had bigger numbers than you did, but I still won. My difference was 9 and yours was 11!*

(Continued on back.)

Support Activity 6 Instructional Considerations (cont.)

Mrs. Fisher *Connor, how can that be? You had bigger numbers, but you still got a smaller difference than I did.*

Colin *Well, it's the difference that matters, not the numbers.*

Mrs. Fisher *Hmm, can you think of some other big numbers that have a small difference?*

Colin *Well, 100 and 101. They're big, but the difference between them is small: 1!*

If students are having difficulty finding the difference between their numbers, ask them to use the base ten pieces for support. The visual model helps students make sense of the process of decomposing tens into ones before subtracting and helps preserve their sense of number as they compute. Do not press students to use the traditional algorithm. In fact, students who are struggling with place value concepts and computation need an opportunity to use the visual models and develop their own methods for solving these problems.

If you find that students are really struggling, either with the strategizing involved in the game or with the place value concepts, go back and play Support Activity 2, More or Less Place Value, with them instead.

Note *If the spins result in a negative difference—if, for instance, a student has set up a problem such as the one shown below and spins a 9 on his final spin—allow him to take another roll or rearrange his digits so that the difference that results isn't negative. We don't want to communicate to students that it's impossible to get a negative outcome, but dealing with negative numbers is outside the scope of this game as a Support Activity for fourth graders.*

Support Activity 6

SUPPORT ACTIVITY

More or Less Subtraction

You'll need

★ Instructions for More or Less Subtraction (Blacklines S 6.3 and S 6.4, 1 copy of each run back-to-back)

★ More or Less Subtraction Record Sheet (Blackline S 6.5, 1 copy per player)

★ More or Less Addition/Subtraction Spinner 1 or 2 (Blackline S 4.5 or 4.6, 1 copy for every 2 pairs of players, cut in half, Spinner 1 contains numbers 1–6 and Spinner 2 contains numbers 4–9. Select the spinner based on students' readiness level.)

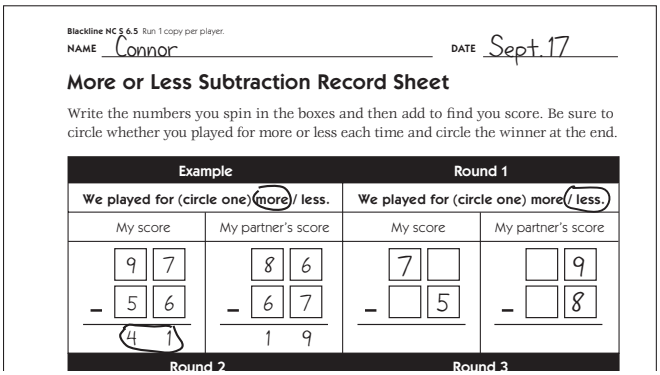
★ a few sets of base ten pieces for each pair of players (Use Blackline S 2.6 to make base ten pieces if needed.)

★ a pencil and paperclip to use as a spinner

More or Less Subtraction

1 Write your name and the date at the top of the record sheet. Spin the more or less spinner to see whether you are playing for the largest or smallest difference. Circle more or less on your record sheet for this round to show what you are playing for.

2 Take turns with your partner spinning the numbered spinner. Each time, decide whether you will put the number in the ones place or the tens place of the top or bottom number. You can build your numbers with base ten pieces as you go.



Blackline NC S 6.5 Run 1 copy per player.

NAME Connor DATE Sept. 17

More or Less Subtraction Record Sheet

Write the numbers you spin in the boxes and then add to find you score. Be sure to circle whether you played for more or less each time and circle the winner at the end.

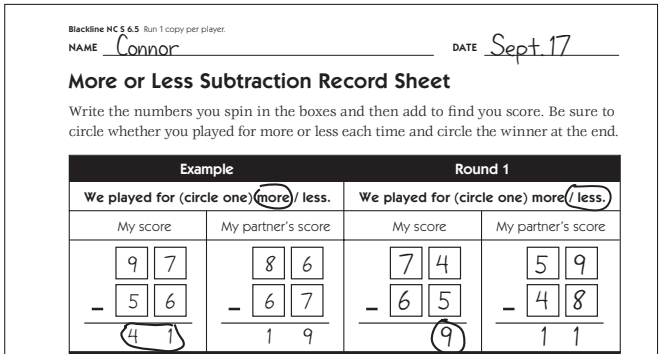
Example		Round 1	
We played for (circle one) more / less.		We played for (circle one) more / less.	
My score	My partner's score	My score	My partner's score
97 − 56 = 41	86 − 67 = 19	7□ − □5 =	□9 − □8 =
Round 2		Round 3	

Connor *I thought I kind of messed up when I put the 7 in the tens place, but now I have spun a 6. If I put that in the tens place below the 7, that's just 10 away. So the difference is going to be around 10 or so. I think that's going to be pretty good!*

(Continued on back.)

Support Activity 6 (cont.)

3 After you have both taken 4 turns each, find the difference between your 2 numbers and see whose difference is higher and whose is lower. You can use the base ten pieces to find the difference if you want to. The player with the lower difference wins if you were playing for less. If you were playing for more, the player with the higher difference wins. Circle the winner on your record sheet.



Blackline NC S 6.5 Run 1 copy per player.

NAME Connor DATE Sept. 17

More or Less Subtraction Record Sheet

Write the numbers you spin in the boxes and then add to find you score. Be sure to circle whether you played for more or less each time and circle the winner at the end.

Example		Round 1	
We played for (circle one) more / less.		We played for (circle one) more / less.	
My score	My partner's score	My score	My partner's score
97 − 56 = 41	86 − 67 = 19	74 − 65 = 9	59 − 48 = 11

Connor *Wow! I had bigger numbers than you did, but I still won. My difference was 9 and yours was 11!*

Mr. Porter *Connor, how can that be? You had bigger numbers, but you still got a smaller difference than I did.*

Connor *Well, it's the difference that matters, not the numbers.*

Mr. Porter *Hmm, can you think of some other big numbers that have a small difference?*

Connor *Well, 100 and 101. They're big, but the difference between them is small: 1!*

4 Play 4 more rounds. Circle whether you were playing for more or less in each round, and circle the winning difference each time.

NAME _____ **DATE** _____

More or Less Subtraction Record Sheet

Write the numbers you spin in the boxes and then add to find you score. Be sure to circle whether you played for more or less each time and circle the winner at the end.

Example		Round 1	
We played for (circle one) more / less.		**We played for (circle one) more / less.**	
My score	My partner's score	My score	My partner's score
9 7 − 5 6 4 1	8 6 − 6 7 1 9	☐☐ − ☐☐	☐☐ − ☐☐

Round 2		Round 3	
We played for (circle one) more / less.		**We played for (circle one) more / less.**	
My score	My partner's score	My score	My partner's score
☐☐ − ☐☐	☐☐ − ☐☐	☐☐ − ☐☐	☐☐ − ☐☐

Round 4		Round 5	
We played for (circle one) more / less.		**We played for (circle one) more / less.**	
My score	My partner's score	My score	My partner's score
☐☐ − ☐☐	☐☐ − ☐☐	☐☐ − ☐☐	☐☐ − ☐☐

Support Activity 7 ★ Instructional Considerations

SUPPORT ACTIVITY

More or Less Subtraction Big Time

Overview

Players begin by spinning a more or less spinner to determine whether they will play for the largest or smallest difference. Then they take turns spinning single-digit numbers, which they arrange to create two triple-digit numbers. When both players have a pair of triple-digit numbers, they each find their own differences. If they were playing for more, the player with the largest difference wins. If they were playing for less, the player with the smaller difference wins.

Skills & Concepts

★ reading, writing, ordering, modeling, comparing, and identifying place value of digits in whole numbers to 1000

★ subtracting 3-digit numbers with and without regrouping using models and a variety of efficient paper/pencil and mental strategies

You'll need

★ Instructions for More or Less Subtraction Big Time (Blackline S 7.3)

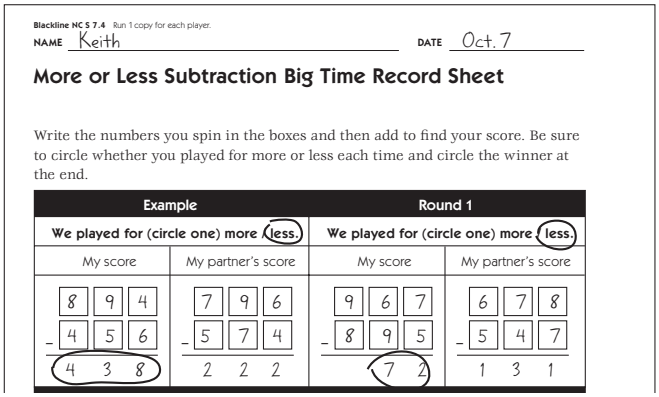
★ More or Less Subtraction Big Time Record Sheet (Blackline S 7.4, 1 copy per player)

★ More or Less Addition/Subtraction Big Time Spinner 1 or 2 (Blacklines S 4.5 or 4.6, 1 copy for every 2 pairs of players, cut in half. Spinner 1 contains numbers 1–6 and Spinner 2 contains numbers 4–9. Select the spinner based on students' readiness level.)

★ a pencil and paperclip to use as a spinner

★ scratch paper

The strategies involved in More or Less Subtraction are quite a bit more complex than in More or Less Addition. In More or Less Addition, students simply tried to get the largest numbers in the hundreds place if playing for more, and the smallest numbers in the hundreds place if playing for less. In More or Less Subtraction, however, it is the difference between the numbers, and not the numbers themselves, that students must consider. For example, it is quite possible to have relatively large numbers and still get the smallest difference, as shown below, and students may also become strategic about arranging numbers that require them to borrow in order to subtract.



Blackline NC S 7.4 Run 1 copy for each player.

NAME Keith DATE Oct. 7

More or Less Subtraction Big Time Record Sheet

Write the numbers you spin in the boxes and then add to find your score. Be sure to circle whether you played for more or less each time and circle the winner at the end.

Example		Round 1	
We played for (circle one) more less.		We played for (circle one) more less.	
My score	My partner's score	My score	My partner's score
8 9 4	7 9 6	9 6 7	6 7 8
− 4 5 6	− 5 7 4	− 8 9 5	− 5 4 7
4 3 8	2 2 2	7 2	1 3 1

(Continued on back.)

Support Activity 7 Instructional Considerations (cont.)

Keith *Wow! I had bigger numbers than you did, but I still won. My difference was 72 and yours was 131!*

Mrs. Gray *Keith, how can that be? You had bigger numbers, but you still got a smaller difference than I did.*

Keith *Well, it's the difference that matters, not the numbers.*

Mrs. Gray *Hmm, can you think of some other big numbers that have a small difference?*

Keith *Well, 1000 and 1001. They're big, but the difference between them is small: 1!*

If students are having difficulty finding the difference between their numbers, you can invite them to use the open number line for support. Do not press students to use the traditional algorithm. In fact, students who are struggling with place value concepts and computation may need to take a fresh look at multi-digit subtraction, using a model different from those they have experienced in the past. The open number line has proven to be particularly effective for students experiencing difficulties with multi-digit addition and subtraction.

67 + 5 = 72 so, 967 – 895 = 72

Using the open number line, students begin with the smaller number and add up to the larger number using landmark numbers in chunks as shown above. The difference is the total amount the student added to get from the smaller number to the larger number. Students who are unfamiliar with this method will need you to model it for them a few times, and you may want to have them practice using it before they begin playing the game.

Note *If the spins result in a negative difference—if, for instance, a student has set up a problem such as the one shown below and spins a 9 on his final spin—allow him to take another spin or rearrange his digits so that the difference that results isn't negative. We don't want to communicate to students that it's impossible to get a negative outcome, but dealing with negative numbers is outside the scope of this game as a support activity for fourth graders.*

Support Activity 7

SUPPORT ACTIVITY

More or Less Subtraction Big Time

You'll need

★ Instructions for More or Less Subtraction Big Time (Blackline S 7.3)

★ More or Less Subtraction Big Time Record Sheet (Blackline S 7.4, 1 copy per player)

★ More or Less Addition/Subtraction Big Time Spinner 1 or 2 (Blacklines S 4.5 and 4.6, 1 copy for every 2 pairs of players, cut in half. Spinner 1 contains numbers 1–6 and Spinner 2 contains numbers 4–9. Select the spinner based on students' readiness level.)

★ a pencil and paperclip to use as a spinner

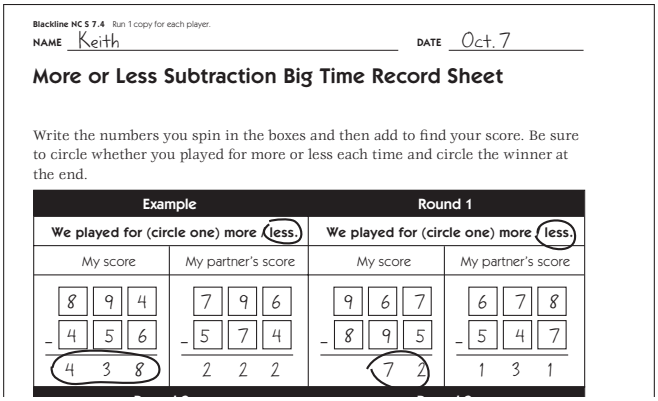
★ scratch paper

Instructions for More or Less Subtraction Big Time

1 Write your name and the date at the top of the record sheet. Spin the more or less spinner to see whether you are playing for the largest or smallest difference. Circle more or less on your record sheet for this round to show what you are playing for.

2 Take turns with your partner spinning the numbered spinner. Each time, decide whether you will put the number in the ones place, tens place, or hundreds place of the top or bottom number.

3 After you have both taken 6 turns each, find the difference between your 2 numbers and see whose difference is higher and whose is lower. The player with the lower difference wins if you were playing for less. If you were playing for more, the player with the higher difference wins. Circle the winner on your record sheet.



Blackline NC S 7.4 Run 1 copy for each player.

NAME Keith DATE Oct. 7

More or Less Subtraction Big Time Record Sheet

Write the numbers you spin in the boxes and then add to find your score. Be sure to circle whether you played for more or less each time and circle the winner at the end.

Example		Round 1	
We played for (circle one) more (less.)		We played for (circle one) more (less.)	
My score	My partner's score	My score	My partner's score
894 − 456 = 438	796 − 574 = 222	967 − 895 = 72	678 − 547 = 131

4 Play 4 more rounds. Circle whether you were playing for more or less in each round, and circle the winning difference each time.

NAME _____ **DATE** _____

More or Less Subtraction Big Time Record Sheet

Write the numbers you spin in the boxes and then add to find your score. Be sure to circle whether you played for more or less each time and circle the winner at the end.

Example		Round 1	
We played for (circle one) more / less.		**We played for (circle one) more / less.**	
My score	My partner's score	My score	My partner's score
8 9 4 – 4 5 6 4 3 8	7 9 6 – 5 7 4 2 2 2	___ ___ ___ – ___ ___ ___	___ ___ ___ – ___ ___ ___
Round 2		**Round 3**	
We played for (circle one) more / less.		**We played for (circle one) more / less.**	
My score	My partner's score	My score	My partner's score
___ ___ ___ – ___ ___ ___	___ ___ ___ – ___ ___ ___	___ ___ ___ – ___ ___ ___	___ ___ ___ – ___ ___ ___
Round 4		**Round 5**	
We played for (circle one) more / less.		**We played for (circle one) more / less.**	
My score	My partner's score	My score	My partner's score
___ ___ ___ – ___ ___ ___	___ ___ ___ – ___ ___ ___	___ ___ ___ – ___ ___ ___	___ ___ ___ – ___ ___ ___

Support Activity 8 ★ Instructional Considerations

SUPPORT ACTIVITY

Larger Numbers on a Line

Overview

Students take turns using the open number line to solve triple-digit subtraction problems. After they have both gone twice, they add their differences together. The player with the larger sum wins.

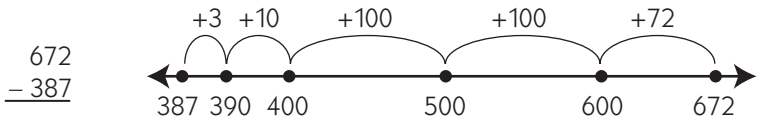
Skills & Concepts

- ★ locating and placing numbers on a number line
- ★ using models, pictures, and/or numbers to find the difference
- ★ identifying the operations needed for solving a problem
- ★ subtracting 3-digit numbers with and without regrouping using models and a variety of strategies

You'll need

- ★ Instructions for Larger Numbers on a Line (Blackline S 8.2)
- ★ Larger Numbers on a Line Problem Cards (Blackline S 8.3, 1 copy cut apart and stored in an envelope or resealable plastic bag for each pair of players)
- ★ Larger Numbers on a Line Record Sheet (Blackline S 8.4, 1 copy run double-sided for each player)

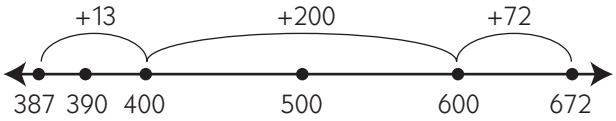
Students who are not yet comfortable with the formal algorithms for addition and subtraction of larger numbers often find it helpful to use a number line when asked to perform these kinds of calculations. They can quickly sketch their line and count in chunks, confident that they have reached the correct answer. As they work, encourage them to look out for different landmark numbers and to use larger, more efficient chunks to add up from the smaller number to the larger number.



100 + 100 + 72 + 10 + 3 = 200 + 75 + 10 = 285

Mrs. Powell *Now that you have this all written out, can you see another way to get from 387 to 672 with fewer, bigger jumps?*

Jorge *Well, I could have done one jump from 400 to 600. That would be 200. And now I guess I could see it's 13 from 387 to 400. I didn't think about that before.*



200 + 72 + 13 = 200 + 85 = 285

Support Activity 8

SUPPORT ACTIVITY

Larger Numbers on a Line

You'll need

★ Instructions for Larger Numbers on a Line (Blackline S 8.2)

★ Larger Numbers on a Line Problem Cards (Blackline S 8.3, 1 copy cut apart and stored in an envelope or resealable plastic bag for each pair of players)

★ Larger Numbers on a Line Record Sheet (Blackline S 8.4, 1 copy run double-sided for each player)

Instructions for Larger Numbers on a Line

1 Write your name and the date at the top of a Larger Numbers on a Line Record Sheet.

2 Pick one problem card. Write the number of the problem on your record sheet.

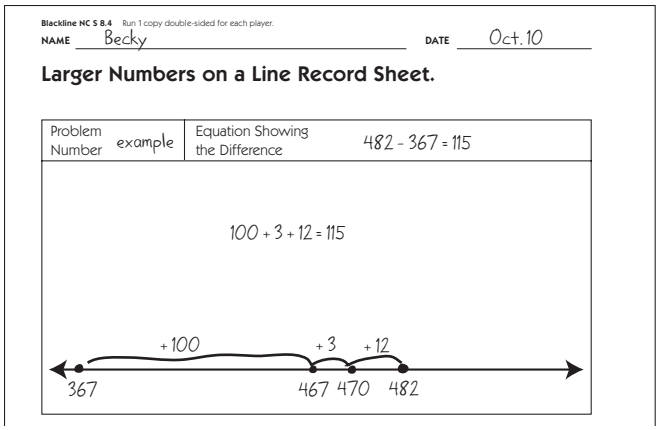
3 If you need help reading the problem, ask another student to help you. Think carefully about what the problem is asking.

4 Use the open number line to show how you solved the problem.

5 Record your solution with a number sentence.

6 Take turns until you have both solved two problems. Then add your two differences together. The player with the higher sum wins.

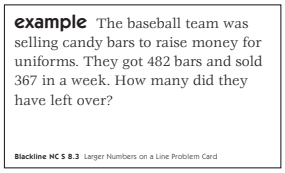
7 Play as many rounds as you have time for.


Blackline NC S 8.4 Run 1 copy double-sided for each player.

NAME Becky DATE Oct. 10

Larger Numbers on a Line Record Sheet.

Problem Number example	Equation Showing the Difference 482 - 367 = 115
100 + 3 + 12 = 115	


example The baseball team was selling candy bars to raise money for uniforms. They got 482 bars and sold 367 in a week. How many did they have left over?

Blackline NC S 8.3 Larger Numbers on a Line Problem Card

Larger Numbers on a Line Problem Cards

1 The milk truck delivered 457 milk cartons to the school this morning. Three hundred eighty-nine of them were plain milk, and the rest were chocolate milk. How many cartons of chocolate milk were delivered to the school?

Blackline NC S 8.3 Larger Numbers on a Line Problem Card

2 Mrs. Olson was in charge of the book fair. She ordered 769 books and sold 583. How many books were not sold?

Blackline NC S 8.3 Larger Numbers on a Line Problem Card

3 Kim had been collecting stickers for a long time. She counted 329 stickers in her box. She gave her new friend Maria 182 of those stickers to get her collection started. How many stickers does Kim have now?

Blackline NC S 8.3 Larger Numbers on a Line Problem Card

4 There are 964 students at the middle school. Four hundred eighty-seven of them ride the bus to school each day, and the rest get to school some other way. How many students at the middle school do not ride the bus to school?

Blackline NC S 8.3 Larger Numbers on a Line Problem Card

5 Kyle was going on a trip from Oregon to San Francisco, California, with his family. His dad said they would travel 672 miles in one day! By lunchtime they had driven 387 miles. How many more miles did they need to travel that day?

Blackline NC S 8.3 Larger Numbers on a Line Problem Card

6 Five hundred twenty-eight students from our city marched in the parades this weekend. Three hundred seventy-one students marched on Saturday and the rest marched on Sunday. How many students marched on Sunday?

Blackline NC S 8.3 Larger Numbers on a Line Problem Card

7 The local zoo is keeping track of how much their baby elephant, Panang, is growing. When Panang was 2 months old, he weighed 476 pounds. When he was 5 months old, he weighed 839 pounds. How much weight did Panang gain during those 3 months?

Blackline NC S 8.3 Larger Numbers on a Line Problem Card

8 A mother horse weighs 922 pounds. Her foal is about a year old and weighs 657 pounds. How much more does the mother horse weigh than her foal? (A foal is a baby horse.)

Blackline NC S 8.3 Larger Numbers on a Line Problem Card

NAME _____ **DATE** _____

Larger Numbers on a Line Record Sheet

Problem Number	Equations Showing the Difference

Problem Number	Equations Showing the Difference

Sum of your differences above:

Support Activity 9 ★ Instructional Considerations

SUPPORT ACTIVITY

Array Challenge

Overview

Players draw cards that each show a rectangular array for a basic multiplication fact. They both find the area of their arrays, and the player with the higher product takes both cards. The player with the most cards after all the cards have been drawn wins.

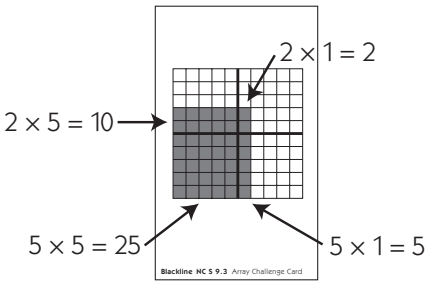
Skills & Concepts

- ★ using models, words, and numbers to demonstrate an understanding of multiplication
- ★ seeing multiplication as repeated addition, equal groups of objects, and arrays
- ★ exploring the commutative and distributive properties of multiplication
- ★ exploring the special properties of 0 and 1 in multiplication

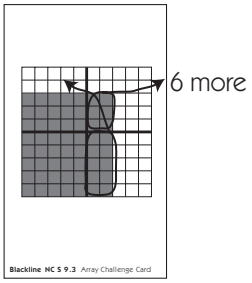
You'll need

- ★ Instructions for Array Challenge (Blackline S 9.2)
- ★ Array Challenge Cards, pages 1–3 (Blacklines S 9.3–9.5, 1 copy for each pair of players, cut apart and stored in a resealable plastic bag or envelope)

The emphasis of Array Challenge is on using efficient grouping methods (chunks of 2, 5, and 10) instead of one-by-one counting to determine the area for each array. Toward this end, encourage students to talk to each other about different ways they could find the total area of each array. Some will use smaller arrays to find the total area, as shown below left. Some of the arrays may lend themselves to other approaches. For example, students might mentally move parts of the array to create chunks that are easier to work with, as in the example below right.



25 + 10 + 5 + 2 = 42
so 7 × 6 = 42



I thought about moving these 10 squares up here. So then it's easy to see it's 50 plus 6 more. So 8 times 7 is 56.

Support Activity 9

SUPPORT ACTIVITY

Array Challenge

You'll need

★ Instructions for Array Challenge (Blackline S 9.2)

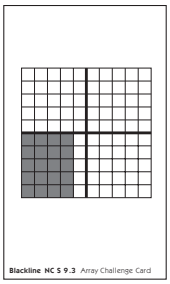
★ Array Challenge Cards, pages 1–3 (Blacklines S 9.3–9.5, 1 copy for each pair of players, cut apart and stored in a resealable plastic bag or envelope)

Instructions for Array Challenge

1 Choose a partner and get a deck of cards to share.

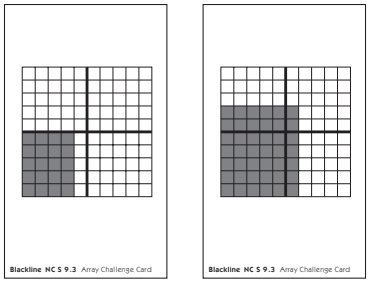
2 Put the cards in a stack in front of you, face down. Decide who will go first.

3 The first player turns over the top card. He or she says what the array shows.



I got 5 × 4. I already know the answer is 20, because I can see columns of 5 on the array. It goes 5, 10, 15, 20!

4 The second player turns over a card and does the same. The player with the greatest product wins both cards. Both players must name their factors and products.



Mine is 7 × 6. That's 7 tripled and then doubled. So 7 × 3 = 21 and then 21 × 2 = 42. I get to take both cards!

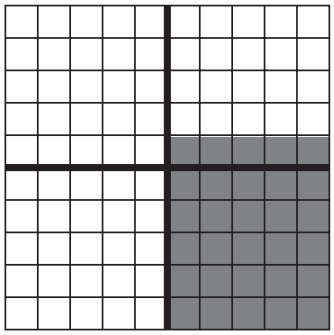
5 If both players have the same product, they each draw a second card. They name their array and its product, and the player with the greatest product wins all 4 cards.

6 As you play, talk to each other about how you found the total area of each array. Can you think of more than one way to find the area? Do you and your partner see different ways to do it?

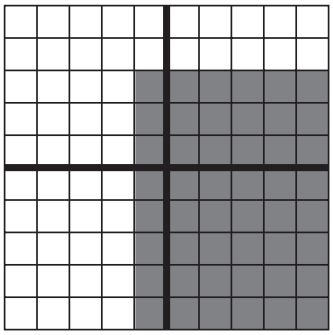
7 When there are no cards left, both players count their cards. The player with the most cards wins.

Building Computational Fluency Blackline S 9.3 Run 1 copy for each pair of players. Cut apart and store in an envelope or resealable plastic bag.

Array Challenge Cards page 1 of 3



Blackline NC S 9.3 Array Challenge Card



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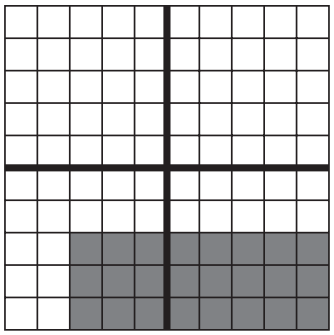
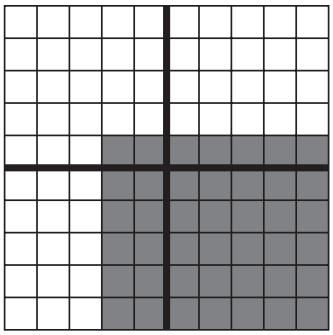
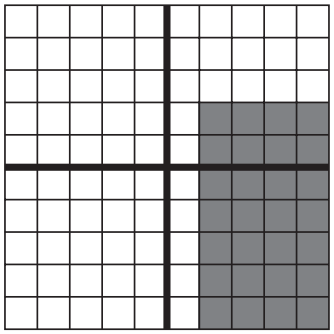


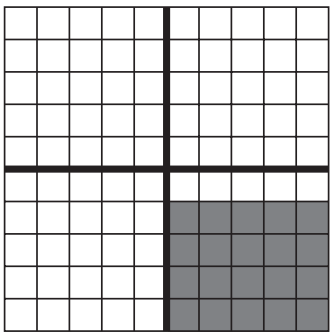
Blackline NC S 9.3 Array Challenge Card



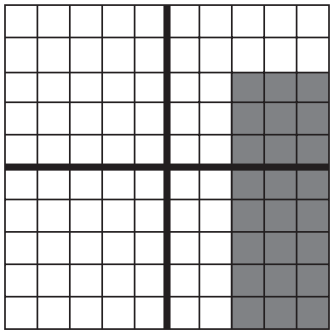
Blackline NC S 9.3 Array Challenge Card



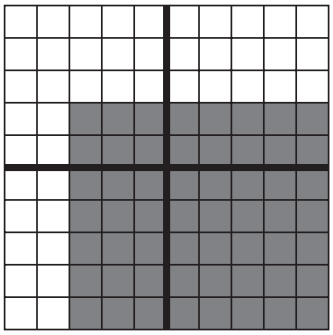
Blackline NC S 9.3 Array Challenge Card



Blackline NC S 9.3 Array Challenge Card

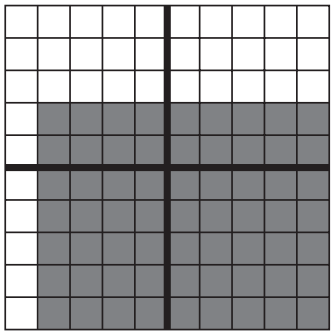


Blackline NC S 9.3 Array Challenge Card

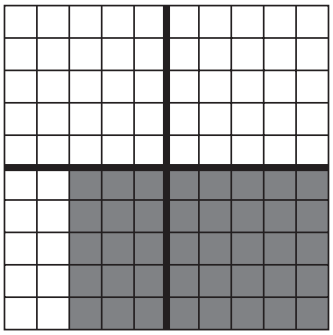


Blackline NC S 9.3 Array Challenge Card

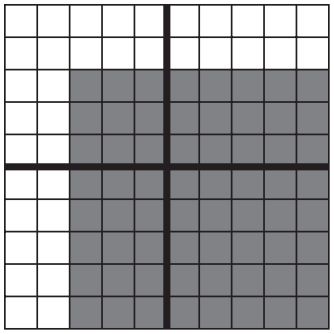
Array Challenge Cards page 2 of 3



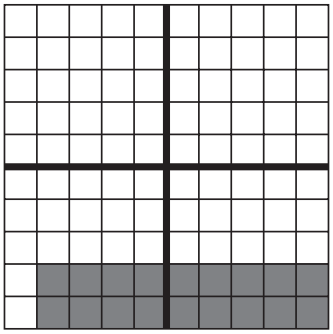
Blackline NC S 9.4 Array Challenge Card



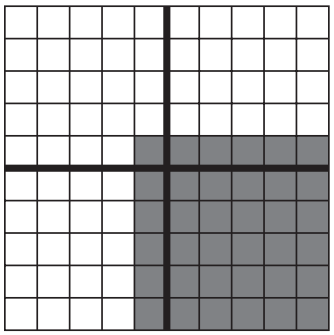
Blackline NC S 9.4 Array Challenge Card



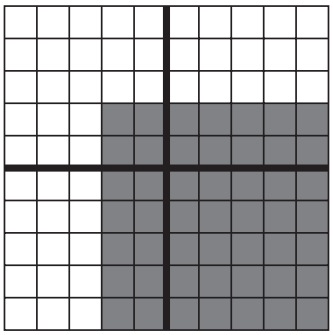
Blackline NC S 9.4 Array Challenge Card



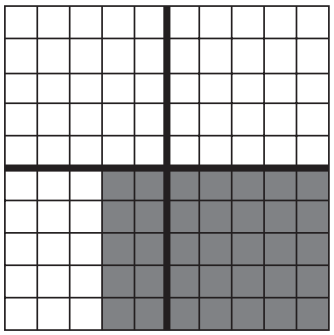
Blackline NC S 9.4 Array Challenge Card



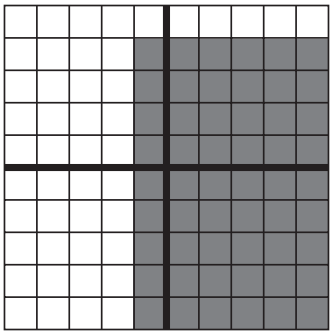
Blackline NC S 9.4 Array Challenge Card



Blackline NC S 9.4 Array Challenge Card

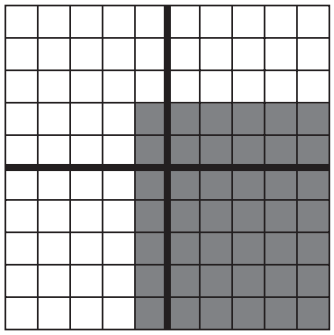


Blackline NC S 9.4 Array Challenge Card

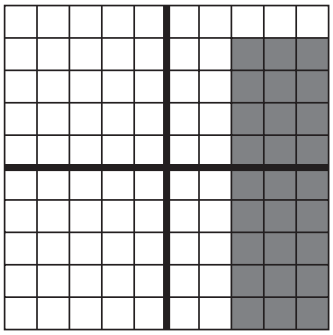


Blackline NC S 9.4 Array Challenge Card

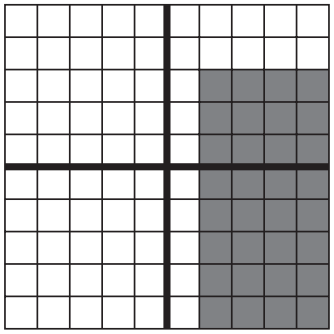
Array Challenge Cards page 3 of 3



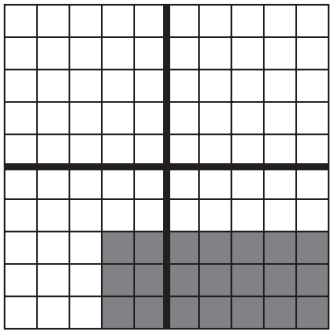
Blackline NC S 9.5 Array Challenge Card



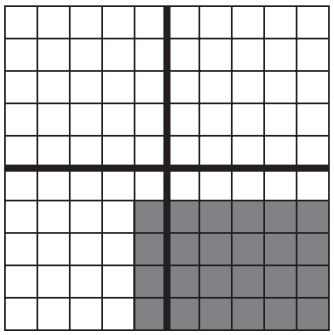
Blackline NC S 9.5 Array Challenge Card



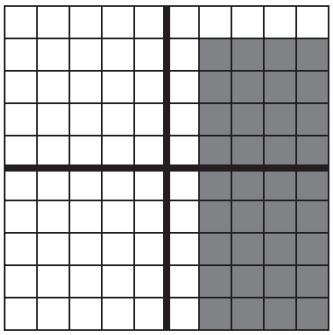
Blackline NC S 9.5 Array Challenge Card



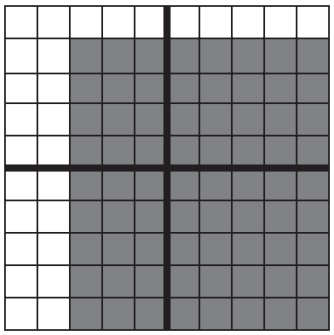
Blackline NC S 9.5 Array Challenge Card



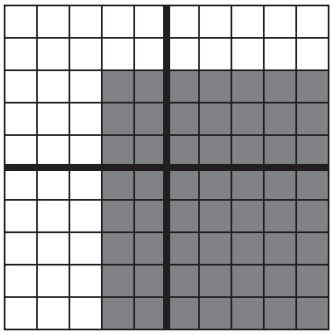
Blackline NC S 9.5 Array Challenge Card



Blackline NC S 9.5 Array Challenge Card



Blackline NC S 9.5 Array Challenge Card



Blackline NC S 9.5 Array Challenge Card

Support Activity 10 ★ Instructional Considerations

SUPPORT ACTIVITY

Multiplication Challenge

Overview

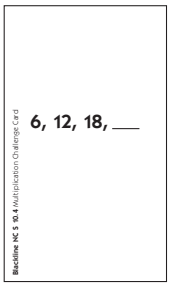
Each player draws a card that shows a multiplication fact depicted as an array, equal groups of something, or an element in a count-by sequence. Players find their products and state the complete multiplication fact. The player with the higher product wins both cards. When all cards have been played, the player with the most cards wins the game.

Skills & Concepts

- ★ using models, words, and numbers to demonstrate an understanding of multiplication
- ★ seeing multiplication as repeated addition, equal groups of objects, arrays, and skip counting
- ★ determining the relationship between two quantities
- ★ extending number patterns by adding and multiplying single-digit numbers

You'll need

- ★ Instructions for Multiplication Challenge (Blackline S 10.2)
- ★ Multiplication Challenge Cards (Blacklines S 10.3–10.5, 1 copy for each pair of players, cut apart and stored in a resealable plastic bag or envelope)



This game provides practice with skip counting, arrays, thinking algebraically about relationships between two quantities, and the grouping model for multiplication. Encourage students to name the factors and describe the strategies they are using to find the products each time they draw a new pair of cards.

Support Activity 10

SUPPORT ACTIVITY

Multiplication Challenge

You'll need

★ Instructions for Multiplication Challenge (Blackline S 10.2)

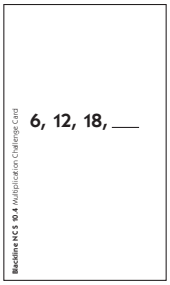
★ Multiplication Challenge Cards (Blacklines S 10.3–10.5, 1 copy for each pair of players, cut apart and stored in a resealable plastic bag or envelope)

Instructions for Multiplication Challenge

1 Choose a partner and get a deck of cards to share.

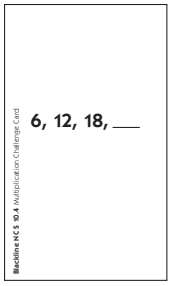
2 Put the cards in a stack in front of you, face down. Decide who will go first.

3 The first player turns over the top card. He or she says what multiplication fact it shows.



Hmm, it's counting by 6, so it'll be 6 times 4. That's 24. I know because 5 times 4 is 20 and another 4 is 24. Also, 18 plus 6 is 24, so I'm sure it's 24.

4 The second player turns over a card and does the same. The player with the greatest product wins both cards. Both players must name their factors and products.



Mine is 8 times 8. That's easy for me to remember it's 64. But I could also say 8 times 4 is 32, and then double that gives you 64. I get both cards!

5 If both players have the same product, they each draw a second card. They name their fact and its product, and the player with the greatest product wins all 4 cards.

6 As you play, talk to each other about how you found the product for each fact. Can you think of more than one way to find the product? Do you and your partner see different ways to do it?

7 When there are no cards left, both players count their cards. The player with the most cards wins.

Multiplication Challenge Cards page 1 of 3

3, 6, 9, ___

Blackline NC S 10.3 Multiplication Challenge Card

8, 16, 24, ___

Blackline NC S 10.3 Multiplication Challenge Card

4, 8, 12, 16, ___

Blackline NC S 10.3 Multiplication Challenge Card

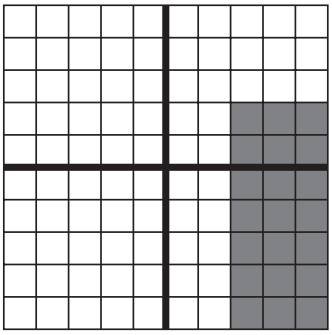
7, 14, 21, ___

Blackline NC S 10.3 Multiplication Challenge Card

6, 12, 18, ___

Blackline NC S 10.3 Multiplication Challenge Card

What is the total area?

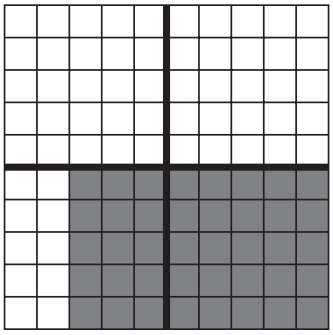


Blackline NC S 10.3 Multiplication Challenge Card

9, 18, 27, ___

Blackline NC S 10.3 Multiplication Challenge Card

What is the total area?

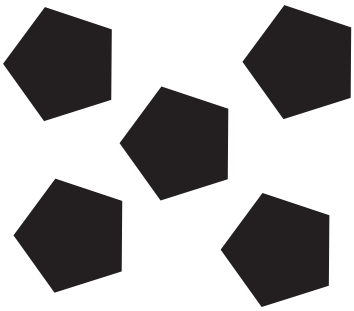


Blackline NC S 10.3 Multiplication Challenge Card

Multiplication Challenge Cards page 2 of 3

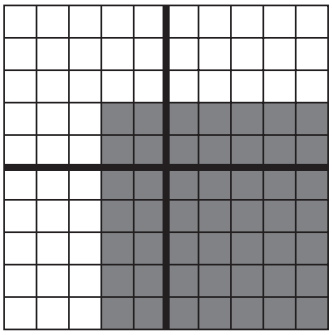
Blackline NC S 10.4 Multiplication Challenge Card

How many sides?



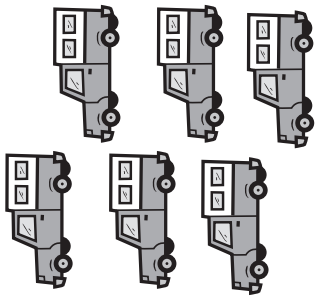
Blackline NC S 10.4 Multiplication Challenge Card

What is the total area?



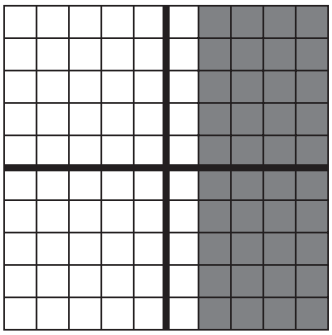
Blackline NC S 10.4 Multiplication Challenge Card

How many tires?



Blackline NC S 10.4 Multiplication Challenge Card

What is the total area?

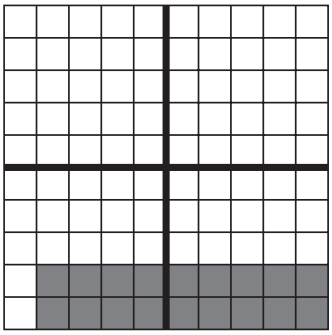


Blackline NC S 10.4 Multiplication Challenge Card

How many legs?

Blackline NC S 10.4 Multiplication Challenge Card

What is the total area?

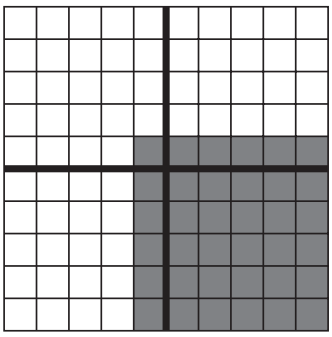


Blackline NC S 10.4 Multiplication Challenge Card

bikes	wheels
1	2
2	4
3	6

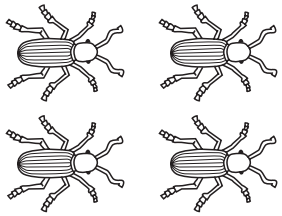
Blackline NC S 10.4 Multiplication Challenge Card

What is the total area?



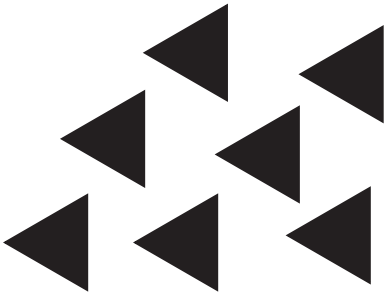
Multiplication Challenge Cards page 3 of 3

How many leg?



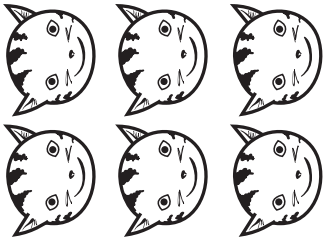
Blackline NC S 10.5 Multiplication Challenge Card

How many angles?



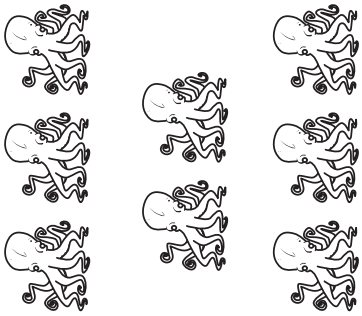
Blackline NC S 10.5 Multiplication Challenge Card

How many eyes?



Blackline NC S 10.5 Multiplication Challenge Card

How many legs?

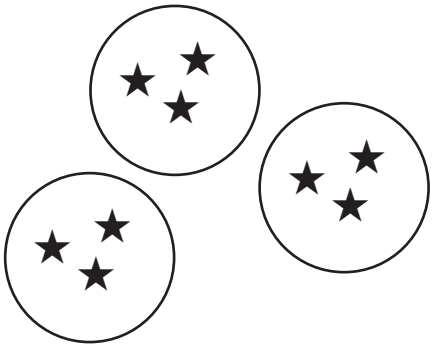


Blackline NC S 10.5 Multiplication Challenge Card

How many stars?

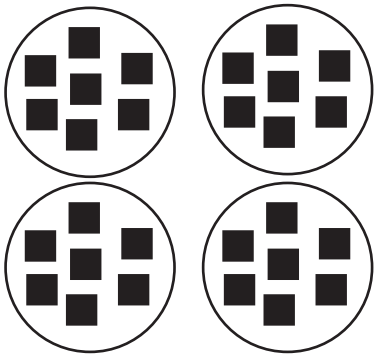
Blackline NC S 10.5 Multiplication Challenge Card

How many stars?



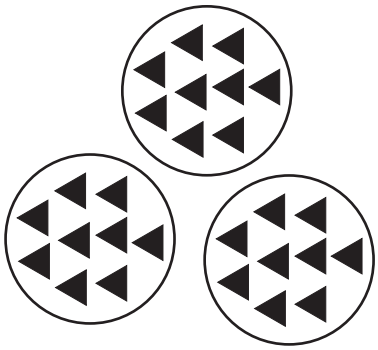
Blackline NC S 10.5 Multiplication Challenge Card

How many squares?



Blackline NC S 10.5 Multiplication Challenge Card

How many triangles?



Blackline NC S 10.5 Multiplication Challenge Card

Support Activity 11 ★ Instructional Considerations

SUPPORT ACTIVITY

Spinning Around Multiplication

Overview

Players take turns spinning multiplication facts and naming the strategies that could be used to solve them. They pick one strategy for each fact and write an equation in the column labeled with that strategy name. The first player to record at least one fact in each column (e.g., one fact for each strategy) wins.

Skills & Concepts

★ demonstrating computational fluency with multiplication facts up to 6 × 6

★ using models, words, and /or numbers to demonstrate an understanding of multiplication as repeated addition, equal groups of objects, arrays, or skip counting

You'll need

★ Instructions for Spinning Around Multiplication (Blackline S 11.3)

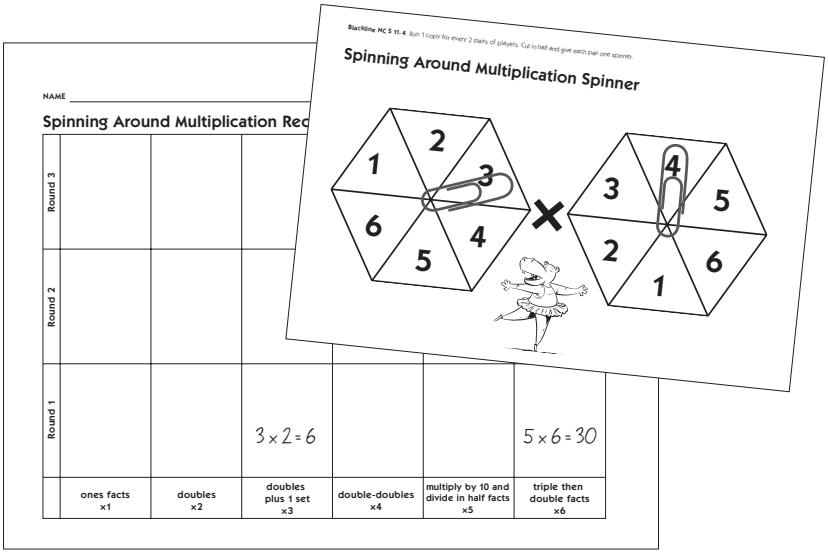
★ Spinning Around Multiplication Spinner (Blackline S 11.4, 1 copy for every 2 pairs of players, cut in half)

★ Spinning Around Multiplication Record Sheet (Blackline S 11.5, 1 copy per player)

★ Grid Paper (Blackline S 11.6, a few copies per player)

★ pencil and paperclip to use as a spinner

When students focus on the strategies they're using to solve these multiplication facts, they become increasingly aware of important patterns and relationships. This focused practice builds computational fluency. When categorizing their facts to arrange them in columns on the record sheet, students will employ the commutative property of multiplication (4 × 3 = 3 × 4).

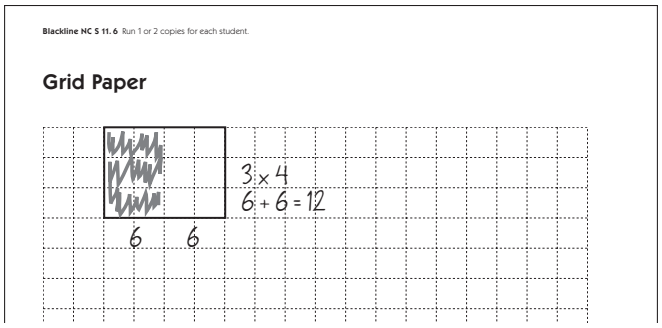


I already have a 3 fact, so I should put 3 × 4 in my double-double column. I can do that because 3 times 4 is the same as 4 times 3.

(Continued on back.)

Support Activity 11 Instructional Considerations (cont.)

Make grid paper available for students who would like to draw the arrays for these multiplication facts.



The table of multiplication strategies below is provided for your reference.

MULTIPLICATION STRATEGIES			
Factor	**Category**	**Example**	**How the strategy works**
× 1	ones facts	1 × 4 = 4 8 × 1 = 8	The product of any number and 1 is that number.
× 2	doubles	2 × 6 = 12 9 × 2 = 18	To multiply any number by 2, double that number.
× 3	doubles plus 1 set facts	3 × 6 = 18 9 × 3 = 27	To multiply any number by 3, double the number and then add that number. For example, 3 × 6 = (2 × 6) + 6 = 12 + 6 = 18.
× 4	double-doubles	4 × 6 = 24 9 × 4 = 36	To multiply any number by 4, double that number and then double the result. For example, 4 x 6 = 2(2 × 6) = 2 × 12 = 24.
× 5	multiply by 10 and divide in half facts	5 × 7 = 35 8 × 5 = 40	To multiply any number by 5, multiply that number by 10 and then divide in half. For example, 8 × 5 = (10 × 8) ÷ 2 = 80 ÷ 2 = 40.
× 6	triple then double facts	6 × 7 = 42 8 × 6 = 48	To multiply any number by 6, first triple that number and then double the result. For example, 6 × 7 = (7 × 3) × 2 = 21 × 2 = 42.

Support Activity 11

SUPPORT ACTIVITY

Spinning Around Multiplication

You'll need

★ Instructions for Spinning Around Multiplication (Blackline S 11.3)

★ Spinning Around Multiplication Spinner (Blackline S 11.4, 1 copy for every 2 pairs of players, cut in half)

★ Spinning Around Multiplication Record Sheet (Blackline S 11.5, 1 copy per player)

★ Grid Paper (Blackline S 11.6, a few copies per player)

★ pencil and paperclip to use as a spinner

Instructions for Spinning Around Multiplication

1 Each player will need a record sheet and a sheet or two of grid paper. You'll share a spinner and a pencil and paperclip to use as a spinner.

2 Spin both spinners and multiply these two numbers. Explain to your partner how you think about this multiplication fact. Do you use repeated addition, skip counting, or other multiplication facts to find the product? You can use the grid paper to make an array for the fact if you want to.

3 Write an equation in the appropriate column on your record sheet. Don't forget to include the product. You'll decide how you want to think about the fact you roll. For example, 2 × 5 is a doubles fact and a *multiply by 10 and divide in half* fact. You can choose the column you want to write the fact in.

4 The first person to complete a row across wins that round. You might have more than one fact in each box before you are able to write at least one fact in every box.

NAME _____ DATE _____

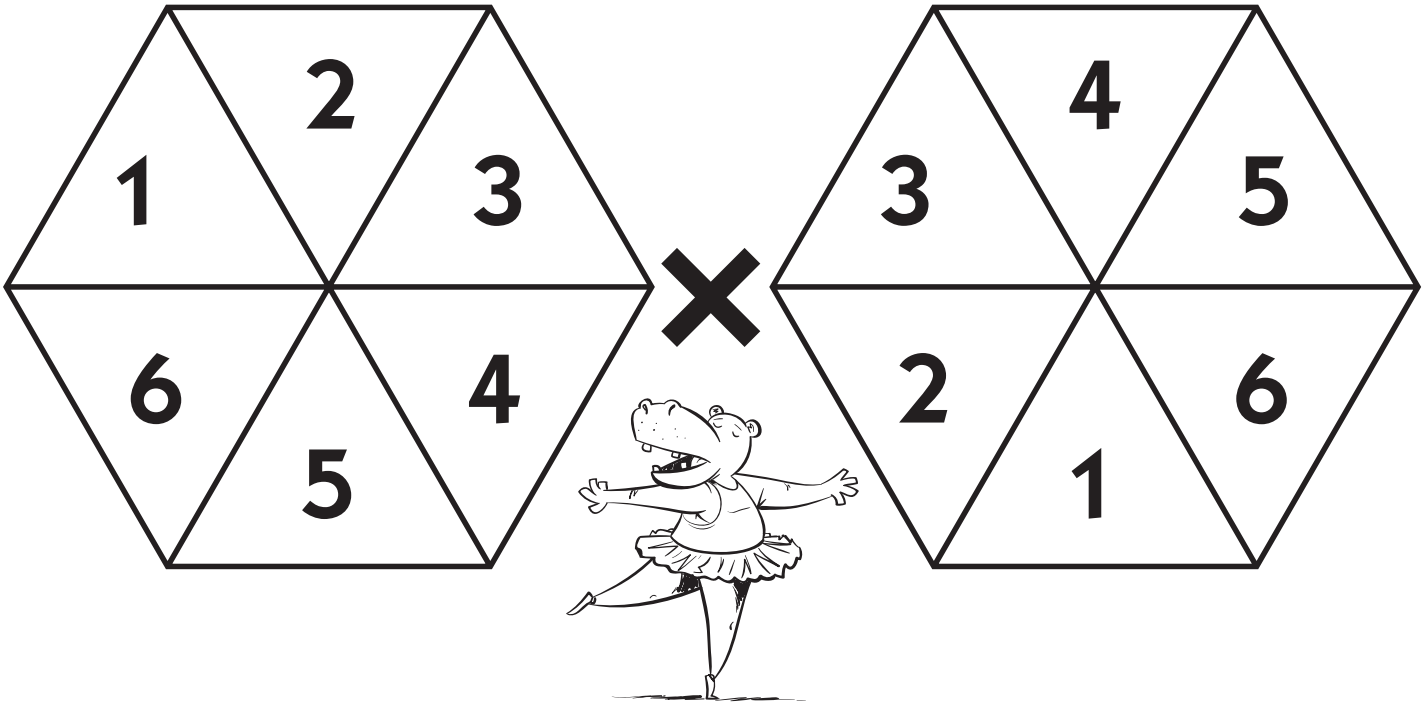
Spinning Around Multiplication Record Sheet

Round 3						
Round 2						
Round 1	1 × 5 = 5 3 × 1 = 3	2 × 4 = 8	3 × 2 = 6 3 × 3 = 9	4 × 5 = 20 4 × 6 = 24	5 × 5 = 25	6 × 3 = 18
	ones facts ×1	doubles ×2	doubles plus 1 set ×3	double-doubles ×4	multiply by 10 and divide in half facts ×5	triple then double facts ×6

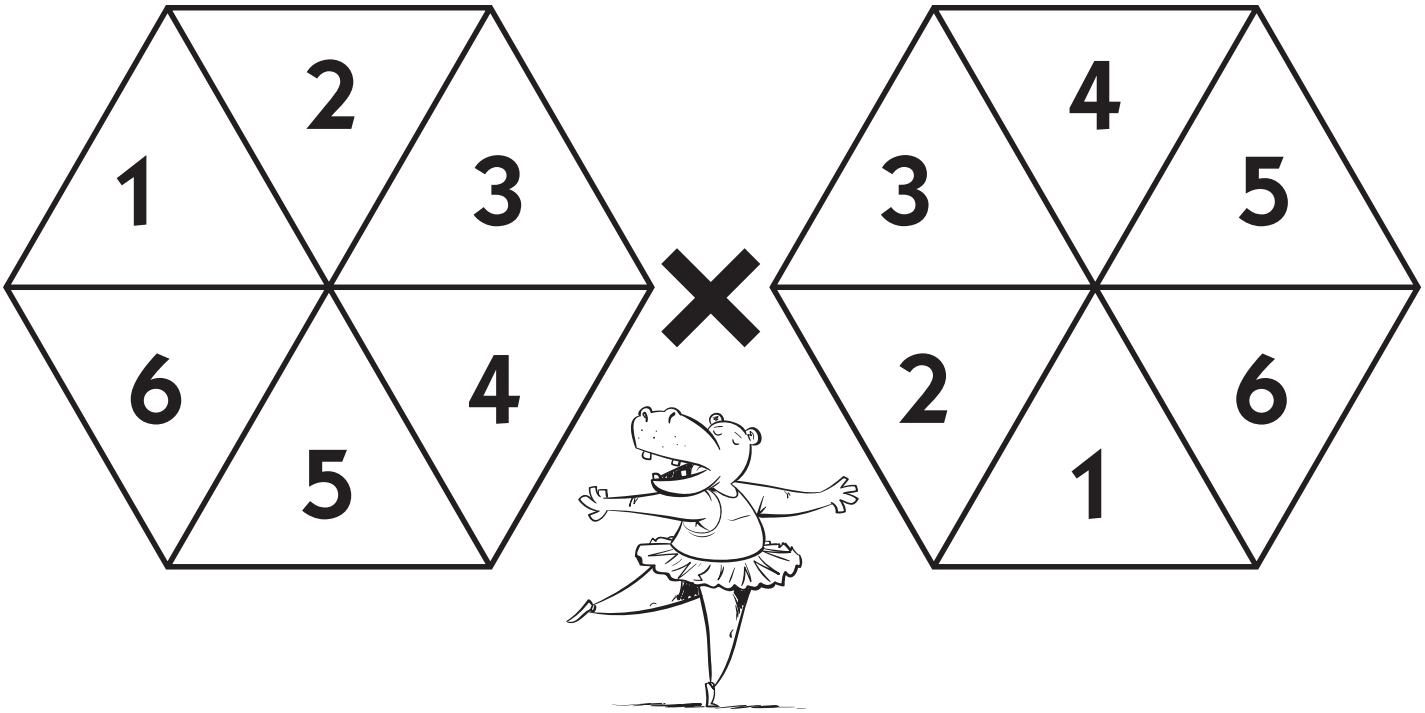
Blackline NCS 11.5 Run 1 copy for each player

5 Play 3 rounds.

Spinning Around Multiplication Spinner



Spinning Around Multiplication Spinner



NAME _____ DATE _____

Spinning Around Multiplication Record Sheet

Round 3						
Round 2						
Round 1						
	ones facts ×1	doubles ×2	doubles plus 1 set ×3	double-doubles ×4	multiply by 10 and divide in half facts ×5	triple then double facts ×6

Grid Paper

Support Activity 12 ★ Instructional Considerations

SUPPORT ACTIVITY

Spinning for Arrays

Overview

Players take turns spinning two number spinners and finding the product of the two numbers. Then, they select an array card with an area that matches that product. They can also add two array cards together if the sum of their products is equal to the product of the two numbers they spun. At the end of the game, the player with the most cards wins.

Skills & Concepts

★ practicing multiplication facts through 8 × 10

★ finding factors of whole numbers to 100 using an understanding of number relationships and models such as arrays

★ applying the commutative, associative, and distributive properties to calculations with whole numbers

★ relating the area of a rectangle and its dimensions to area models for multiplication and division

You'll need

★ Instructions for Spinning for Arrays (Blackline S 12.2)

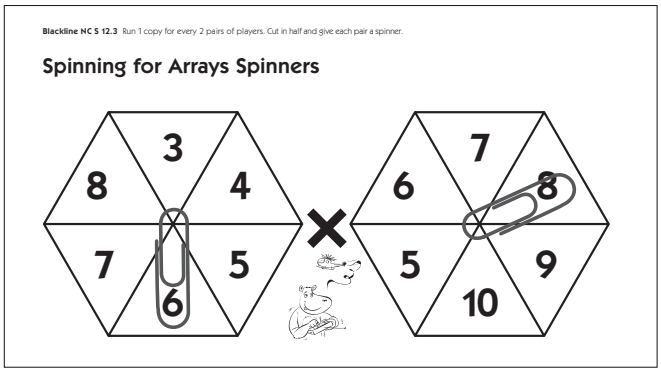
★ Spinning for Arrays Spinner (Blackline S 12.3, 1 copy for every 2 pairs of players, cut in half)

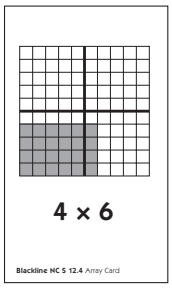
★ Array Cards, pages 1–4 (Blacklines S 12.4–12.7, 1 copy for each pair of players, cut apart and stored in an envelope or resealable plastic bag)

★ pencil and paperclip to use as a spinner

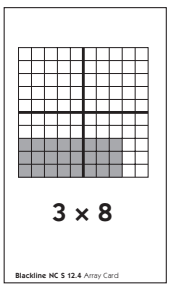
Encourage students to think carefully about how they organize the cards at the beginning of the game. After playing a few rounds, they may have a better sense of how to organize the cards in the most helpful way. Some may want to organize them by common factor, but players will likely find it most helpful to organize the cards by product.

When they begin playing this game, many students will search for arrays that have dimensions equal to the two numbers they spun. As they get used to the game, encourage them to search for arrays with different dimensions whose areas are equal to the target product. As they become more fluent with their facts, challenge them to add the areas of two or more arrays to reach their target product. You might first have them practice finding pairs of products whose sum is equal to a target product.





4 × 6 = 24



3 × 8 = 24

Support Activity 12

SUPPORT ACTIVITY

Spinning for Arrays

You'll need

★ Instructions for Spinning for Arrays (Blackline S 12.2)

★ Spinning for Arrays Spinner (Blackline S 12.3, 1 copy for every 2 pairs of players, cut in half)

★ Array Cards, pages 1–4 (Blacklines S 12.4–12.7, 1 copy for each pair of players, cut apart and stored in an envelope or resealable plastic bag)

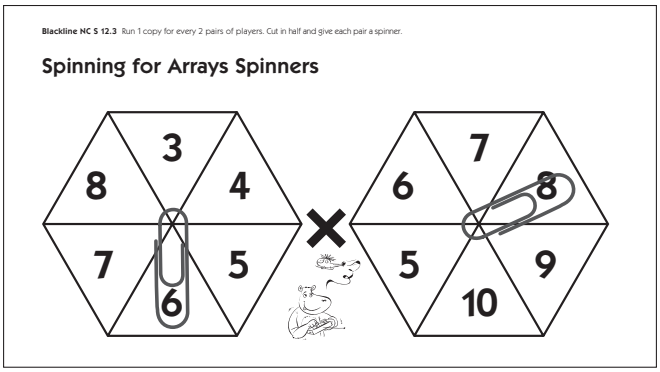
★ pencil and paperclip to use as a spinner

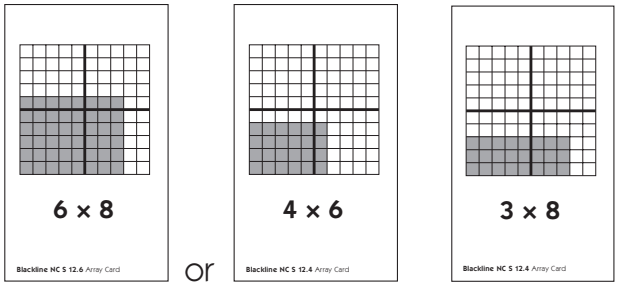
Instructions for Spinning for Arrays

1 Work with your partner to set out the Array Cards so that it will be easy for you to find a specific card when you need it. Then decide who will go first using any method you like.

2 Spin both spinners and multiply the two numbers.

3 Then find a card that shows an array whose total area is the same as the product you just computed. You could also add together the products of more than one card to make the total and then take those cards.





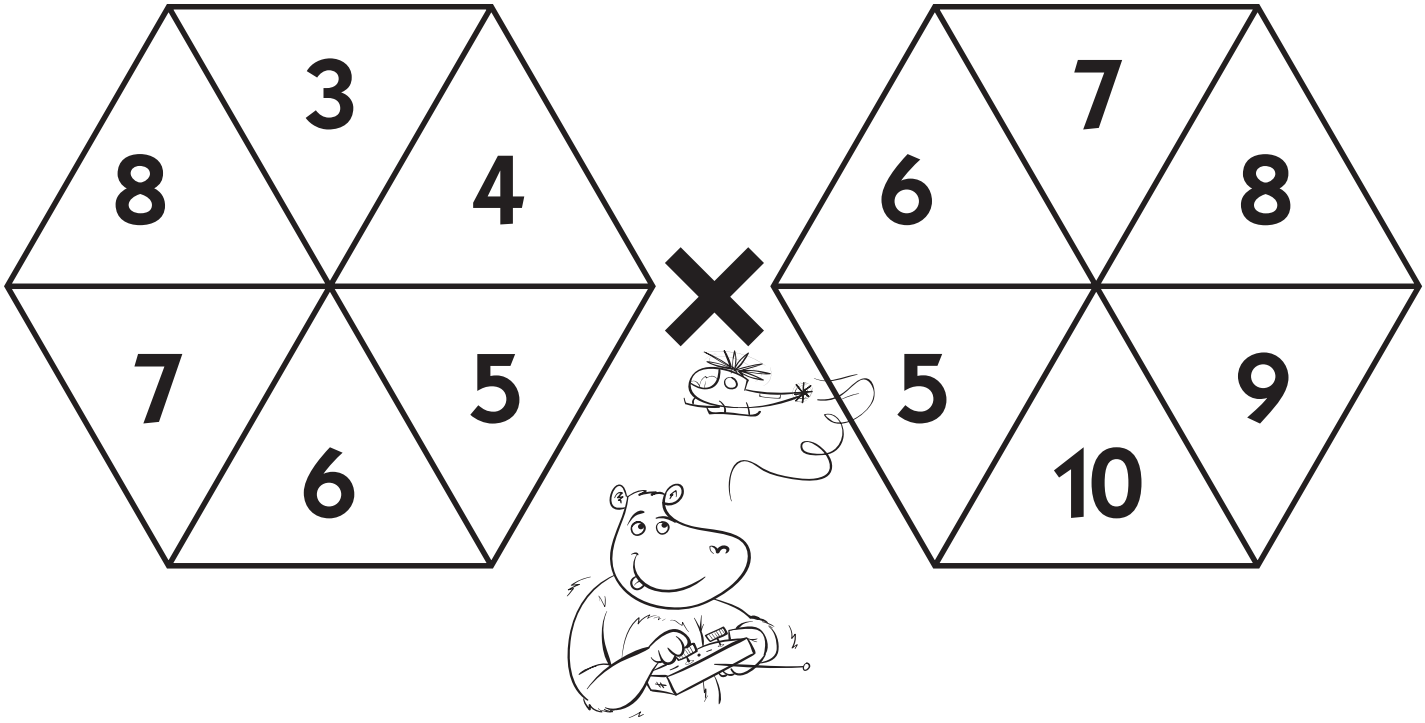
6 × 8 = 48 4 × 6 = 24 3 × 8 = 24

6 times 8 is 48. I could take the 6 times 8 card. Or I could add these two cards together. 8 times 3 is 24 and so is 4 times 6. So add 24 and 24 and that's 48.

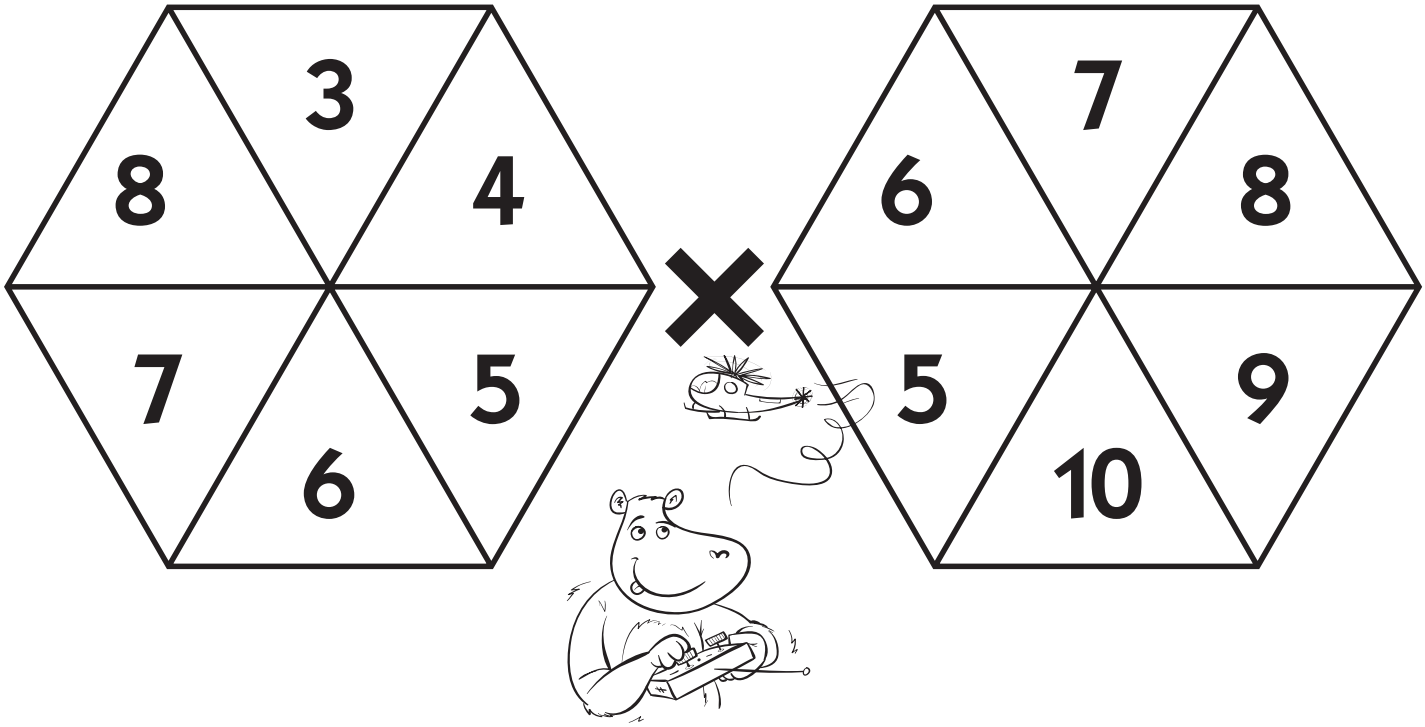
4 If you can't find any card or combination of cards to match the product, you lose that turn.

5 Continue to take turns until all the cards have been taken. Then count up your cards. The player with the most cards at the end wins.

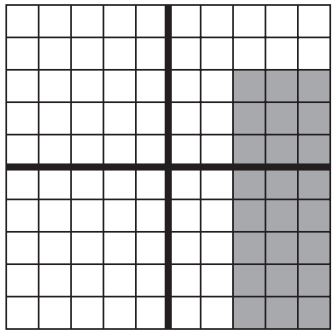
Spinning for Arrays Spinner



Spinning for Arrays Spinner

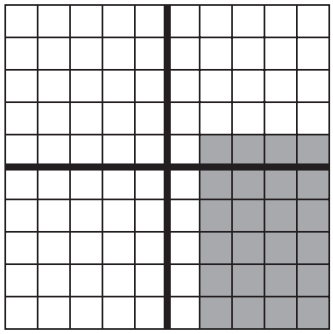


Array Cards page 1 of 4



3 × 8

Blackline NC S 12.4 Array Card



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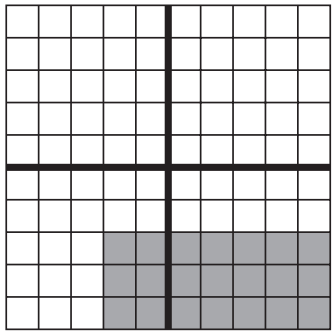

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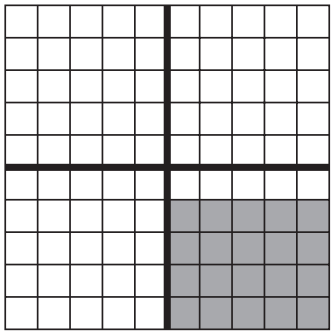

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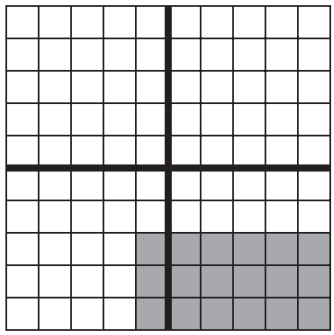

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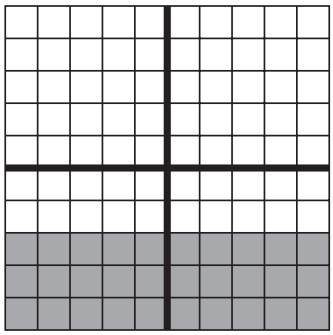

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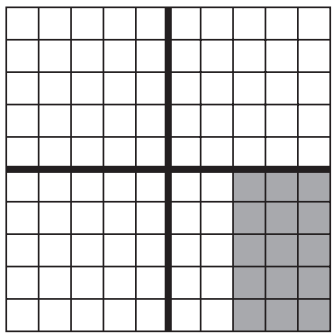

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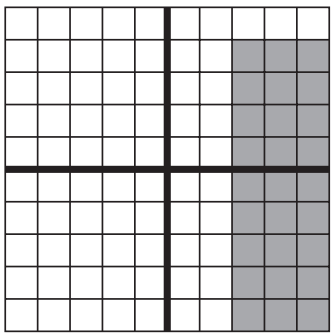

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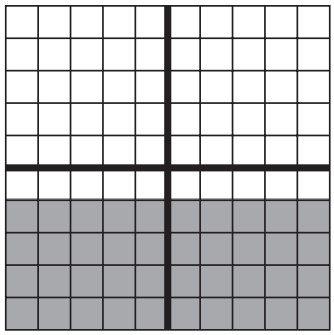
Blackline NC S 12.4 Array Card

Array Cards page 2 of 4



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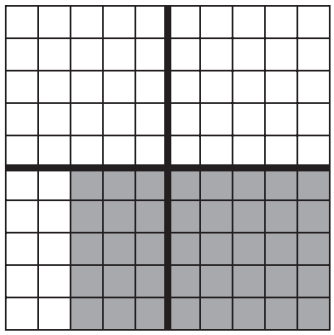

8 × 5

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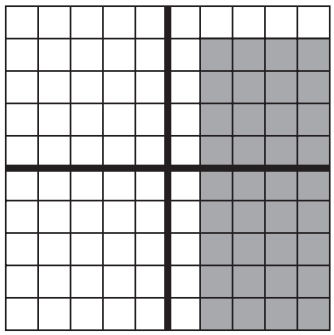

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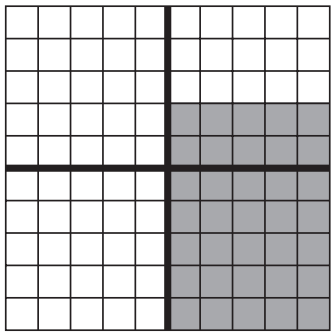

5 × 7

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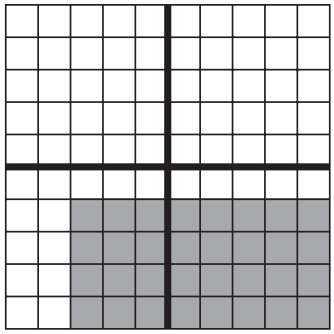

8 × 4

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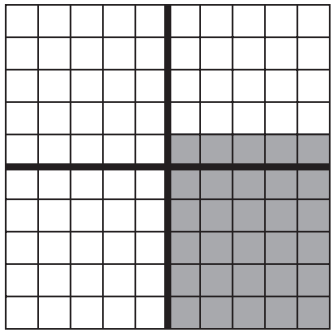
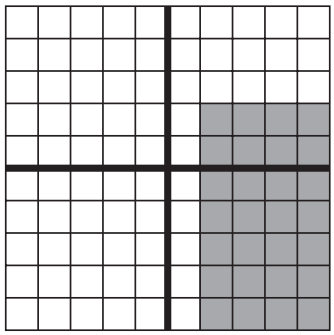


5 × 6

Blackline NC S 12.5 Array Card



4 × 7

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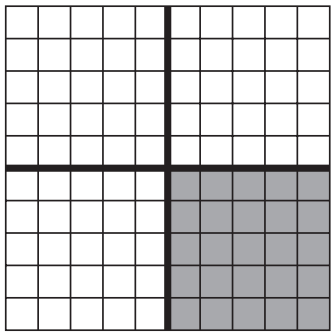
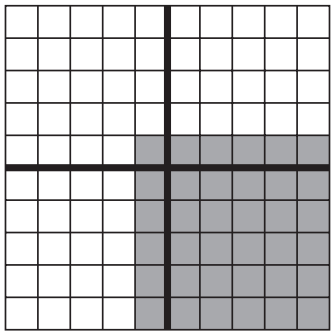


5 × 5

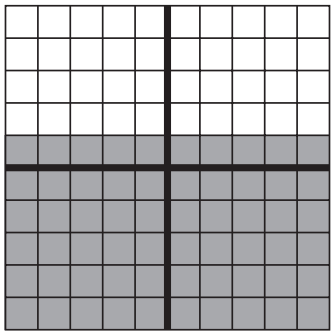
Blackline NC S 12.5 Array Card

Array Cards page 3 of 4



6 x 6

Blackline NC S 12.6 Array Card



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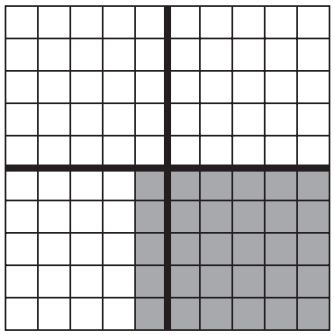

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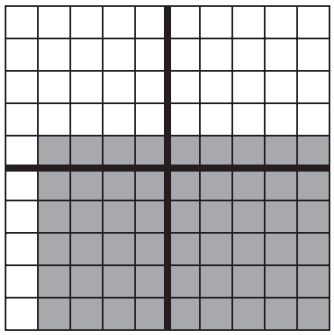

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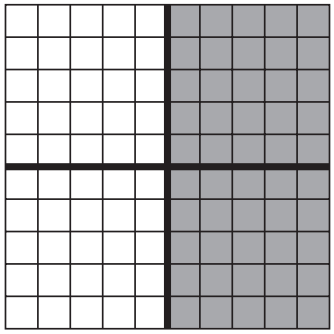

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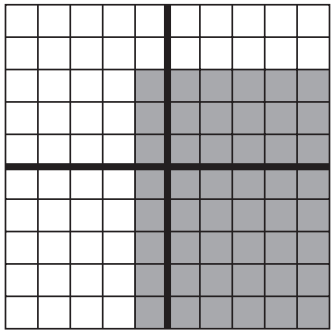

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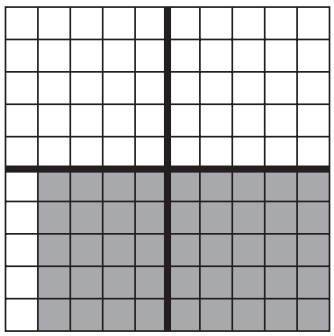

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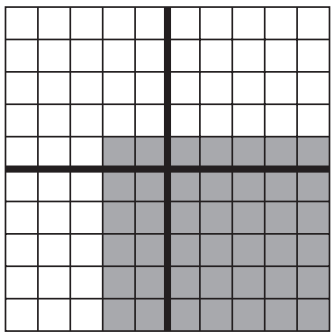
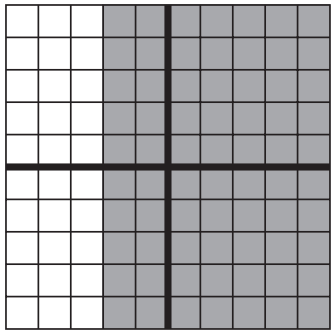


7 x 6

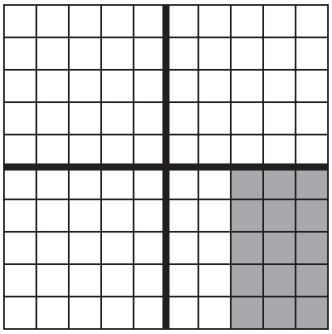
Blackline NC S 12.6 Array Card

Array Cards page 4 of 4



7 × 10

Blackline NC S 12.7 Array Card



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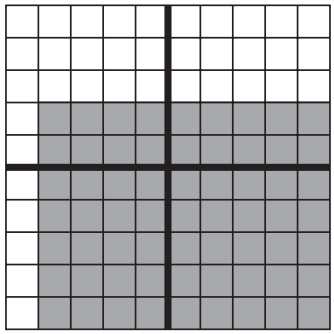

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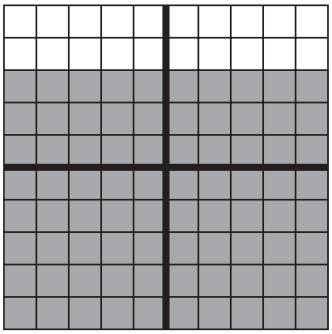
Blackline NC S 12.7 Array Card



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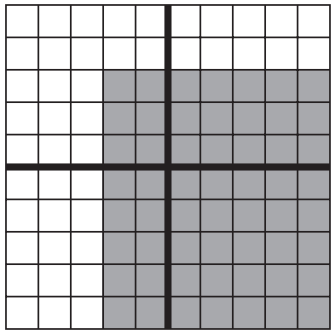

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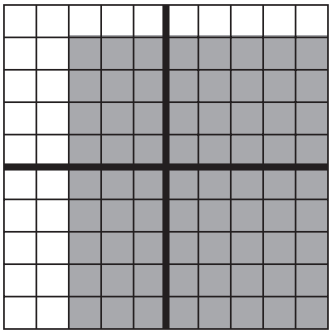
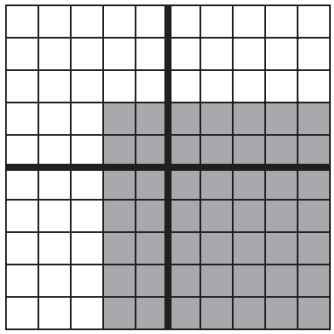


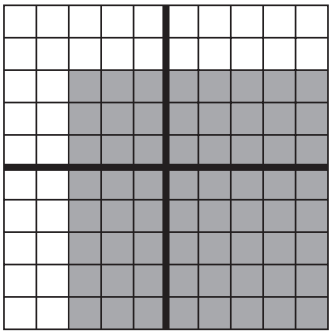
8 × 9

Blackline NC S 12.7 Array Card



7 × 7

Blackline NC S 12.7 Array Card



8 × 8

Blackline NC S 12.7 Array Card

Support Activity 13 ★ Instructional Considerations

SUPPORT ACTIVITY

Product Bingo

Overview

Students spin two spinners, each of which features numbers from 4 to 9. They multiply the two numbers and then locate the product on their bingo boards. The first player to get 4 numbers in a row wins.

Skills & Concepts

★ practicing multiplication facts through 9 × 9

You'll need

★ Instructions for Product Bingo (Blackline S 13.2)

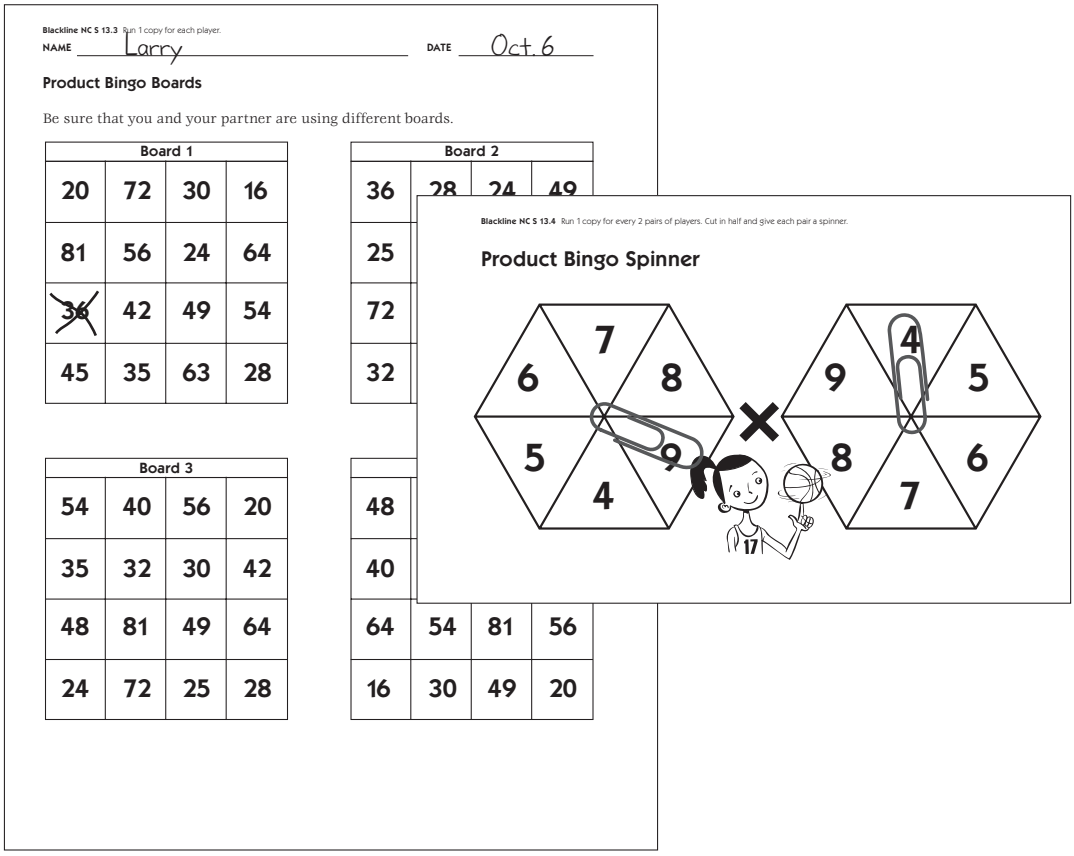
★ Product Bingo Boards (Blackline S 13.3, 1 copy for each player)

★ Product Bingo Spinner (Blackline S 13.4, 1 copy for every 2 pairs of players, cut in half)

★ pencils, crayons, or markers

This game is meant to promote fluency with multiplication facts to 9 × 9. Ask students to play this game when they are relatively close to being able to recall products from memory. If they need the aid of visual models, have them play one of the other multiplication support games that feature visual models, such as Array Challenge, Spinning for Arrays, or Multiplication Challenge.

You may need to remind players to select just one board on the sheet for each game and to make sure that they are using different boards from each other. Students can use a single sheet to play 4 separate games.



Blackline NC S 13.3 Run 1 copy for each player.

NAME Larry DATE Oct. 6

Product Bingo Boards

Be sure that you and your partner are using different boards.

Board 1			
20	72	30	16
81	56	24	64
~~36~~	42	49	54
45	35	63	28

Board 2			
36	28	24	49
25			
72			
32			

Board 3			
54	40	56	20
35	32	30	42
48	81	49	64
24	72	25	28

48			
40			
64	54	81	56
16	30	49	20

Blackline NC S 13.4 Run 1 copy for every 2 pairs of players. Cut in half and give each pair a spinner.

Product Bingo Spinner

Support Activity 13

SUPPORT ACTIVITY

Product Bingo

You'll need

★ Instructions for Product Bingo (Blackline S 13.2)

★ Product Bingo Boards (Blackline S 13.3, 1 copy for each player)

★ Product Bingo Spinner (Blackline S 13.4, 1 copy for every 2 pairs of players, cut in half)

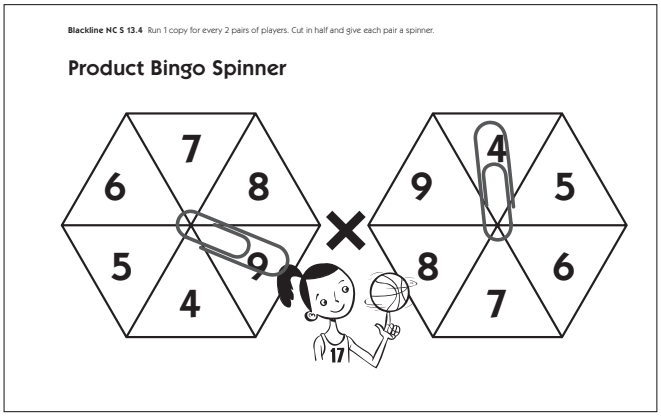
★ pencils, crayons, or markers

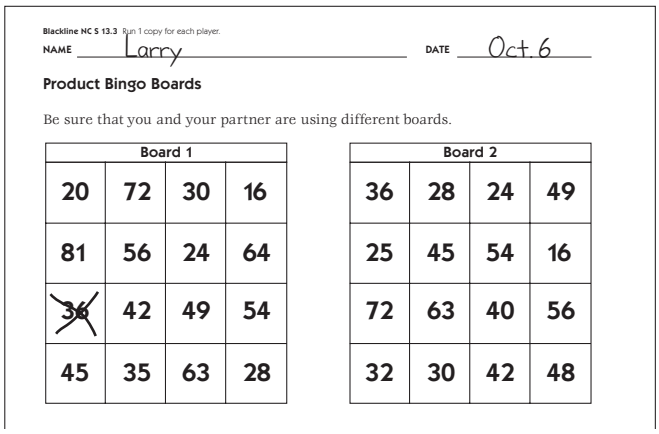
Instructions for Product Bingo

1 Pick a bingo board that is different from your partner's. Select just one bingo board each per game.

2 Take turns spinning both spinners. Multiply the two numbers on the spinners. Talk to your partner about how you know the product. Do you just know it, or do you have a strategy for figuring it out?

3 Draw an X over the product if you have it on your board. Each board is missing some products.





Blackline NC S 13.3 Run 1 copy for each player.

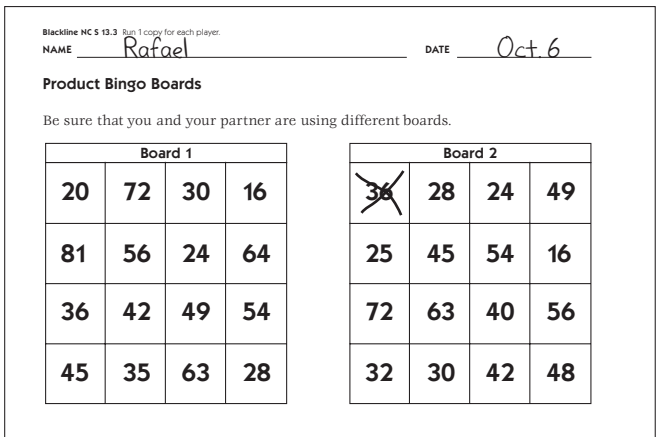
NAME Larry DATE Oct. 6

Product Bingo Boards

Be sure that you and your partner are using different boards.

Board 1			
20	72	30	16
81	56	24	64
~~36~~	42	49	54
45	35	63	28

Board 2			
36	28	24	49
25	45	54	16
72	63	40	56
32	30	42	48



Blackline NC S 13.3 Run 1 copy for each player.

NAME Rafael DATE Oct. 6

Product Bingo Boards

Be sure that you and your partner are using different boards.

Board 1			
20	72	30	16
81	56	24	64
36	42	49	54
45	35	63	28

Board 2			
~~36~~	28	24	49
25	45	54	16
72	63	40	56
32	30	42	48

4 Keep playing until one person has 4 X's in a row, either horizontally, vertically, or diagonally.

NAME _____ **DATE** _____

Product Bingo Boards

Be sure that you and your partner are using different boards.

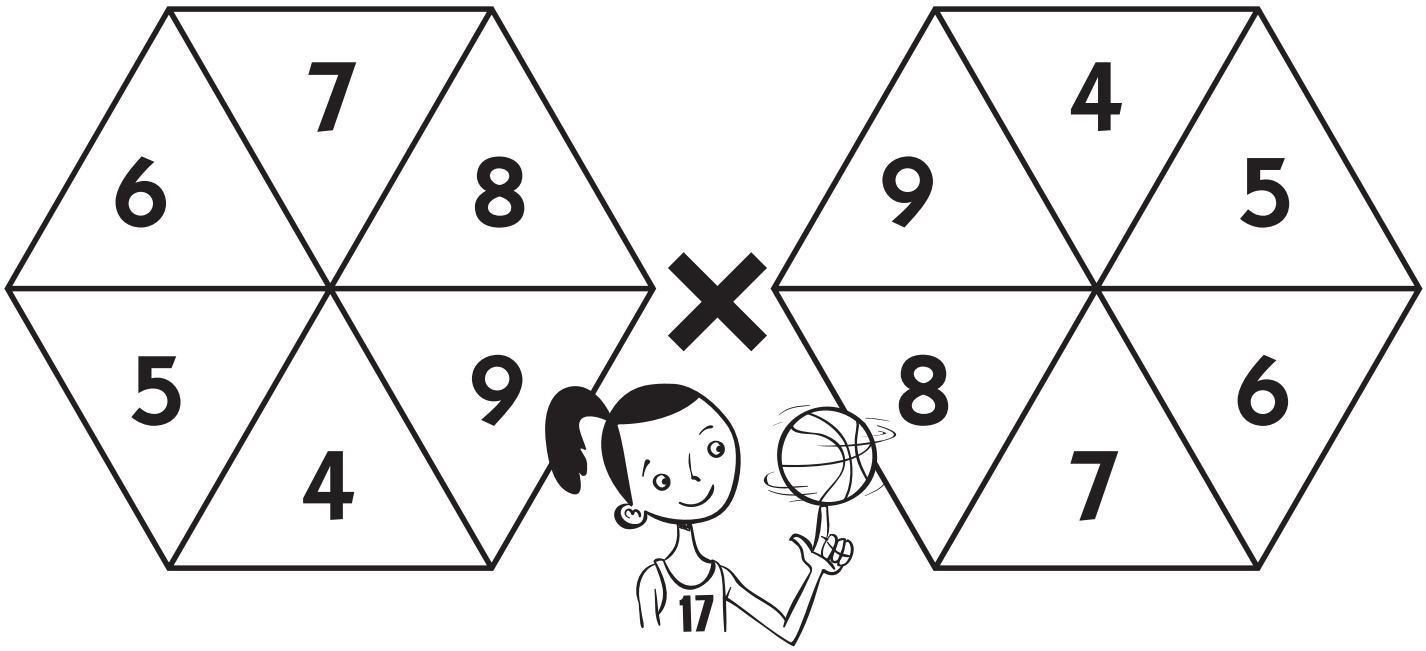
Board 1			
20	72	30	16
81	56	24	64
36	42	49	54
45	35	63	28

Board 2			
36	28	24	49
25	45	54	16
72	63	40	56
32	30	42	48

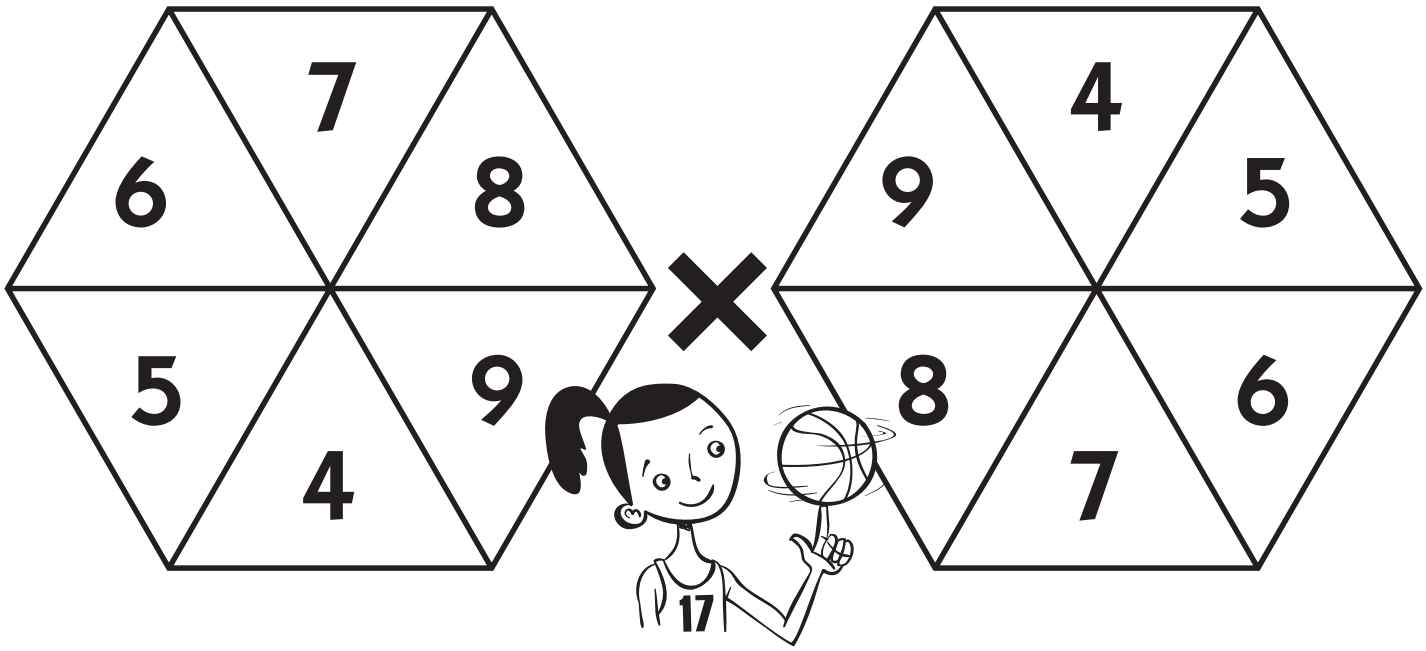
Board 3			
54	40	56	20
35	32	30	42
48	81	49	64
24	72	25	28

Board 4			
48	72	63	42
40	32	35	28
64	54	81	56
16	30	49	20

Product Bingo Spinner



Product Bingo Spinner



Support Activity 14 ★ Instructional Considerations

SUPPORT ACTIVITY

What's Missing? Bingo

Overview

Students take turns drawing cards, each of which features an equation that is missing a single number. Students determine what the missing number is and draw an X over that number on their bingo boards. The first player to get 4 numbers in a row wins.

Skills & Concepts

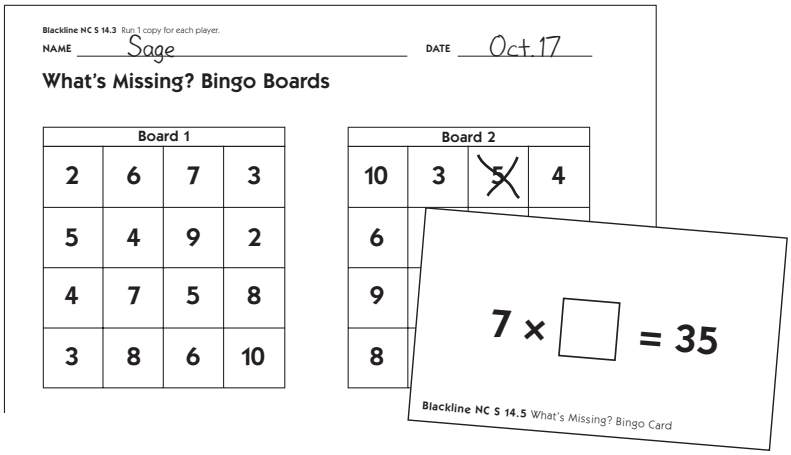
- ★ using models, pictures, and numbers to demonstrate an understanding of multiplication/division as repeated addition/subtraction, equal groups of objects, arrays, or skip counting
- ★ demonstrating computational fluency with multiplication facts up to 5 × 10
- ★ developing and using strategies for multiplication facts up to 10 × 10
- ★ solving for an unknown number in an equation

You'll need

- ★ Instructions for What's Missing? Bingo (Blackline S 14.2)
- ★ What's Missing? Bingo Boards (Blackline S 14.3, 1 copy per player)
- ★ What's Missing? Bingo Cards, pages 1–4 (Blacklines S 14.4–14.7, 1 copy for each pair of players, cut apart and stored in an envelope or resealable plastic bag)
- ★ Grid Paper (Blackline S 14.8, 1 copy for each player)

This bingo game helps students develop an explicit understanding of the inverse relationship between multiplication and division, which is key to their ability to solve missing factor problems and to their fluency with division facts. It also provides an opportunity for students to practice applying the commutative property of multiplication. If you find students are still struggling with multiplication facts, have them go back and use one of the multiplication support games to shore up their skills with multiplication before playing this game, which involves quite a bit of division practice.

You may need to remind players to select just one board on the sheet for each game and to make sure that they are using different boards from each other. Students can use a single sheet to play 4 separate games.



Support Activity 14

SUPPORT ACTIVITY

What's Missing? Bingo

You'll need

★ Instructions for What's Missing? Bingo (Blackline S 14.2)

★ What's Missing? Bingo Boards (Blackline S 14.3, 1 copy per player)

★ What's Missing? Bingo Cards, pages 1–4 (Blacklines S 14.4–14.7, 1 copy for each pair of players, cut apart and stored in an envelope or resealable plastic bag)

★ Grid Paper (Blackline S 14.8, 1 copy for each player)

Instructions for What's Missing? Bingo

1 Pick a bingo board that is different from your partner's. Select just one bingo board each per game.

2 Decide who will go first and put the cards between you in a stack, face down.

3 Draw a card and determine what the missing number is. Talk to your partner and make sure you agree. You can draw on the grid paper if you like.

7 × ☐ = 35

Blackline NC S 14.5 What's Missing? Bingo Card

Hmm. This means that something times 7 is 35. What times 7 is 35? … Oh! I remember. The 7 in the clock is 35 minutes, so it has to be 5, because the numbers on the clock count by 5's.

4 Draw an X over the missing number if it appears on your bingo board. Some numbers may appear more than once, so think carefully about where you draw the X.

Blackline NC S 14.3 Run 1 copy for each player.

NAME Sage DATE Oct. 17

What's Missing? Bingo Boards

Board 1			
2	6	7	3
5	4	9	2
4	7	5	8
3	8	6	10

Board 2			
10	~~3~~	5	4
6	~~4~~	~~9~~	7
9	~~5~~	6	3
~~8~~	3	~~7~~	2

Blackline NC S 14.3 Run 1 copy for each player.

NAME Nicole DATE Oct. 17

What's Missing? Bingo Boards

Board 1			
2	6	7	~~3~~
5	4	~~9~~	2
~~4~~	~~7~~	5	~~8~~
3	8	6	10

Board 2			
10	3	5	4
6	4	9	7
9	5	6	3
8	3	7	2

I have two 5's on here, but if I put my X here, I can win!

5 Take turns drawing cards until one player gets 4 numbers in a row to win.

NAME _____ **DATE** _____

What's Missing? Bingo Boards

Board 1			
2	6	7	3
5	4	9	2
4	7	5	8
3	8	6	10

Board 2			
10	3	5	4
6	4	9	7
9	5	6	3
8	3	7	2

Board 3			
7	4	8	6
3	9	10	3
5	2	7	9
8	5	6	4

Board 4			
3	5	6	10
7	2	9	8
5	4	6	3
8	9	7	4

What's Missing? Bingo Cards page 1 of 4

$9 \times \square = 18$ **Blackline NC S 14.4** What's Missing? Bingo Card	$\square \times 7 = 21$ **Blackline NC S 14.4** What's Missing? Bingo Card
$5 \times \square = 30$ **Blackline NC S 14.4** What's Missing? Bingo Card	$\square \times 7 = 49$ **Blackline NC S 14.4** What's Missing? Bingo Card
$7 \times \square = 14$ **Blackline NC S 14.4** What's Missing? Bingo Card	$\square \times 8 = 24$ **Blackline NC S 14.4** What's Missing? Bingo Card
$3 \times \square = 18$ **Blackline NC S 14.4** What's Missing? Bingo Card	$\square \times 8 = 56$ **Blackline NC S 14.4** What's Missing? Bingo Card

What's Missing? Bingo Cards page 2 of 4

$\square \times 8 = 32$ **Blackline NC S 14.5** What's Missing? Bingo Card	$\square \times 5 = 25$ **Blackline NC S 14.5** What's Missing? Bingo Card
$\square \times 3 = 24$ **Blackline NC S 14.5** What's Missing? Bingo Card	$6 \times \square = 54$ **Blackline NC S 14.5** What's Missing? Bingo Card
$\square \times 6 = 24$ **Blackline NC S 14.5** What's Missing? Bingo Card	$7 \times \square = 35$ **Blackline NC S 14.5** What's Missing? Bingo Card
$\square \times 4 = 32$ **Blackline NC S 14.5** What's Missing? Bingo Card	$8 \times \square = 80$ **Blackline NC S 14.5** What's Missing? Bingo Card

What's Missing? Bingo Cards page 3 of 4

16 ÷ ☐ = 8 **Blackline NC S 14.6** What's Missing? Bingo Card	21 ÷ ☐ = 7 **Blackline NC S 14.6** What's Missing? Bingo Card
☐ ÷ 3 = 2 **Blackline NC S 14.6** What's Missing? Bingo Card	14 ÷ ☐ = 2 **Blackline NC S 14.6** What's Missing? Bingo Card
☐ ÷ 5 = 2 **Blackline NC S 14.6** What's Missing? Bingo Card	18 ÷ ☐ = 6 **Blackline NC S 14.6** What's Missing? Bingo Card
☐ ÷ 2 = 3 **Blackline NC S 14.6** What's Missing? Bingo Card	49 ÷ ☐ = 7 **Blackline NC S 14.6** What's Missing? Bingo Card

What's Missing? Bingo Cards page 4 of 4

$12 \div \square = 3$ **Blackline NC S 14.7** What's Missing? Bingo Card	$40 \div \square = 8$ **Blackline NC S 14.7** What's Missing? Bingo Card
$32 \div \square = 4$ **Blackline NC S 14.7** What's Missing? Bingo Card	$\square \div 3 = 3$ **Blackline NC S 14.7** What's Missing? Bingo Card
$8 \div \square = 2$ **Blackline NC S 14.7** What's Missing? Bingo Card	$35 \div \square = 7$ **Blackline NC S 14.7** What's Missing? Bingo Card
$\square \div 4 = 2$ **Blackline NC S 14.7** What's Missing? Bingo Card	$27 \div \square = 3$ **Blackline NC S 14.7** What's Missing? Bingo Card

Grid Paper

Support Activity 15 ★ Instructional Considerations

SUPPORT ACTIVITY

Round & Add Tens

Overview

Players take turns spinning two digits. They arrange those digits to form a 2-digit number and then round the number to the nearest ten. After all multiples of 10 from 0 to 100 have been claimed, players estimate who has the highest total and then add their two-digit numbers to find the exact sum for each player. The player with the higher sum wins the game.

Skills & Concepts

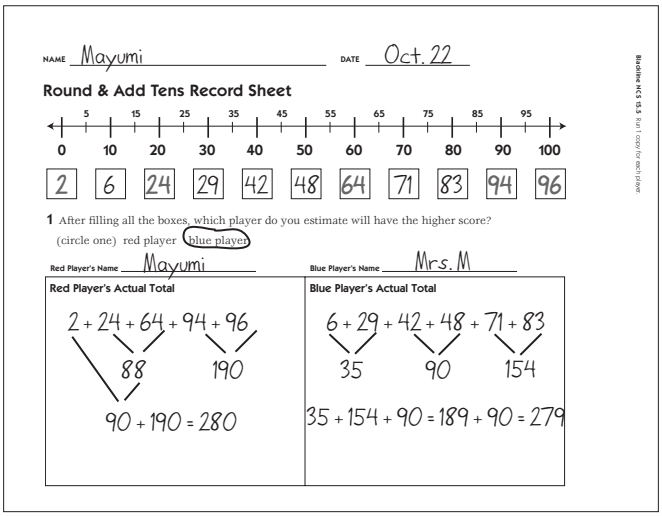
- ★ reading, ordering, and comparing the place value of digits in whole numbers
- ★ rounding whole numbers to the nearest ten
- ★ using estimation strategies to solve problems
- ★ adding columns of multi-digit numbers

You'll need

- ★ Instructions for Round & Add Tens (Blacklines S 15.2 and S 15.3, 1 copy of each run back-to-back)
- ★ Round & Add Tens Spinner (Blackline S 15.4, 1 copy for every 2 pairs of players, cut in half)
- ★ Round & Add Tens Record Sheet (Blackline S 15.5, 1 copy for each player)
- ★ pencil and paperclip to use as a spinner
- ★ 1 red and 1 blue colored pencil or marker for each player

If players have trouble rounding a number, encourage them to locate the number on the number line and then identify whether it is closer to the next smaller multiple of 10 or the next higher multiple of 10.

When finding the sum of their numbers, encourage players to look for pairs of addends that are easy to add, rather than try to add the numbers in order or all at once using the traditional algorithm.


NAME Mayumi DATE Oct. 22

Round & Add Tens Record Sheet

0 10 20 30 40 50 60 70 80 90 100

2 6 24 29 42 48 64 71 83 94 96

1 After filling all the boxes, which player do you estimate will have the higher score?
(circle one) red player blue player

Red Player's Name Mayumi Blue Player's Name Mrs. M

Red Player's Actual Total	Blue Player's Actual Total
2 + 24 + 64 + 94 + 96	6 + 29 + 42 + 48 + 71 + 83
88 190	35 90 154
90 + 190 = 280	35 + 154 + 90 = 189 + 90 = 279

Blackline HCS 15.5 (run 1 copy for each player)

You can also invite players to compare the totals of the rounded numbers with the actual totals. This will give them some sense of how accurately the rounded numbers allow them to estimate the actual totals.

Support Activity 15

SUPPORT ACTIVITY

Round & Add Tens

You'll need

★ Instructions for Round & Add Tens (Blacklines S 15.2 and S 15.3, 1 copy of each run back-to-back)

★ Round & Add Tens Spinner (Blackline S 15.4, 1 copy for every 2 pairs of players, cut in half)

★ Round & Add Tens Record Sheet (Blackline S 15.5, 1 copy for each player)

★ pencil and paperclip to use as a spinner

★ 1 red and 1 blue colored pencil or marker for each player

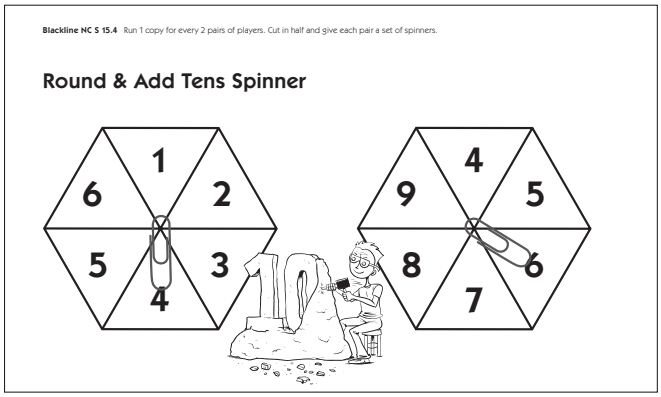
Instructions for Round & Add Tens

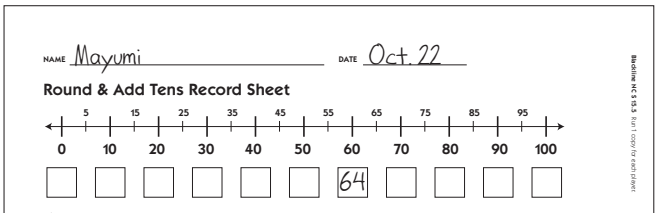
1 Decide who will be the red player and who will be the blue player. Then write your names in the right places on the record sheet.

2 Take turns spinning one of the spinners. The player with the higher number gets to go first.

3 Spin both spinners. Decide which number to put in the tens place and which number to put in the ones place. You are trying to get the highest total score.

4 Round your number to the nearest ten and record it under the rounded number on the record sheet. Be sure to use your own colored pencil or marker. If the number in the ones place is less than 5, round down. If the number in the ones place is 5 or greater, round up.



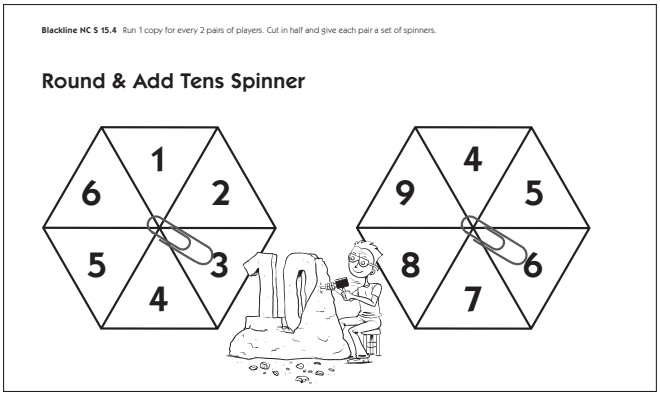


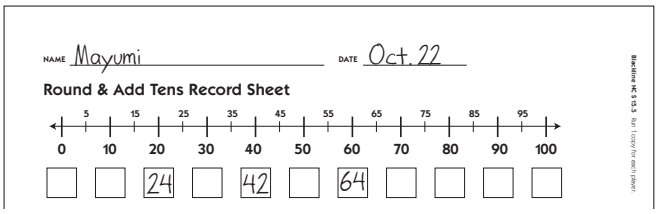
Mayumi I could have made 46 or 64, but I did 64, because it is higher. 64 rounds down to 60, so I wrote it in the box under 60.

(Continued on back.)

Support Activity 15 (cont.)

5 Take turns spinning both spinners, rounding, and recording. If a player can't round two numbers to fill an empty box, he or she loses that turn.



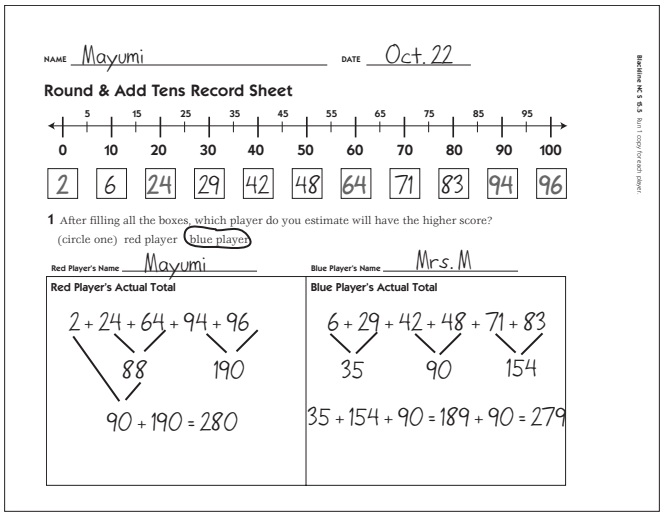


Mrs. M I could make 36, which rounds to 40. Or I could make 63, which rounds to 60. 40 and 60 are both filled already. That's too bad. I lose that turn.

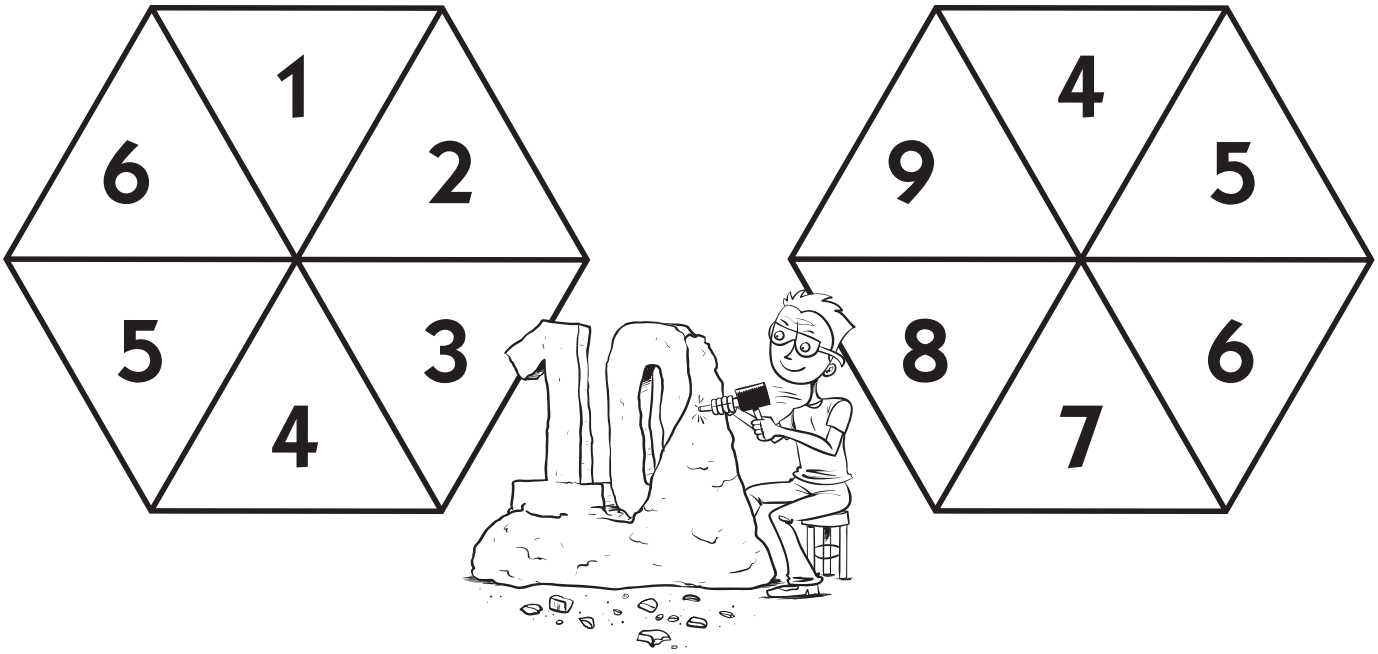
6 Keep playing until all the boxes are filled. Any player can decide at any time to spin just one spinner to try to get the 0 or 10.

7 After all the boxes are filled, estimate which player will have the highest score and circle the player on your record sheet.

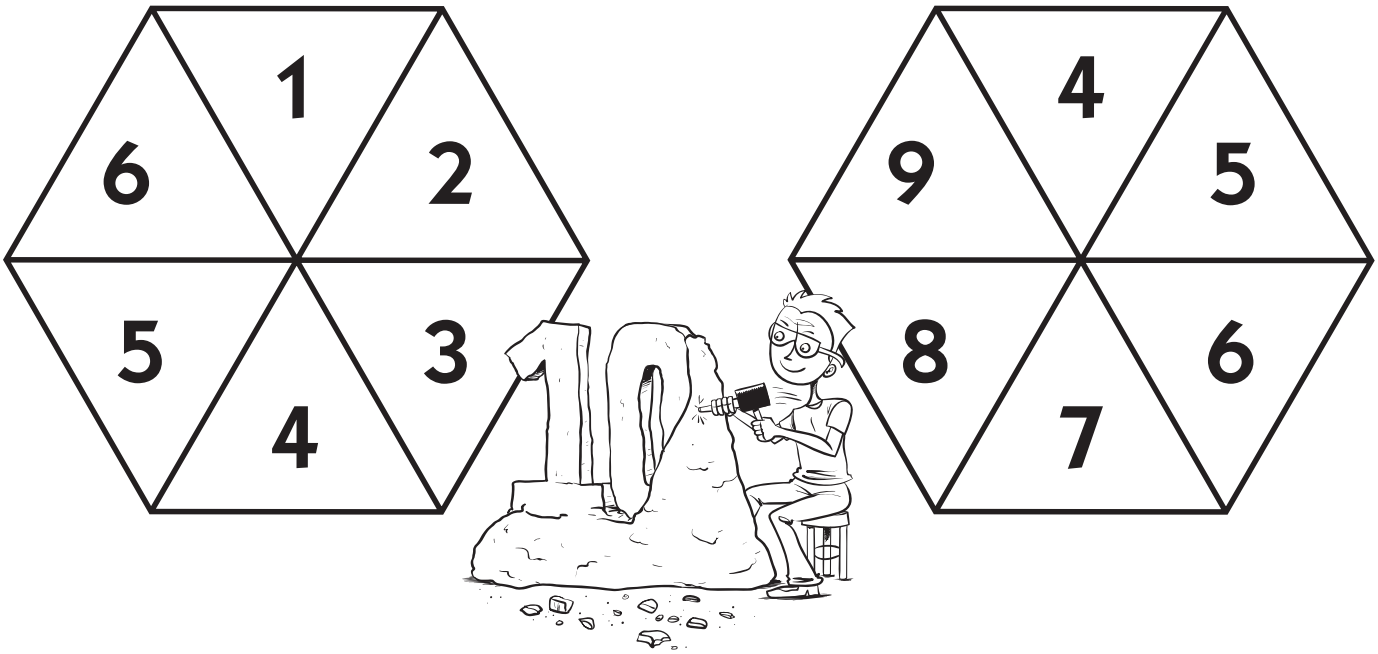
8 Now add up your actual scores in the boxes below your names to find out who really got the highest score.



Round & Add Tens Spinner

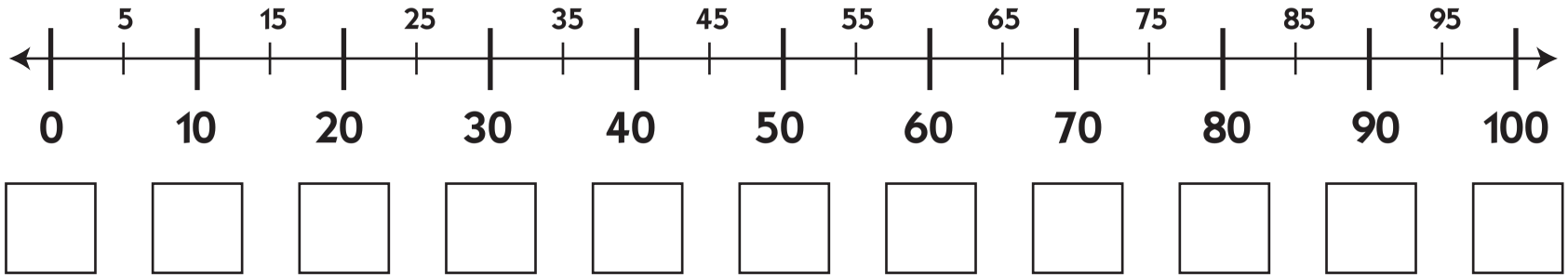


Round & Add Tens Spinner



NAME _____ DATE _____

Round & Add Tens Record Sheet



1 After filling all the boxes, which player do you estimate will have the higher score?

(circle one) red player blue player

Red Player's Name _____ **Blue Player's Name** _____

Red Player's Actual Total	Blue Player's Actual Total

Support Activity 16 ★ Instructional Considerations

SUPPORT ACTIVITY

Round & Add Hundreds

Overview

Players take turns spinning three digits. They arrange those digits to form a 3-digit number and then round the number to the nearest hundred. After all multiples of 100 from 0 to 1000 have been claimed, players estimate who has the highest total and then add their three-digit numbers to find the exact sum for each player. The player with the higher sum wins the game.

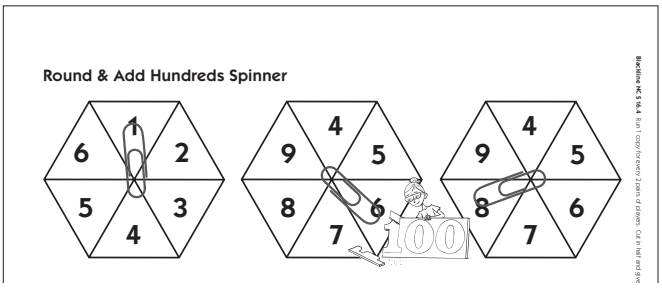
Skills & Concepts

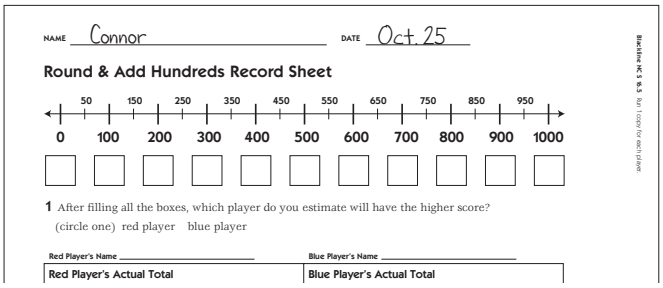
- ★ reading, ordering, and comparing the place value of digits in whole numbers
- ★ rounding whole numbers to the nearest hundred
- ★ using estimation strategies to solve problems
- ★ adding columns of multi-digit numbers

You'll need

- ★ Instructions for Round & Add Hundreds (Blacklines S 16.2 and S 16.3, 1 copy of each run back-to-back)
- ★ Round & Add Hundreds Spinner (Blackline S 16.4, 1 copy for every 2 pairs of players, cut in half)
- ★ Round & Add Hundreds Record Sheet (Blackline S 16.5, 1 copy for each player)
- ★ calculator (optional)
- ★ pencil and paperclip to use as a spinner
- ★ 1 red and 1 blue colored pencil or marker for each player

If players have trouble rounding a number, encourage them to locate the number on the number line and then identify whether it is closer to the next smaller multiple of 100 or the next higher multiple of 100.





I'll make 861. That would be between 850 and 900, so it's closer to 900 than 800.

When finding the sum of their numbers, encourage players to look for pairs of addends that are easy to add, rather than try to add the numbers in order or all once using the traditional algorithm. You might also invite them to use a calculator if adding a series of 3-digit numbers mentally or with paper and pencil methods is beyond the scope of what incoming fifth graders are expected to do in your district.

You can also invite players to compare the totals of the rounded numbers with the actual totals. This will give them some sense of how accurately the rounded numbers allow them to estimate the actual totals.

Support Activity 16

SUPPORT ACTIVITY

Round & Add Hundreds

You'll need

★ Instructions for Round & Add Hundreds (Blacklines S 16.2 and S 16.3, 1 copy of each run back-to-back)

★ Round & Add Hundreds Spinner (Blackline S 16.4, 1 copy for every 2 pairs of players, cut in half)

★ Round & Add Hundreds Record Sheet (Blackline S 16.5, 1 copy for each player)

★ calculator (optional)

★ pencil and paperclip to use as a spinner

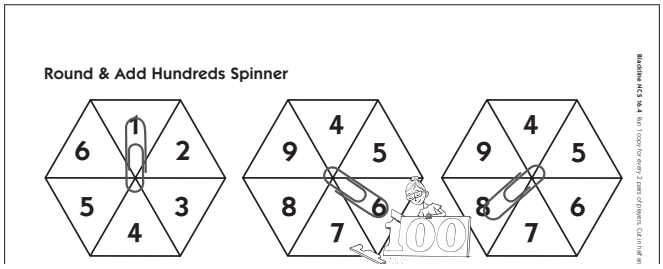
★ 1 red and 1 blue colored pencil or marker for each player

Instructions for Round & Add Hundreds

1 Decide who will be the red player and who will be the blue player. Then write your names in the right places on the record sheet.

2 Take turns spinning one of the spinners. The player with the higher number gets to go first.

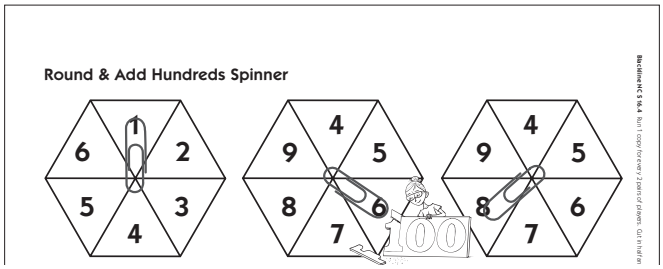
3 Spin all three spinners. Decide which number to put in the hundreds place, tens place, and ones place. You are trying to get the highest total score.

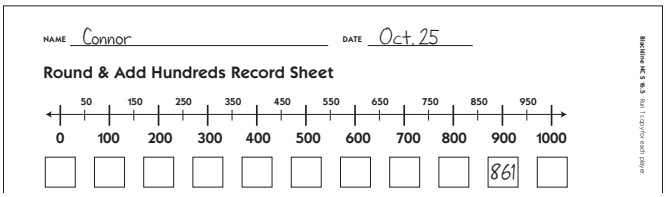


4 Round your number to the nearest hundred and record it under the rounded number on the record sheet. Be sure to use your own color pencil or marker. If the number in the tens place is less than 5, round down. If the number in the tens place is 5 or greater, round up.

(Continued on back.)

Support Activity 16 (cont.)





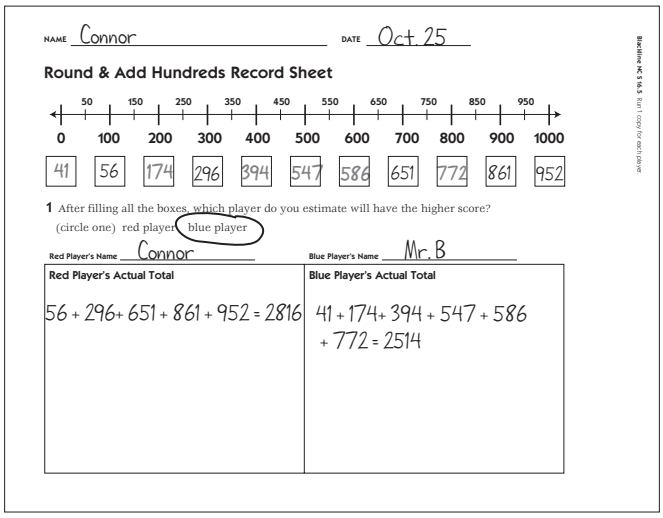
I got 1, 6, and 8. I'll put the 8 in the hundreds place, because I want the biggest number. So I could have 861 or 816. 816 rounds down to 800, but 861 rounds up to 900. I'll write 861 under the 900.

5 Take turns spinning both spinners, rounding, and recording. If a player can't round three numbers to fill an empty box, he or she loses that turn.

6 Keep playing until all the boxes are filled. Any player can decide at any time to spin just one or two spinners to try to get the 0 or 100.

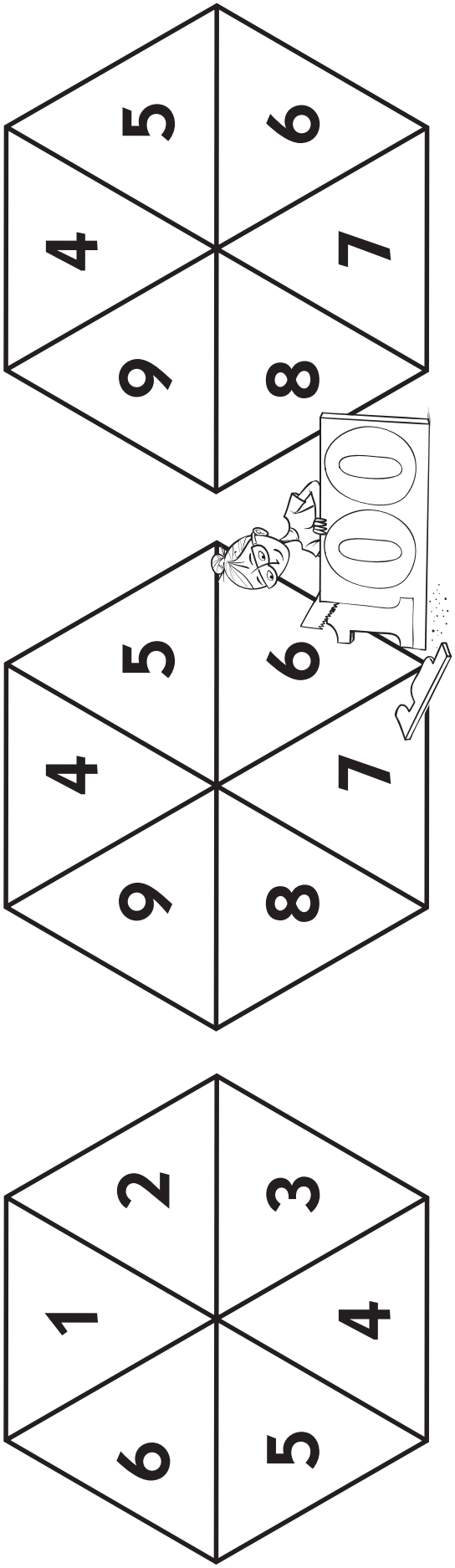
7 After all the boxes are filled, estimate which player will have the highest score and circle the player on your record sheet.

8 Now add up your actual scores in the boxes below your names to find out who really got the highest score.

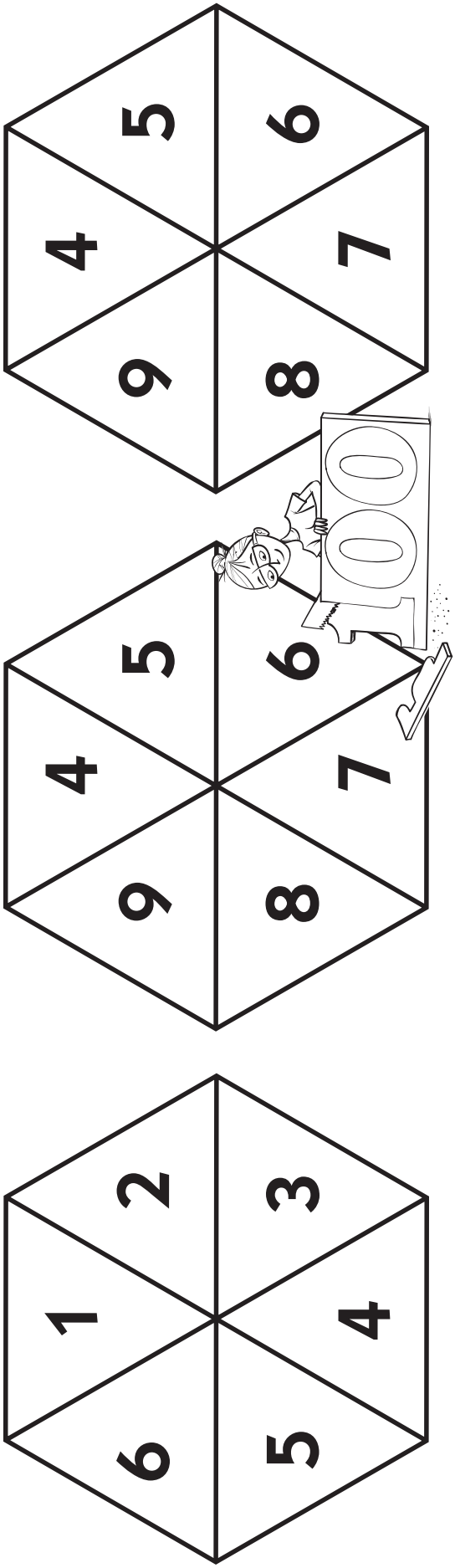


Building Computational Fluency Blackline S 16.4 Run 1 copy for every 2 pairs of players. Cut in half and give each pair a set of spinners.

Round & Add Hundreds Spinner

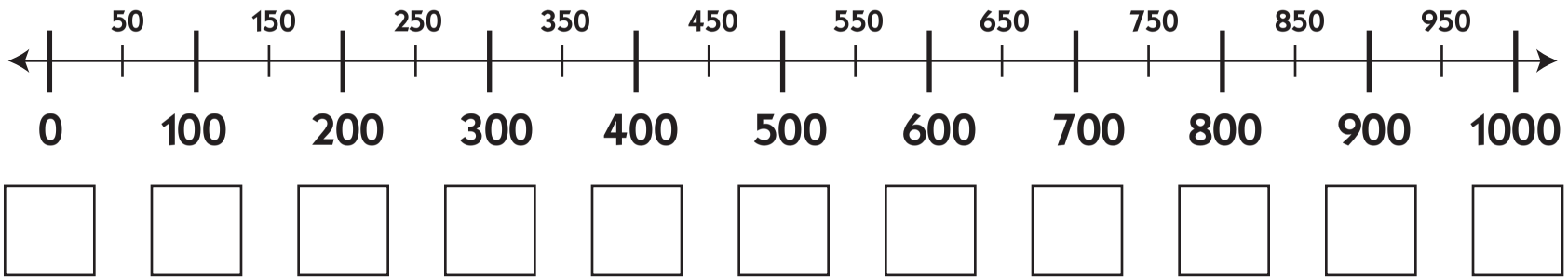


Round & Add Hundreds Spinner



NAME _____ DATE _____

Round & Add Hundreds Record Sheet



1 After filling all the boxes, which player do you estimate will have the higher score?

(circle one) red player blue player

Red Player's Name _____ Blue Player's Name _____

Red Player's Actual Total	Blue Player's Actual Total

Support Activity 17 ★ Instructional Considerations

SUPPORT ACTIVITY

Round & Add Thousands

Overview

Players take turns spinning four digits. They arrange the digits to make a four-digit number, which they locate on a number line and then circle the multiple of 1000 to which it rounds. After all multiples of 1000 from 0 to 10,000 have been claimed, students use the rounded numbers to estimate which player will have the highest total. Then they each add their numbers, and the player with the highest total wins.

Skills & Concepts

- ★ reading, ordering, identifying, and comparing the place value of digits in whole numbers
- ★ rounding 3- and 4-digit whole numbers to the nearest thousand
- ★ adding 4- and 5-digit numbers with regrouping

You'll need

- ★ Round & Add Thousands Instructions (Blacklines S 17.3 and 17.4, 1 copy run back-to-back for each pair of players)
- ★ Digit Spinner (Blackline S 17.5, 1 copy for every 2 pairs of players, cut in half)
- ★ Round & Add Thousands Record Sheet (Blackline S 17.6, a few copies for each pair of players run back-to-back)
- ★ colored pencils in two colors or one regular pencil and one colored pencil
- ★ pencil and paperclip to use as a spinner
- ★ scratch paper

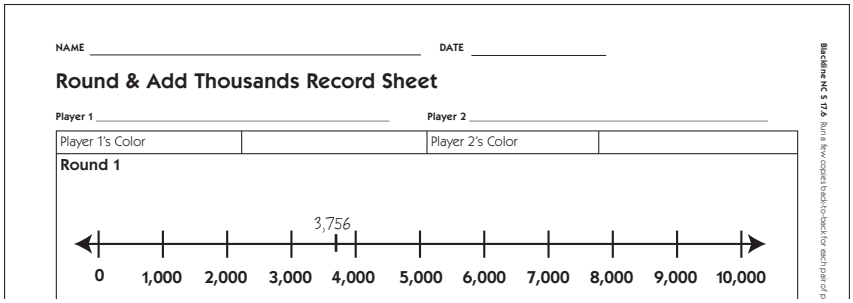
Before playing the game, you might ask students to practice rounding the following numbers to the nearest thousand as a warm-up. The number to which each rounds is shown in parentheses for your benefit.

1250 (1000)	5783 (6000)
965 (1000)	9326 (9000)
341 (0)	6358 (6000)

If students are having trouble rounding to the nearest thousand, remind them that they need to focus on the number in the hundreds place. If the number in the hundreds place is 5 or higher, the number rounds up. If the number in the hundreds place is less than 5, the number rounds down. You might invite them to locate the number on the number line and then consider whether it is closer to the next higher or lower multiple of 1000.

(Continued on back.)

Support Activity 17 Instructional Considerations (cont.)


NAME _____ DATE _____

Round & Add Thousands Record Sheet

Player 1 _____ Player 2 _____

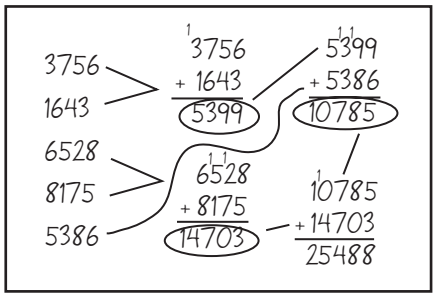
Player 1's Color		Player 2's Color	

Round 1

Blackline NC S 17.6 Run a few copies back-to-back for each pair of p

I can see 3756 is closer to 4000 than 3000 because it's more than halfway between 3000 and 4000.

When students find their totals at the end of the game, they may find it most efficient to use the traditional algorithm to add their five or six 4-digit numbers. Talk through the steps with them and make sure they are identifying the place values of the numbers they are adding (e.g., 700 + 600 = 1300, instead of 7 + 6 = 13).



Support Activity 17

SUPPORT ACTIVITY

Round & Add Thousands

You'll need

★ Round & Add Thousands Instructions (Blacklines S 17.3 and 17.4, 1 copy run back-to-back for each pair of players)

★ Digit Spinner (Blackline S 17.5, 1 copy for every 2 pairs of players, cut in half)

★ Round & Add Thousands Record Sheet (Blackline S 17.6, a few copies for each pair of players run back-to-back)

★ colored pencils in two colors or one regular pencil and one colored pencil

★ pencil and paperclip to use as a spinner

★ scratch paper

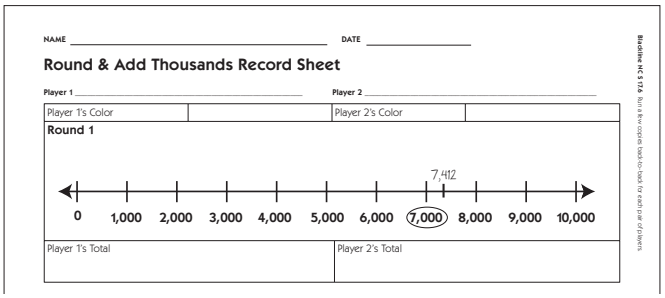
Instructions for Round & Add Thousands

1 Spin one numbered spinner each. The player with the higher number goes first.

2 You'll share a record sheet. On the record sheet, color in the boxes to show which color pencil each player will use.

3 Spin both spinners twice and write the numbers you get on a piece of scratch paper. Arrange the four numbers to make a four-digit number. Remember that at the end of the game, you want to have the highest total.

4 On the record sheet, make a mark on the number line where your number belongs and write your number above the mark. Then circle the multiple of 1000 to which your number rounds.


NAME _____ DATE _____

Round & Add Thousands Record Sheet

Player 1 _____ Player 2 _____

Player 1's Color		Player 2's Color	

Round 1

Player 1's Total	Player 2's Total

Blackline S 17.6 Run a few copies back-to-back for each pair of players.

5 Take turns until all the multiples of 1000 have been claimed. Make sure each player uses his or her own color pencil to record his or her numbers.

(Continued on back.)

Support Activity 17 (cont.)

6 If a player spins 4 digits that cannot form a number that rounds to an unclaimed multiple of 1000, the player loses his or her turn.

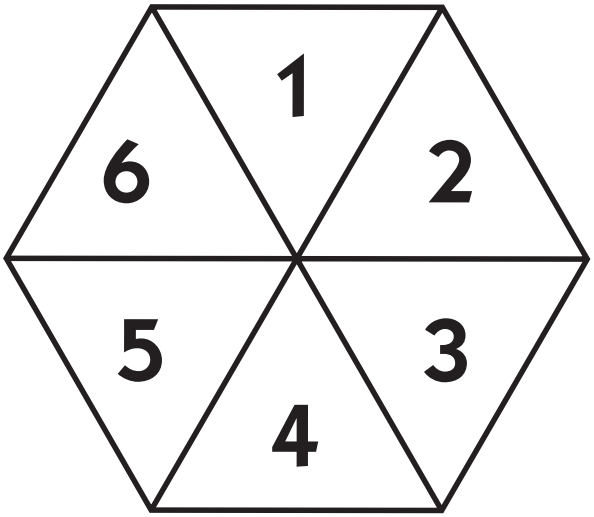
7 At any time, a player can decide to use just 3 of the spinners to make a number that rounds to 0.

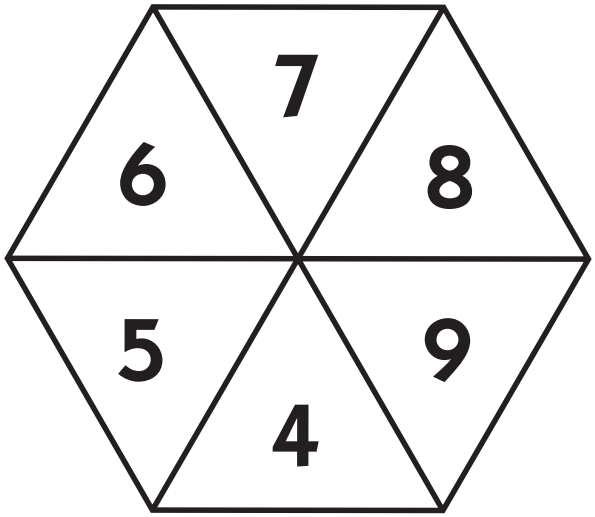
8 After all the multiples on the line have been circled, use the rounded numbers to estimate which player will have the highest total after each player adds up his or her numbers.

9 Then find the total for each player. Think carefully about the order in which you add your numbers.

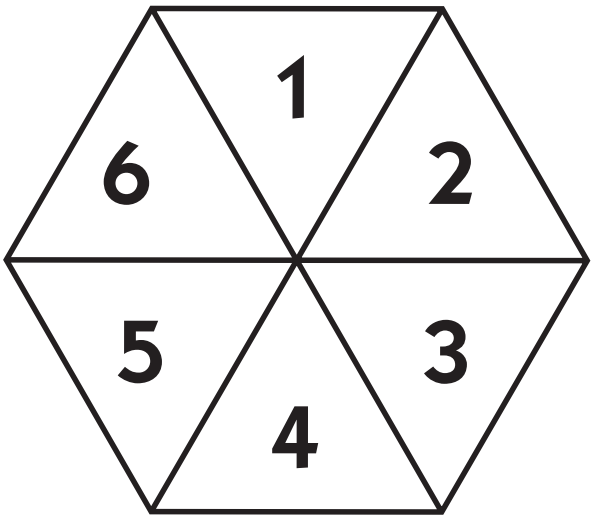
10 The player with the highest total wins.

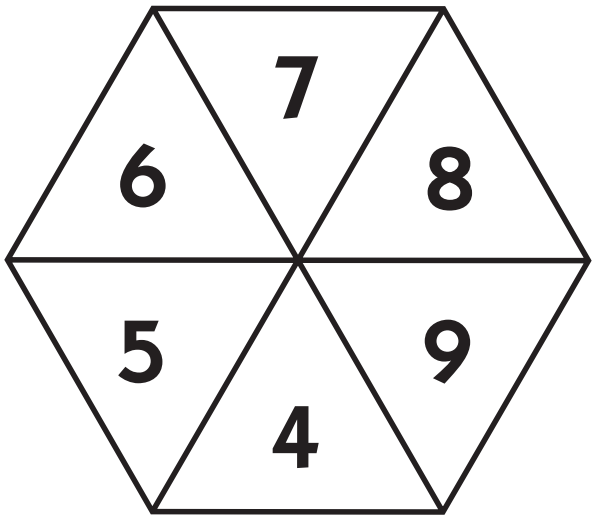
Digit Spinner





Digit Spinner





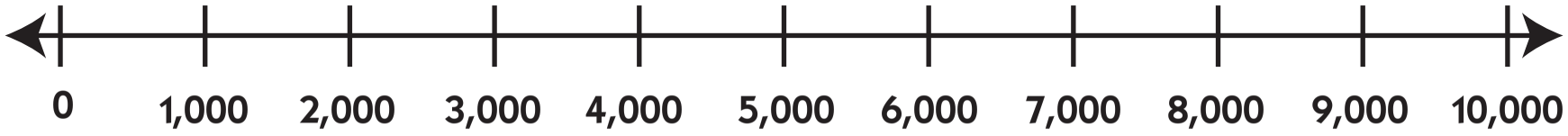
NAME _____ DATE _____

Round & Add Thousands Record Sheet

Player 1 _____ Player 2 _____

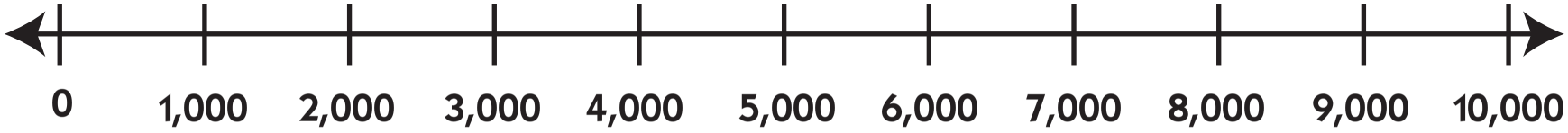
Player 1's Color		Player 2's Color	

Round 1



Player 1's Total	Player 2's Total

Round 2



Player 1's Total	Player 2's Total

Support Activity 18 ★ Instructional Considerations

SUPPORT ACTIVITY

Spin & Multiply

Overview

Players take turns spinning 1-by-2-digit multiplication combinations. After they have each taken 3 turns, they find the sum of their 3 products. The player with the larger sum wins.

Skills & Concepts

★ multiplying 1-digit numbers by 2-digit numbers

★ adding 2- and 3-digit numbers

★ paperclip and pencil for use as a spinner

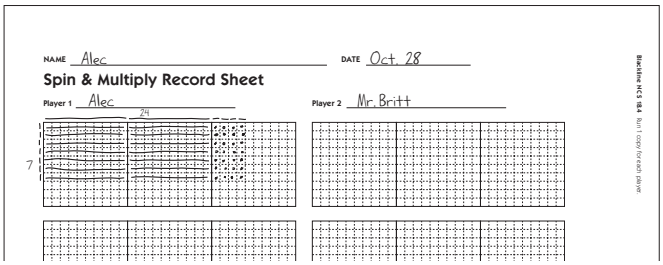
You'll need

★ Instructions for Spin & Multiply (Blackline S 18.2, 1 copy)

★ Spin & Multiply Spinner (Blackline S 18.3, 1 copy for every 2 pairs of players, cut in half)

★ Spin & Multiply Record Sheet (Blackline S 18.4, 1 copy per player)

It may be helpful if, before students play a full game of Spin & Multiply, you model how to sketch the frame and then the array for a 1-by-2-digit combination. As they compute their products, encourage players to think in chunks and use friendly numbers.



Alec *I can do 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 120, 130, 140. And then add 7 times 4.*

Mr. Britt *Alec, is there any way you could have gotten the 140 part without counting each ten?*

Alec *Umm, well, I could count down by 20's. Oh! Or I could see it's 70 plus 70. That's a fast way to get 140.*

Students who are working more fluently might be encouraged, if they don't come up with it on their own, to think about 7 × 25 to solve 7 × 24. Working with landmark numbers and then adjusting their answers can be a quick way to work mentally. (e.g., 7 × 25 = 175 and 175 – 7 = 168. So 7 × 24 is 168.)

Support Activity 18

SUPPORT ACTIVITY

Spin & Multiply

You'll need

★ Instructions for Spin & Multiply (Blackline S 18.2, 1 copy)

★ Spin & Multiply Spinner (Blackline S 18.3, 1 copy for every 2 pairs of players, cut in half)

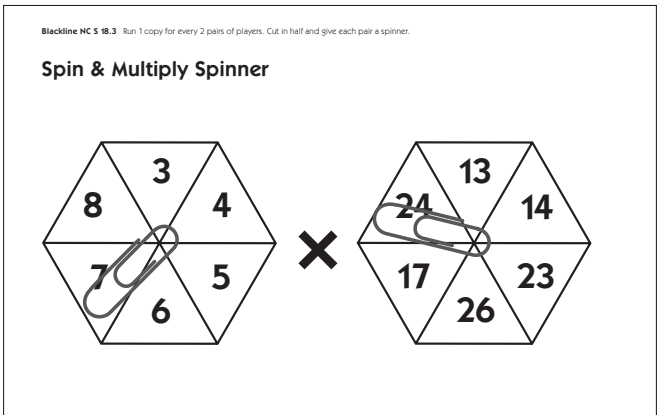
★ Spin & Multiply Record Sheet (Blackline S 18.4, 1 copy per player)

★ paperclip and pencil for use as a spinner

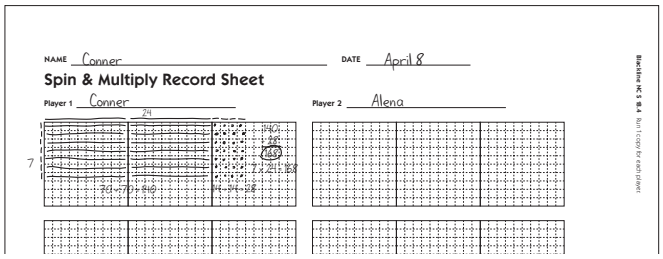
Instructions for Spin & Multiply

1 Record both players' names on a Spin & Multiply Record Sheet.

2 Spin each spinner to get two numbers to multiply.



3 Sketch the frame of linear pieces onto the grid on the record sheet first, and then fill in the array. Explain how you computed the product of those two factors to your partner.



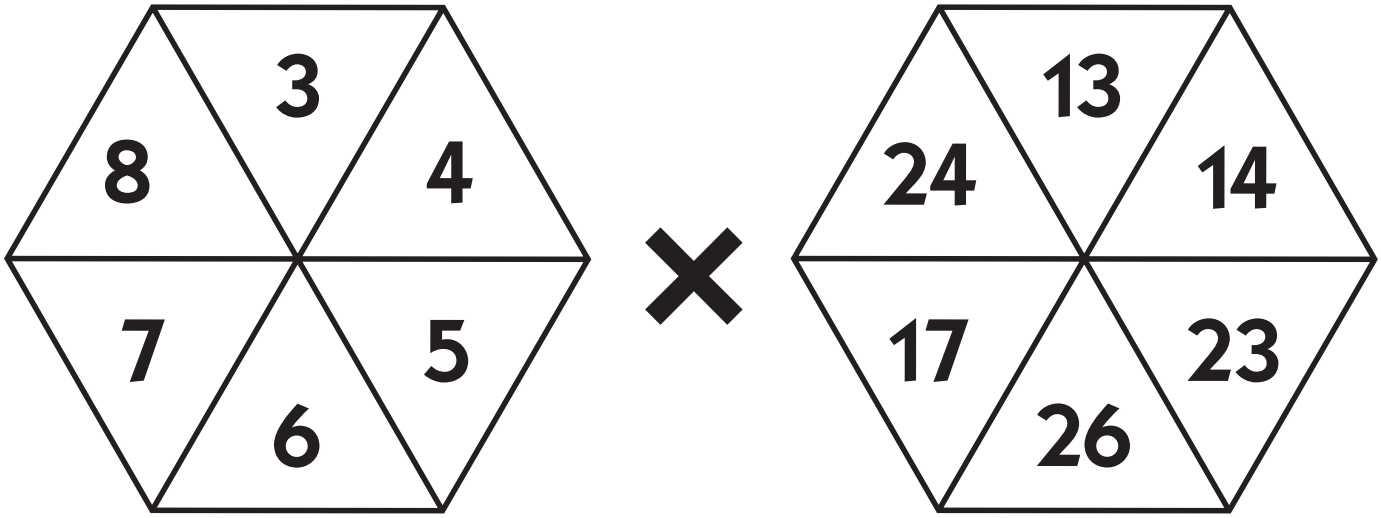
I drew the array to show the tens and ones. First I saw the 70 plus 70. I forgot 7 times 4 is 28, but I saw it was 14 plus 14. 140 plus 28 is 168. That means 7 times 24 is 168.

4 You and your partner will each take 3 turns spinning, sketching, and finding the product.

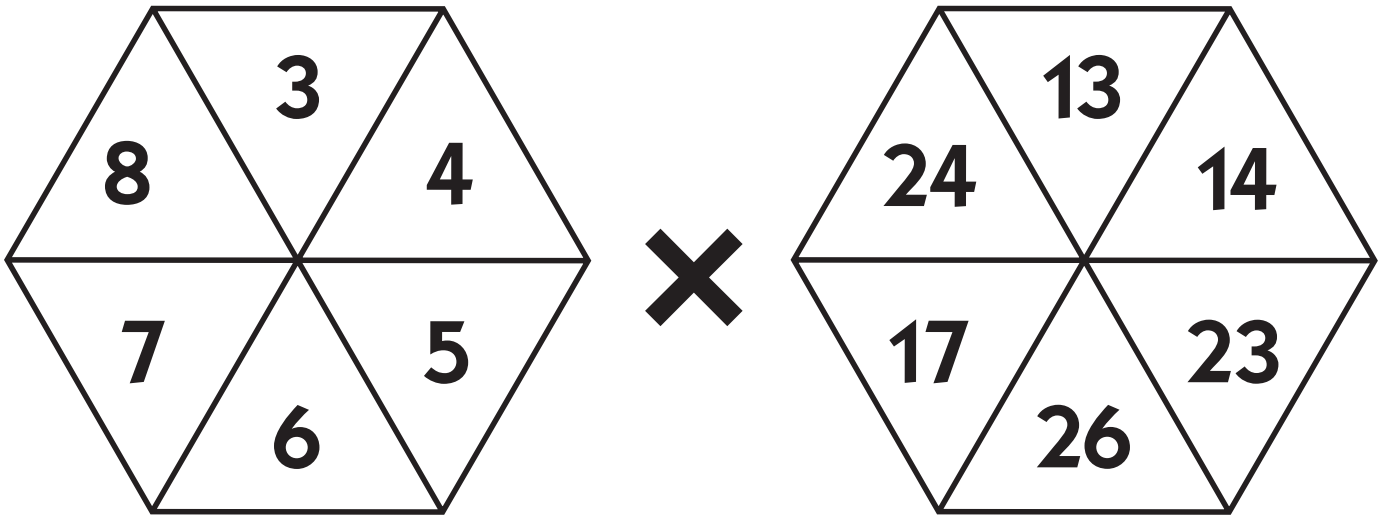
5 When you have both taken 3 turns, find the sums of your products. Double-check each other's work.

6 The player with the larger sum wins the game.

Spin & Multiply Spinner



Spin & Multiply Spinner



NAME _____ DATE _____

Spin & Multiply Record Sheet

Player 1 _____

Player 2 _____

Total

Total

Support Activity 19 ★ Instructional Considerations

SUPPORT ACTIVITY

Moolah on My Mind

Overview

Players take turns spinning numbers and coins to accumulate collections of money. After 10 turns each, the player with the most money wins.

Skills & Concepts

★ knowing and fluently using multiplication facts

★ multiplying 2-digit by 1- or 2-digit numbers

★ adding money amounts

You'll need

★ Moolah on My Mind Instructions (Blackline S 19.2, 1 copy)

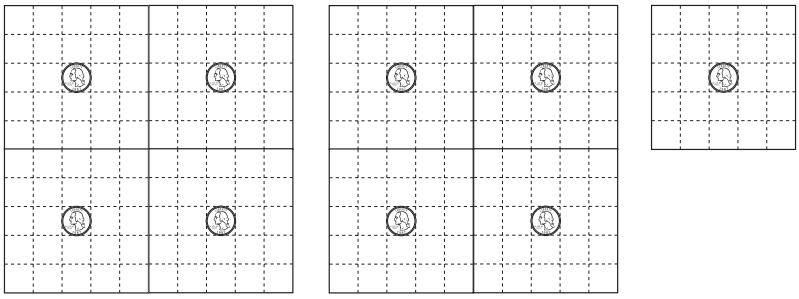
★ Moolah on My Mind Spinner (Blackline S 19.3, 1 copy for every 2 pairs of players, cut in half)

★ Moolah on My Mind Record Sheet (Blackline S 19.4, 1 copy for each player)

★ pencil and paperclip to use as a spinner

★ money value pieces (Use Blacklines S 19.5–19.7 to make your own if needed.)

Encourage students who are struggling with multiplication of landmark numbers (1, 5, 10, and 25) to use money value pieces and think about what they already know about money. For example, if a student spins a 3, a 6, and a quarter, he can count out 9 quarter pieces and arrange them in groups of 4 to make dollars rather than trying to skip count by 25's.



I can see that 9 times 25¢ is $2.25 because 4 quarters make a dollar. So that's 1 dollar, 2 dollars, and 25¢. This isn't so hard!

Support Activity 19

SUPPORT ACTIVITY

Moolah on My Mind

You'll need

★ Moolah on My Mind Instructions (Blackline S 19.2, 1 copy)

★ Moolah on My Mind Spinner (Blackline S 19.3, 1 copy for every 2 pairs of players, cut in half)

★ Moolah on My Mind Record Sheet (Blackline S 19.4, 1 copy for each player)

★ pencil and paperclip to use as a spinner

★ money value pieces (Use Blacklines S 19.5 –19.7 to make your own if needed.)

Instructions for Moolah on My Mind

1 Take turns spinning one numbered spinner. The player with the highest number goes first.

2 Spin the number spinners, add the two numbers, and then spin the coin spinner.

3 Write an expression in the first column on the record sheet to show the results of your rolls and spin.

4 Multiply to find out how much money you collected and write that amount in the second column. Write it again in the last column so you can keep a running total of your money.

5 Take turns with your partner. Help each other make sure that you are adding your money accurately. In other words, be sure each other's running totals are correct.

Blackline NC S 19.4 Run 1 copy for each player.

NAME Ravi DATE _____

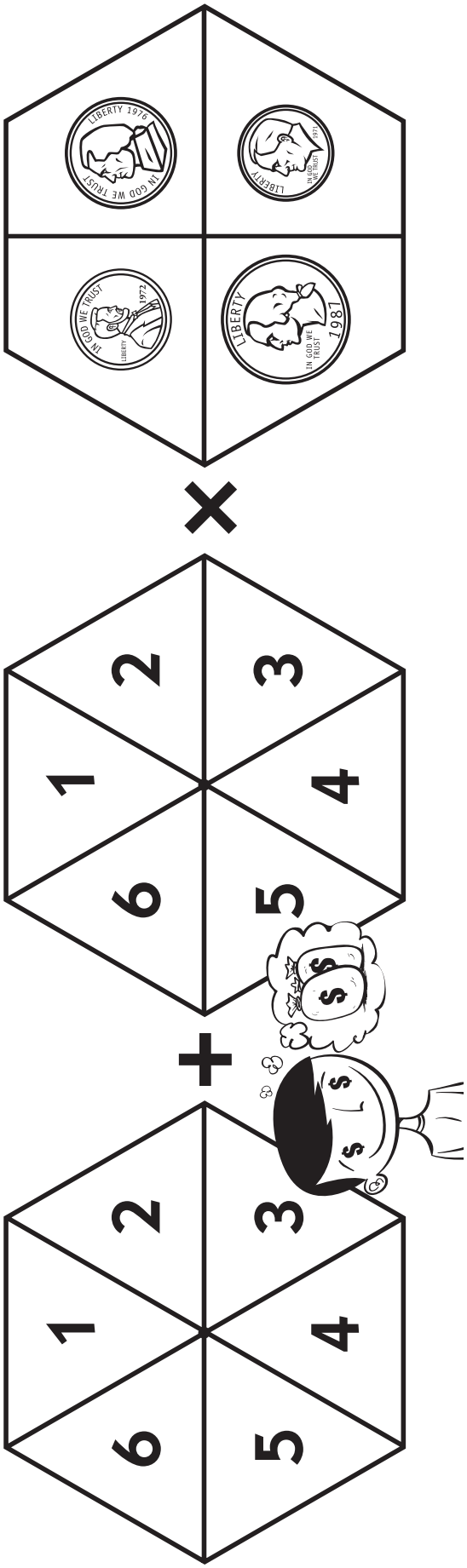
Moolah on My Mind Record Sheet

Round 1

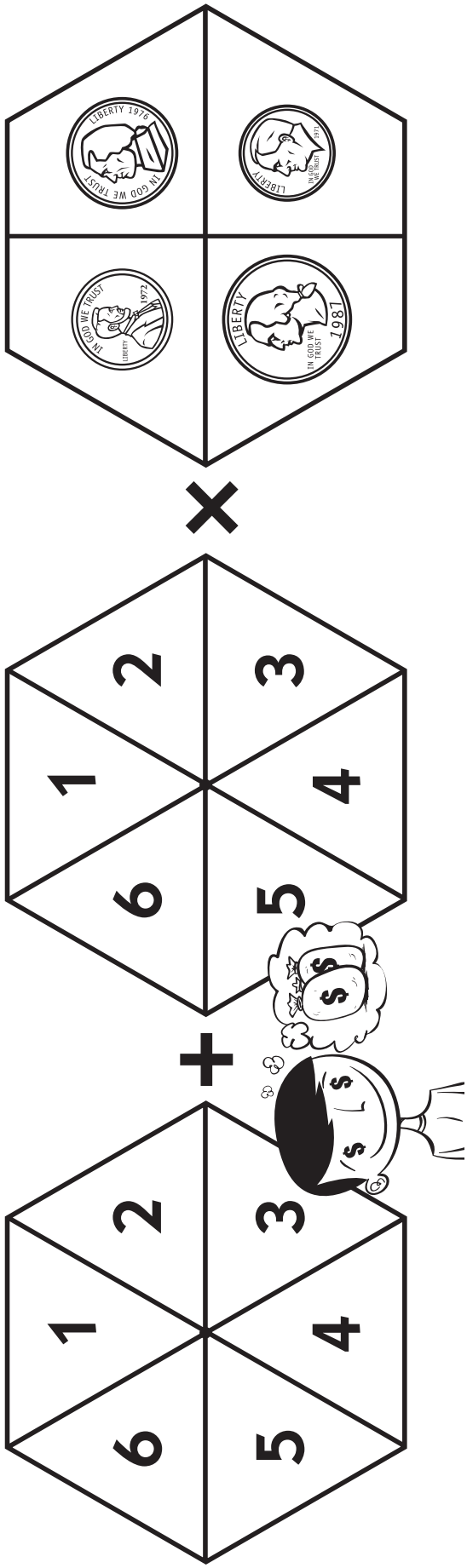
Multiplication Expression (sum of the 2 numbers times the coin value you spin)	Amount of Money You Got in This Turn	Total Money So Far
7 × 25¢	$1.75	$1.75
9 × 10¢	.90	$2.65

6 When both players have taken 10 turns, the game is over and the player with the most money wins.

Moolah on My Mind Spinner



Moolah on My Mind Spinner



NAME _____ **DATE** _____

Moolah on My Mind Record Sheet

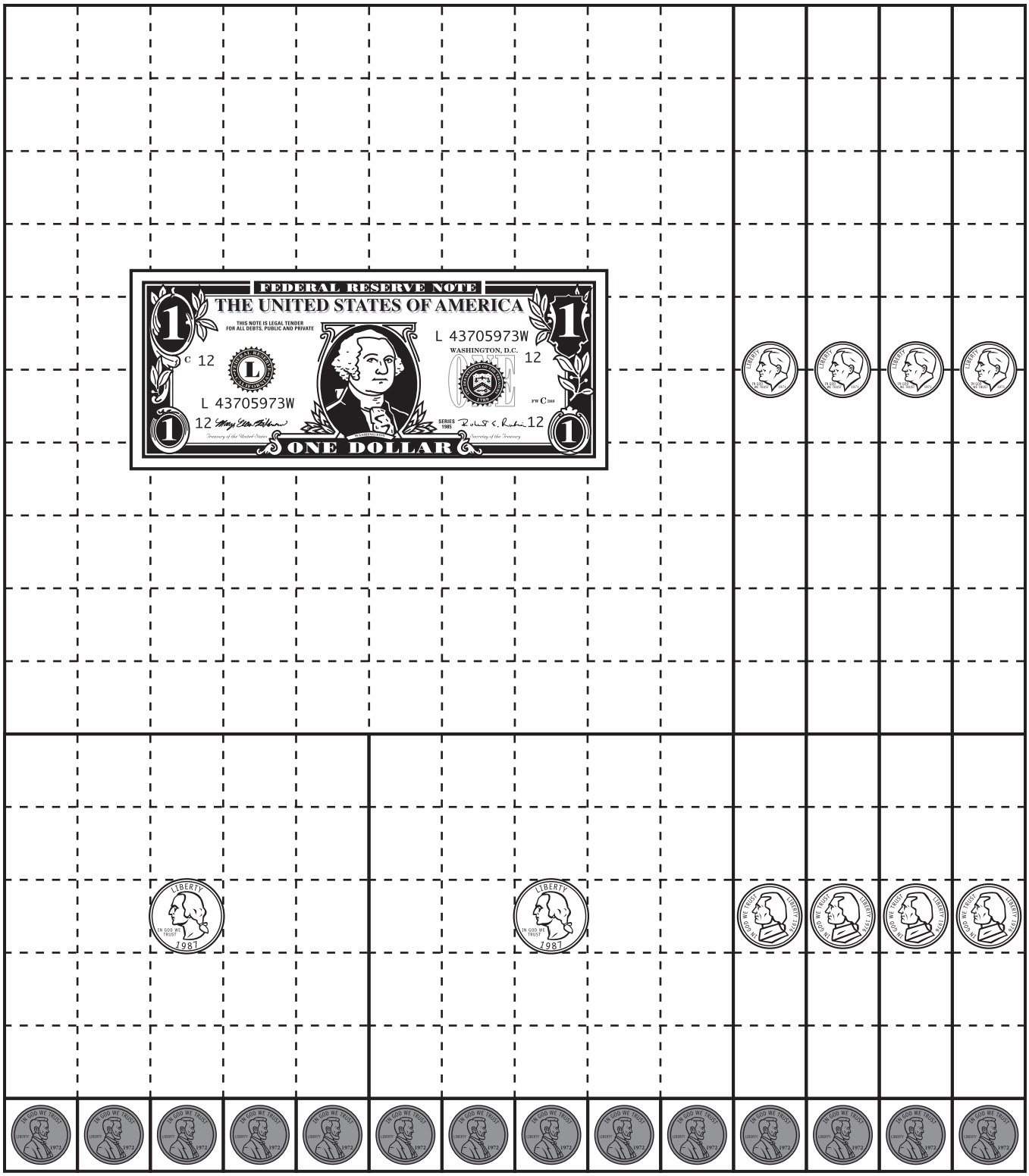
Round 1

Multiplication Expression (sum of the 2 numbers times the coin value you spin)	Amount of Money You Got in This Turn	Total Money So Far

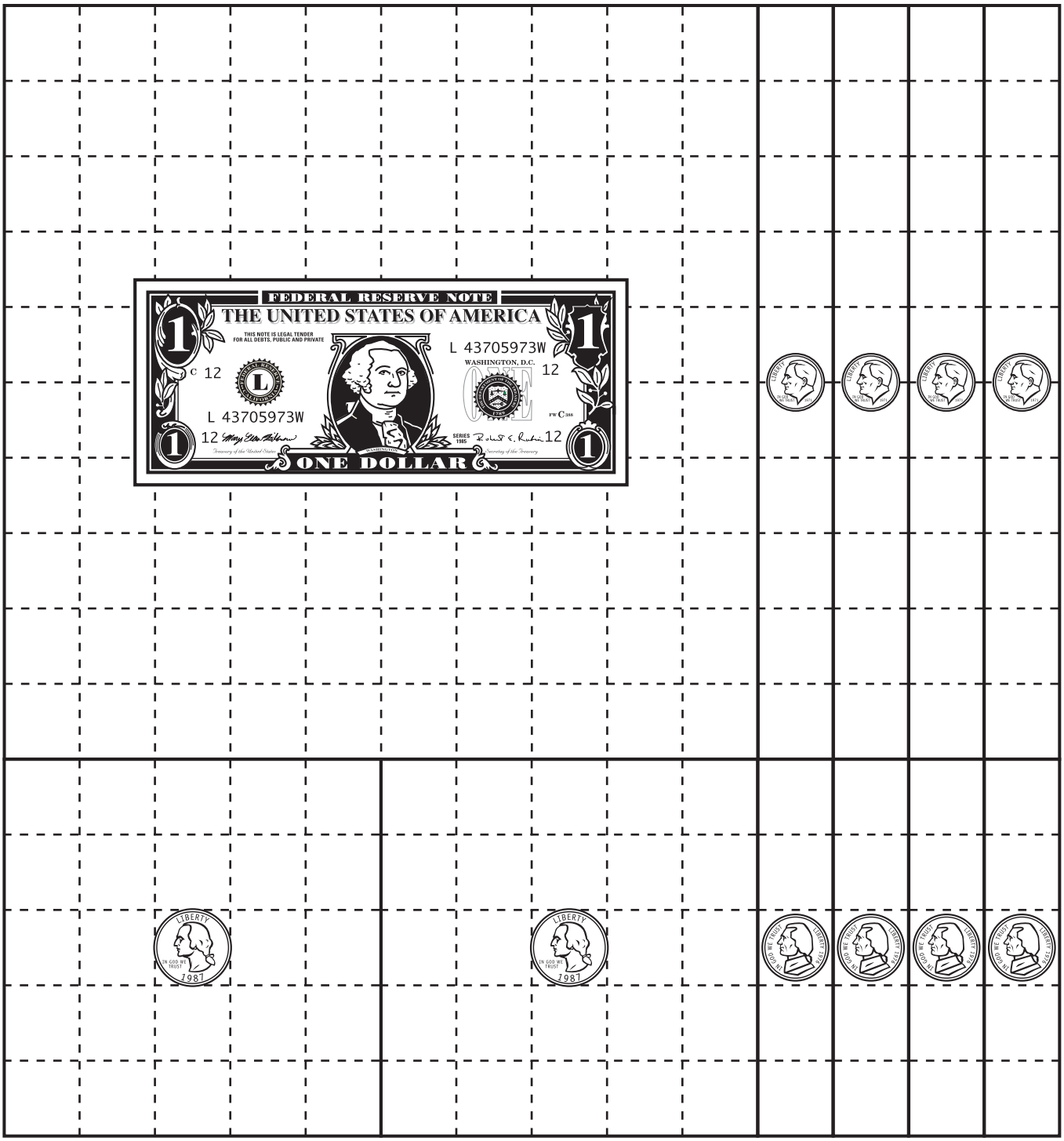
Round 2

Multiplication Expression (sum of the 2 numbers times the coin value you spin)	Amount of Money You Got in This Turn	Total Money So Far

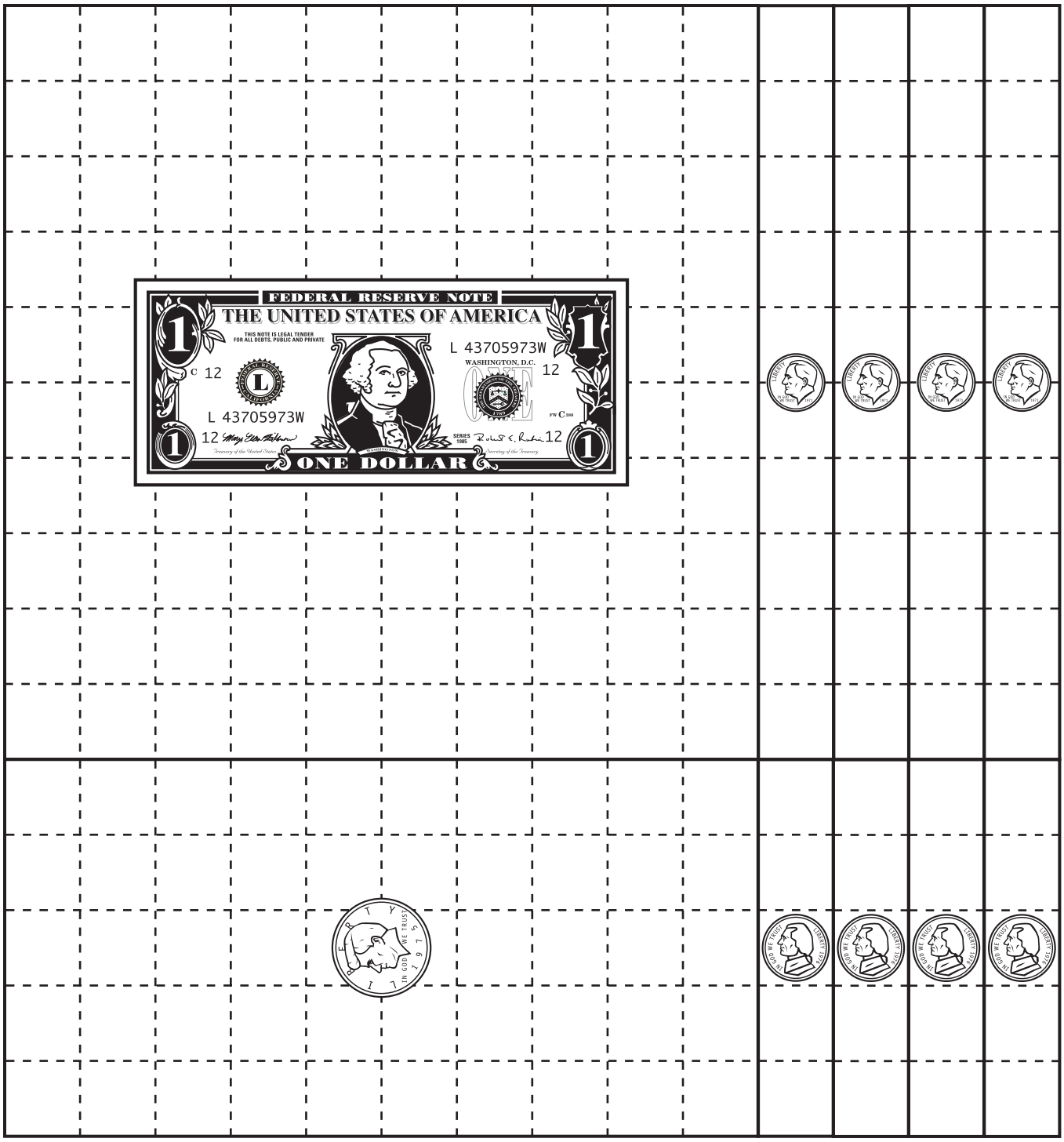
Money Value Pieces page 1 of 3



Money Value Pieces page 2 of 3



Money Value Pieces page 3 of 3



Support Activity 20 ★ Instructional Considerations

SUPPORT ACTIVITY

More or Less Multiplication

Overview

Players take turns spinning 3 numbers. Each player must decide in which order it will make the most sense to multiply his or her 3 numbers. After both players have found their products, they compare products and the spin of a more or less spinner determines the winner.

Skills & Concepts

★ developing efficient strategies for multiplying 2-digit by 1-digit numbers

You'll need

★ More or Less Multiplication Instructions (Blackline S 20.2 and 20.3, 1 copy run back-to-back.)

★ More or Less Multiplication Spinner (Blackline S 20.4, 1 copy for every 2 pairs of players, cut in half)

★ More or Less Multiplication Record Sheet (Blackline S 20.5, 1 copy for each player)

★ Large and Small Base Ten Grid Paper (Blacklines S 20.6 and 20.7, optional)

★ colored pencils

★ calculators (optional)

Students may need help recording their numbers. The game has a fair number of steps, and some students will need more review than others to record and then multiply the three numbers they spin.

You might need to encourage some students to use a variety of strategies and help them discover that thinking in terms of what they know about coin values, or working with a strategy like the double-doubles to compute something like 4×27, is more efficient than drawing a sketch.

> ***Beth*** *I know 4 times 27 is like 4 times 25. 4 times 25 is 100, and then I need to add 4 times 2, or 8, more. So it's 108.*

> ***Javier*** *I thought about double-doubles. I know 27 plus 27 is 54, and 54 times 2 is 108.*

Support Activity 20

SUPPORT ACTIVITY

More or Less Multiplication

You'll need

★ More or Less Multiplication Instructions (Blackline S 20.2 and 20.3, 1 copy run back-to-back)

★ More or Less Multiplication Spinner (Blackline S 20.4, 1 copy for every 2 pairs of players, cut in half)

★ More or Less Multiplication Record Sheet (Blackline S 20.5, 1 copy for each player)

★ Large and Small Base Ten Grid Paper (Blacklines S 20.6 and 20.7, optional)

★ colored pencils

★ pencil and paperclip to use as a spinner

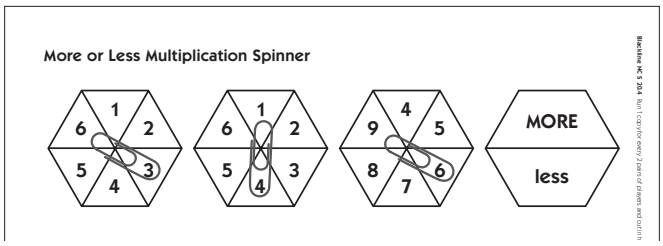
★ calculators (optional)

Instructions for More or Less Multiplication

1 Take turns spinning one number spinner. The player with the higher number goes first.

2 Spin the more or less spinner to see if you will play for more or for less. Circle the word more or less on your record sheet.

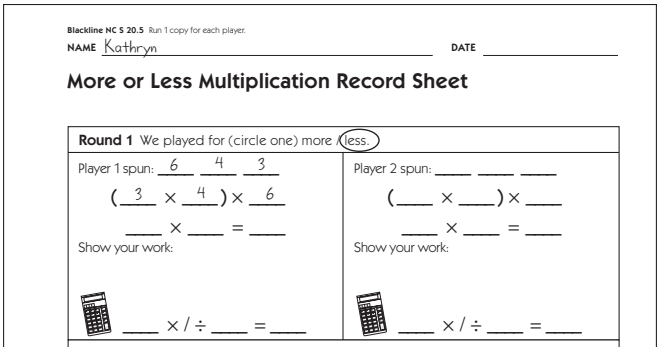
3 Spin the 3 number spinners and record the numbers on your record sheet. You are going to multiply these 3 numbers. Think about the best order to put them in.



4 Write a number sentence to show the order you will multiply the numbers. Write the 2 numbers you will multiply first inside the parentheses, and the third one outside the parentheses.

(Continued on back.)

Support Activity 20 (cont.)


Blackline NC S 20.5 Run 1 copy for each player.

NAME Kathryn DATE _____

More or Less Multiplication Record Sheet

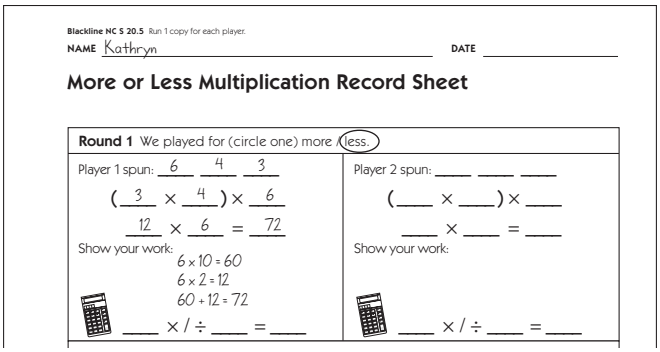
Round 1 We played for (circle one) more / less.

Player 1 spun: 6 4 3	Player 2 spun: ___ ___ ___
(3 × 4) × 6	(___ × ___) × ___
___ × ___ = ___	___ × ___ = ___
Show your work:	Show your work:
___ × / ÷ ___ = ___	___ × / ÷ ___ = ___

Player 1 I got a 6, a 4, and a 3. What would be the easiest way to multiply those three numbers? Oh, I know! I'll go 3 × 4, that's 12, and then multiply 12 × 6.

5 Now multiply the first two numbers inside the parentheses and write the product, along with the third number, on the next line.

6 Find the product and show your work. Find a way to solve the problem that uses multiplication instead of repeated addition. You can use Base Ten Grid Paper or the multiplication facts you know to help. You can't use the calculator for this part of the game, though.


Blackline NC S 20.5 Run 1 copy for each player.

NAME Kathryn DATE _____

More or Less Multiplication Record Sheet

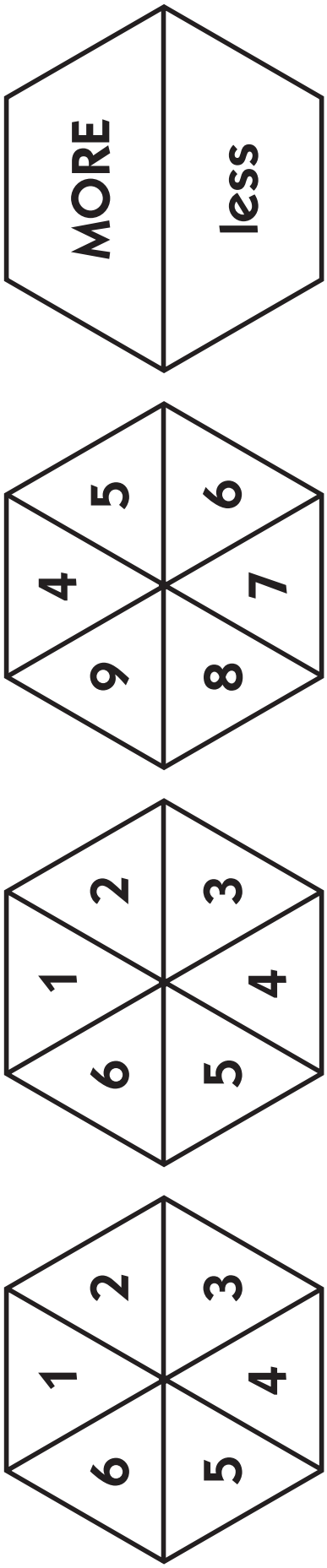
Round 1 We played for (circle one) more / less.

Player 1 spun: 6 4 3	Player 2 spun: ___ ___ ___
(3 × 4) × 6	(___ × ___) × ___
12 × 6 = 72	___ × ___ = ___
Show your work: 6 × 10 = 60 6 × 2 = 12 60 + 12 = 72	Show your work:
___ × / ÷ ___ = ___	___ × / ÷ ___ = ___

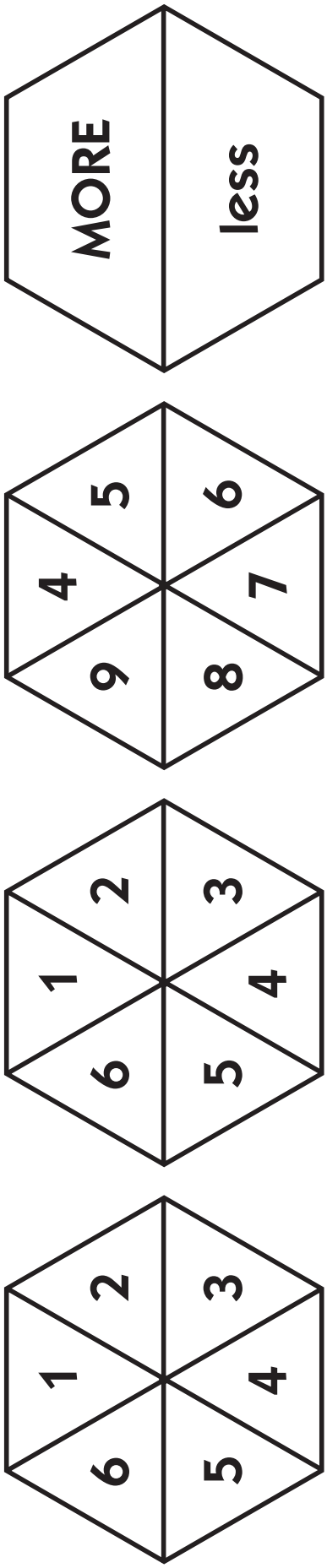
7 The Last Toss Option: If you're not happy with your total, you can choose to spin one 1–6 spinner, write the number in the box beside the little calculator, and then multiply or divide your total by that number. You can use a calculator to help you do this part, but be sure to write a number sentence to show what you did.

8 Now it's your partner's turn. Be sure to record your partner's turn too. After your partner has found his or her total, compare them and circle the winner. (The lower total wins if you spun "less" at the start of the round. The higher total wins if you spun "more" at the start of the round.)

More or Less Multiplication Spinner



More or Less Multiplication Spinner

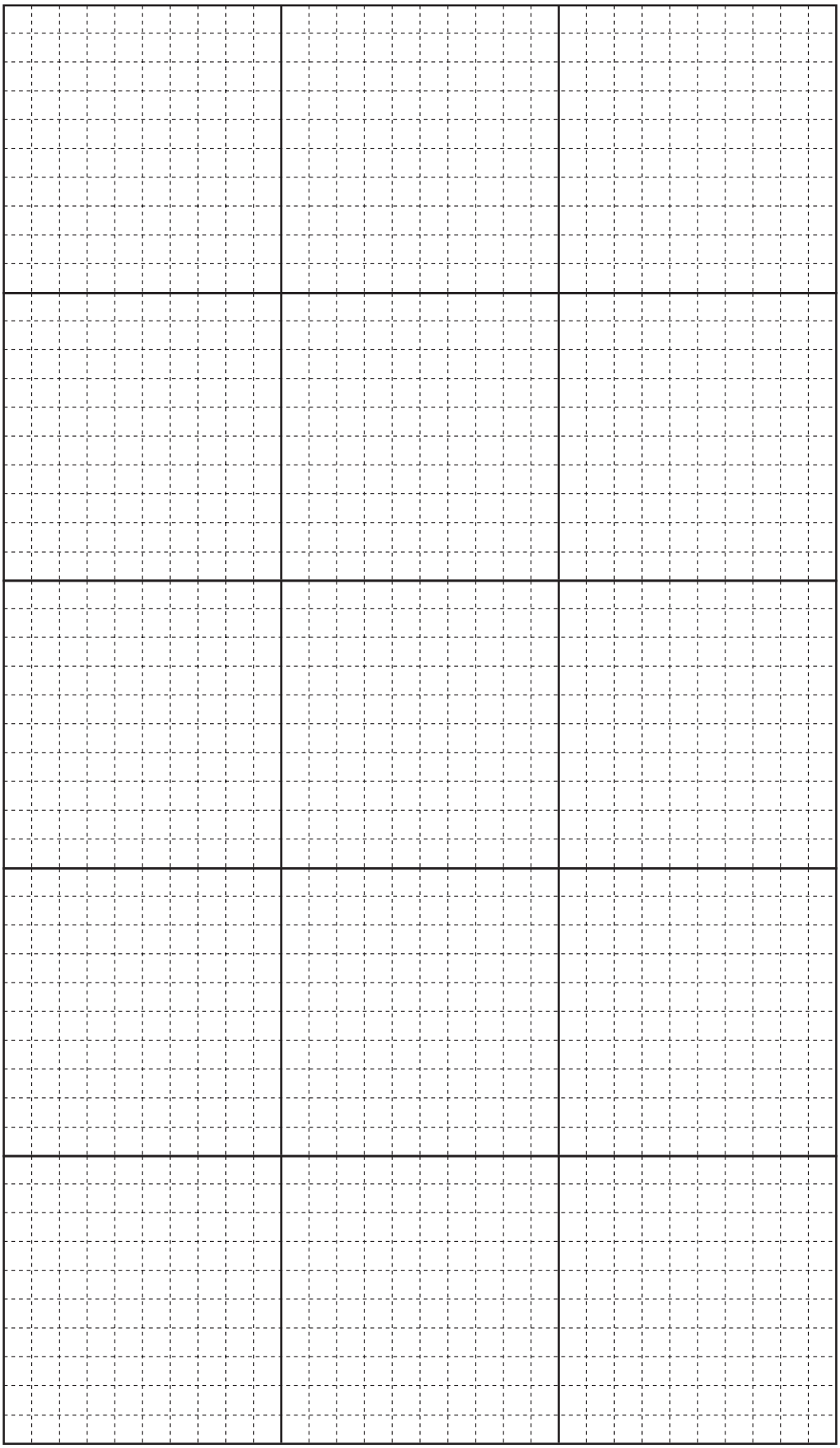


NAME _____ **DATE** _____

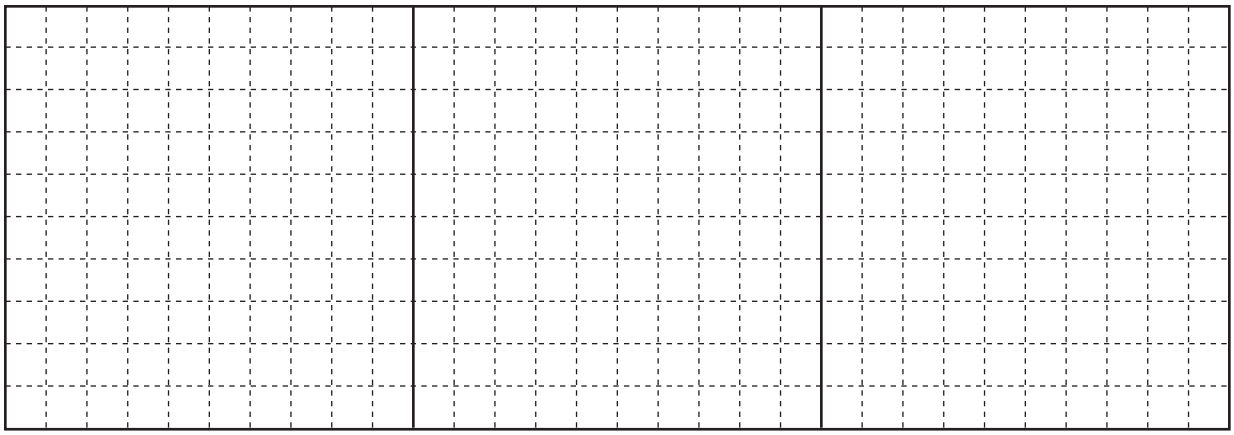
More or Less Multiplication Record Sheet

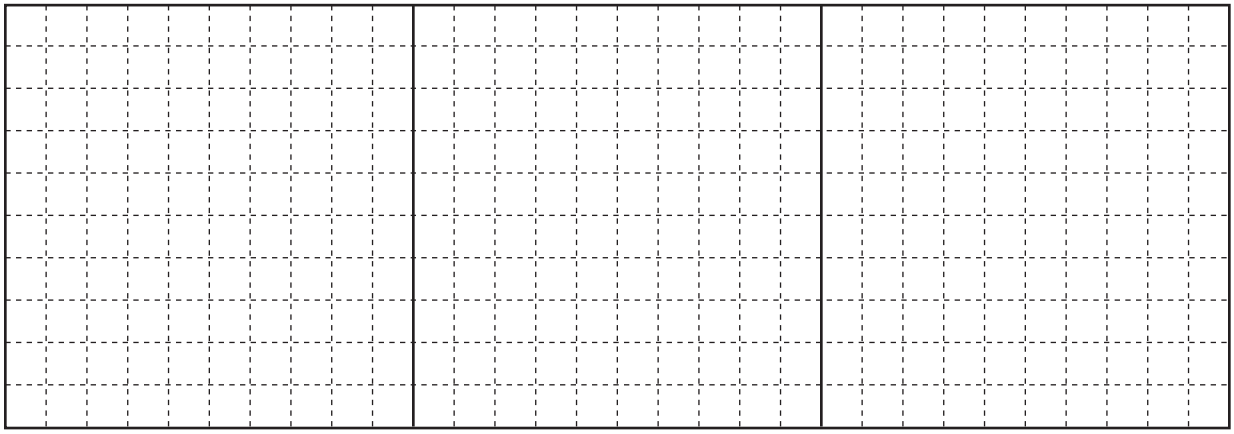
Round 1 We played for (circle one) more / less.	
Player 1 spun: ____ ____ ____ (____ × ____) × ____ ____ × ____ = ____ Show your work: ____ × / ÷ ____ = ____	Player 2 spun: ____ ____ ____ (____ × ____) × ____ ____ × ____ = ____ Show your work: ____ × / ÷ ____ = ____
Round 2 We played for (circle one) more / less.	
Player 1 spun: ____ ____ ____ (____ × ____) × ____ ____ × ____ = ____ Show your work: ____ × / ÷ ____ = ____	Player 2 spun: ____ ____ ____ (____ × ____) × ____ ____ × ____ = ____ Show your work: ____ × / ÷ ____ = ____
Round 3 We played for (circle one) more / less.	
Player 1 spun: ____ ____ ____ (____ × ____) × ____ ____ × ____ = ____ Show your work: ____ × / ÷ ____ = ____	Player 2 spun: ____ ____ ____ (____ × ____) × ____ ____ × ____ = ____ Show your work: ____ × / ÷ ____ = ____

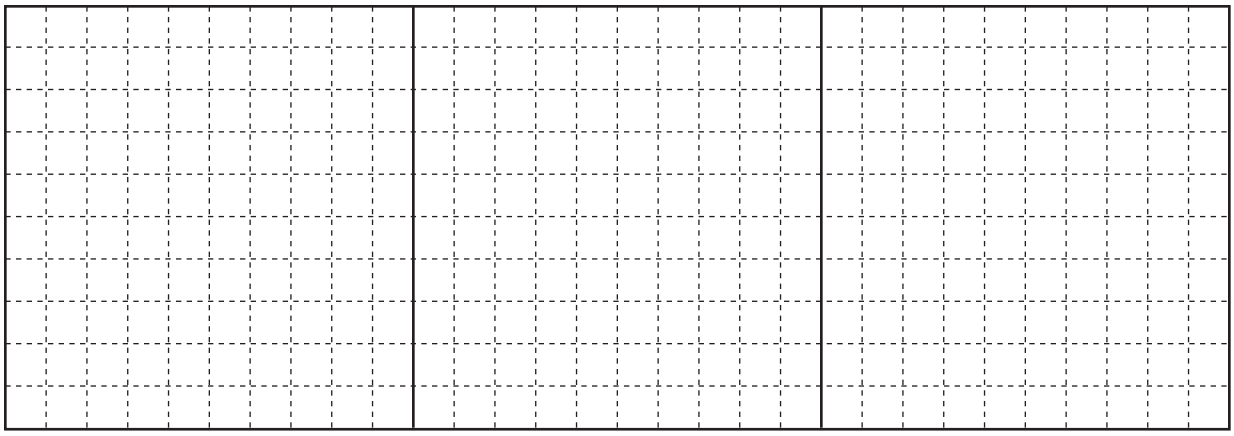
Small Base Ten Grid Paper



Large Base Ten Grid Paper







Support Activity 21 ★ Instructional Considerations

SUPPORT ACTIVITY

Find the Average

Overview

Players take turns taking three scoops of centimeter cubes out of a container. They each privately make an estimate about who has a higher average number of cubes in their three scoops. Then each player finds his or her average number of cubes, and players spin a more or less spinner to see whether the player with a higher or lower average earns a point in the round. Each player also earns a point if his or her initial estimate was correct. After three rounds, the player with the most points wins.

Skills & Concepts

★ finding the average (mean) of 3–5 numbers

You'll need

★ Find the Average Instructions (Blackline S 21.3, 1 copy)

★ Find the Average Record Sheet (Blackline S 21.4, 1 copy for each player)

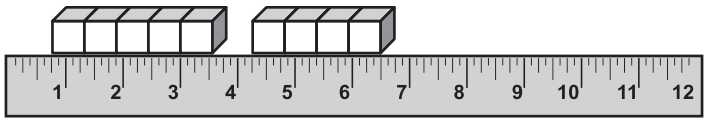
★ about 120 centimeter cubes in a tub or similar container

★ 2 rulers

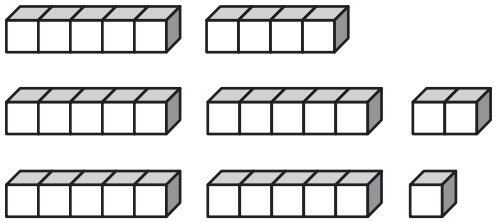
★ plastic teaspoon

★ pencil and paperclip to use as a spinner

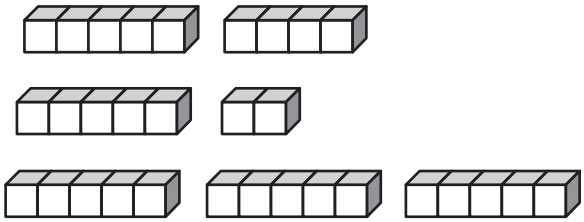
You may want to suggest that students arrange their cubes in rows that are partitioned into groups of 5 or 10 cubes to make them easier to count. They can use rulers to straighten their rows.



When students make their initial estimates, encourage them to reason carefully instead of simply guessing. It may help if you model such a thinking process out loud for them a few times before they get started.



Player 1's Collection



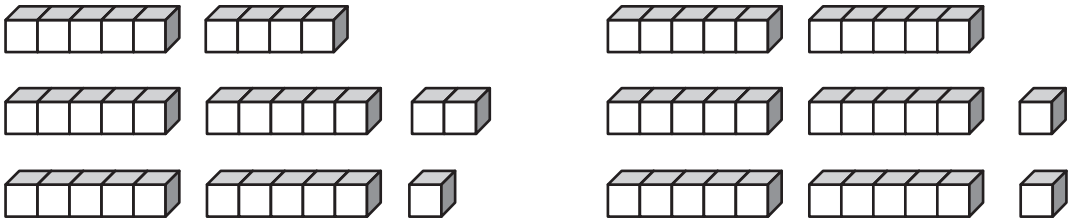
Player 2's Collection

Mr. Alvarez *I can see that if player 1 moves 1 cube from the middle row to the top row, they'll be close to even, and each row will have a little more than 10. Player 2's rows are harder to even out. 15 is a lot of cubes, but 7 isn't very many. So I think after player 2's rows are evened out, the average number per row will be smaller than for player 1.*

(Continued on back.)

Support Activity 21 Instructional Considerations (cont.)

During the first round, players will need to decide how to handle any leftover cubes. If they have a strong grasp of fractions, they might choose to report averages as mixed numbers. On the other hand, they might agree to round up or down. In the example below, for instance, players might express the average as 10 2/3 or round up to 11.



Original Rows
9, 12, and 11

After Averaging
10 in eash row, plus 2 left over

When students are comfortable with the game, you might ask them each to draw 4 or 5 scoops of cubes.

Support Activity 21

SUPPORT ACTIVITY

Find the Average

You'll need

★ Find the Average Instructions (Blackline S 21.3, 1 copy)

★ Find the Average Record Sheet (Blackline S 21.4, 1 copy for each player)

★ about 120 centimeter cubes in a tub or similar container

★ 2 rulers

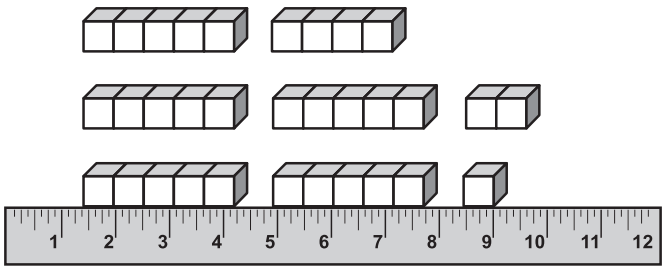
★ plastic teaspoon

★ pencil and paperclip to use as a spinner

Instructions for Find the Average

1 Take turns with your partner taking spoonfuls of wooden cubes. Each time you take a scoop, line your cubes up in a row. You can use a ruler to help keep your rows straight.

2 Take turns until you each have 3 rows of cubes.



3 Think privately about who you think has a greater average number cubes among their 3 rows. Record your estimate on your record sheet.

4 Then find the average number of cubes in your 3 rows while your partner does the same.

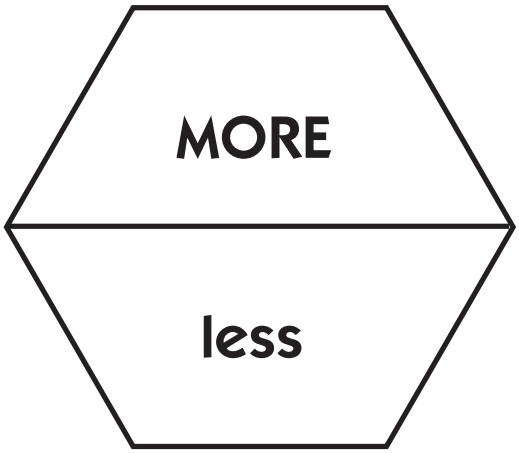
5 Compare your averages and then spin one of the more or less spinners on your record sheets. If you get More, the player with the higher average earns a point. If you spin Less, the player with the lower average earns a point.

6 Each player also earns a point if his or her estimate was correct.

7 Repeat 3 times. After 3 rounds, the player with the most points wins.

NAME _____ **DATE** _____

Find the Average Record Sheet



Round 1
Your numbers:
Which player do you estimate will have the higher average? (circle one) Me / My Partner
The average of your numbers:
Points you earned this round:
Round 2
Your numbers:
Which player do you estimate will have the higher average? (circle one) Me / My Partner
The average of your numbers:
Points you earned this round:
Round 3
Your numbers:
Which player do you estimate will have the higher average? (circle one) Me / My Partner
The average of your numbers:
Points you earned this round:
Total points:

Support Activity 22 ★ Instructional Considerations

SUPPORT ACTIVTY

Round & Add Tenths

Overview

Players take turns spinning two digits. They place one digit in the tenths place and one digit in the hundredths place. They locate that number along a 0 to 10 number line and then circle the number to which it rounds to the nearest tenth. After all whole numbers from 0 to 10 have been claimed, players use the rounded numbers to estimate which player will have the highest total. Then they each add their numbers, and the player with the highest total wins.

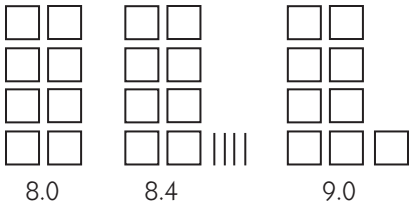
Skills & Concepts

- ★ recognizing, modeling, comparing, and using decimals to tenths
- ★ adding and subtracting commonly used decimals to tenths using concrete models
- ★ rounding decimal numbers to the nearest whole number

You'll need

- ★ Round & Add Tenths Instructions (Blackline S 22.3 and 22.4, 1 copy for each pair of players run back-to-back)
- ★ Digit Spinner (Blackline S 22.5, 1 copy for every 2 pairs of players, cut in half)
- ★ Round & Add Tenths Record Sheet (Blackline S 22.6, a few copies for each pair of players run back-to-back)
- ★ colored pencils in two colors or one regular pencil and one colored pencil
- ★ pencil and paperclip to use as a spinner
- ★ scratch paper

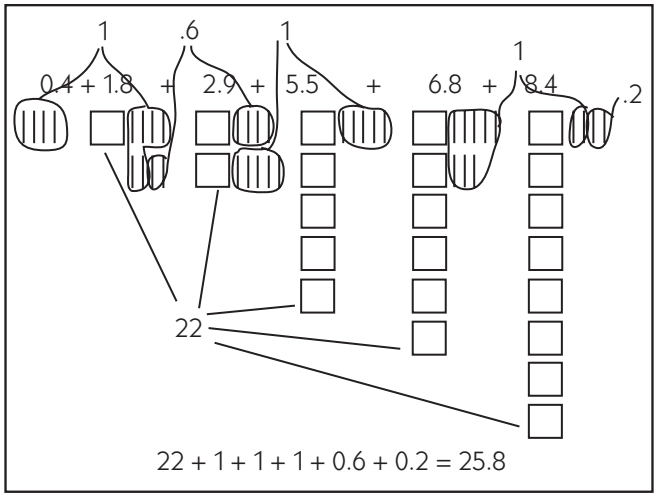
If you find students are having trouble rounding decimal numbers to the nearest whole number, give them scratch paper and invite them to make a quick sketch of each number in base ten form. When they look at the sketch, can they see whether it is closer to the next higher or to the next lower whole number?



I can see if I take away 4 tenths, it's 8, but I'd have to add 6 more tenths to get to 9. So I can see 8.4 is closer to 8 than to 9.

(Continued on back.)

Support Activity 22 Instructional Considerations (cont.)



If students are having difficulty adding decimal numbers, invite them to use quick sketches as well. By sketching the numbers, students can compute the totals by grouping the numbers into ones and tenths.

Support Activity 22

SUPPORT ACTIVTY

Round & Add Tenths

You'll need

★ Round & Add Tenths Instructions (Blackline S 22.3 and 22.4, 1 copy for each pair of players run back-to-back)

★ Digit Spinner (Blackline S 22.5, 1 copy for every 2 pairs of players, cut in half)

★ Round & Add Tenths Record Sheet (Blackline S 22.6, a few copies for each pair of players run back-to-back)

★ colored pencils in two colors or one regular pencil and one colored pencil

★ pencil and paperclip to use as a spinner

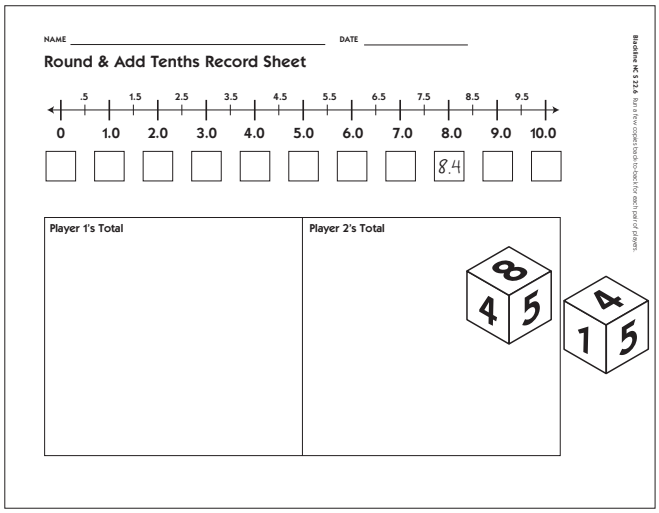
★ scratch paper

Instructions for Round & Add Tenths

1 Take turns spinning one spinner. The player with the higher number goes first. The other player will go second and use a different color to record his or her numbers on the record sheet.

2 The first player spins both spinners. The player decides which number to put in the ones place and which number to put in the tenths place.

3 Then both players record that number under the whole number to which it rounds using Player 1's color. (Each player uses their own record sheet.)



4 Players take turns spinning and making and rounding numbers. If you can't make a number that rounds to an unclaimed whole number, you lose that

(Continued on back.)

Support Activity 22 (cont.)

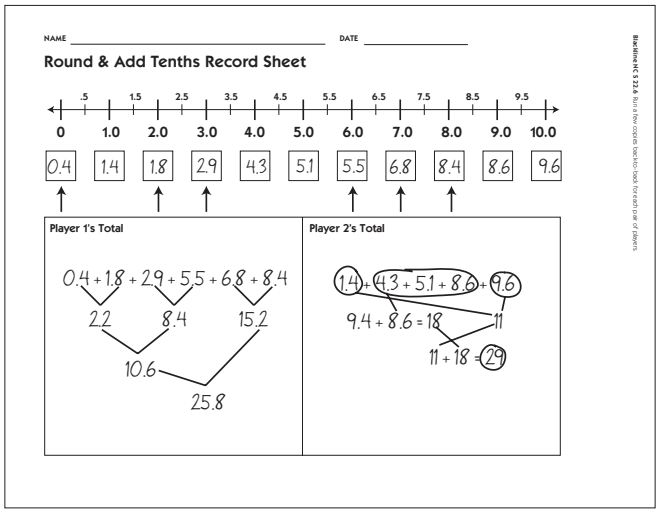
turn. Throughout the game, both players record their own and their partner's numbers. Remember to use a different color for each player's number.

5 At any point in the game, either player can decide to spin just one spinner to claim the 0 or 1.

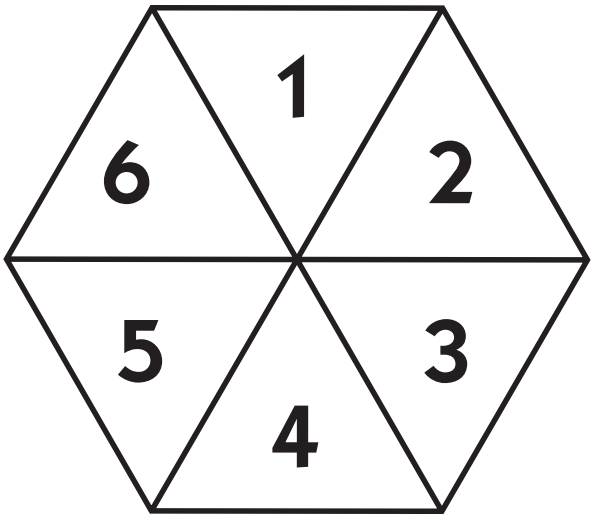
6 Once all the whole numbers have been claimed, predict who will win.

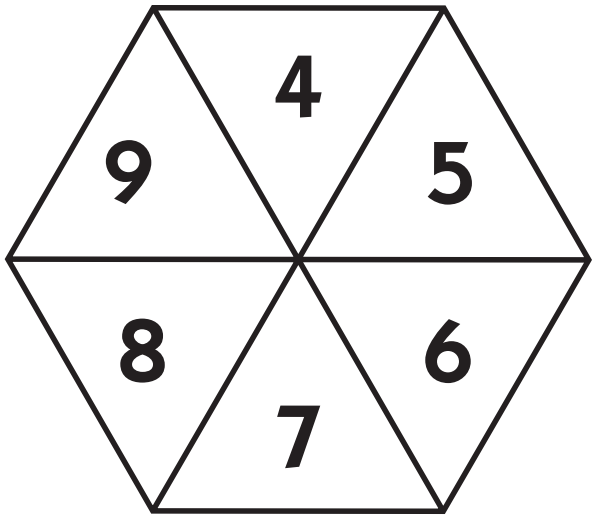
7 Add up your own decimal numbers to find your total score. Explain to your partner how you added the numbers. Check each other's work to make sure you agree both totals are correct.

8 The highest score wins. Circle the winning score on your record sheet.

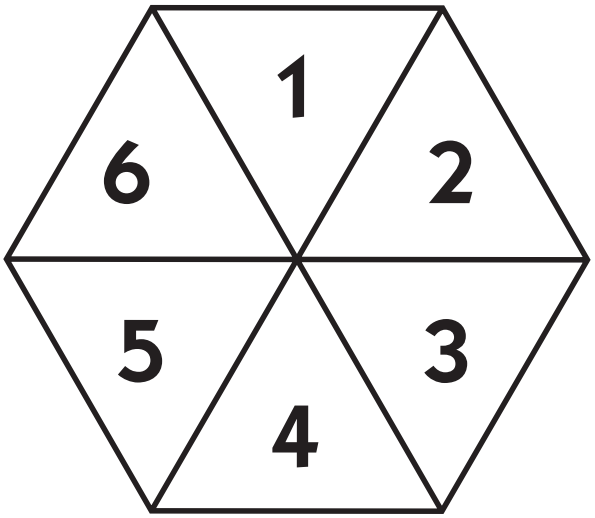


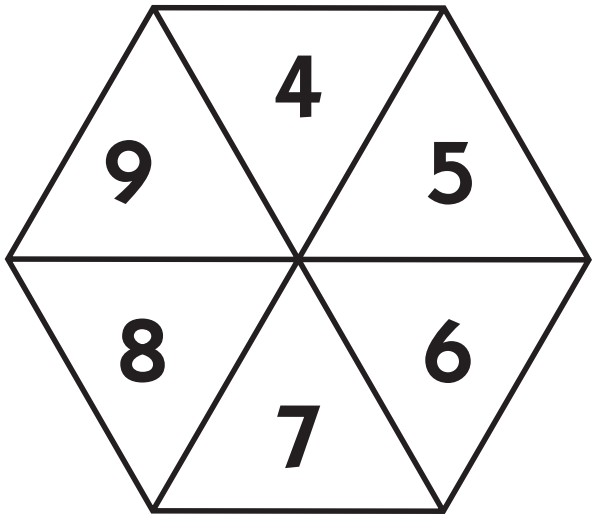
Digit Spinner





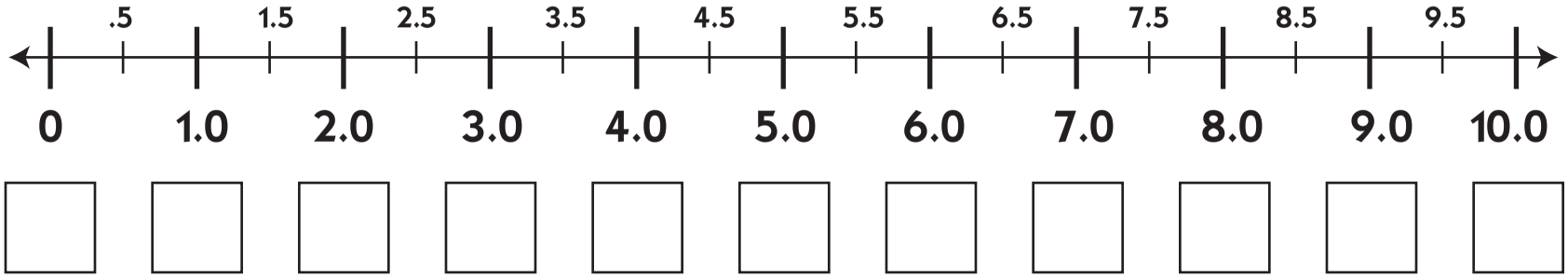
Digit Spinner





NAME _____ DATE _____

Round & Add Tenths Record Sheet



Player 1's Total	Player 2's Total

Support Activity 23 ★ Instructional Considerations

SUPPORT ACTIVTY

Decimal More or Less

Overview

Players take turns spinning three digits. Each time, they decide whether to put a digit in the ones, tenths, or hundredths place, trying to create either the smallest or largest 3-digit decimal number they can. After both players have created two numbers, they add their numbers together, and the player with either the highest or lowest total wins.

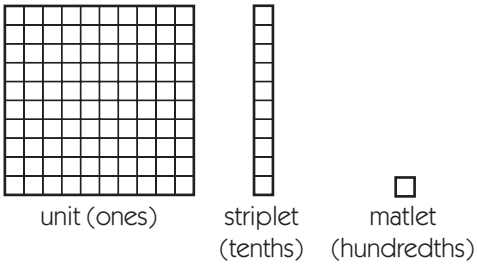
Skills & Concepts

- ★ relating decimals to fractions using concrete models of tenths and hundredths
- ★ recognizing, modeling, comparing, and using decimals to hundredths
- ★ subtracting commonly used decimals to hundredths using concrete models

You'll need

- ★ Decimal More or Less Instructions (Blackline S 23.2 and 23.3, 1 copy for each pair of players run back-to-back)
- ★ Decimal More or Less Spinner (Blackline S 23.3, 1 copy for every 2 pairs of players, cut in half)
- ★ Decimal More or Less Record Sheet (Blackline S 23.4, a few copies run back-to-back for each pair of players)
- ★ pencil and paperclip to use as a spinner
- ★ 2 sets of base ten pieces (Use Blackline S 2.6 to make your own base ten pieces if needed.)

Because students are still developing an understanding of decimal numbers, it is important that they build their numbers with the base ten pieces. These physical models will form strong visual memories upon which children can draw in their future thinking and learning about decimals. You may need to remind some students that the mat now represents a magnified unit and that the other pieces are a striplet and a matlet. The visual model also provides a way for students to find the difference between their scores. While some students will use mental strategies or a traditional algorithm, others may attempt this portion of the game by adding up from one amount to the other using the base ten pieces.



Support Activity 23

SUPPORT ACTIVITY

Decimal More or Less

You'll need

★ Decimal More or Less Instructions (Blackline S 23.2 and 23.3, 1 copy for each pair of players run back-to-back)

★ Decimal More or Less Spinner (Blackline S 23.4, 1 copy for every 2 pairs of players, cut in half)

★ Decimal More or Less Record Sheet (Blackline S 23.5, a few copies run back-to-back for each pair of players)

★ pencil and paperclip to use as a spinner

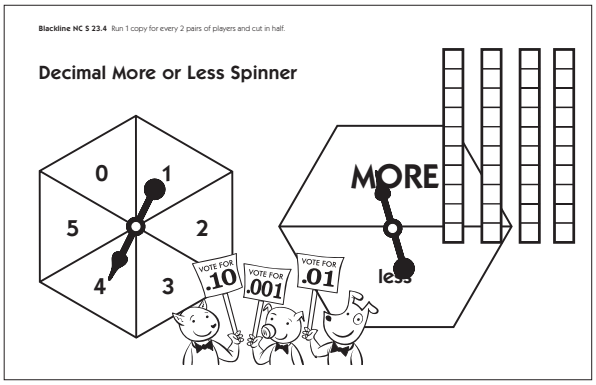
★ 2 sets of base ten pieces (Use Blackline S 2.6 to make your own base ten pieces if needed.)

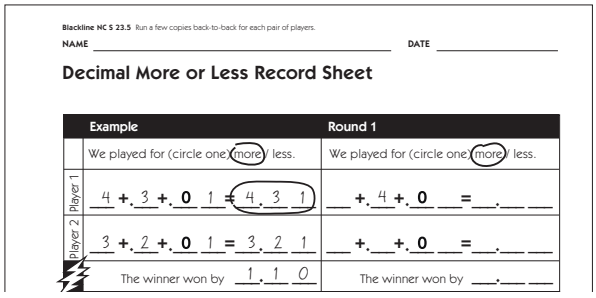
Instructions for Decimal More or Less

1 Spin the more or less spinner to determine whether you will play for more or less in this round. Circle the word *more* or *less* on your record sheet.

2 Take turns spinning the number spinner. The player with the larger number goes first.

3 The first player spins the spinner and decides whether to place that number in the ones, tenths, or hundredths place. Both players write the number in the appropriate place on their own record sheet and player 1 sets out base ten pieces to show the value of that number.





I got a 4, so I put it in the tenths. We're playing for more, so I could still get a 5 to put in the ones place. I put out 4 striplets to show four-tenths.

(Continued on back.)

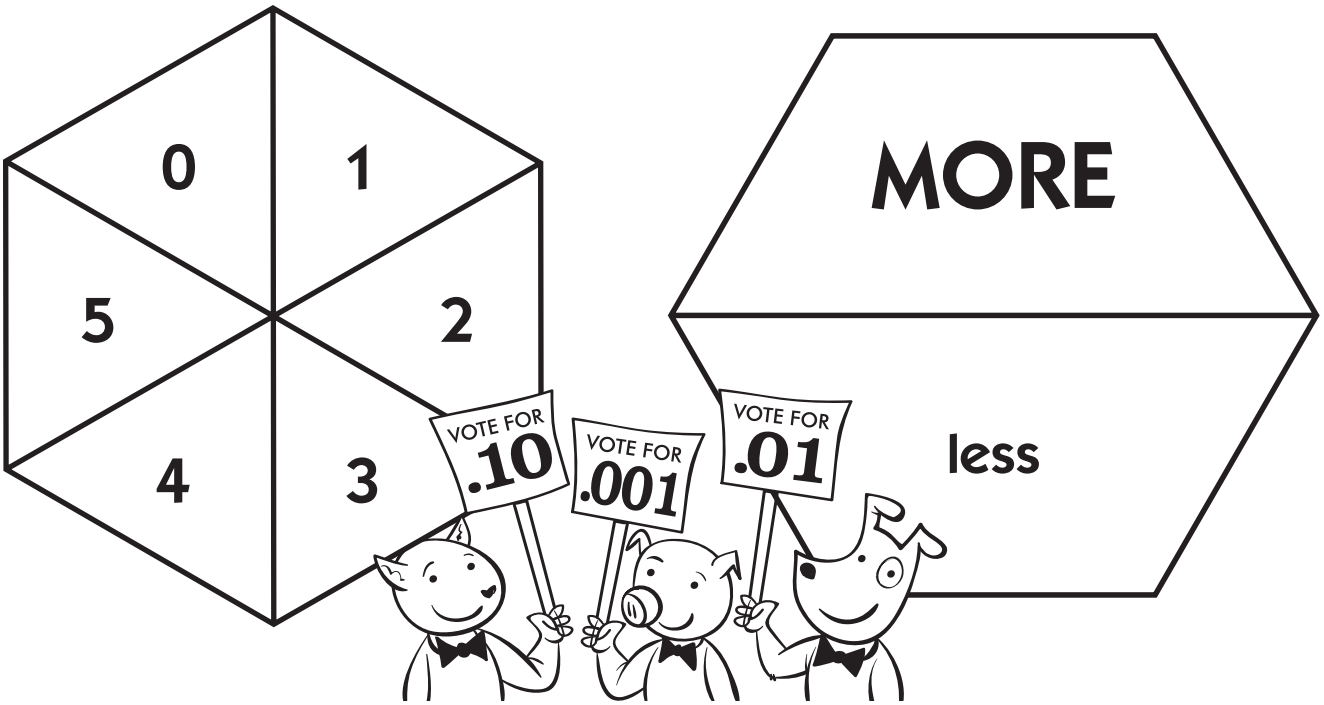
Support Activity 23 (cont.)

4 Players take turns until they have each taken 3 spins. Each time, players decide where to place their numbers and set out base ten pieces to show the value of that number. Once they have made their decisions, they cannot change their minds.

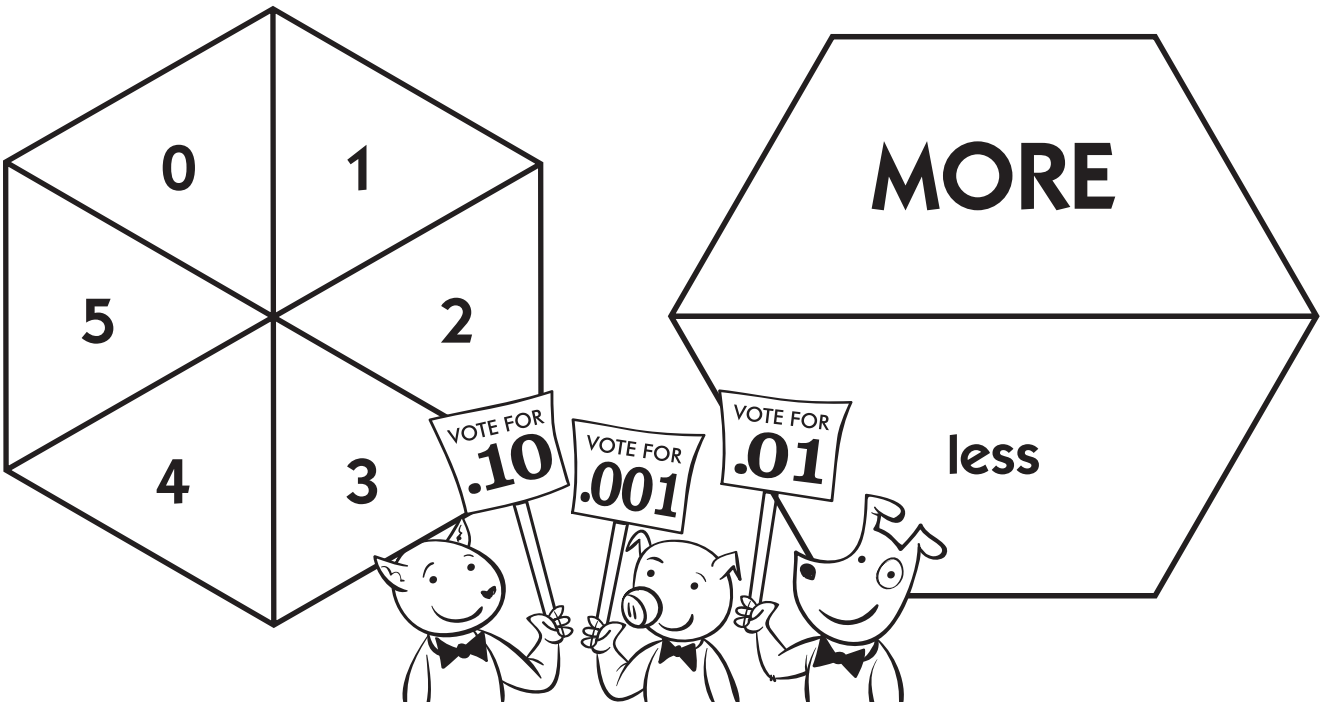
5 After both players have had three turns to spin, build, and record, mark the winner for the round. For an extra challenge, subtract the high score from the low score to determine how much the winner won by.

6 Play the game again. Remember to spin the more or less spinner before each new round so you know if you're playing for more or less.

Decimal More or Less Spinner



Decimal More or Less Spinner



NAME _____ **DATE** _____

Decimal More or Less Record Sheet

	Example	Round 1
	We played for (circle one) more / less.	We played for (circle one) more / less.
Player 1	4 + .3 + .0 1 = 4.3 1	___ + .___ + .0 ___ = ___.___ ___
Player 2	3 + .2 + .0 1 = 3.2 1	___ + .___ + .0 ___ = ___.___ ___
	The winner won by 1.1 0	The winner won by ___.___ ___

	Round 2	Round 3
	We played for (circle one) more / less.	We played for (circle one) more / less.
Player 1	___ + .___ + .0 ___ = ___.___ ___	___ + .___ + .0 ___ = ___.___ ___
Player 2	___ + .___ + .0 ___ = ___.___ ___	___ + .___ + .0 ___ = ___.___ ___
	The winner won by ___.___ ___	The winner won by ___.___ ___

	Round 4	Round 5
	We played for (circle one) more / less.	We played for (circle one) more / less.
Player 1	___ + .___ + .0 ___ = ___.___ ___	___ + .___ + .0 ___ = ___.___ ___
Player 2	___ + .___ + .0 ___ = ___.___ ___	___ + .___ + .0 ___ = ___.___ ___
	The winner won by ___.___ ___	The winner won by ___.___ ___

Support Activity 24 ★ Instructional Considerations

SUPPORT ACTIVITY

Perimeter Showdown

Overview

Players take turns drawing cards that show rectangles. Each player determines the perimeter of his or her rectangle, and then they find the difference between their perimeters. Depending on the perimeter, one player will take both cards. When all the cards have been played, the player with the most cards wins.

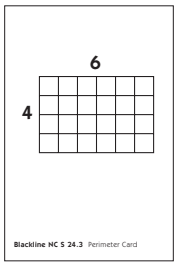
Skills & Concepts

- ★ adding, subtracting, and multiplying numbers using mental strategies
- ★ understanding the difference between perimeter and area
- ★ developing strategies for finding the perimeter of rectangles

You'll need

- ★ Instructions for Perimeter Showdown (Blackline S 24.2)
- ★ Perimeter Cards (Blackline S 24.3, 1 copy cut apart and stored in an envelope or resealable plastic bag for each pair of players)
- ★ Perimeter Showdown Record Sheet (Blackline S 24.4, 1 copy per player)
- ★ Grid Paper (Blackline S 24.5, 1 copy run double-sided per player, optional)
- ★ 1 die marked 1–6 (optional)
- ★ paperclip and pencil to use as a spinner

As students play, make sure they are calculating the perimeter, not the area, of each rectangle. If needed, clarify that the perimeter is the total distance around the rectangle. Ask students to share their strategies for calculating the perimeter.



Brittany *I know it's 20 because I add 4 and 6, and that's 10. Then double and you get 20.*

David *I know there's 2 pairs of sides that are the same. So 4 and 4 is 8 and 6 and 6 is 12. So 8 plus 12 is 20. That's what you got too!*

If students are really struggling, you might offer them a piece of grid paper so they can sketch and label an array to make it easier to compute the perimeter.

Support Activity 24

SUPPORT ACTIVITY

Perimeter Showdown

You'll need

★ Instructions for Perimeter Showdown (Blackline S 24.2)

★ Perimeter Cards (Blackline S 24.3, 1 copy cut apart and stored in an envelope or resealable plastic bag for each pair of players)

★ Perimeter Showdown Record Sheet (Blackline S 24.4, 1 copy per player)

★ Grid Paper (Blackline S 24.5, 1 copy run double-sided per player, optional)

★ 1 die marked 1–6 (optional)

★ paperclip and pencil to use as spinner

Instructions for Perimeter Showdown

1 Take turns rolling the die. The player with the higher number is Player 1 and the other player is Player 2. (If you don't have a die, play Rock, Paper, Scissors or a similar contest to see who goes first.)

2 Write both your names in the correct places on the record sheet. Mix up the deck of Perimeter Cards and place them in a stack between you face down.

3 Take turns drawing a card and determining the perimeter of the rectangle on the card. Record both perimeters on the record sheet.

4 Work together to find the difference between your perimeters. If the difference is 1 or 2, Player 1 gets both cards. If the difference is 3 or more, Player 2 gets both cards. If the perimeters are the same, both players keep their own cards.

Blackline NC S 24.4 Run 1 copy for each player.

NAME Mayumi DATE January 2

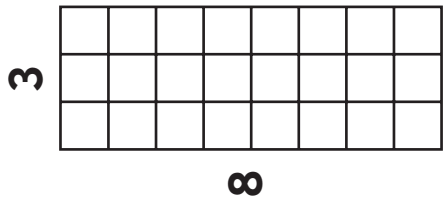
Perimeter Showdown Record Sheet

Player 1 Mayumi Player 2 Jorge

Game 1			
Round	Player 1 Perimeter	Player 2 Perimeter	Difference
1	30	24	6
2			
3			

5 Continue to play until you have used up all 8 cards. The player who has the most cards at the end wins. Play up to 3 games per record sheet.

Perimeter Cards



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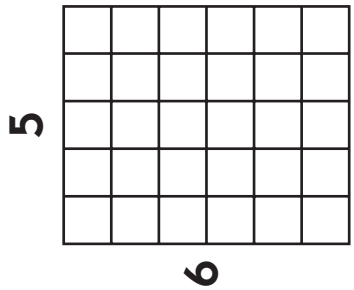
8

Blackline NC S 24.3 Perimeter Card



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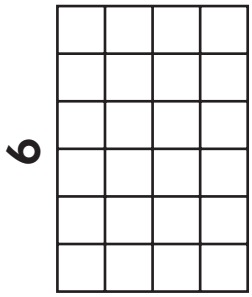
Blackline NC S 24.3 Perimeter Card



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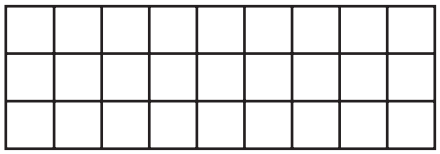
Blackline NC S 24.3 Perimeter Card



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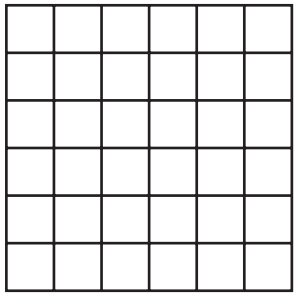
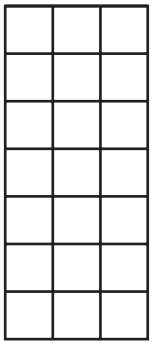
Blackline NC S 24.3 Perimeter Card



6

6

Blackline NC S 24.3 Perimeter Card



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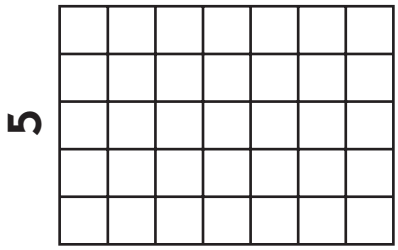
Blackline NC S 24.3 Perimeter Card



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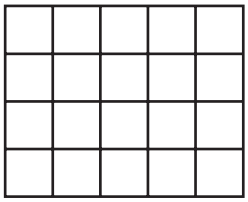
Blackline NC S 24.3 Perimeter Card



4

5

Blackline NC S 24.3 Perimeter Card

NAME _____ **DATE** _____

Perimeter Showdown Record Sheet

Player 1 _____ **Player 2** _____

Game 1			
Round	Player 1 Perimeter	Player 2 Perimeter	Difference
1			
2			
3			
4			

Game 2			
Round	Player 1 Perimeter	Player 2 Perimeter	Difference
1			
2			
3			
4			

Game 3			
Round	Player 1 Perimeter	Player 2 Perimeter	Difference
1			
2			
3			
4			

NAME _____ **DATE** _____

Grid Paper

Support Activity 25 ★ Instructional Considerations

SUPPORT ACTIVITY

An Hour or Bust to the Minute

Overview

Players work their way around an analog clock face by spinning a spinner that shows how many minutes to color in for each turn. After no more than 5 spins each, the player who gets closest to an hour without going over wins. As players get closer to completing one whole hour around the clock, they must decide whether to stop spinning or whether to continue spinning and risk going over an hour.

Skills & Concepts

★ telling time to the minute

★ counting by 5's and 1's

★ adding 1- and 2-digit numbers

You'll need

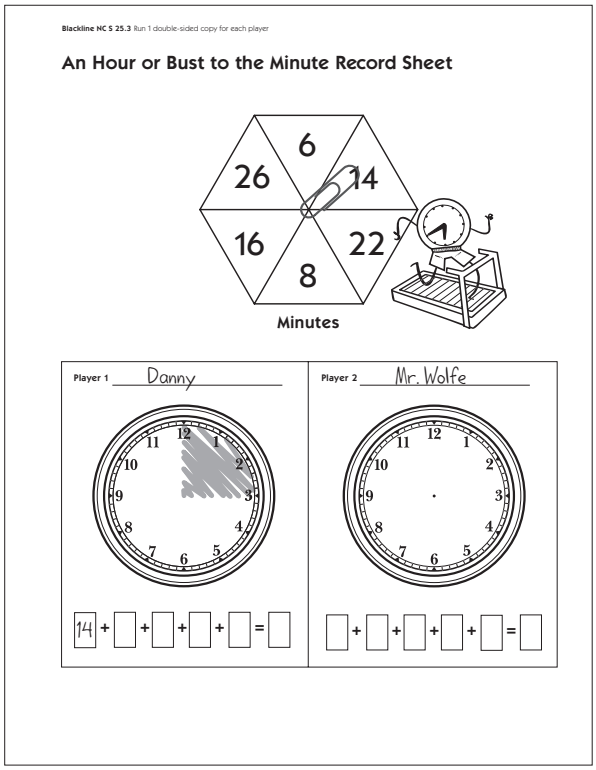
★ Instructions for An Hour or Bust to the Minute (Blackline S 25.2)

★ An Hour or Bust to the Minute Record Sheet (Blackline S 25.3, 1 copy run double-sided per player)

★ pencil and paperclip to use as a spinner (one set for each pair of players)

★ crayons or colored pencils in 5 different colors

After each spin, ask the student how many minutes he has colored in so far. If he is counting the minutes on the clock face one-by-one, review the fact that the minutes on a clock can be counted by 5's and 1's. Also ask him to estimate how many more minutes he needs to get to an hour. As the student gets closer to an hour, encourage him to consider whether it is a good idea to spin again. How close is he to an hour? What are the possible spins on the spinner?



Support Activity 25

SUPPORT ACTIVITY

An Hour or Bust to the Minute

You'll need

★ Instructions for An Hour or Bust to the Minute (Blackline S 25.2)

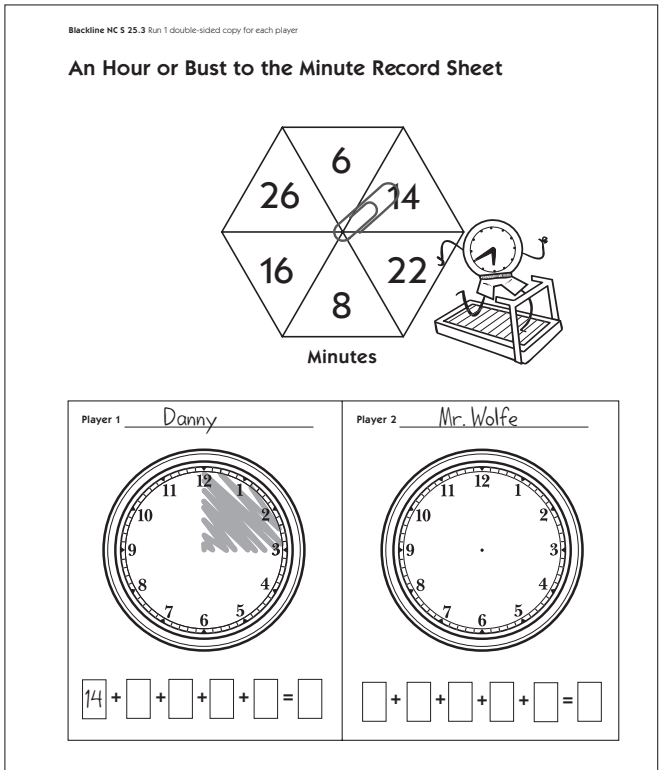
★ An Hour or Bust to the Minute Record Sheet (Blackline S 25.3, 1 copy run double-sided per player)

★ pencil and paperclip to use as a spinner (one set for each pair of players)

★ crayons or colored pencils in 5 different colors

Instructions for An Hour or Bust to the Minute

1 Decide who gets to spin first. Take your first spin, and color in the number of minutes you spun, beginning at the 12 on your clock face. Write that number in the first box below your clock.


Blackline NC S 25.3 Run 1 double-sided copy for each player

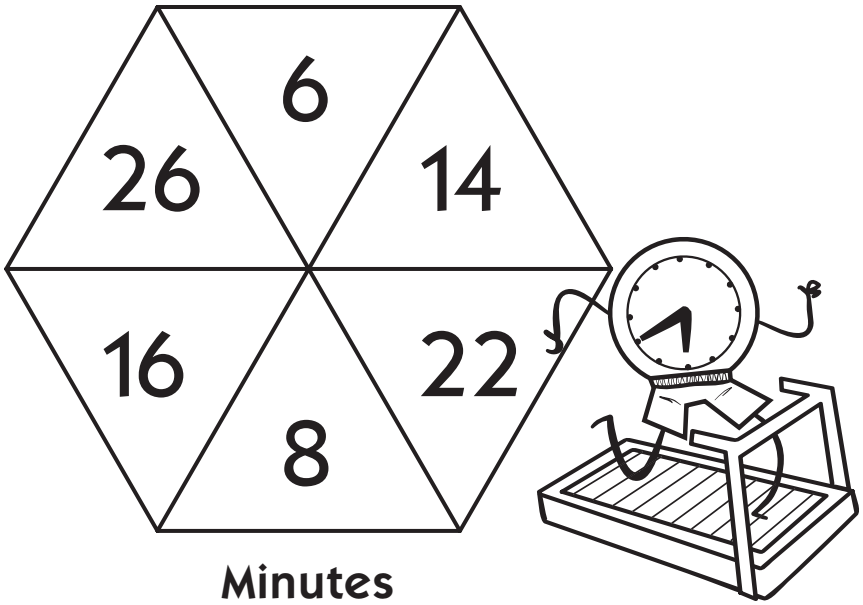
An Hour or Bust to the Minute Record Sheet

2 Take turns spinning and coloring. Be sure to record each new spin with a different color crayon on the clock face and also remember to write it in one of the boxes below your clock face. You can quit spinning any time after 2 spins, whenever you feel like you are close enough to 60 minutes. You can also risk it and spin again to get closer to an hour. You can take up to 5 spins, but don't go over 60 minutes!

3 The player closest to coloring in an hour without going beyond an hour wins.

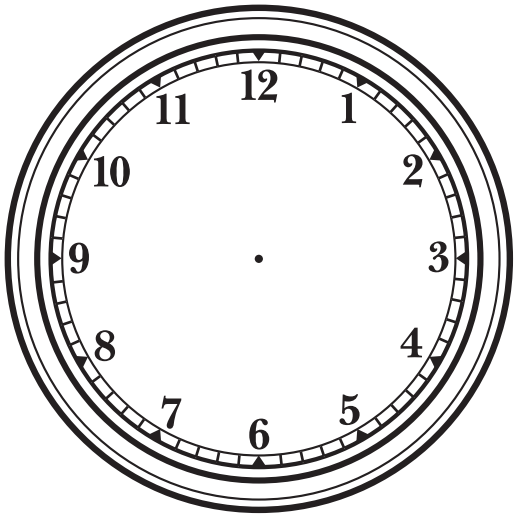
4 Play another round on the back of your record sheet.

An Hour or Bust to the Minute Record Sheet



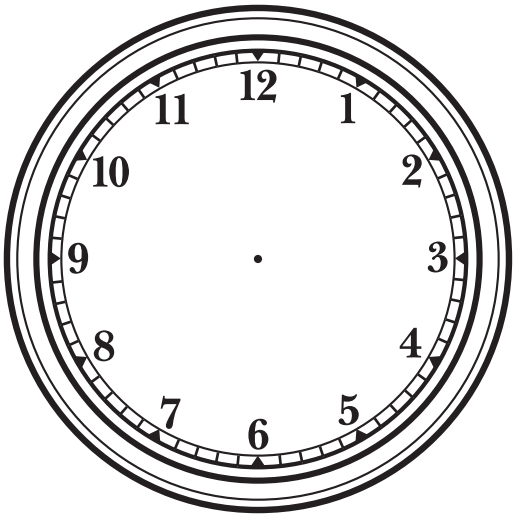
Minutes

Player 1 _____



☐ + ☐ + ☐ + ☐ + ☐ = ☐

Player 2 _____



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Support Activity 26 ★ Instructional Considerations

SUPPORT ACTIVITY

Get Me to the Bus on Time

Overview

In this game, players have an hour to get ready for school and catch the bus. With each turn, they move ahead on the game board. Each space on the game board has the player spending a specific number of minutes doing a particular activity. The goal is to be ready to go in an hour or less. If both players succeed, they win the game together.

Skills & Concepts

★ calculating elapsed time

You'll need

★ Instructions for Get Me to the Bus on Time (Blackline S 26.3)

★ Get Me to the Bus on Time Game Board (Blacklines S 26.4 and 26.5, 1 copy of each sheet taped together for each pair of players)

★ Get Me to the Bus on Time Record Sheet (Blackline S 26.6, 1 copy per player)

★ markers or colored pencils

★ student clocks (optional)

As you play this game with the student, ask her to tell how much time she has spent after each turn. Encourage her to count by 5's when appropriate, rather than one by one, and to use landmark positions on the clock, such as the 3, 6, 9, and 12.


Blackline NC S 26.6 Run 1 copy per player.

NAME Amber DATE Nov. 3

Get Me to the Bus on Time Record Sheet

Keep track of the time you spend in each turn on this clock. Use a different color marker or colored pencil to color in each turn.

Amber *I'm not sure how much time I used up so far.*

Miss Chen *Have you gotten close to a time on the clock that you do know?*

Amber *Well, the 6 is 30 minutes, because it's half way.*

Miss Chen *How can you use that to help you figure out how much time you've spent so far?*

(Continued on back.)

Support Activity 26 Instructional Considerations (cont.)

Amber *Oh, I can just count 1, 2, 3, 4 little marks from the 6. 34 minutes.*

Miss Chen *Is there another way you could see that quickly, maybe using the 7 as a landmark instead?*

Amber *The 7 shows where 35 is, so it's just one back from there. 34, like I said.*

If you find that a student is ready for more challenge, you could set a time for both players to wake up, for example 7:30. In that case, they would need to be ready to leave no later than 8:30. Players can use the small student clocks to keep track of how much time has passed. In this version of the game, prompt students to identify not only how much time they have spent after each turn, but also the current time.

Support Activity 26

SUPPORT ACTIVITY

Get Me to the Bus on Time

You'll need

★ Instructions for Get Me to the Bus on Time (Blackline S 26.3)

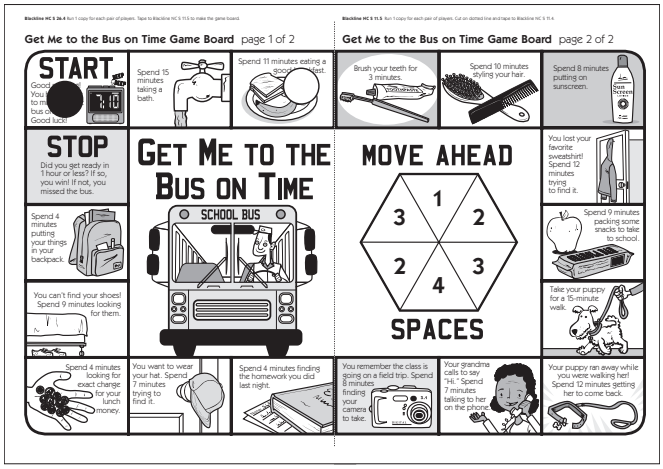
★ Get Me to the Bus on Time Game Board (Blacklines S 26.4 and 26.5, 1 copy of each sheet taped together for each pair of players)

★ Get Me to the Bus on Time Record Sheet (Blackline S 26.6, 1 copy per player)

★ 2 game markers, each in a different color

★ student clocks (optional)

★ markers or colored pencils



Instructions for Get Me to the Bus on Time

1 Begin by placing your game markers on the start space.

2 Take turns spinning the spinner using a pencil and paperclip. The player with the higher spin goes first.

3 Take turns spinning the spinner and moving ahead. Whenever a player lands on a space, he reads the words and adds that number of minutes to the clock on his record sheet.

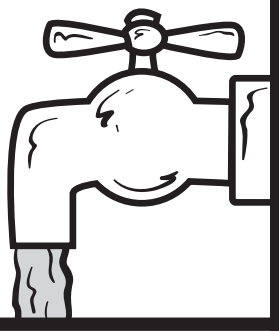
4 Any player who makes it around the game board in less than an hour wins! Both players can win.

Get Me to the Bus on Time Game Board page 1 of 2

START

Good morning!
You have 1 hour to make it to the bus on time.
Good luck!

Spend 15 minutes taking a bath.

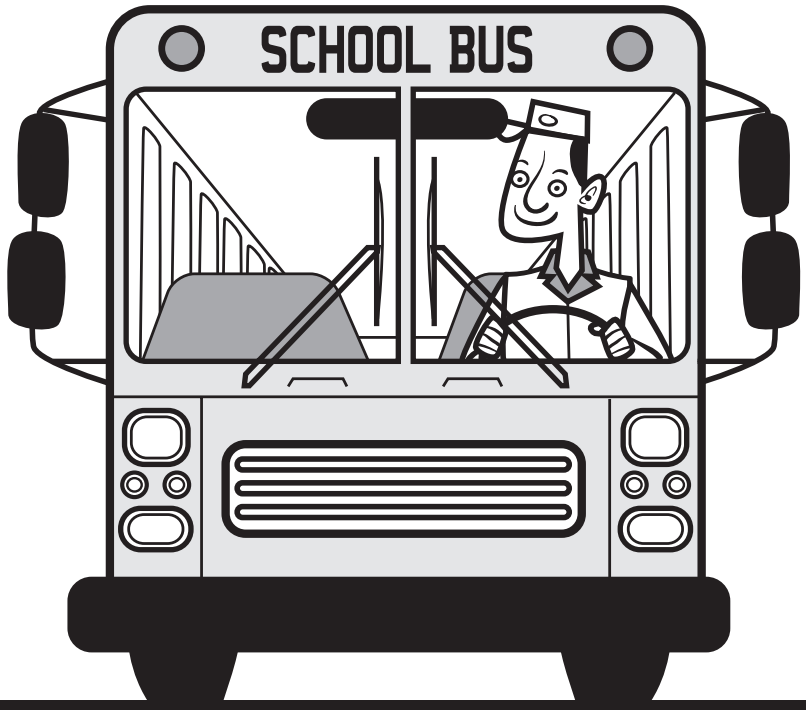


Spend 11 minutes eating a good breakfast.

STOP

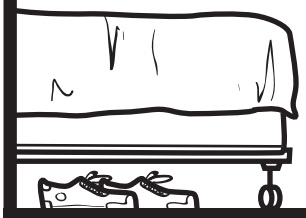
Did you get ready in 1 hour or less? If so, you win!
If not, you missed the bus.

Get Me to the Bus on Time



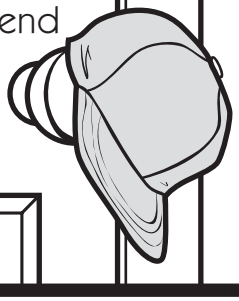
Spend 4 minutes putting your things in your backpack.

You can't find your shoes! Spend 9 minutes looking for them.



Spend 4 minutes looking for exact change for your lunch money.

You want to wear your hat. Spend 7 minutes trying to find it.



Spend 4 minutes finding the homework you did last night.

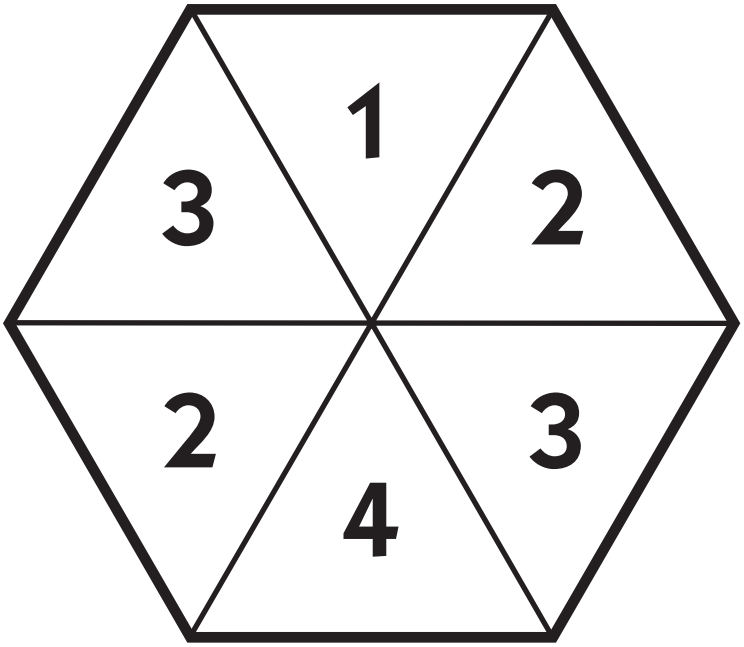
Get Me to the Bus on Time Game Board page 2 of 2

Brush your teeth for 3 minutes.

Spend 10 minutes styling your hair.

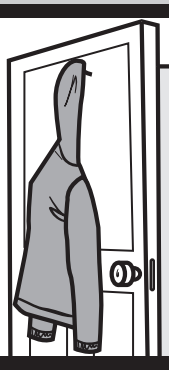
Spend 8 minutes putting on sunscreen.

MOVE AHEAD

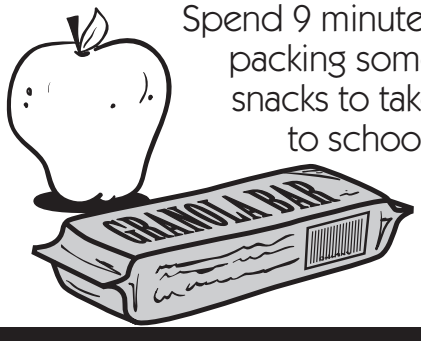


SPACES

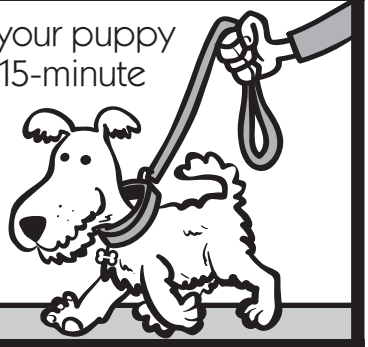
You lost your favorite sweatshirt! Spend 12 minutes trying to find it.



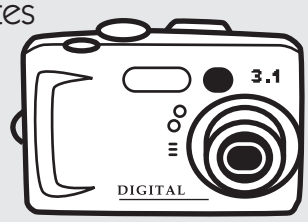
Spend 9 minutes packing some snacks to take to school.



Take your puppy for a 15-minute walk.



You remember the class is going on a field trip. Spend 8 minutes finding your camera to take.

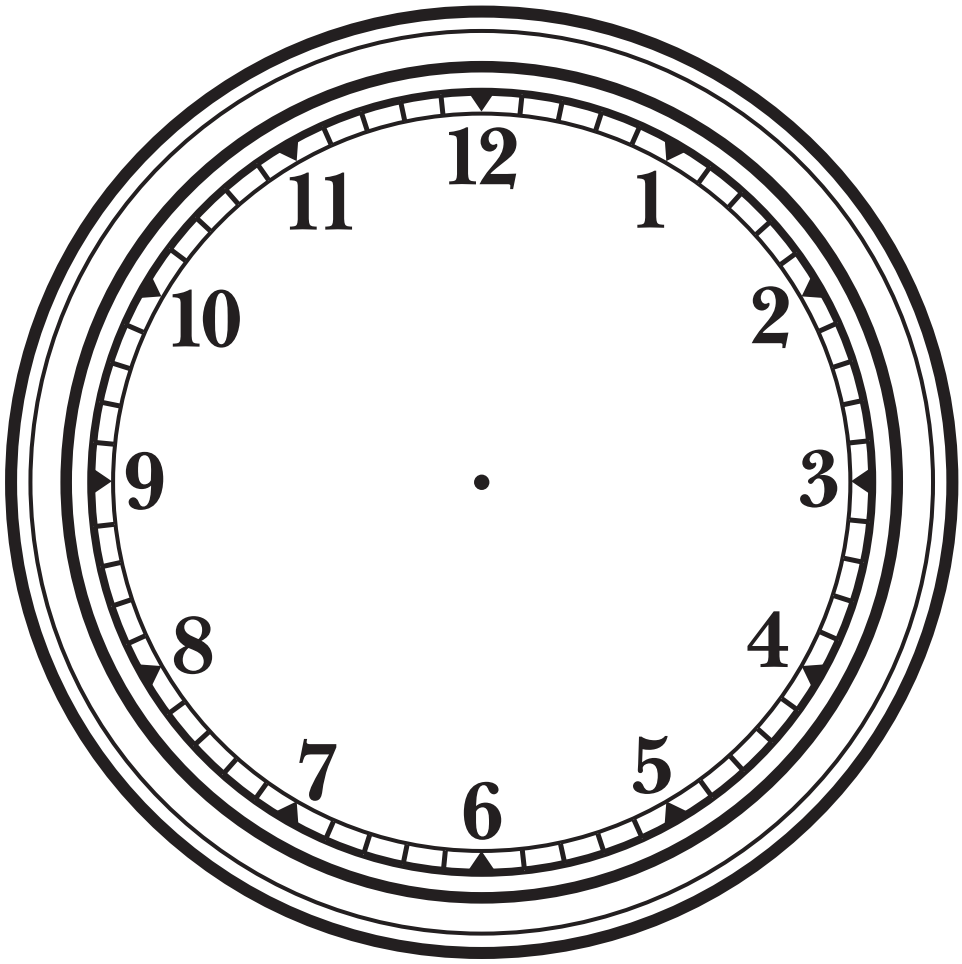


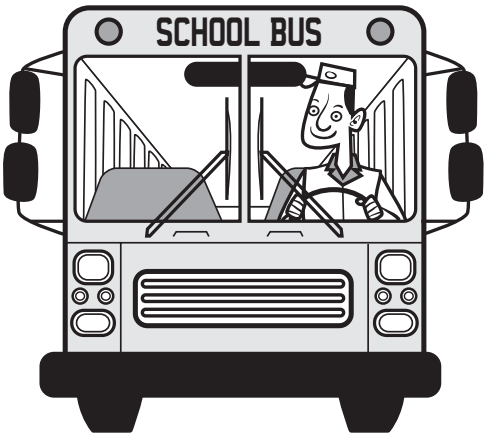
Your grandma calls to say "Hi." Spend 7 minutes talking to her on the phone.

Your puppy ran away while you were walking her! Spend 12 minutes getting her to come back.

Get Me to the Bus on Time Record Sheet

Keep track of the time you spend in each turn on this clock. Use a different color marker or colored pencil to color in each turn.





Support Activity 27 ★ Instructional Considerations

SUPPORT ACTIVITY

Fraction Race

Overview

Players take turns adding different fractions to their collections until one player gets a total of exactly 1. At that point, players begin subtracting fractions from their collections until one player reaches exactly 0 to win. This game can be played using halves, fourths, and eighths or thirds, sixths, and twelfths.

Skills & Concepts

★ using physical models to model, compare, add, and subtract fractions

★ exploring equivalent fractions and using equivalence to compare fractions

You'll need

★ Instructions for Fraction Race (Blacklines S 27.2 and 27.3, 1 copy of each run back-to-back)

★ Eighths Strips (Blackline S 27.4, 1 copy per player)

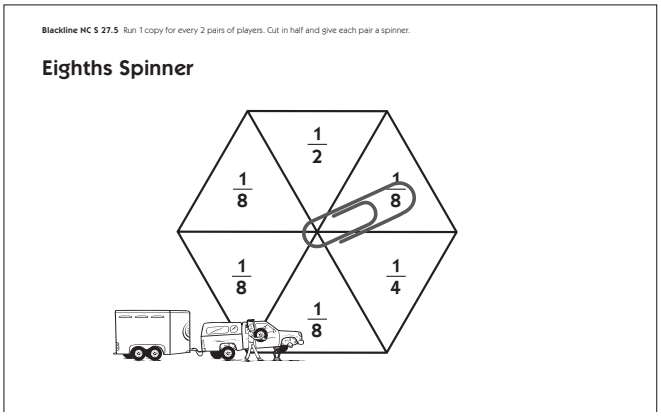
★ Eighths Spinner (Blackline S 27.5, 1 copy for every 2 pairs of players, cut in half)

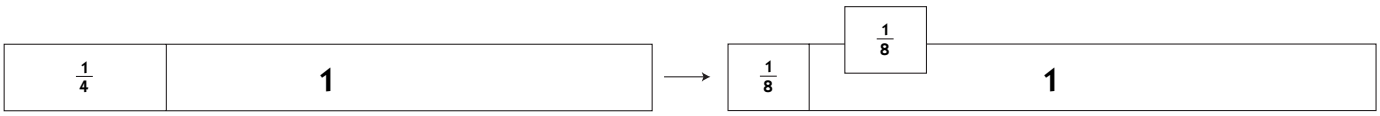
★ Twelfths Strips (Blackline S 27.6, 1 copy per player, optional)

★ Twelfths Spinner (Blackline S 27.7, 1 copy for every 2 pairs of players, cut in half, optional)

★ a pencil and paperclip to use as a spinner

As they play, encourage players to look for trades they can make, for example, exchanging two eighths for a fourth. When they begin subtracting fractions from their collections, students will probably need to make trades in order to remove a particular fraction. For example, if a player has $1/4$ left and he spins $1/8$, he will need to trade in his fourth for two-eighths in order to subtract an eighth.





Encourage students to verbalize the equivalencies on which these trades are based, for example, "I can trade in this fourth for two eighths because one-fourth is equal to two-eighths."

Once students seem comfortable playing with eighths, fourths, and halves, you can give them the Twelfths Strips and Spinner so they can play using thirds, sixths, and twelfths.

Support Activity 27

SUPPORT ACTIVITY

Fraction Race

You'll need

★ Instructions for Fraction Race (Blacklines S 27.2 and 27.3, 1 copy of each run back-to-back)

★ Eighths Strips (Blackline S 27.4, 1 copy per player)

★ Eighths Spinner (Blackline S 27.5, 1 copy for every 2 pairs of players, cut in half)

★ Twelfths Strips (Blackline S 27.6, 1 copy per player, optional)

★ Twelfths Spinner (Blackline S 27.7, 1 copy for every 2 pairs of players, cut in half, optional)

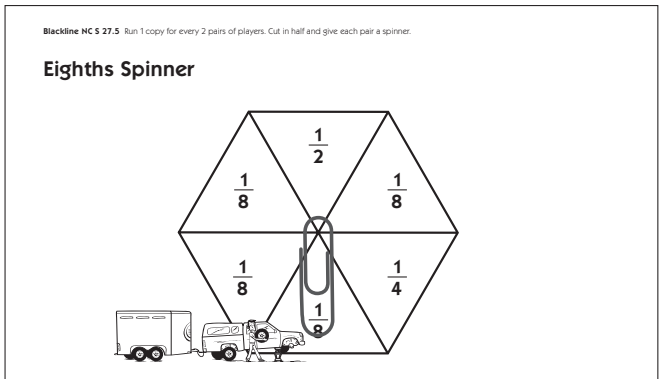
★ a pencil and paperclip to use as a spinner (optional)

Instructions for Fractions Race

1 Cut the strips on your sheet of paper apart so that you have 1 one strip, 2 half strips, 4 fourth strips, and 8 eighth strips.

2 Take turns spinning the Eighths Spinner. The player who spins the larger fraction goes first.

3 The first player spins the spinner and puts that fraction on his or her 1 strip.



4 Players take turns spinning the spinner and adding the fractions shown to their strips, racing to be the first to fill the strip exactly. To fill your strip, you must spin exactly the fraction you need to make a whole or a smaller fraction. If you spin a fraction that is bigger than what you need, you lose that turn.

5 When 1 player gets to 1 exactly, both players begin subtracting fractions from their strips with each spin, starting right from where they are. (For instance, if one player fills his

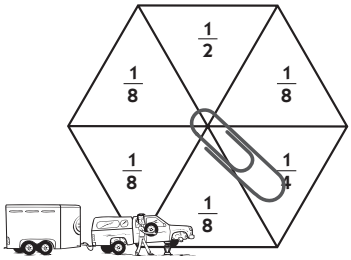
(Continued on back.)

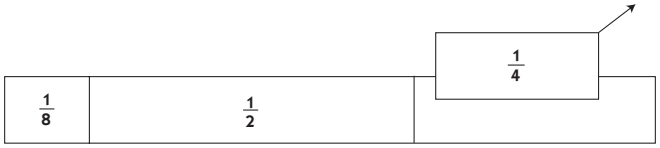
Support Activity 27 (cont.)

strip exactly, but the other player has only filled $\frac{3}{4}$ of her strip, they both get to go backwards. This means that the player who was behind is now ahead.)

Blackline NC S 27.5 Run 1 copy for every 2 pairs of players. Cut in half and give each pair a spinner.

Eighths Spinner





6 The first player to remove all of his or her fractions exactly wins. For example, if you have $\frac{1}{4}$ left, and you spin $\frac{1}{2}$, you cannot remove the $\frac{1}{4}$ piece. Instead, you lose the turn and must wait for your next turn to try again.

Eighths Strips

Cut out these fraction strips and then cut each strip into the appropriate number of parts. For example, cut the strip with the parts marked $\frac{1}{2}$ into two pieces along the line.

<table>
<tr><td colspan="8">1</td></tr>
<tr><td colspan="4">$\frac{1}{2}$</td><td colspan="4">$\frac{1}{2}$</td></tr>
<tr><td colspan="2">$\frac{1}{4}$</td><td colspan="2">$\frac{1}{4}$</td><td colspan="2">$\frac{1}{4}$</td><td colspan="2">$\frac{1}{4}$</td></tr>
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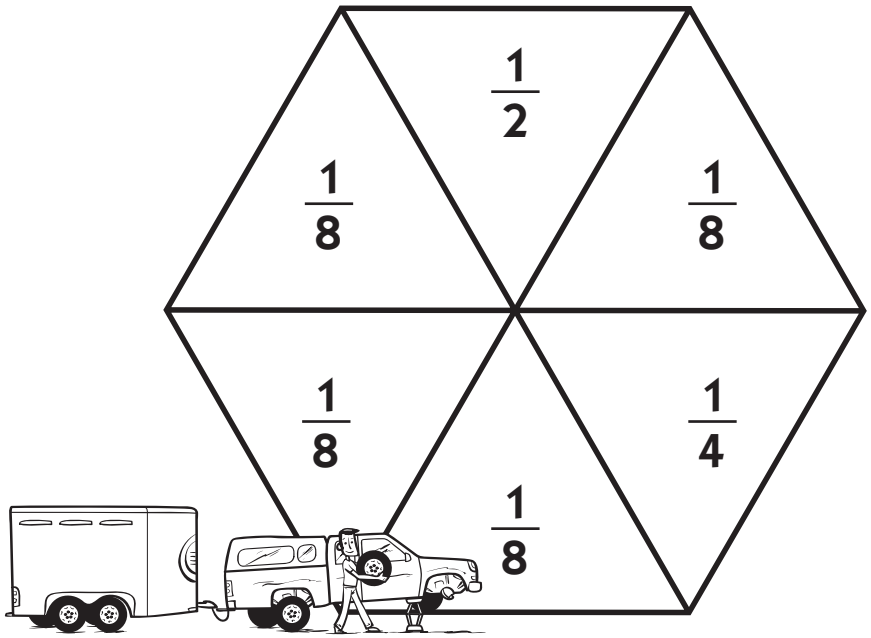
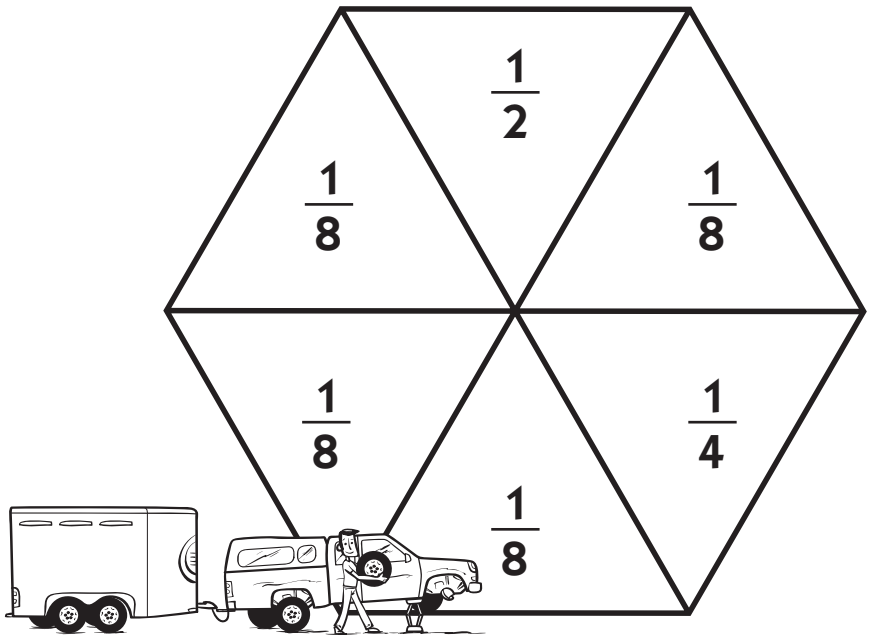
</table>

Eighths Spinner



Eighths Spinner



Twelfths Strips

Cut out these fraction strips and then cut each strip into the appropriate number of parts. For example, cut the strip with the parts marked $\frac{1}{3}$ into three pieces along the lines.

<table>
<tr><td colspan="12">1</td></tr>
<tr><td colspan="4">$\frac{1}{3}$</td><td colspan="4">$\frac{1}{3}$</td><td colspan="4">$\frac{1}{3}$</td></tr>
<tr><td colspan="2">$\frac{1}{6}$</td><td colspan="2">$\frac{1}{6}$</td><td colspan="2">$\frac{1}{6}$</td><td colspan="2">$\frac{1}{6}$</td><td colspan="2">$\frac{1}{6}$</td><td colspan="2">$\frac{1}{6}$</td></tr>
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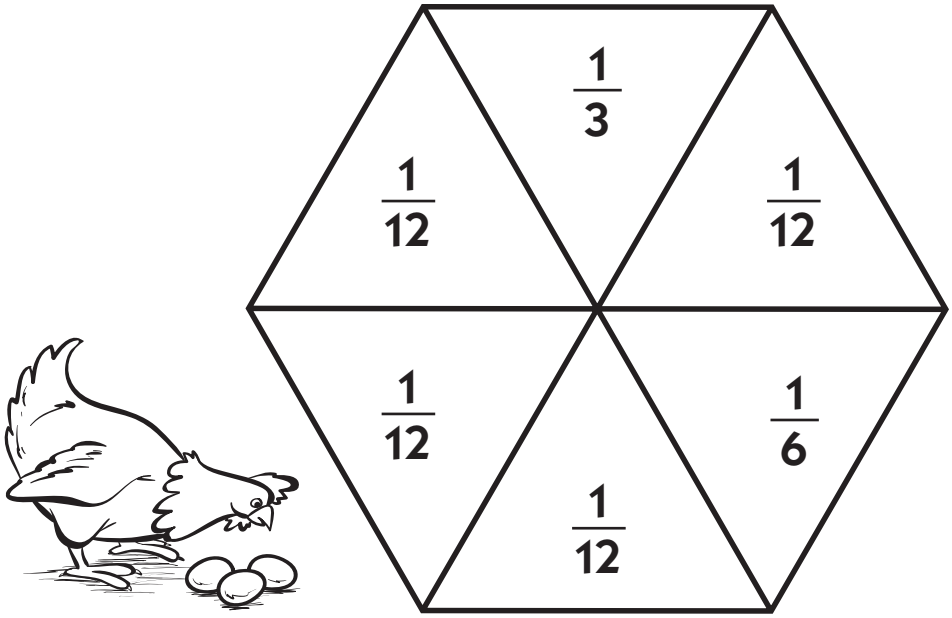
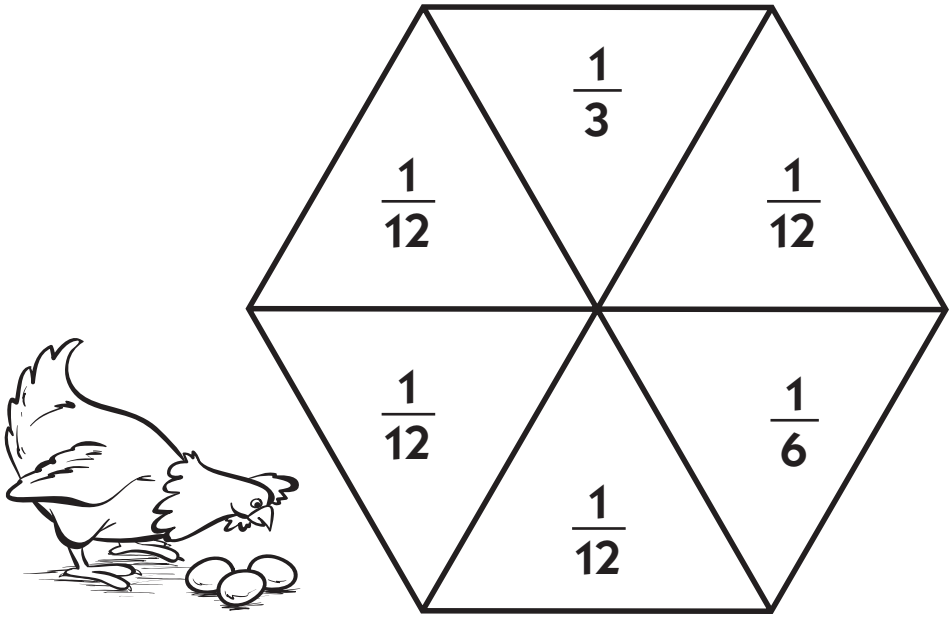
</table>

Twelfths Spinner



Twelfths Spinner



Support Activity 28 ★ Instructional Considerations

SUPPORT ACTIVITY

Fraction Bingo

Overview

This game can be played in pairs or groups of 3 or 4. Each player gets a different bingo board. They take turns drawing cards that show a fraction on either a clock, ruler, pizza, tile array, or egg carton. If players have that fraction or an equivalent fraction on their boards, they cover it with a game marker. The first player to get 3 markers in a row wins.

Skills & Concepts

★ understanding and modeling fractions

★ reading and writing common fractions

★ comparing fractions

★ exploring fractions as parts of a whole and parts of a set

You'll need

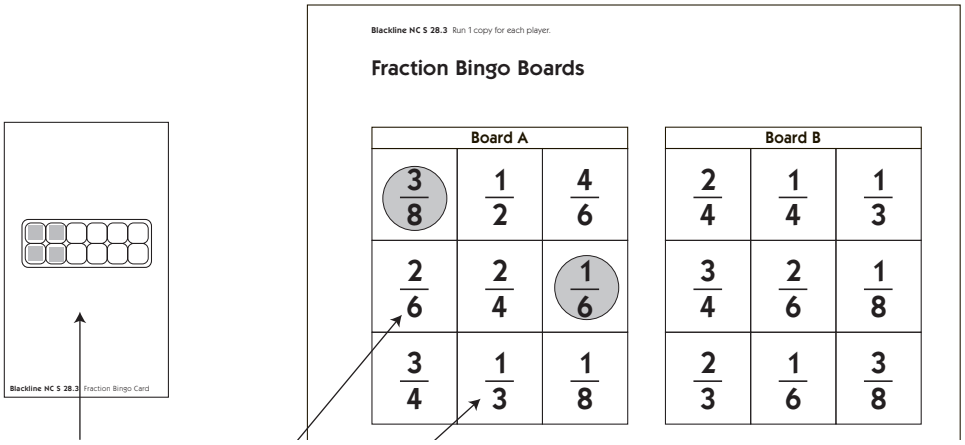
★ Instructions for Fraction Bingo (Blackline S 28.2)

★ Fraction Bingo Boards (Blackline S 28.3, 1 copy for each player)

★ Fraction Bingo Cards, pages 1–3 (Blacklines S 28.4–28.6, 1 copy cut apart and stored in an envelope or resealable plastic bag for each pair or small group of players)

★ game markers (Use coins or small objects if you do not have game markers.)

As they play this game, some students may start to see equivalencies between fractions, for example, $^2/_4$ and $^6/_{12}$ are equal to $^1/_2$. If so, they can cover any equivalent fraction on their board. For example, if they draw a card showing $^4/_{12}$, they could cover any fraction that is equivalent to $^4/_{12}$ (e.g., $^1/_3$ or $^2/_6$).



$^4/_{12}$ is not on the board but is equal to $^1/_3$ and $^2/_6$. The player can cover $^1/_3$ or $^2/_6$, but not both.

Support Activity 28

SUPPORT ACTIVITY

Fraction Bingo

You'll need

★ Instructions for Fraction Bingo (Blackline S 28.2)

★ Fraction Bingo Boards (Blackline S 28.3, 1 copy for each player)

★ Fraction Bingo Cards, pages 1–3 (Blacklines S 28.4–28.6, 1 copy cut apart and stored in an envelope or resealable plastic bag for each pair or small group of players)

★ game markers (Use coins or small objects if you do not have game markers.)

Instructions for Fraction Bingo

1 Each player chooses a different Fraction Bingo Board and gets 9 game markers.

2 Mix up the Fraction Bingo Cards and place them face down in a pile.

3 Let one player draw a card. Talk to each other about what fraction is shown on the card. How would it be shown in numerical form on your bingo boards?

4 Look for that fraction on your board and cover it with a game marker if you have it on your board. Each board is missing some fractions, but if you find a fraction on your board that is equal to the fraction on the card, you can put a game marker on it. *You can only cover one fraction for each card, though.*

5 Take turns drawing cards until one of you has 3 game markers in a row horizontally, vertically, or diagonally. Decide if you want to keep playing until everyone wins or if you want to start a new game.

Blackline NC S 28.3 Run 1 copy for each player.

Fraction Bingo Boards

Board A		
$\frac{3}{8}$	$\frac{1}{2}$	$\frac{4}{6}$
$\frac{2}{6}$	$\frac{2}{4}$	$\frac{1}{6}$
$\frac{3}{4}$	$\frac{1}{3}$	$\frac{1}{8}$

Board B		
$\frac{2}{4}$	$\frac{1}{4}$	$\frac{1}{3}$
$\frac{3}{4}$	$\frac{2}{6}$	$\frac{1}{8}$
$\frac{2}{3}$	$\frac{1}{6}$	$\frac{3}{8}$

Fraction Bingo Boards

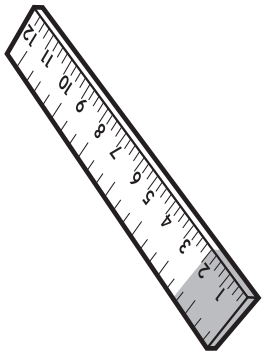
Board A		
$\frac{3}{8}$	$\frac{1}{2}$	$\frac{4}{6}$
$\frac{2}{6}$	$\frac{2}{4}$	$\frac{1}{6}$
$\frac{3}{4}$	$\frac{1}{3}$	$\frac{1}{8}$

Board B		
$\frac{2}{4}$	$\frac{1}{4}$	$\frac{1}{3}$
$\frac{3}{4}$	$\frac{2}{6}$	$\frac{1}{8}$
$\frac{2}{3}$	$\frac{1}{6}$	$\frac{3}{8}$

Board C		
$\frac{1}{4}$	$\frac{4}{6}$	$\frac{3}{8}$
$\frac{1}{3}$	$\frac{2}{4}$	$\frac{3}{4}$
$\frac{1}{8}$	$\frac{1}{6}$	$\frac{1}{2}$

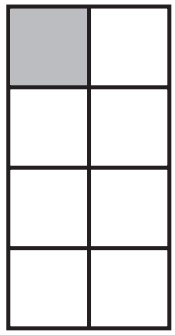
Board D		
$\frac{1}{3}$	$\frac{1}{4}$	$\frac{3}{4}$
$\frac{2}{6}$	$\frac{2}{4}$	$\frac{2}{3}$
$\frac{1}{8}$	$\frac{3}{8}$	$\frac{1}{6}$

Fraction Bingo Cards page 1 of 3

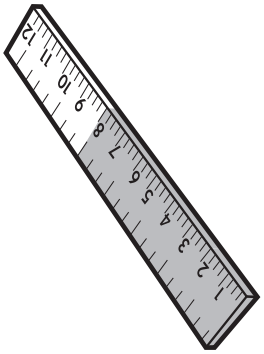


2 inches

Blackline NC S 28.4 Fraction Bingo Card

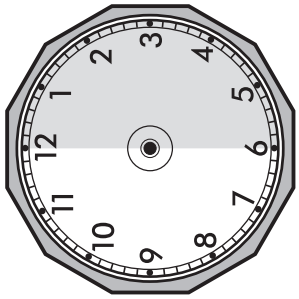


Blackline NC S 28.4 Fraction Bingo Card

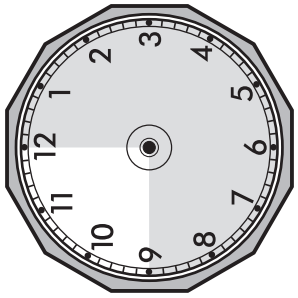


8 inches

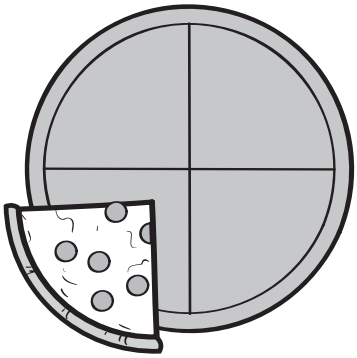
Blackline NC S 28.4 Fraction Bingo Card



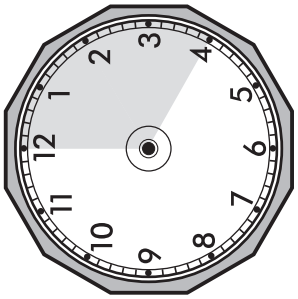
Blackline NC S 28.4 Fraction Bingo Card



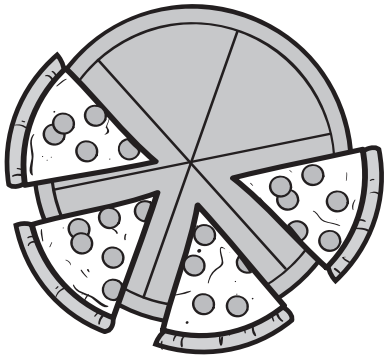
Blackline NC S 28.4 Fraction Bingo Card



Blackline NC S 28.4 Fraction Bingo Card

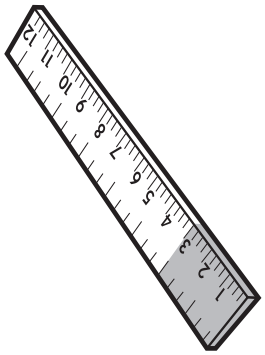


Blackline NC S 28.4 Fraction Bingo Card



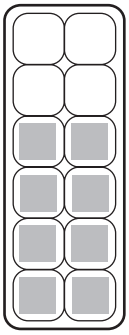
Blackline NC S 28.4 Fraction Bingo Card

Fraction Bingo Cards page 2 of 3

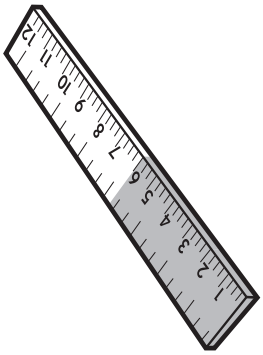


3 inches

Blackline NC S 28.5 Fraction Bingo Card

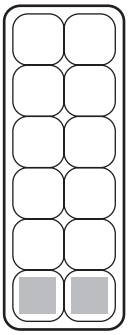


Blackline NC S 28.5 Fraction Bingo Card

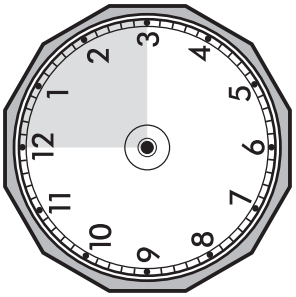


6 inches

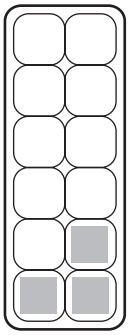
Blackline NC S 28.5 Fraction Bingo Card



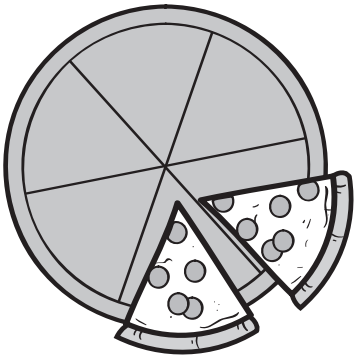
Blackline NC S 28.5 Fraction Bingo Card



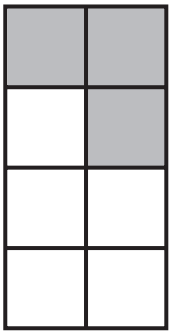
Blackline NC S 28.5 Fraction Bingo Card



Blackline NC S 28.5 Fraction Bingo Card

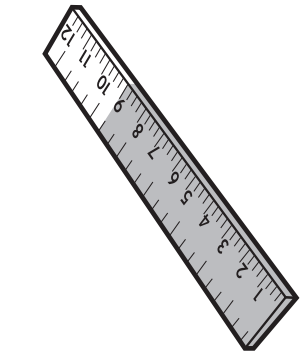


Blackline NC S 28.5 Fraction Bingo Card



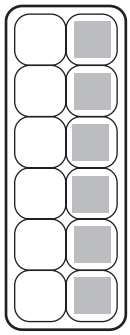
Blackline NC S 28.5 Fraction Bingo Card

Fraction Bingo Cards page 3 of 3

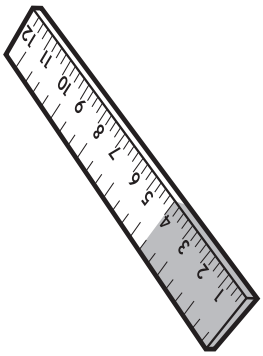


9 inches

Blackline NC S 28.6 Fraction Bingo Card

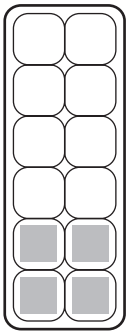


Blackline NC S 28.6 Fraction Bingo Card

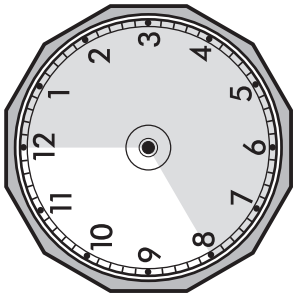


4 inches

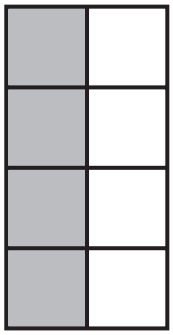
Blackline NC S 28.6 Fraction Bingo Card



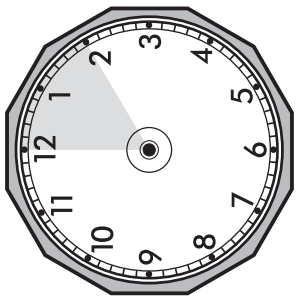
Blackline NC S 28.6 Fraction Bingo Card



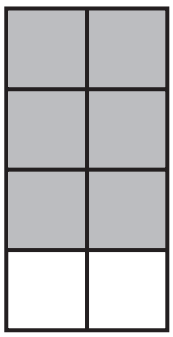
Blackline NC S 28.6 Fraction Bingo Card



Blackline NC S 28.6 Fraction Bingo Card



Blackline NC S 28.6 Fraction Bingo Card



Blackline NC S 28.6 Fraction Bingo Card

Support Activity 29 ★ Instructional Considerations

SUPPORT ACTIVITY

Decimal Draw

Overview

Players take turns drawing cards that show either a visual model of a decimal, a decimal fraction (one in which the denominator is 100), or a common fraction that is easily converted to decimal form. Players order their numbers along a number line and then add them to see who wins.

Skills & Concepts

★ modeling, recognizing, and ordering decimals

★ recognizing equivalent forms of common fractions and decimals to hundredths

★ locating decimals to hundredths on a number line

★ adding decimals (tenths and hundredths)

You'll need

★ Instructions for Decimal Draw (Blackline S 29.2, 1 copy for each pair of players)

★ Decimal Number Lines (Blackline S 29.3, 1 copy run double-sided for each pair of players)

★ Decimal Draw Cards (Blacklines S 29.4 and 29.5, 1 copy on cardstock cut apart for each pair of players)

★ scratch paper

★ regular pencil and red colored pencil

Encourage students to compare their numbers to landmark numbers if they are having difficulty locating them along the number line. When they add their four numbers, you might prompt them to add just a single pair of numbers at a time. Encourage them to pick pairs of numbers that will be fairly easy to add, for example, because they involve relatively little regrouping.

0.50 + 0.41 + 0.33 + 0.27

$$\begin{array}{r} 0.50 \\ +\ 0.41 \\ \hline 0.91 \end{array} \qquad \begin{array}{r} 0.33 \\ +\ 0.27 \\ \hline 0.60 \end{array} \qquad \begin{array}{r} 0.91 \\ +\ 0.27 \\ \hline 1.18 \end{array}$$

Student I'll add 0.50 and 0.41. Then I'll do 0.33 plus 0.27. Then I add those two sums together for my total.

Support Activity 29

SUPPORT ACTIVITY

Decimal Draw

You'll need

★ Instructions for Decimal Draw (Blackline S 29.2, 1 copy for each pair of players)

★ Decimal Number Lines (Blackline S 29.3, 1 copy run double-sided for each pair of players)

★ Decimal Draw Cards (Blacklines S 29.4 and 29.5, 1 copy on cardstock cut apart for each pair of players)

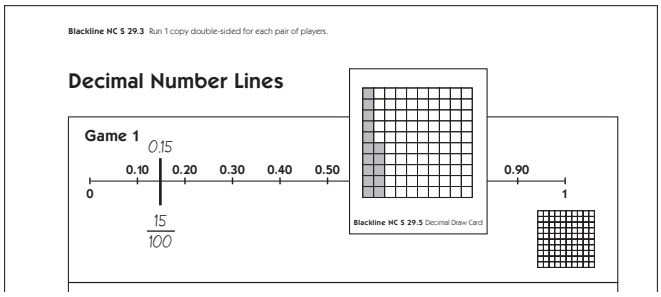
★ scratch paper

★ regular pencil and red colored pencil

Instructions for Decimal Draw

1 Lay the stack of Decimal Draw Cards face down between both players. Play rock, paper, scissors or find another way to decide who will go first. The first player will use a regular pencil to record his or her numbers. The second player will use a red colored pencil.

2 The first player draws a card and record the number shown on the card as both a fraction and a decimal on the number line. Then the second player does the same.



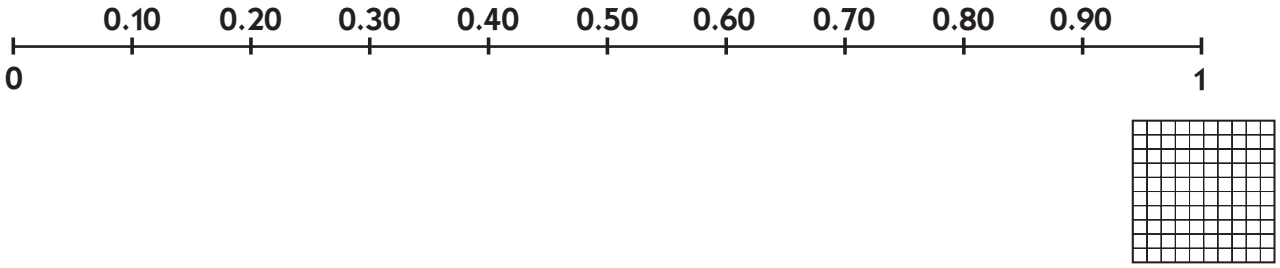
3 Players continue to take turns until both players have recorded four numbers on the number line.

4 Each player finds the sum of his or her four numbers. Players compare their work to make sure they have both reached the correct sum. The player with the higher sum wins.

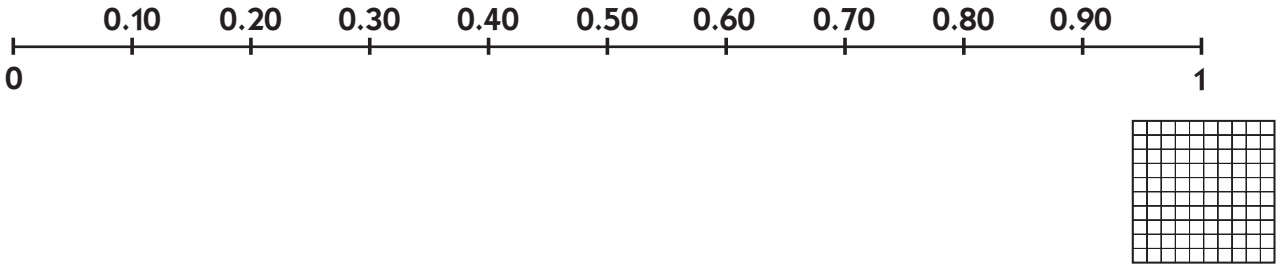
5 To play again, return the cards to the deck, mix them up, and return them to a pile face down. Start over at step 1.

Decimal Number Lines

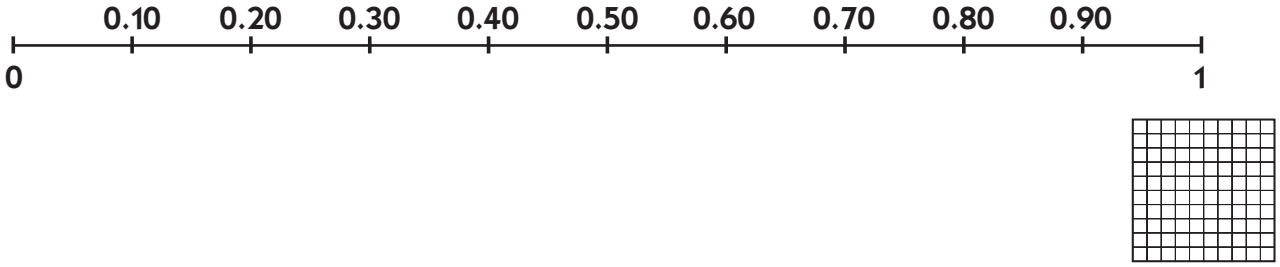
Game 1



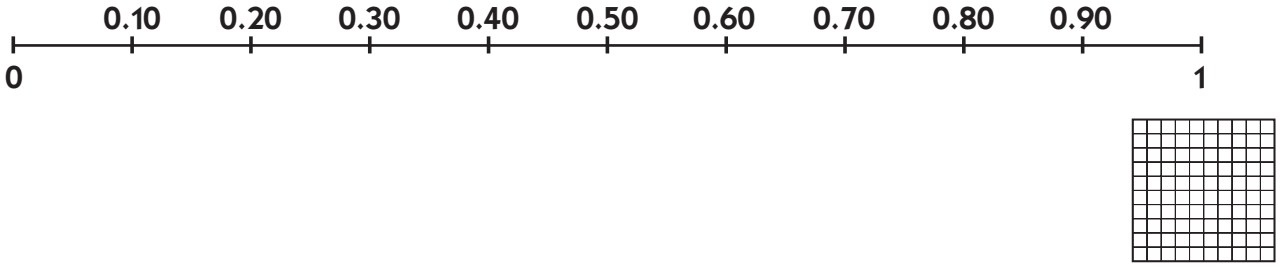
Game 2



Game 3



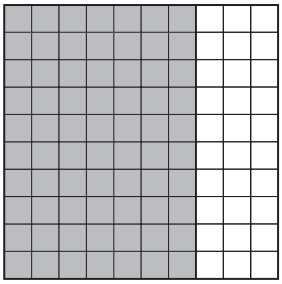
Game 4



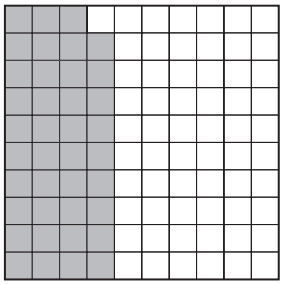
Decimal Draw Cards page 1 of 2

$\frac{1}{5}$ **Blackline NC S 29.4** Decimal Draw Card	$\frac{12}{100}$ **Blackline NC S 29.4** Decimal Draw Card	$\frac{41}{100}$ **Blackline NC S 29.4** Decimal Draw Card	$\frac{1}{10}$ **Blackline NC S 29.4** Decimal Draw Card
$\frac{91}{100}$ **Blackline NC S 29.4** Decimal Draw Card	$\frac{35}{100}$ **Blackline NC S 29.4** Decimal Draw Card	$\frac{3}{4}$ **Blackline NC S 29.4** Decimal Draw Card	$\frac{27}{100}$ **Blackline NC S 29.4** Decimal Draw Card
$\frac{18}{100}$ **Blackline NC S 29.4** Decimal Draw Card	$\frac{1}{4}$ **Blackline NC S 29.4** Decimal Draw Card	$\frac{6}{10}$ **Blackline NC S 29.4** Decimal Draw Card	$\frac{88}{100}$ **Blackline NC S 29.4** Decimal Draw Card
$\frac{1}{2}$ **Blackline NC S 29.4** Decimal Draw Card	$\frac{2}{10}$ **Blackline NC S 29.4** Decimal Draw Card	$\frac{62}{100}$ **Blackline NC S 29.4** Decimal Draw Card	

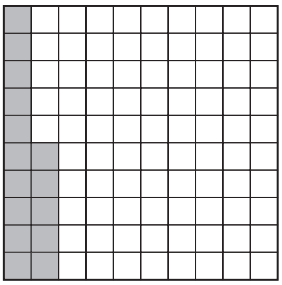
Decimal Draw Cards page 2 of 2



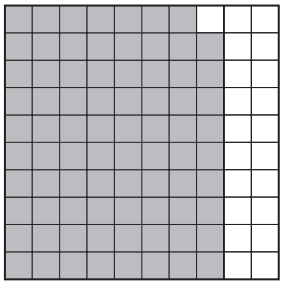
Blackline NC S 29.5 Decimal Draw Card



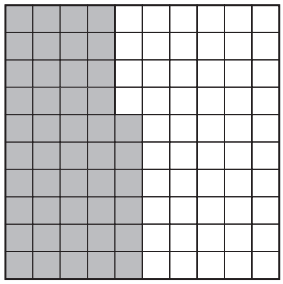
Blackline NC S 29.5 Decimal Draw Card



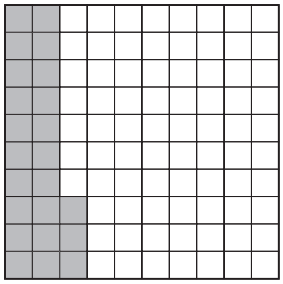
Blackline NC S 29.5 Decimal Draw Card



Blackline NC S 29.5 Decimal Draw Card



Blackline NC S 29.5 Decimal Draw Card



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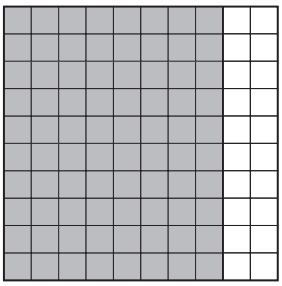
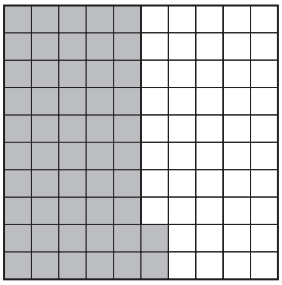
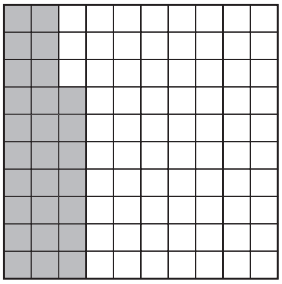


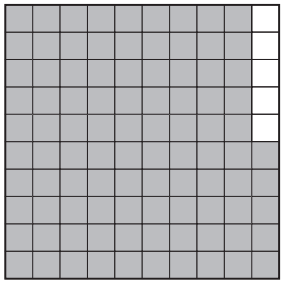
Blackline NC S 29.5 Decimal Draw Card



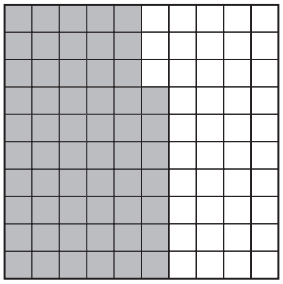
Blackline NC S 29.5 Decimal Draw Card



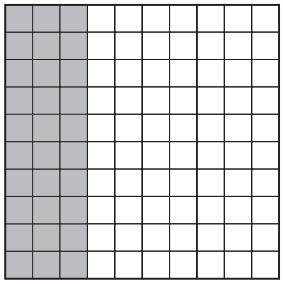
Blackline NC S 29.5 Decimal Draw Card



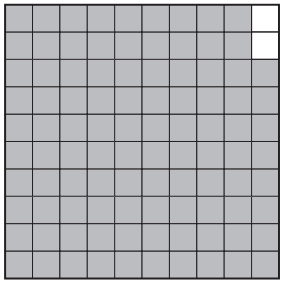
Blackline NC S 29.5 Decimal Draw Card



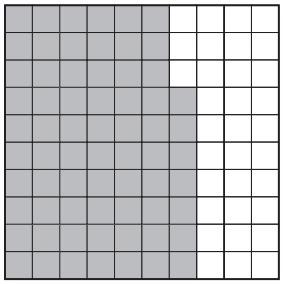
Blackline NC S 29.5 Decimal Draw Card



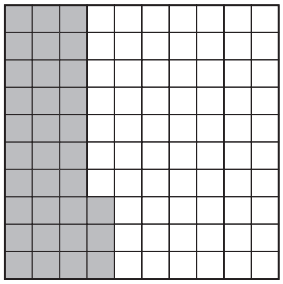
Blackline NC S 29.5 Decimal Draw Card



Blackline NC S 29.5 Decimal Draw Card



Blackline NC S 29.5 Decimal Draw Card



Blackline NC S 29.5 Decimal Draw Card

Support Activity 30 ★ Instructional Considerations

SUPPORT ACTIVITY

Money, Fraction & Decimal Showdown

Overview

Players take turns drawing cards, each of which shows a fraction, decimal number, or money amount. Players compare their amounts, and the player with the greater amount takes both cards. The player with the most cards at the end wins.

Skills & Concepts

★ recognizing, ordering, and comparing common fractions and decimals

★ recognizing equivalent forms of common fractions and decimals

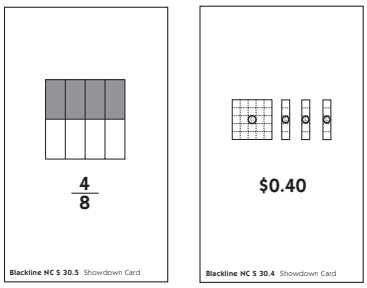
★ using equivalence to compare fractions

You'll need

★ Instructions for Money, Fraction & Decimal Showdown (Blackline S 30.2)

★ Money, Fraction & Decimal Showdown Cards, pages 1–5 (Blacklines S 30.3–30.7, 1 copy for each pair of players cut apart and stored in an envelope or plastic bag)

The models used in this game help students strengthen their understanding of the connections between money, fractions, and decimals. If students are having trouble comparing the amounts, encourage them to focus on the visual models. You may need to help students see that the whole for all three models is the same size, which is what allows us to compare the amounts using all three models.



I can put them next to each other and see $\frac{4}{8}$ is bigger than $0.40.

Support Activity 30

SUPPORT ACTIVITY

Money, Fraction & Decimal Showdown

You'll need

★ Instructions for Money, Fraction & Decimal Showdown (Blackline S 30.2)

★ Money, Fraction & Decimal Showdown Cards, pages 1–5 (Blacklines S 30.3–30.7, 1 copy for each pair of players cut apart and stored in an envelope or plastic bag)

Instructions for Money, Fraction & Decimal Showdown

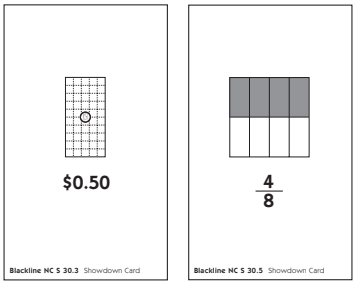
1 Place the cards in a stack face down.

2 Take turns drawing a card and reporting the money amount, fraction, or decimal you see. Work with your partner to compare the amounts on the two cards: which is worth more and how do you know? The person whose card is worth more gets to take both cards. If the two cards are worth the same amount, both players should each draw another card. The player whose card is worth more this time gets to take all 4 cards.

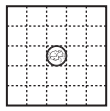
3 Continue until there are no cards left. The player with the most cards wins.

4 Shuffle the cards and play again.

5 After you have played the game at least twice, shuffle the cards well and then pick 14 of them. Put them in order from smallest to greatest. If some are equal in value, like \$0.50 and $\frac{4}{8}$, put them next to each other.

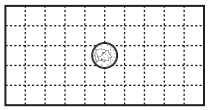


Money, Fraction & Decimal Showdown Cards page 1 of 5



$0.25

Blackline NC S 30.3 Showdown Card

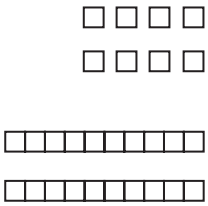


$0.50

Blackline NC S 30.3 Showdown Card

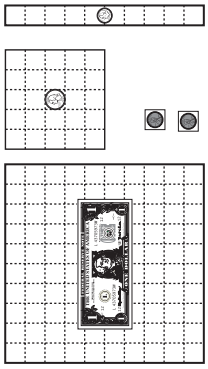
$\frac{2}{5}$

Blackline NC S 30.3 Showdown Card



0.28

Blackline NC S 30.3 Showdown Card

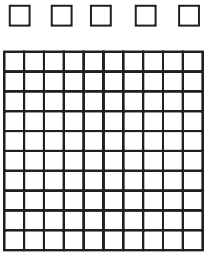


$1.37

Blackline NC S 30.3 Showdown Card

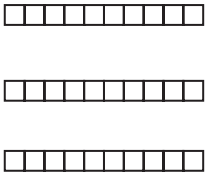
0.05

Blackline NC S 30.3 Showdown Card



1.05

Blackline NC S 30.3 Showdown Card



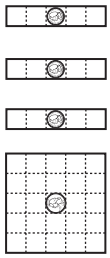
0.3

Blackline NC S 30.3 Showdown Card

Money, Fraction & Decimal Showdown Cards page 2 of 5

$0.10

Blackline NC S 30.4 Showdown Card



$0.40

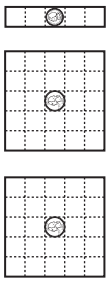
Blackline NC S 30.4 Showdown Card

$\frac{3}{4}$

Blackline NC S 30.4 Showdown Card

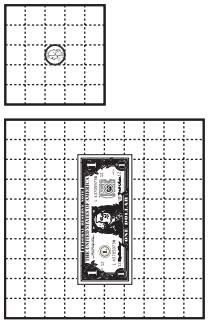
$\frac{4}{4}$

Blackline NC S 30.4 Showdown Card



$0.55

Blackline NC S 30.4 Showdown Card

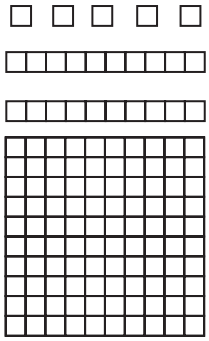


$1.25

Blackline NC S 30.4 Showdown Card

$0.06

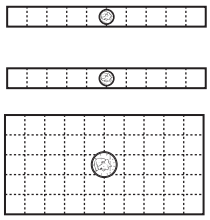
Blackline NC S 30.4 Showdown Card



1.25

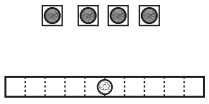
Blackline NC S 30.4 Showdown Card

Money, Fraction & Decimal Showdown Cards page 3 of 5



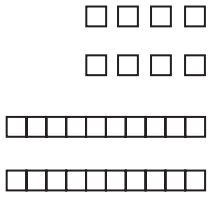
$0.70

Blackline NC S 30.5 Showdown Card



$0.14

Blackline NC S 30.5 Showdown Card



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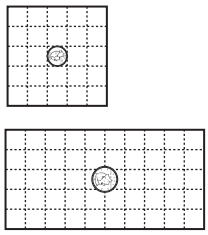
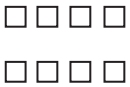
Blackline NC S 30.5 Showdown Card



$0.75

Blackline NC S 30.5 Showdown Card



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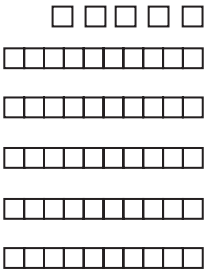
Blackline NC S 30.5 Showdown Card



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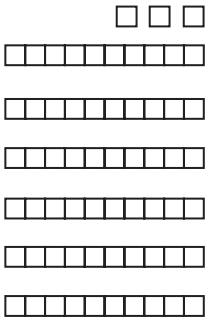
Blackline NC S 30.5 Showdown Card



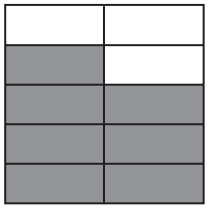
0.63

Blackline NC S 30.5 Showdown Card

$\frac{4}{8}$

Blackline NC S 30.5 Showdown Card

Money, Fraction & Decimal Showdown Cards page 4 of 5



$\frac{7}{10}$

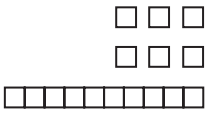
Blackline NC S 30.6 Showdown Card

$\frac{3}{5}$

Blackline NC S 30.6 Showdown Card

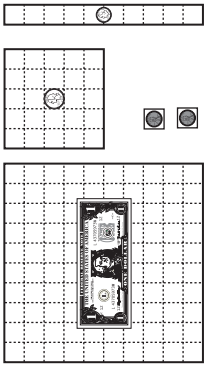
$\frac{2}{5}$

Blackline NC S 30.6 Showdown Card



0.16

Blackline NC S 30.6 Showdown Card

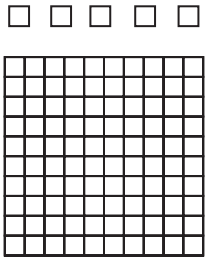


$1.37

Blackline NC S 30.6 Showdown Card

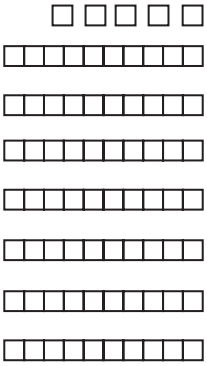
0.02

Blackline NC S 30.6 Showdown Card



1.05

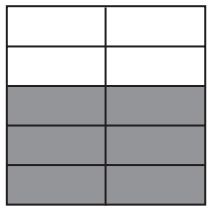
Blackline NC S 30.6 Showdown Card



0.75

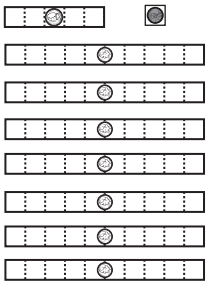
Blackline NC S 30.6 Showdown Card

Money, Fraction & Decimal Showdown Cards page 5 of 5



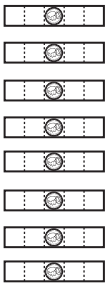
$\frac{6}{10}$

Blackline NC S 30.7 Showdown Card



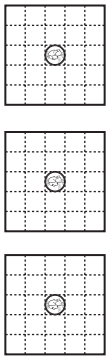
$0.76

Blackline NC S 30.7 Showdown Card



$0.40

Blackline NC S 30.7 Showdown Card



$0.75

Blackline NC S 30.7 Showdown Card

Support Activity 31 ★ Instructional Considerations

SUPPORT ACTIVITY

Spin & Multiply Big Time

Overview

Players take turns spinning 2-by-2-digit multiplication combinations. After they have each taken 3 turns, they find the sum of their 3 products. The player with the larger sum wins.

Skills & Concepts

★ multiplying 2-digit numbers by 2-digit numbers

★ adding 3- and 4-digit numbers

You'll need

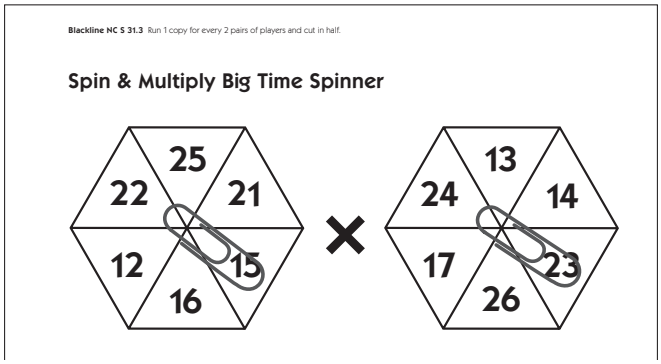
★ Instructions for Spin & Multiply Big Time (Blackline S 31.2)

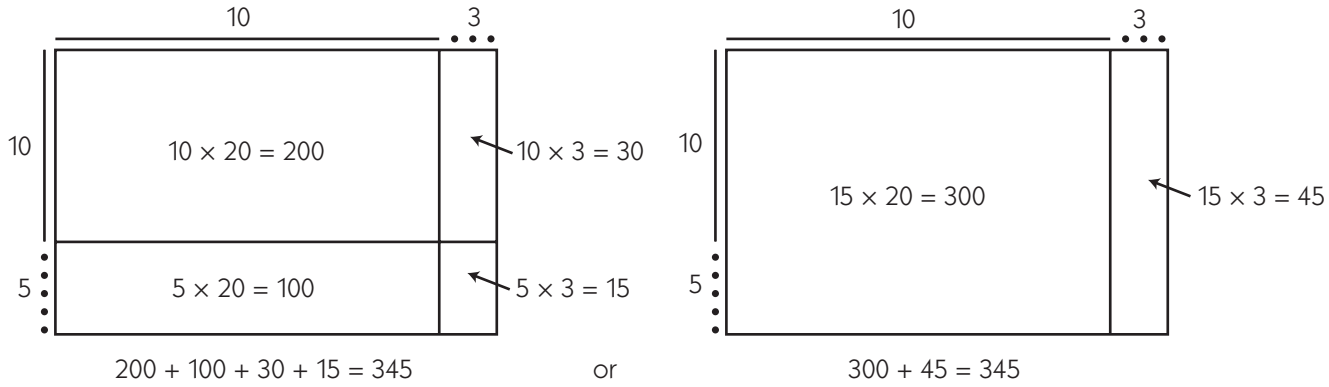
★ Spin & Multiply Big Time Spinner (Blackline S 31.3, 1 copy for every 2 pairs of players, cut in half)

★ Spin & Multiply Big Time Record Sheet (Blackline S 31.4, 1 copy per player)

★ paperclip and pencil for use as a spinner

It may be helpful if, before students play a full game of Spin & Multiply, you model how to sketch the frame and then the array for a 2-by-2-digit combination. As they compute their products, encourage players to think in chunks and use friendly numbers.





Encourage students to estimate a reasonable answer before they compute the exact product. If they are having trouble, encourage them to round each number to the nearest ten. You might also have them first sketch the combination and then estimate if working with numbers alone is too abstract for them.

Support Activity 31

SUPPORT ACTIVITY

Spin & Multiply Big Time

You'll need

★ Instructions for Spin & Multiply Big Time (Blackline S 31.2)

★ Spin & Multiply Big Time Spinner (Blackline S 31.3, 1 copy for every 2 pairs of players, cut in half)

★ Spin & Multiply Big Time Record Sheet (Blackline S 31.4, 1 copy per player)

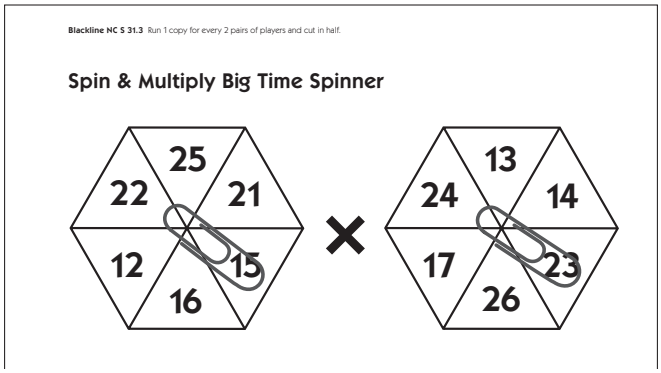
★ paperclip and pencil for use as a spinner

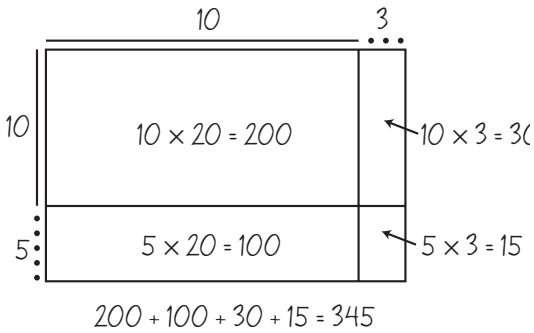
Instructions for Spin & Multiply Big Time

1 Record both players' names on a record sheet.

2 Spin each spinner to get two numbers to multiply. Estimate *about* what the product will be.

3 Sketch an array to show the combination on the record sheet. Then compute the product in the way that makes the best sense to you. Explain how you computed the product of those two factors to your partner.





Player I broke my array into four parts. I got the area of each part and then added them all together.

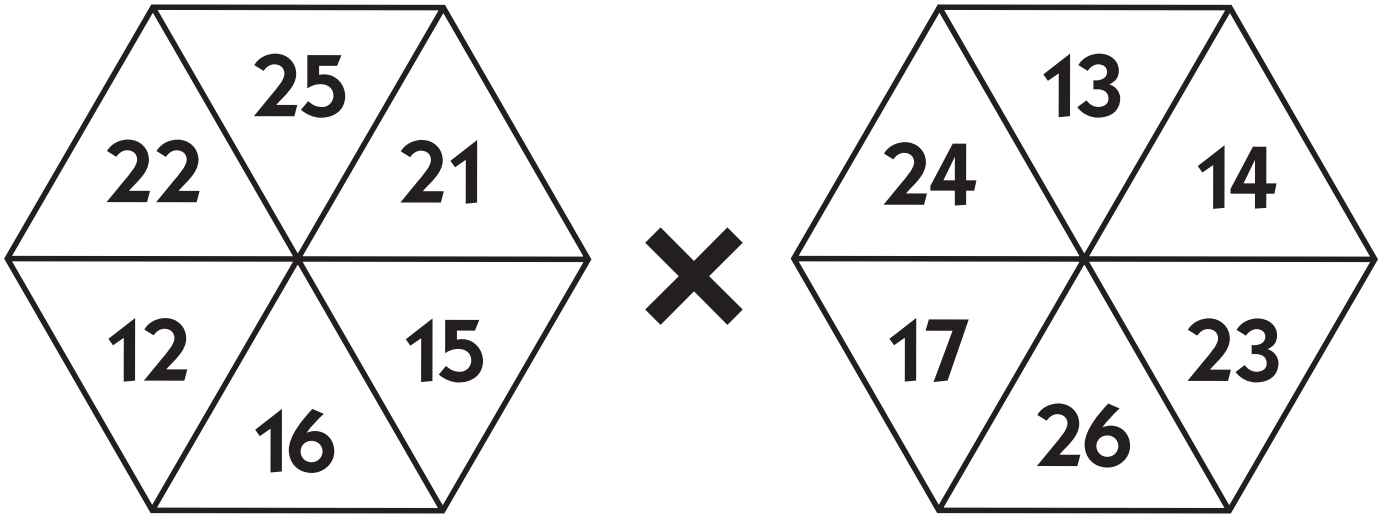
4 Record the combination and the product in the space provided on the record sheet.

5 You and your partner will each take 3 turns spinning, sketching, and finding the product.

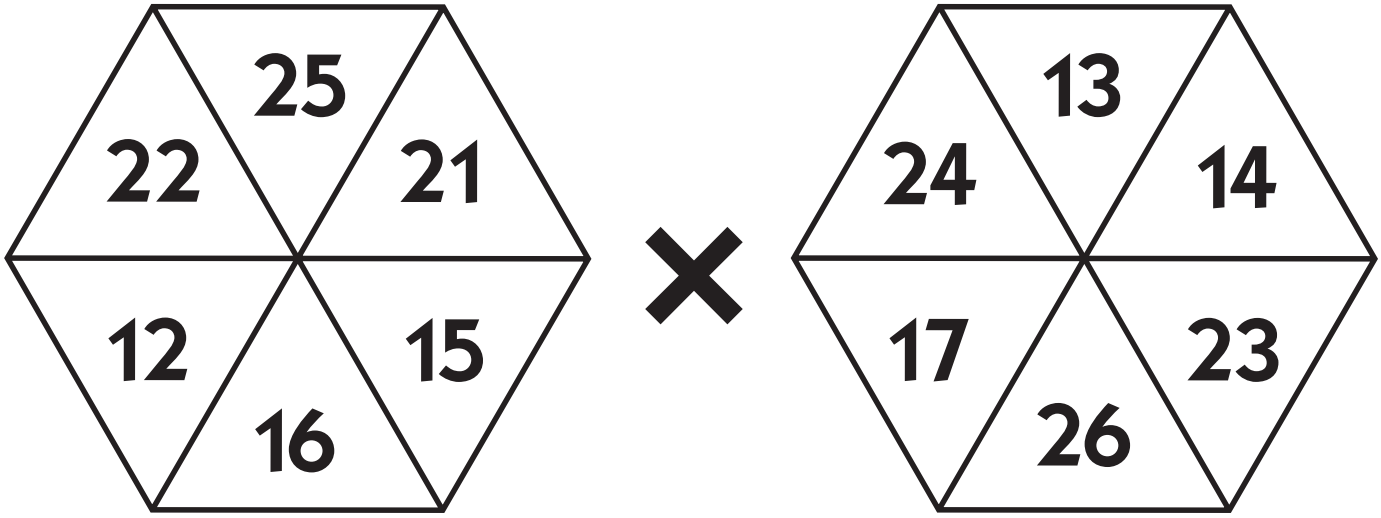
6 When you have both taken 3 turns, find the sums of your products. Double-check each other's work.

7 The player with the larger sum wins the game.

Spin & Multiply Big Time Spinner



Spin & Multiply Big Time Spinner



NAME _____ **DATE** _____

Spin & Multiply Big Time Record Sheet

Player 1 _____ **Player 2** _____

1st Product _____ × _____ = _____	**1st Product** _____ × _____ = _____
2nd Product _____ × _____ = _____	**2nd Product** _____ × _____ = _____
3rd Product _____ × _____ = _____	**3rd Product** _____ × _____ = _____
Sum	**Sum**

Support Activity 32 ★ Instructional Considerations

SUPPORT ACTIVITY

Divide 'Em Up

Overview

Together, players spin a number from 4 to 9 and then they each select one 2- or 3-digit number from a set of six numbers to divide by the number spun. The goal is to have the lowest total remainders after 3 turns, so players try to select a number that will divide by the number on the spinner with as little left over as possible. After 3 turns, players find the sum of their remainders and the player with the lowest sum wins.

Skills & Concepts

★ developing fluency with division facts

★ dividing 2-digit and 3-digit numbers by 1-digit numbers

You'll need

★ Instructions for Divide 'Em Up (Blackline S 32.2)

★ Divide 'Em Up Spinner (Blackline S 32.3, 1 copy for every 2 pairs of players, cut in half)

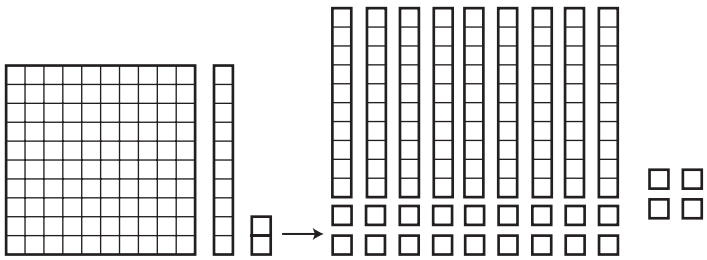
★ Divide 'Em Up Record Sheet (Blackline S 32.4, 1 copy for each player)

★ base ten pieces (Use Blackline S 2.6 to make your own if needed.)

★ pencil and paperclip to use as a spinner

At the end of the game, the goal is to have the lowest total of remainders. Therefore, players will want to pick numbers from a given set of choices that divide as evenly as possible by the number on the spinner. At first, students may pick the numbers more or less randomly, but as their number sense gets better, they may be able to make more strategic choices.

Give students the freedom to use whatever methods make the most sense to them to complete the calculations. Some will want to move base ten pieces around to form equal groups, while others may feel more comfortable working with numbers.



112 $\qquad$ 112 ÷ 9 = 12 r4

Student 1

112 ÷ 9
9 × 10 = 90
9 × 11 = 99
9 × 12 = 108
9 × 13 = 117
112 – 108 = 4
112 ÷ 9 = 12r4

Student 2

Support Activity 32

SUPPORT ACTIVITY

Divide 'Em Up

You'll need

★ Instructions for Divide 'Em Up (Blackline S 32.2)

★ Divide 'Em Up Spinner (Blackline S 32.3, 1 copy for every 2 pairs of players, cut in half)

★ Divide 'Em Up Record Sheet (Blackline S 32.4, 1 copy for each player)

★ base ten pieces (Use Blackline S 2.6 to make your own if needed.)

★ pencil and paperclip to use as a spinner

Instructions for Divide 'Em Up

1 Get your own record sheet and write your name on it.

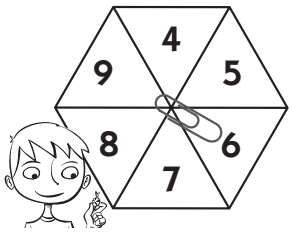
2 Spin the spinner.

3 You and your partner each pick one of the six numbers for this game. You'll divide this number by the number on the spinner. The goal is to get no remainder or the smallest remainder possible, so pick a number that you think will divide evenly or almost evenly by the number on the spinner. Once you pick a number, you cannot use it again during the game. You and your partner may pick the same number or different numbers each time.

4 Now divide the number you chose by the number on the spinner. You can do it in your head, use numbers or base ten pieces, or make sketches. Write an equation on the record sheet to show the division and record the remainder if there is one.

Blackline NC S 32.3 Run 1 copy for each pair of players. Cut in half and give each pair a spinner.

Divide 'Em Up Spinner



Blackline NC S 32.4 Run 1 copy for each player.

NAME Cheyenne DATE June 12

Divide 'Em Up Record Sheet

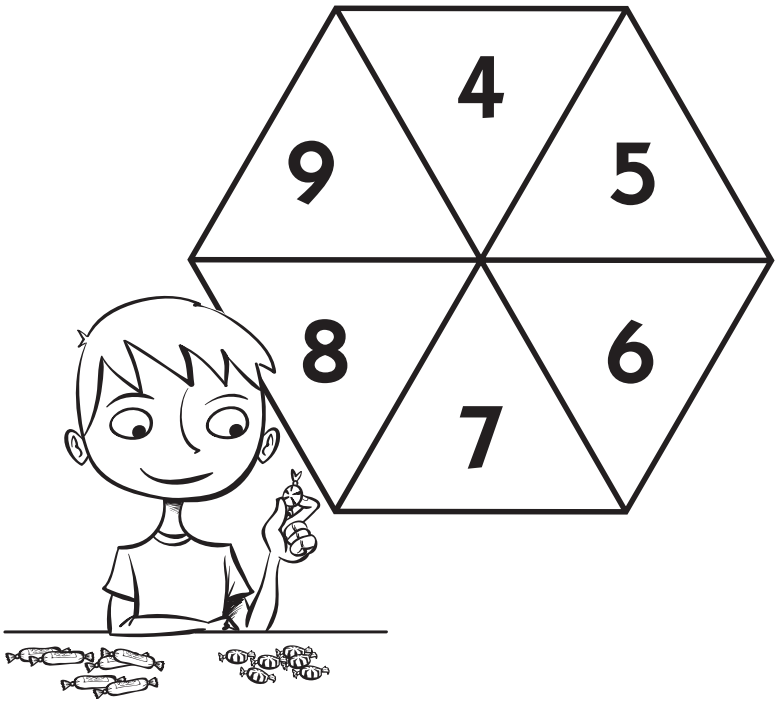
Game 1

60	75	84
91	112	117

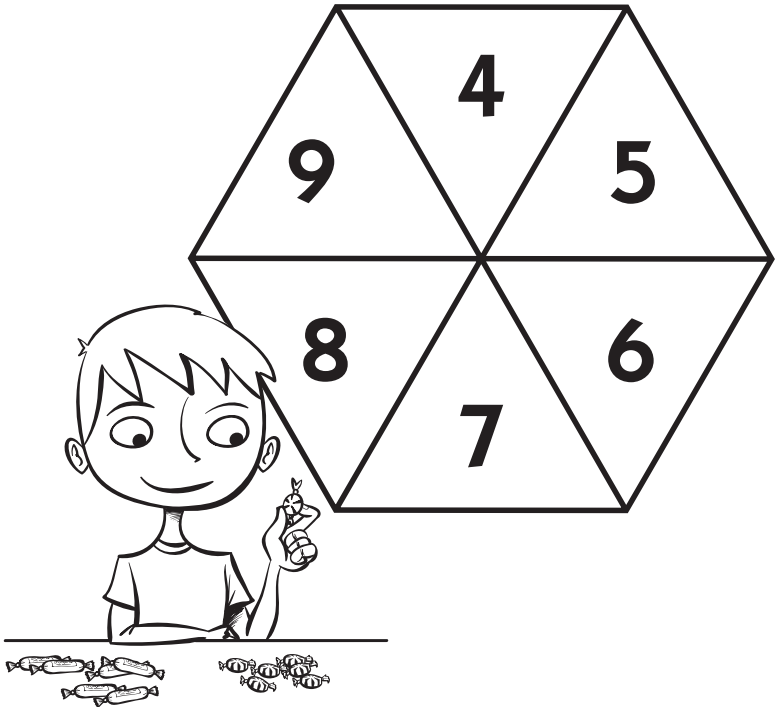
Equation	Remainder (if any)
112 ÷ 6 = 18r4	4
Sum of remainders	

5 Do this three times. After three turns, add up your remainders. The player with the smallest sum wins.

Divide 'Em Up Spinner



Divide 'Em Up Spinner



NAME _____ **DATE** _____

Divide 'Em Up Record Sheet

Game 1

60	**75**	**84**
91	**112**	**117**

Equation	Remainder (if any)
Sum of Remainders	

Game 2

72	**83**	**96**
127	**135**	**143**

Equation	Remainder (if any)
Sum of Remainders	

Game 3

52	**68**	**78**
92	**112**	**119**

Equation	Remainder (if any)
Sum of Remainders	

Support Activity 33 ★ Instructional Considerations

SUPPORT ACTIVITY

Fractions, Decimals & Dollars

Overview

Players take turns spinning different fractions of a dollar and adding them together. At the end of the game, the player who comes closest to a dollar, even if his or her score is over a dollar, wins.

Skills & Concepts

- ★ relating decimals to fractions using concrete models of tenths and hundredths
- ★ recognizing, modeling, comparing, and using decimals to hundredths
- ★ adding and subtracting commonly used decimals to hundredths using concrete models

You'll need

- ★ Fractions, Decimals & Dollars Instructions (Blacklines S 33.2 and 33.3, 1 copy, run back-to-back)
- ★ Fractions Spinner (Blackline S 33.4, 1 copy for every 2 pairs of players, cut in half)
- ★ Fractions, Decimals & Dollars Record Sheet (Blackline S 33.5, 2 copies for each player run back-to-back)
- ★ Money Value Pieces (Blacklines S 19.5–19.7, 1 set run on cardstock and cut out for each player)
- ★ pencil and paperclip to use as a spinner

This game moves very quickly and gives students practice adding and subtracting landmark decimals and fractions. As students get more comfortable with the game, you might encourage them not to accumulate the money value pieces on the dollar mat. If you have them play this way, they can use the money value pieces to help determine each fraction and decimal equivalence, but they'll need to add the fractions or decimals using numbers on their record sheet, on scratch paper, or mentally.

Support Activity 33

SUPPORT ACTIVITY

Fractions, Decimals & Dollars

You'll need

★ Fractions, Decimals & Dollars Instructions (Blacklines S 33.2 and 33.3, 1 copy run back-to-back)

★ Fractions Spinner (Blackline S 33.4, 1 copy for every 2 pairs of players, cut in half)

★ Fractions, Decimals & Dollars Record Sheet (Blackline S 33.5, 2 copies for each player run back-to-back)

★ Money Value Pieces (Blacklines S 19.5–19.7, 1 set run on cardstock and cut out for each player)

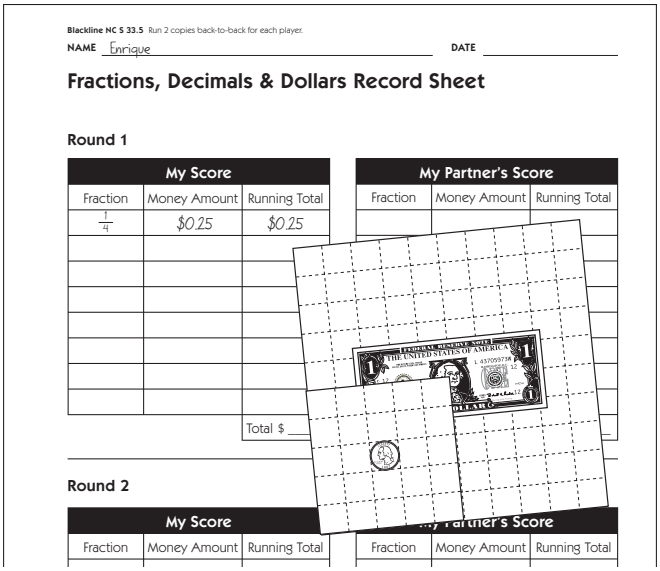
★ pencil and paperclip to use as a spinner

Instructions for Fractions, Decimals & Dollars

1 Each player gets a dollar money value piece to use as a playing mat.

2 Take turns spinning the fractions spinner. The player with the largest amount goes first.

3 Player 1 spins the fraction spinner. She or he takes out a money value piece or collection of pieces that is worth that fraction of a dollar and puts that piece or pieces on his or her dollar piece. Then she or he writes the decimal money amount that is equal to the fraction. Player 2 also records Player 1's fraction and money amount on his or her record sheet.


Blackline NC S 33.5 Run 2 copies back-to-back for each player.

NAME Enrique DATE

Fractions, Decimals & Dollars Record Sheet

Round 1

My Score			My Partner's Score		
Fraction	Money Amount	Running Total	Fraction	Money Amount	Running Total
$\frac{1}{4}$	$0.25	$0.25			
		Total $			

Round 2

My Score			My Partner's Score		
Fraction	Money Amount	Running Total	Fraction	Money Amount	Running Total

4 Players take turns spinning, building, and recording until one player's dollar piece is completely filled. It is

(Continued on back.)

Support Activity 33 (cont.)

fine to go over a dollar. The other player gets to take his or her turn in that round, but no more rounds are played after one player has reached a dollar. To make the pieces fit on the dollar piece, players might need to rearrange or trade in money value pieces for other pieces that are worth the same amount.

5 Both players find the total amount of money they collected in that round and write it at the bottom of their tables for the round.

6 The player whose total is closest to one dollar, either under or over, wins. Both players circle the winner on their own record sheets.

Blackline NC S 33.5 Run 2 copies back-to-back for each player.

NAME Enrique **DATE** _____

Fractions, Decimals & Dollars Record Sheet

Round 1

My Score		
Fraction	Money Amount	Running Total
$\frac{1}{4}$	$0.25	$0.25
$\frac{1}{100}$	$0.01	$0.26
$\frac{1}{20}$	$0.05	$0.31
$\frac{1}{2}$	$0.50	$0.81
$\frac{1}{4}$	$0.25	$1.06
		Total $ 1.06

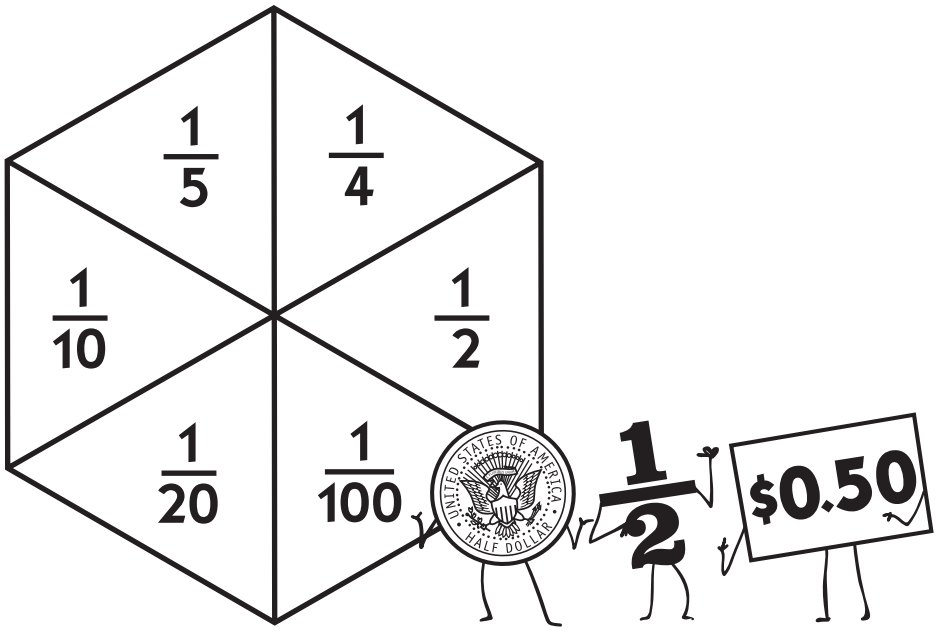
My Partner's Score		
Fraction	Money Amount	Running Total
$\frac{1}{10}$	$0.10	$0.10
$\frac{1}{20}$	$0.05	$0.15
$\frac{1}{2}$	$0.50	$0.65
$\frac{1}{20}$	$0.05	$0.70
$\frac{1}{4}$	$0.25	$0.95
		Total $ 0.95

Round 2

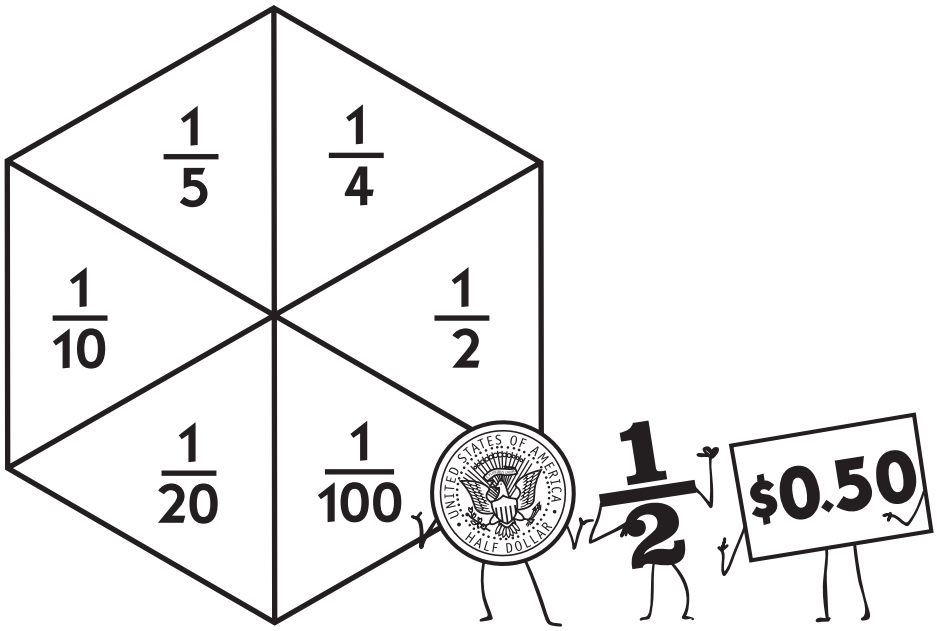
My Score		
Fraction	Money Amount	Running Total
		Total $ _____

My Partner's Score		
Fraction	Money Amount	Running Total
		Total $ _____

Fractions Spinner



Fractions Spinner



NAME _____ **DATE** _____

Fractions, Decimals & Dollars Record Sheet

Round 1

My Score		
Fraction	Money Amount	Running Total
		Total $ _____

My Partner's Score		
Fraction	Money Amount	Running Total
		Total $ _____

Round 2

My Score		
Fraction	Money Amount	Running Total
		Total $ _____

My Partner's Score		
Fraction	Money Amount	Running Total
		Total $ _____

Support Activity 34 ★ Instructional Considerations

SUPPORT ACTIVITY

Decimal Race to Three

Overview

Players take turns spinning decimal numbers and shading them in on a grid that represents a whole divided into hundredths. Each time, they think of fractions that are equal to that decimal number, using the grid for support. After four turns each, the player with the highest sum wins.

Skills & Concepts

★ relating decimals to fractions using concrete models of tenths and hundredths

★ recognizing, modeling, comparing, and using decimals to hundredths

★ adding decimal numbers in the tenths and hundredths

You'll need

★ Decimal Race to Three Instructions (Blackline S 34.3, 1 copy)

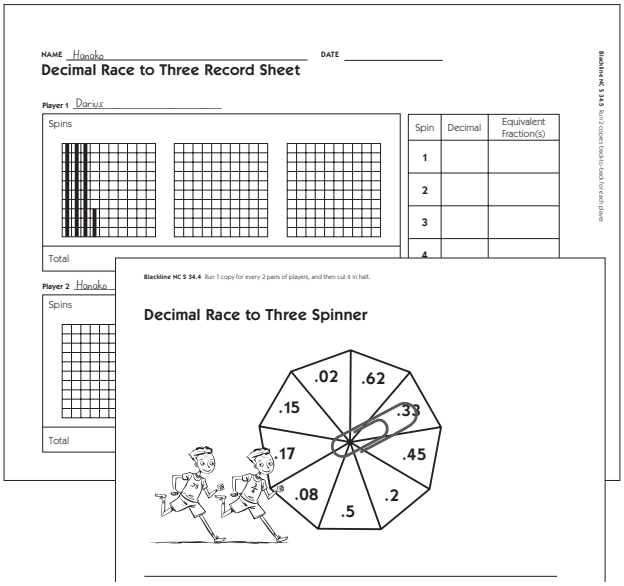
★ Decimal Race to Three Spinner (Blackline S 34.4, 1 copy for every 2 pairs of players, cut in half)

★ Decimal Race to Three Record Sheet (Blackline S 34.5, 2 copies run back-to-back for each player)

★ pencil and paperclip for use as a spinner

★ colored pencils

Some students will undoubtedly want to color in each decimal amount carefully. Encourage them to simply make a line through the squares on the grid to show each amount.

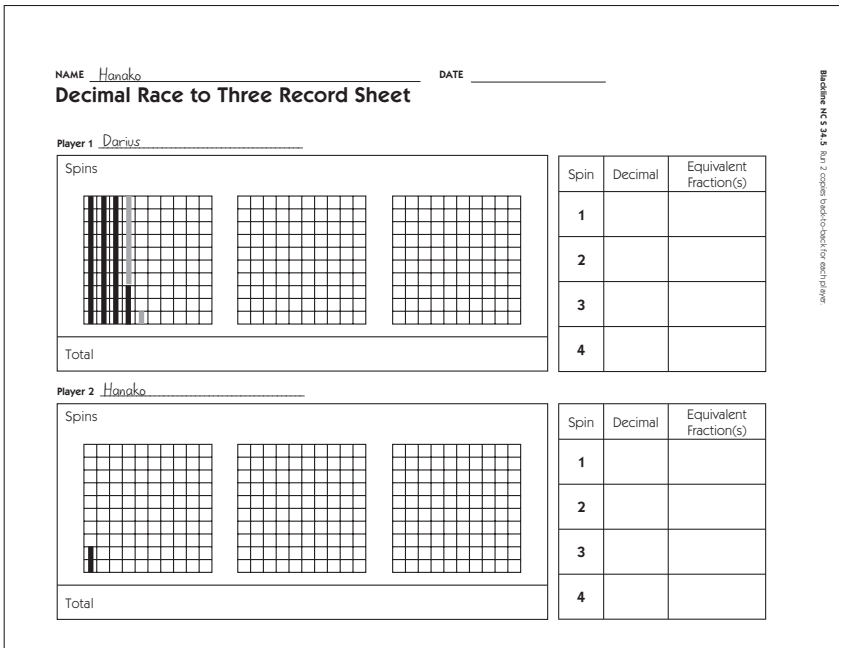


As they shade in the different decimal amounts, encourage students to compare the decimals to landmarks such as 0.5. Is a given amount more or less than 0.5 or one-half? When they are adept at comparing amounts to one-half, encourage them to compare amounts to 0.25 (one-fourth) and 0.75 (three-fourths). Having strong images of these important landmark numbers will help in future work with decimals.

(Continued on back.)

Support Activity 34 Instructional Considerations (cont.)

As they take turns, you might also ask them which decimal or decimals they could spin to overtake the other player. You could also ask them to estimate how much more they would need to spin to reach certain landmark numbers, like 1.5 or 2.



NAME Hanako DATE

Decimal Race to Three Record Sheet

Blackline NC S 34.5 Run 2 copies back-to-back for each player.

Player 1 Darius

Spins

Total

Spin	Decimal	Equivalent Fraction(s)
1		
2		
3		
4		

Player 2 Hanako

Spins

Total

Spin	Decimal	Equivalent Fraction(s)
1		
2		
3		
4		

Mrs. Ruttle *Hanako, before you spin, would it be possible for you to overtake Darius in this one turn? If so, which numbers on the spinner would get you there?*

Hanako *Well, he has 0.41 and I have 0.02. I kind of think of that like 41 and 2, so I'd need 39 more. I mean, 0.39 more. I could get … let's see … the 0.62 or the 0.45. Oh! Or the 0.5.*

Mrs. Ruttle *Which one of those numbers would get you closest to three-fourths?*

Hanako *I'm pretty far from three-fourths. I'd need the 0.62, but that would only get me to 0.64.*

Support Activity 34

SUPPORT ACTIVITY

Decimal Race to Three

You'll need

★ Decimal Race to Three Instructions (Blackline S 34.3, 1 copy)

★ Decimal Race to Three Spinner (Blackline S 34.4, 1 copy for every 2 pairs of players, cut in half)

★ Decimal Race to Three Record Sheet (Blackline S 34.5, 2 copies run back-to-back for each player)

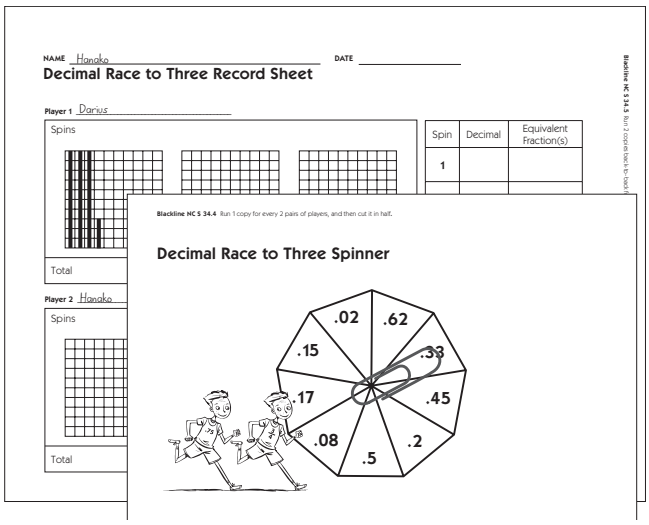
★ pencil and paperclip for use as a spinner

★ colored pencils

Instructions for Decimal Race to Three

1 Take turns spinning the spinner. The player with the larger number goes first.

2 Player 1 spins the spinner. He or she quickly shades in that amount on his or her first grid. Player 2 should also shade in this amount for Player 1 on his or her own record sheet.



3 Then Player 1 names a fraction that is equal to that decimal number. Both players record the fraction.

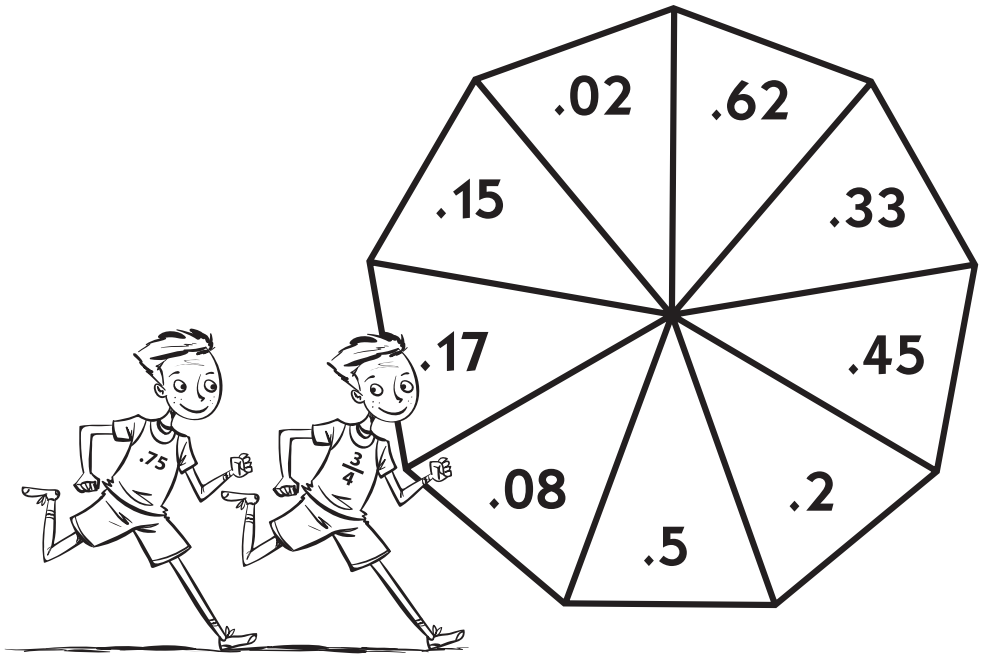
4 Players work together to see if they can think of any other fractions that are also equal to that number. If so, they both record them on their record sheets.

5 Players take turns spinning, shading in, and thinking of equivalent fractions until both players have taken 4 turns.

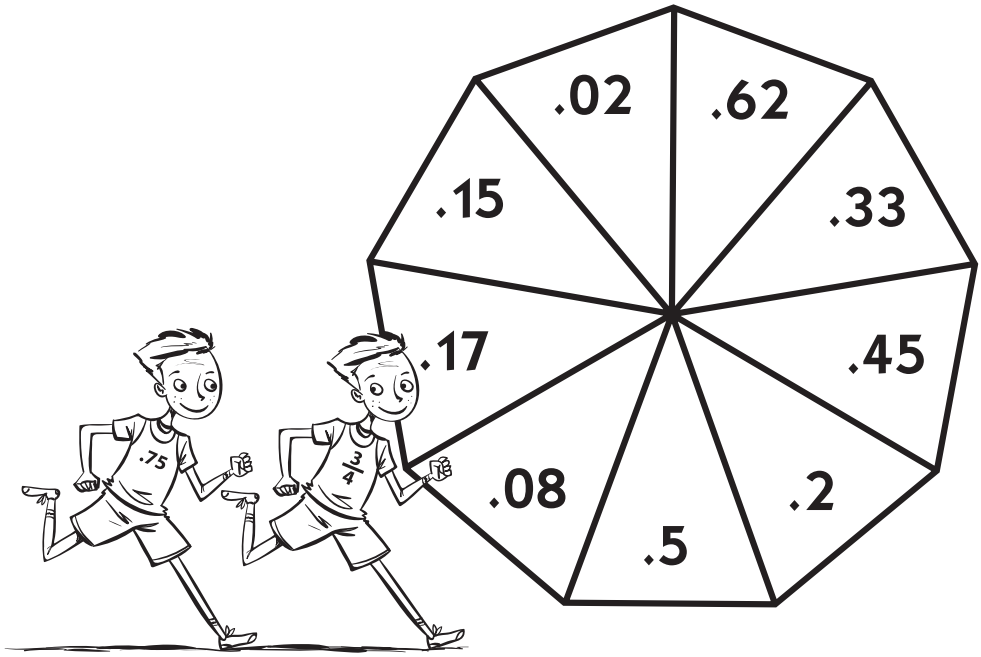
6 Each player determines his or her total and then writes an equation to show the sum of their decimal amounts. The player with the largest sum wins.

7 Both players circle the winner and then play again if there is time.

Decimal Race to Three Spinner



Decimal Race to Three Spinner

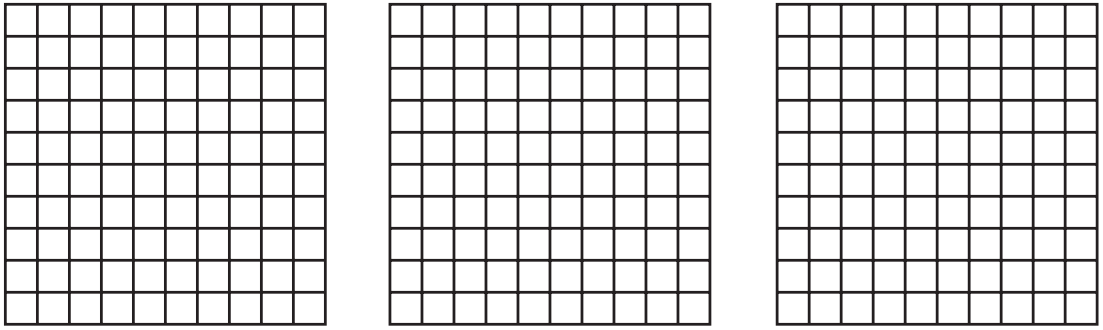


NAME _____ DATE _____

Decimal Race to Three Record Sheet

Player 1 _____

Spins

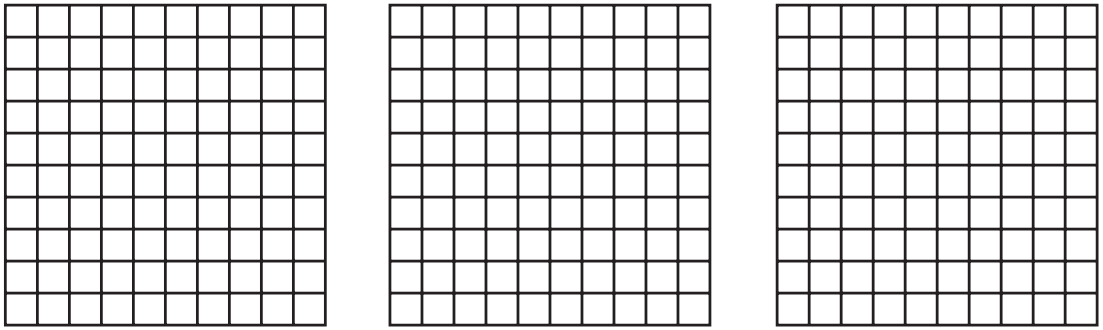


Total

Spin	Decimal	Equivalent Fraction(s)
1		
2		
3		
4		

Player 2 _____

Spins



Total

Spin	Decimal	Equivalent Fraction(s)
1		
2		
3		
4		

Support Activity 35 ★ Instructional Considerations

SUPPORT ACTIVITY

Decimal Pick Two

Overview

Each player gets three decimal numbers, from which they select two whose sum is as close to a target number as possible. The player whose sum comes closest to the target number wins.

Skills & Concepts

★ estimating the results of adding decimal numbers

★ adding decimal numbers to the hundredths place

You'll need

★ Decimal Pick Two Instructions (Blacklines S 35.2 and 35.3, 1 copy run back-to-back)

★ Decimal Pick Two Spinners (Blackline S 35.4, 1 copy for every 2 pairs of players, cut in half)

★ Decimal Pick Two Cards (Blacklines S 35.5 and 35.6, 1 copy for every pair of players, cut apart)

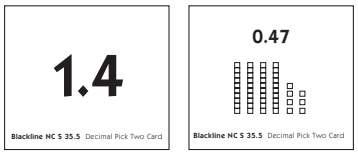
★ Decimal Pick Two Record Sheet (Blackline S 35.7, 2 copies run back-to-back for each player)

★ pencil and paperclip to use as a spinner

You may need to remind students to keep their decimal points aligned when adding their numbers, especially if the two numbers don't have digits in all the same place values.

1.4	^{1}1.4
+ 0.67	+ 0.67
2.07	0.81
Correct	Incorrect

The visual models on the first page of cards may help students interpret the numbers on the cards that do not include a visual model. You might even suggest that students sketch out a number using similar models if they need to clarify what the number is and how it compares to the other numbers.



Alexandra *Hmm. 1.4. That's shorter than the other numbers. What's the 4 again?*

Mrs. Ruiz *Can you find a card with a four right next to the decimal that has a picture on it that might help?*

Alexandra *Oh, 0.47. The 4 is 4 tenths, those strips. So 1.4 is 1 and 4 tenths.*

Support Activity 35

SUPPORT ACTIVITY

Decimal Pick Two

You'll need

★ Decimal Pick Two Instructions (Blacklines S 35.2 and 35.3, 1 copy run back-to-back)

★ Decimal Pick Two Spinners (Blackline S 35.4, 1 copy for every 2 pairs of players, cut in half)

★ Decimal Pick Two Cards (Blacklines S 35.5 and 35.6, 1 copy for every pair of players, cut apart)

★ Decimal Pick Two Record Sheet (Blackline S 35.7, 2 copies run back-to-back for each player)

★ pencil and paperclip to use as a spinner

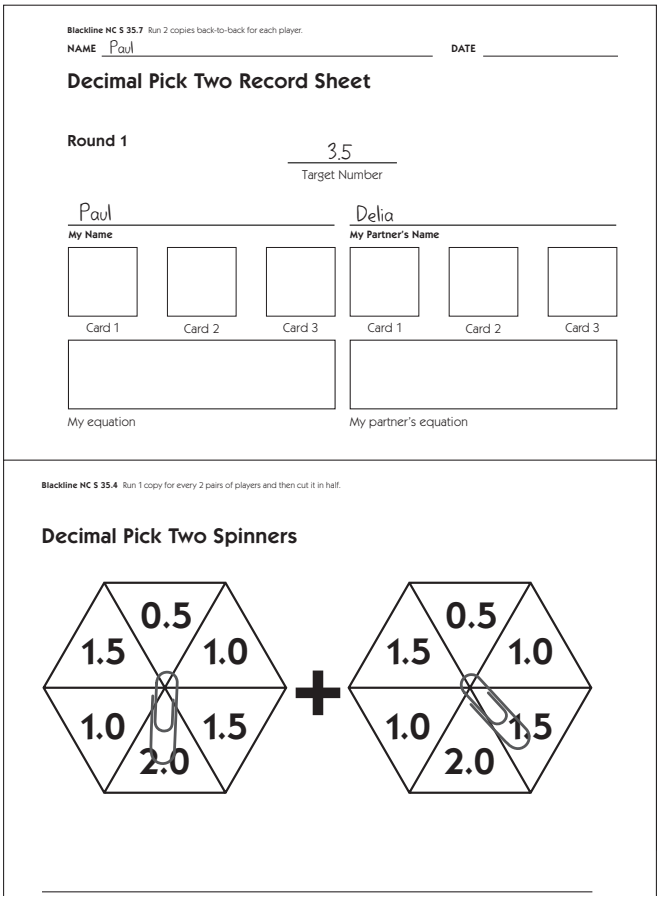
Instructions for Decimal Pick Two

1 Both players spin one of the spinners. The player with the higher number goes first.

2 Mix up the cards and put them in a stack face down between both players.

3 Player 1 spins both spinners. Both players add the two numbers. Compare your answers and your work to make sure you agree on the sum.

4 When both players agree on the sum, they write it in the Target Number space for round 1 on their own record sheets.



Blackline NC S 35.7 Run 2 copies back-to-back for each player.

NAME Paul DATE

Decimal Pick Two Record Sheet

Round 1

3.5
Target Number

Paul — My Name
Delia — My Partner's Name

Card 1 | Card 2 | Card 3 | Card 1 | Card 2 | Card 3

My equation | My partner's equation

Blackline NC S 35.4 Run 1 copy for every 2 pairs of players and then cut it in half.

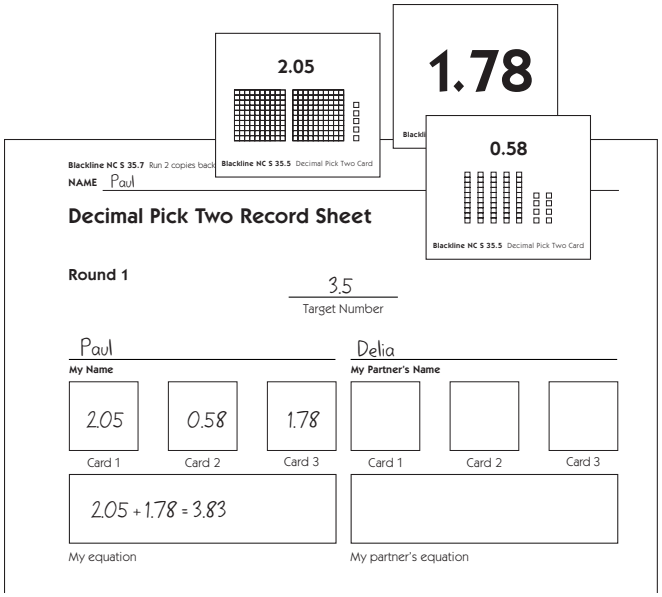
Decimal Pick Two Spinners

(Continued on back.)

Support Activity 35 (cont.)

5 Players take turns drawing cards and displaying them face up. Take turns until each player has drawn three cards. Then players write their own numbers, and their partner's numbers, in the three spaces on their own record sheets.

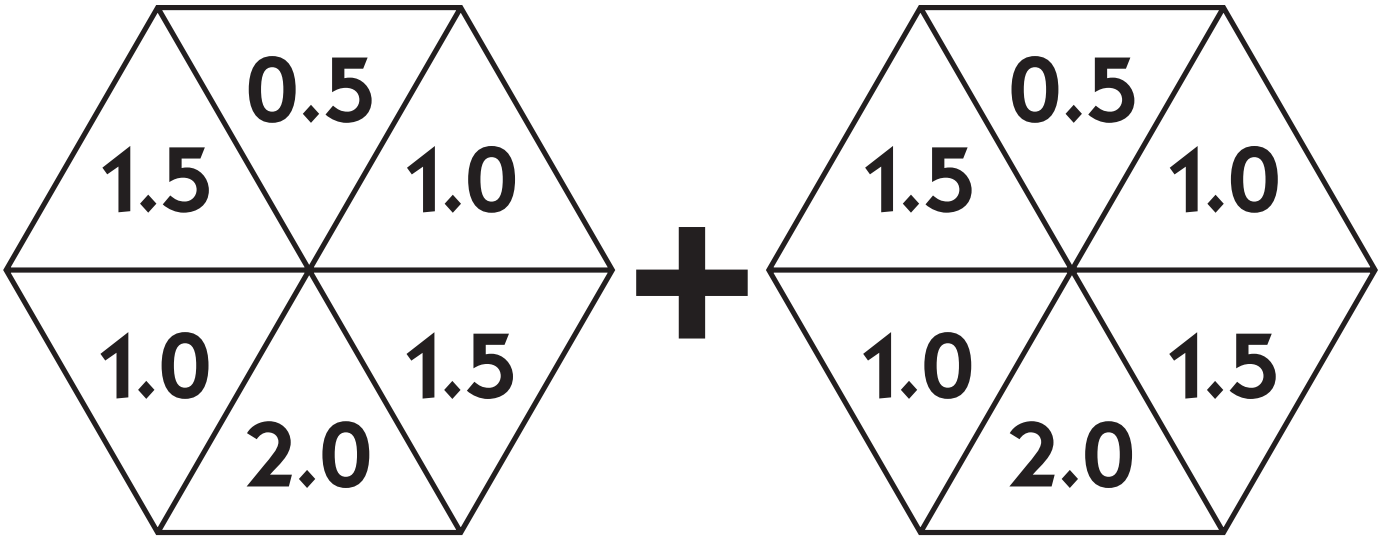
6 Players study their own numbers and pick the two that, when added, have a sum that is closest to the target number. They write an equation to show the two numbers and their sum in the space provided.



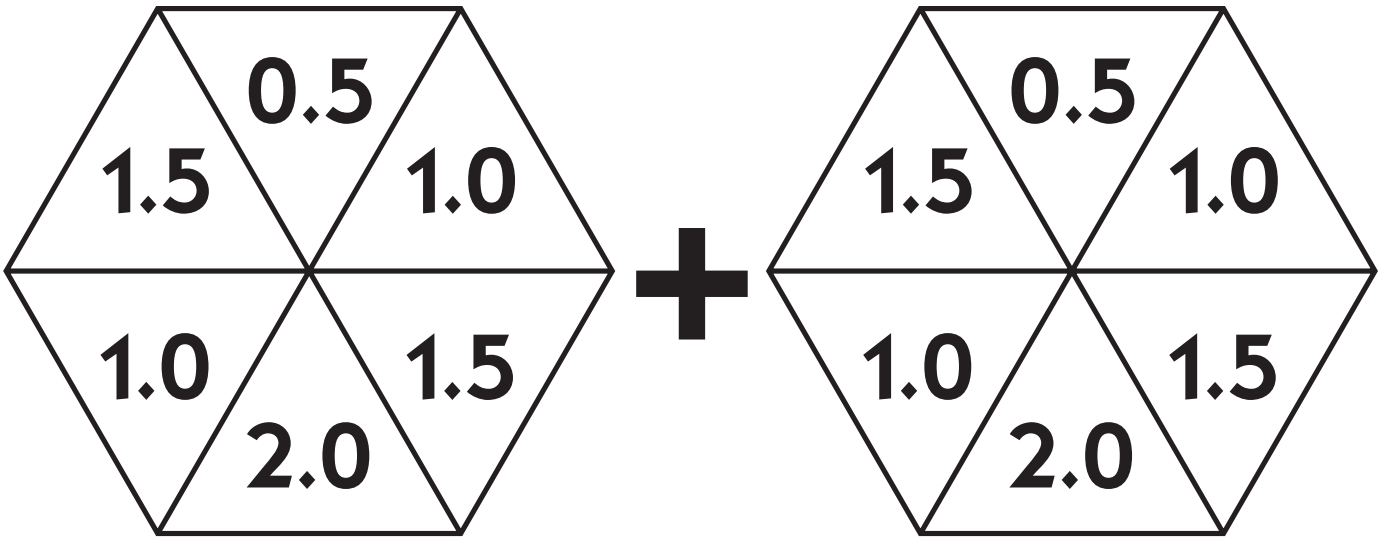
7 When both players are done, they copy each other's equations onto their own record sheets.

8 Players compare their sums to see who got closest to the target number. The winning sum can be greater or less than the target number. Players circle the winner on their own record sheets.

Decimal Pick Two Spinners

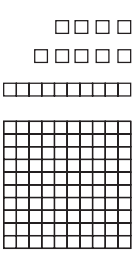


Decimal Pick Two Spinners



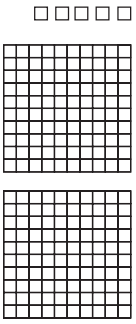
Decimal Pick Two Cards page 1 of 2

1.19



Blackline NC S 35.5 Decimal Pick Two Card

2.05

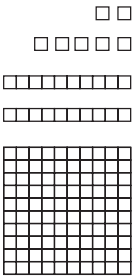


Blackline NC S 35.5 Decimal Pick Two Card

0.58

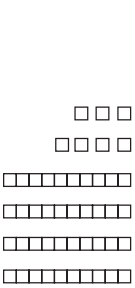
Blackline NC S 35.5 Decimal Pick Two Card

1.27



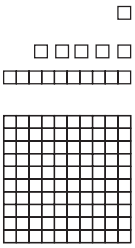
Blackline NC S 35.5 Decimal Pick Two Card

0.47



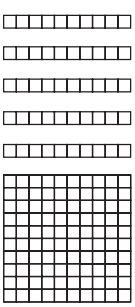
Blackline NC S 35.5 Decimal Pick Two Card

1.16



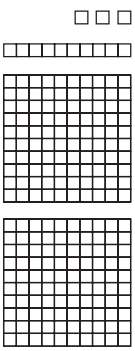
Blackline NC S 35.5 Decimal Pick Two Card

1.52



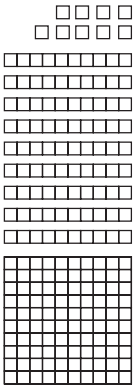
Blackline NC S 35.5 Decimal Pick Two Card

2.12



Blackline NC S 35.5 Decimal Pick Two Card

1.89

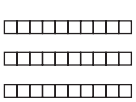


Blackline NC S 35.5 Decimal Pick Two Card

0.9

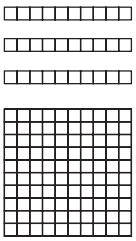
Blackline NC S 35.5 Decimal Pick Two Card

0.36



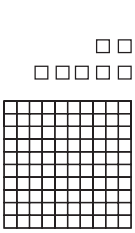
Blackline NC S 35.5 Decimal Pick Two Card

1.3



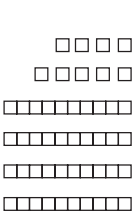
Blackline NC S 35.5 Decimal Pick Two Card

1.07



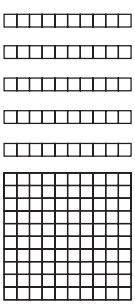
Blackline NC S 35.5 Decimal Pick Two Card

0.49



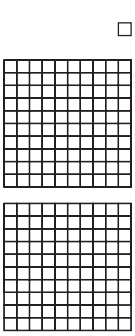
Blackline NC S 35.5 Decimal Pick Two Card

1.53



Blackline NC S 35.5 Decimal Pick Two Card

2.01



Blackline NC S 35.5 Decimal Pick Two Card

Decimal Pick Two Cards page 2 of 2

0.7 **Blackline NC S 35.5** Decimal Pick Two Card	0.25 **Blackline NC S 35.5** Decimal Pick Two Card	0.3 **Blackline NC S 35.5** Decimal Pick Two Card	0.88 **Blackline NC S 35.5** Decimal Pick Two Card
1.03 **Blackline NC S 35.5** Decimal Pick Two Card	1.14 **Blackline NC S 35.5** Decimal Pick Two Card	1.25 **Blackline NC S 35.5** Decimal Pick Two Card	1.6 **Blackline NC S 35.5** Decimal Pick Two Card
1.34 **Blackline NC S 35.5** Decimal Pick Two Card	1.78 **Blackline NC S 35.5** Decimal Pick Two Card	1.08 **Blackline NC S 35.5** Decimal Pick Two Card	1.90 **Blackline NC S 35.5** Decimal Pick Two Card
2.13 **Blackline NC S 35.5** Decimal Pick Two Card	2.26 **Blackline NC S 35.5** Decimal Pick Two Card	2.6 **Blackline NC S 35.5** Decimal Pick Two Card	1.4 **Blackline NC S 35.5** Decimal Pick Two Card

NAME _____ **DATE** _____

Decimal Pick Two Record Sheet

Round 1

_____
Target Number

My Name _____

Card 1	Card 2	Card 3

My equation

My Partner's Name _____

Card 1	Card 2	Card 3

My partner's equation

Round 2

_____
Target Number

My Name _____

Card 1	Card 2	Card 3

My equation

My Partner's Name _____

Card 1	Card 2	Card 3

My partner's equation

Support Activity 36 ★ Instructional Considerations

SUPPORT ACTIVITY

Multiplication Tic-Tac-Toe

Overview

Students play a version of tic-tac-toe that is based on multiplication. Students draw cards with multiplication combinations. They decide which product on a 9-by-9 grid is most likely the product for their combination and then do the calculations to find out. Players score a point every time they identify the correct product, and the player who gets tic-tac-toe scores 2 points. At the end of the game, the player with the most points wins.

Skills & Concepts

★ estimating the result of multiplying 2-digit numbers

★ multiplying 2-digit numbers

You'll need

★ Multiplication Tic-Tac-Toe Instructions (Blackline S 36.3, 1 copy)

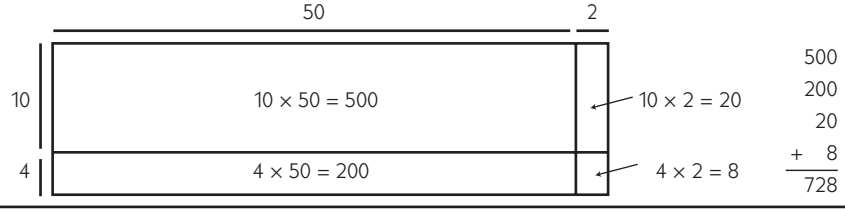
★ Multiplication Tic-Tac-Toe Cards (Blacklines S 37.4 – 36.7, 1 copy for every pair of players, cut apart)

★ Multiplication Tic-Tac-Toe Record Sheet (Blacklines S 36.8–36.11, 1 copy for each player)

When deciding which cards and record sheets to use, keep in mind that they get progressively more difficult, from 1 to 4.

Students can solve their multiplication problems using any method they like. Some might prefer the traditional algorithm, while others might be able to break the combinations into smaller pieces. Others may still rely on the array model. If so, help them connect the model to a numeric method, and try to encourage them to move toward using numbers alone. The array model is an excellent scaffold and promotes a solid conceptual understanding of multi-digit multiplication, but numeric methods will likely prove most efficient for most students.

DIFFERENT METHODS FOR SOLVING 52 × 14

Method	What It Looks Like
traditional algorithm	15 × 14 208 + 520 728
smaller pieces	52 × 14 = (52 × 10) + (52 × 4) 520 + 208 = 728
array	

(Continued on back.)

Support Activity 36 Instructional Considerations (cont.)

When they try to identify their products before computing, students may be able to narrow their choices by looking at the digit in the ones place. For example, if their combination is 52 × 14, they know the product must have an 8 in the ones place. That would leave them with the following choices on the first game board: 728, 238, and 2,448. In this case, they might reason that 238 is too low, because 50 × 10 is 500, and they have 52 × 14, which has to be more than 500. Many will also see that 2,448 is quite a bit too high, and reason that the most reasonable choice is 728. You might help them move toward this kind of reasoning by asking first what they know for certain about the product of these two numbers (e.g., it will have an 8 in the ones place or it will be an even number). When they have narrowed the pool of possible products, ask if they can rule any of them out quickly. Are any obviously too low or too high?

Support Activity 36

SUPPORT ACTIVITY

Multiplication Tic-Tac-Toe

You'll need

★ Multiplication Tic-Tac-Toe Instructions (Blackline S 36.3, 1 copy)

★ Multiplication Tic-Tac-Toe Cards (Blacklines S 37.4–36.7, 1 copy for every pair of players, cut apart)

★ Multiplication Tic-Tac-Toe Record Sheet (Blacklines S 36.8–36.11, 1 copy for each player)

Instructions for Multiplication Tic-Tac-Toe

1 Decide which player goes first by playing Rock, Paper, Scissors or flipping a coin.

2 Make sure you are using a matching record sheet and deck of cards. Then mix the cards thoroughly and place them face down between both players.

3 The first player draws a card. Then the second player draws a card.

4 Players look at the combination on their card and then decide which product on the tic-tac-toe board is most likely to be the product for their combination. Each player records his or her informed guess on his or her record sheet in the column marked "Most Reasonable Choice."

5 Then players determine their exact products using a method of their choice.

6 Players record their products on their record sheets. If a player's initial choice matches his or her exact product, he or she scores a point.

7 Then they both show which player claimed which product on their record sheets. Player 1's product is crossed out with an X, and player 2's product is circled with an O.

8 Repeat steps 3–7 until one player has three in a row horizontally, vertically, or diagonally, or all the cards are used up. The player who got three in a row gets 2 points. If no one got three products in a row, then neither player gets the last 2 points.

9 When the game is over, players add up all their points, and the player with the most points wins.

Multiplication Tic-Tac-Toe Cards, Set 1

21 x 15 **Blackline NC S 36.4** Tic-Tac-Toe Card, Set 1	32 x 22 **Blackline NC S 36.4** Tic-Tac-Toe Card, Set 1	15 x 20 **Blackline NC S 36.4** Tic-Tac-Toe Card, Set 1
	35 x 25 **Blackline NC S 36.4** Tic-Tac-Toe Card, Set 1	12 x 22 **Blackline NC S 36.4** Tic-Tac-Toe Card, Set 1
	20 x 12 **Blackline NC S 36.4** Tic-Tac-Toe Card, Set 1	32 x 12 **Blackline NC S 36.4** Tic-Tac-Toe Card, Set 1
	25 x 32 **Blackline NC S 36.4** Tic-Tac-Toe Card, Set 1	20 x 35 **Blackline NC S 36.4** Tic-Tac-Toe Card, Set 1

Multiplication Tic-Tac-Toe Cards, Set 2

52 × 12 **Blackline NC S 36.5** Tic-Tac-Toe Card, Set 2	13 × 31 **Blackline NC S 36.5** Tic-Tac-Toe Card, Set 2	20 × 32 **Blackline NC S 36.5** Tic-Tac-Toe Card, Set 2
	24 × 21 **Blackline NC S 36.5** Tic-Tac-Toe Card, Set 2	23 × 11 **Blackline NC S 36.5** Tic-Tac-Toe Card, Set 2
	40 × 15 **Blackline NC S 36.5** Tic-Tac-Toe Card, Set 2	12 × 22 **Blackline NC S 36.5** Tic-Tac-Toe Card, Set 2
	23 × 21 **Blackline NC S 36.5** Tic-Tac-Toe Card, Set 2	30 × 27 **Blackline NC S 36.5** Tic-Tac-Toe Card, Set 2

Multiplication Tic-Tac-Toe Cards, Set 3

11 x 32 **Blackline NC S 36.6** Tic-Tac-Toe Card, Set 3	42 x 15 **Blackline NC S 36.6** Tic-Tac-Toe Card, Set 3	25 x 25 **Blackline NC S 36.6** Tic-Tac-Toe Card, Set 3
	22 x 33 **Blackline NC S 36.6** Tic-Tac-Toe Card, Set 3	14 x 17 **Blackline NC S 36.6** Tic-Tac-Toe Card, Set 3
	32 x 13 **Blackline NC S 36.6** Tic-Tac-Toe Card, Set 3	21 x 16 **Blackline NC S 36.6** Tic-Tac-Toe Card, Set 3
	51 x 48 **Blackline NC S 36.6** Tic-Tac-Toe Card, Set 3	52 x 14 **Blackline NC S 36.6** Tic-Tac-Toe Card, Set 3

Multiplication Tic-Tac-Toe Cards, Set 4

33 × 42 **Blackline NC S 36.7** Tic-Tac-Toe Card, Set 4	27 × 31 **Blackline NC S 36.7** Tic-Tac-Toe Card, Set 4	33 × 43 **Blackline NC S 36.7** Tic-Tac-Toe Card, Set 4
	37 × 11 **Blackline NC S 36.7** Tic-Tac-Toe Card, Set 4	39 × 31 **Blackline NC S 36.7** Tic-Tac-Toe Card, Set 4
	32 × 23 **Blackline NC S 36.7** Tic-Tac-Toe Card, Set 4	53 × 13 **Blackline NC S 36.7** Tic-Tac-Toe Card, Set 4
	46 × 31 **Blackline NC S 36.7** Tic-Tac-Toe Card, Set 4	17 × 21 **Blackline NC S 36.7** Tic-Tac-Toe Card, Set 4

NAME _____ **DATE** _____

Multiplication Tic-Tac-Toe, Record Sheet 1

300	**384**	**700**
704	**875**	**240**
264	**800**	**315**

Combination	Most Reasonable Choice	The Exact Answer	1 Point if Choice and Answer Match
		Award 2 points if you got tic-tac-toe	
		Total Points	

NAME _____ **DATE** _____

Multiplication Tic-Tac-Toe, Record Sheet 2

640	403	504
600	483	253
264	810	624

Combination	Most Reasonable Choice	The Exact Answer	1 Point if Choice and Answer Match
Award 2 points if you got tic-tac-toe			
Total Points			

NAME _____ **DATE** _____

Multiplication Tic-Tac-Toe, Record Sheet 3

625	336	416
2,448	728	352
726	630	238

Combination	Most Reasonable Choice	The Exact Answer	1 Point if Choice and Answer Match
Award 2 points if you got tic-tac-toe			
Total Points			

NAME _____ **DATE** _____

Multiplication Tic-Tac-Toe, Record Sheet 4

1,419	899	689
357	837	407
736	1,426	1,386

Combination	Most Reasonable Choice	The Exact Answer	1 Point if Product Matches
Award 2 points if you got tic-tac-toe			
Total Points			

Support Activity 37 ★ Instructional Considerations

SUPPORT ACTIVITY

Remainder Roundup

Overview

Players use the same divisor to complete two different division problems. Each player scores the number of points equal to the remainder they get. After three rounds, players add up their points and the player with the largest sum wins.

Skills & Concepts

★ multiplying by 10 and multiples of 10

★ dividing 3-digit by 1- and 2-digit numbers with and without remainders

★ estimating the results of operations performed on whole numbers

You'll need

★ Remainder Roundup Instructions (Blacklines S 37.3 and 37.4, 1 copy back-to-back)

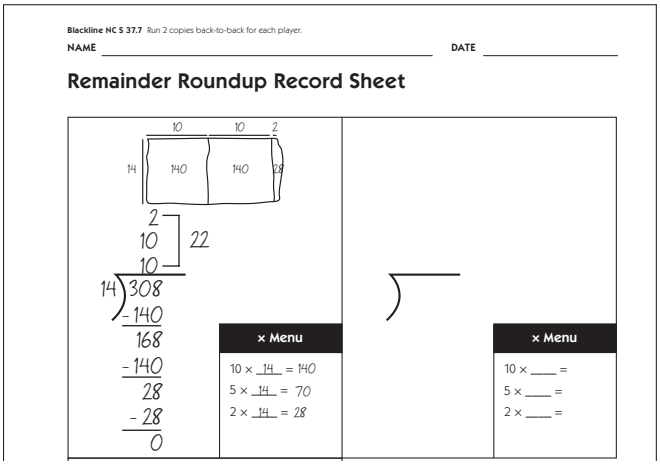
★ Remainder Roundup Spinner (Blackline S 37.5, 1 copy for every 2 pairs of players, cut in half)

★ Remainder Roundup Cards (Blackline S 37.6, 1 copy for each pair of players, cut apart)

★ Remainder Roundup Record Sheet (Blackline S 37.7, 2 copies run back-to-back for each player)

★ pencil and paperclip to use as spinners

Students who need the visual support can use arrays to help solve their division problems. To solve 308 ÷ 14, for example, a student can sketch the known dimension of the rectangle, 14, and then build up to the dividend, 308, by sketching in multiples of the divisor as shown below. The area of each region is subtracted from the dividend to see how much still remains.



As students get more comfortable, encourage them to work with the numbers alone. While the array model is very helpful, it is too cumbersome for students to rely on it indefinitely for completing such computations. You can also make the game more challenging by having them use the challenge spinner.

(Continued on back.)

Support Activity 37 Instructional Considerations (cont.)

Press students to estimate what a reasonable answer might be after they have recorded their problems, but before they have started working (they can use their multiplication menus to help). Also have them predict whether or not they will get a remainder before they do each problem. This may activate what they already know about divisibility and offer you an opportunity to share some strategies as well. Students might have a hunch, for example, that 195 ÷ 15 will have no remainder because numbers that end in a 5 or a 0 divide evenly by 5, and 15 ends with a 5. On the other hand, they may predict that 347 ÷ 15 will result in a remainder, because there's no way to multiply 15 and get an answer that ends in a 7.

Support Activity 37

SUPPORT ACTIVITY

Remainder Roundup

You'll need

★ Remainder Roundup Instructions (Blacklines S 37.3 and 37.4, 1 copy un back-to-back)

★ Remainder Roundup Spinner (Blackline S 37.5, 1 copy for every 2 pairs of players, cut in half)

★ Remainder Roundup Cards (Blackline S 37.6, 1 copy for each pair of players, cut apart)

★ Remainder Roundup Record Sheet (Blackline S 37.7, 2 copies run back-to-back for each player)

★ pencil and paperclip to use as spinners

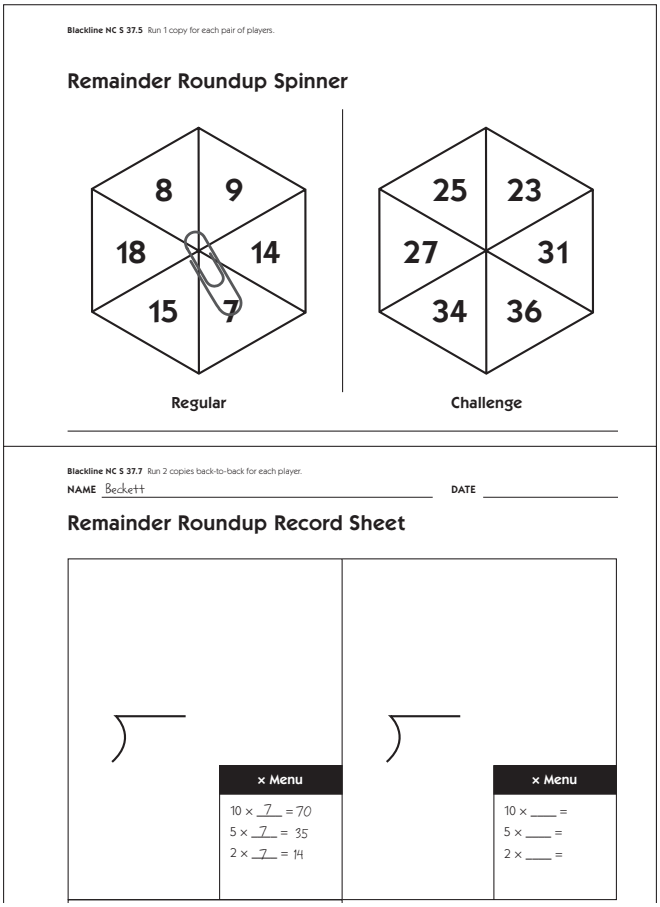
Instructions for Remainder Roundup

1 Both players spin the regular spinner. The player who gets the largest number goes first.

2 Place the Remainder Roundup Cards in a stack face down between both players.

3 The first player spins the spinner. The number he or she spins is the divisor for both players. In other words, it is the number by which each player will divide another number.

4 Players work together to create a multiplication menu for that divisor. Each player writes on his or her own record sheet.



Blackline NC S 37.5 Run 1 copy for each pair of players.

Remainder Roundup Spinner

8 9 18 14 15 7

Regular

25 23 27 31 34 36

Challenge

Blackline NC S 37.7 Run 2 copies back-to-back for each player.

NAME Beckett DATE

Remainder Roundup Record Sheet

× Menu

10 × 7 = 70
5 × 7 = 35
2 × 7 = 14

× Menu

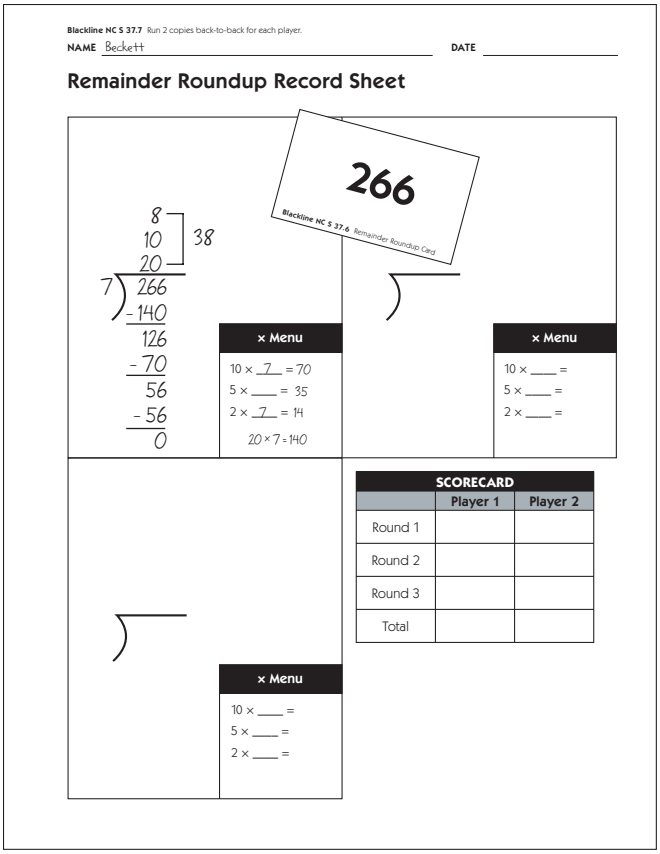
10 × ___ =
5 × ___ =
2 × ___ =

(Continued on back.)

Support Activity 37 (cont.)

5 Then the first player draws a card. The number on the card is his or her dividend. He or she will divide the number on the card by the number on the spinner. Player 1 writes out his or her division problem on his or her own record sheet.

6 Player 2 repeats step 5. Then both players use the multiplication menu to solve their own division problems on their record sheets. Players can draw arrays to show the problem if they like, and they can add to their multiplication menus too. When both players are done, they review each other's work to make sure they agree.



Blackline NC S 37.7 Run 2 copies back-to-back for each player.

NAME Beckett DATE

Remainder Roundup Record Sheet

266

Blackline NC S 37.6 Remainder Roundup Card

8
10 38
20
7) 266
-140
126
-70
56
-56
0

× Menu

10 × 7 = 70
5 × ___ = 35
2 × 7 = 14
20 × 7 = 140

× Menu

10 × ___ =
5 × ___ =
2 × ___ =

× Menu

10 × ___ =
5 × ___ =
2 × ___ =

SCORECARD

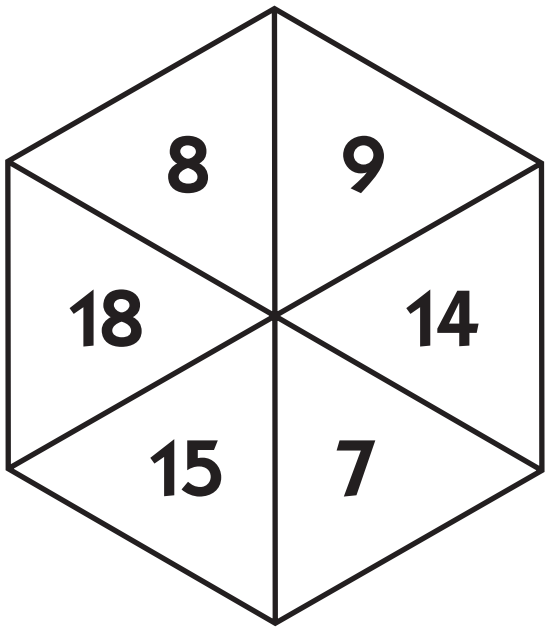
	Player 1	Player 2
Round 1		
Round 2		
Round 3		
Total		

7 Both players record on the scorecard the remainder for each player (if there is one). The remainder is the number of points each player scores for that round.

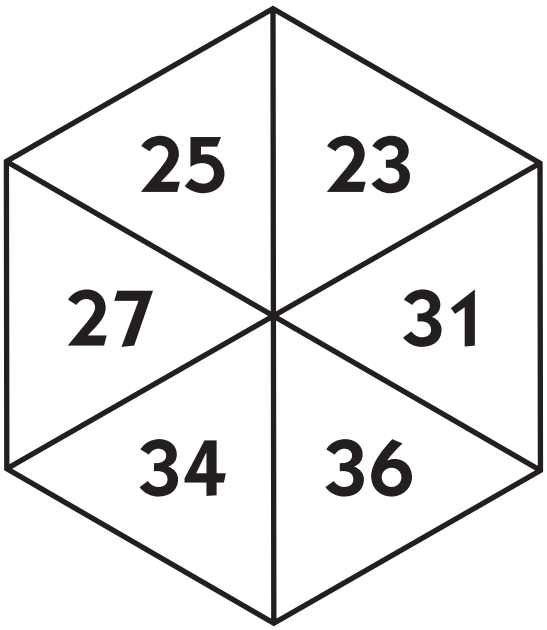
8 Repeat steps 3 to 7 to complete three rounds. Then add up the points for each player. The player with the most points wins.

9 Use the Challenge Spinner when you feel ready to work with larger numbers.

Remainder Roundup Spinner

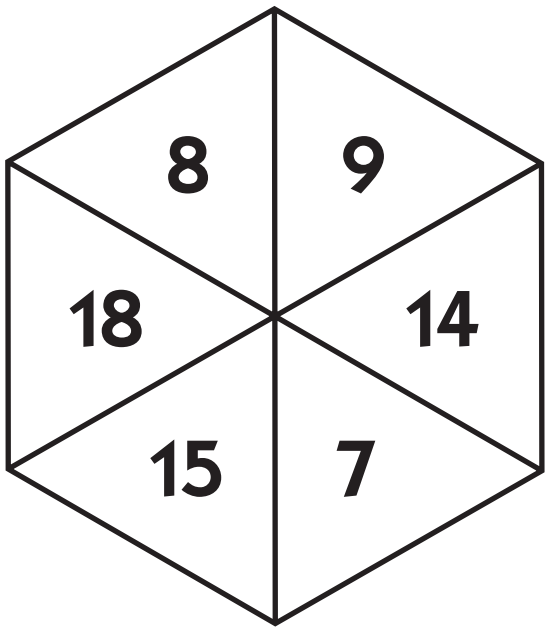


Regular

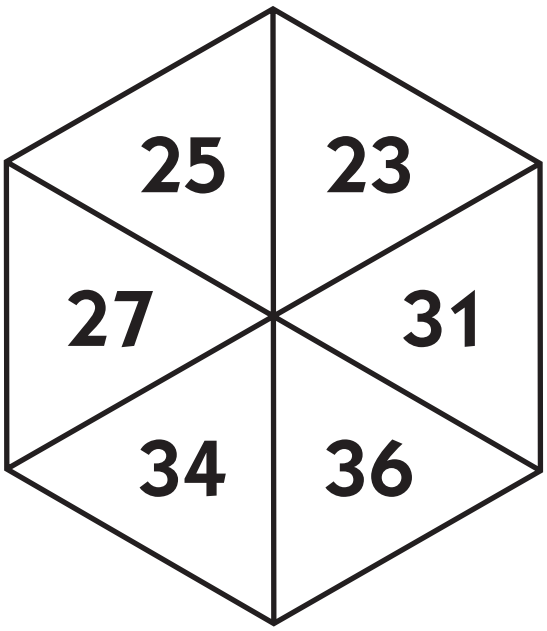


Challenge

Remainder Roundup Spinner



Regular



Challenge

Remainder Roundup Cards

424 **Blackline NC S 37.6** Remainder Roundup Card	**267** **Blackline NC S 37.6** Remainder Roundup Card	**350** **Blackline NC S 37.6** Remainder Roundup Card
321 **Blackline NC S 37.6** Remainder Roundup Card	**294** **Blackline NC S 37.6** Remainder Roundup Card	**179** **Blackline NC S 37.6** Remainder Roundup Card
218 **Blackline NC S 37.6** Remainder Roundup Card	**266** **Blackline NC S 37.6** Remainder Roundup Card	**175** **Blackline NC S 37.6** Remainder Roundup Card
337 **Blackline NC S 37.6** Remainder Roundup Card	**415** **Blackline NC S 37.6** Remainder Roundup Card	**356** **Blackline NC S 37.6** Remainder Roundup Card
183 **Blackline NC S 37.6** Remainder Roundup Card	**204** **Blackline NC S 37.6** Remainder Roundup Card	**203** **Blackline NC S 37.6** Remainder Roundup Card
226 **Blackline NC S 37.6** Remainder Roundup Card	**443** **Blackline NC S 37.6** Remainder Roundup Card	**372** **Blackline NC S 37.6** Remainder Roundup Card

NAME _____ **DATE** _____

Remainder Roundup Record Sheet

× Menu
10 × ____ =
5 × ____ =
2 × ____ =

× Menu
10 × ____ =
5 × ____ =
2 × ____ =

× Menu
10 × ____ =
5 × ____ =
2 × ____ =

SCORECARD		
	Player 1	Player 2
Round 1		
Round 2		
Round 3		
Total		

fact fluency

Fact Fluency Supplement Multiplication and Division

The Fact Fluency Supplement provides the kind of practice students need to become fluent with multiplication and related division facts, and is designed to complement any intermediate grade math program. You can assess students' fluency on a regular basis using Assessment 2: Quick Facts (pages 21–26), or you can use the Fact Fluency Supplement as a stand-alone resource if you prefer. The supplement contains a 6-page section for each multiplier from 2 through 12. The material in this supplement is based on accessible and effective strategies for learning and remembering multiplication and related division facts. The table below summarizes each for your reference.

MULTIPLICATION STRATEGIES			
Factor	**Category**	**Example**	**How the strategy works**
×2	doubles	2 × 6 = 12 9 × 2 = 18	To multiply any number by 2, double that number.
×3	doubles plus 1 set facts	3 × 6 = 18 9 × 3 = 27	To multiply any number by 3, double the number and then add that number. For example, 3 × 6 = (2 × 6) + 6, which equals 18.
×4	double-doubles	4 × 6 = 24 9 × 4 = 36	To multiply any number by 4, double that number and then double the result. For example, 4 × 6 = 2(2 × 6). This is equivalent to 2 × 12 = 24.
×5	half-decade facts	5 × 7 = 35 8 × 5 = 40	To multiply any number by 5, multiply by 10 first and divide the result by 2. For example, 5 × 7 = (10 × 7) ÷ 2. 10 × 7 = 70, and 70 ÷ 2= 35.
×6	triple then double facts	6 × 7 = 42 8 × 6 = 48	To multiply any number by 6, triple the number first and then double the result. For example, 6 × 7 = 2(3 × 7). 3 × 7 = 21, and 21 × 2 = 42.
×8	double-double-doubles	4 × 8 = 32 8 × 12 = 96	To multiply any number by 8, double the number 3 times. For example, 8 × 12 = (2(2(2 × 8))). 2 × 8 = 16, 2 × 16 = 32, and 2 × 32 = 64.
×9	decade minus 1 set facts	9 × 7 = 63 9 × 9 = 81	To multiply any number by 9, think of the related decade fact and then subtract 1 set of the number itself. For example, 9 × 7 = (10 × 7) – 7. (10 × 7) – 7 = 70 – 7, which is 63.
×10	decade facts	10 × 7 = 70 9 × 10 = 90	Multiplying by 10 comes naturally for students who have a solid grasp of skip counting and place value concepts.
×11	decade plus 1 set facts	11 × 3 = 33 8 × 11 = 88	To multiply any number by 11, think of the related 10's fact and then add 1 set of the number itself. For example, 11 × 9 = (10 × 9) + 9. (10 × 9) + 9 = 90 + 9, which is 99.
×12	decade plus 2 sets facts	12 × 5 = 60 7 × 12 = 84	To multiply any number by 12, think of the related 10's fact and then add 2 sets of the number itself. For example, 12 × 7 = (10 × 7) + (2 × 7). (10 × 7) + (2 × 7) = 70 + 14, which is 84.

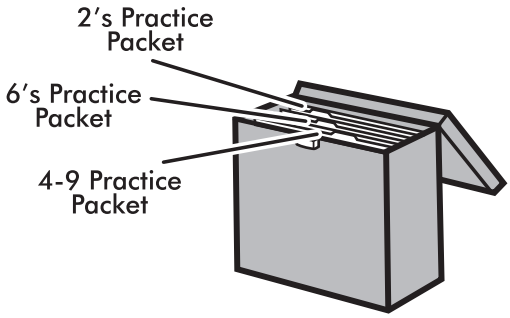
You'll notice that there is no explicit strategy for multiplying by 7. That's because all of the 7's facts, with the exception of 7 × 7, can be solved using the other strategies. Students will generate their own strategies for 7 × 7, for example, recalling that 7 × 5 is 35 and then adding 7 × 2 for a total of 49. Others may remember that 7 × 6 is 42 and add another 7 to get 49.

You'll notice too, that there are no explicit division strategies listed above. This is because students generally learn their division facts by remembering the related multiplication facts. The expression 56 ÷ 7, for instance, can be interpreted to mean, "How many 7's are there in 56?" This question is easily answered if one knows that 8 × 7 = 56. For this reason, every worksheet in this supplement pairs multiplication and division. In order to provide that extra boost many students need with division, however, this operation is featured on the game sheets throughout the supplement.

Fact Fluency Supplement Multiplication and Division (cont.)

The Fact Fluency Supplement contains a 6-page section for each multiplier from 2 through 12. For each multiplier, you'll find" 2 worksheets, 2 games, and a set of flashcards suitable for use at home or school. These materials are formatted in the same way for every multiplier, and each set refers to a strategy for multiplying by that number.

Depending on the needs of your class, you might run a copy of the entire supplement for each student to use throughout the year. Alternatively, you might run multiple copies of the sheets for each multiplier and each range of facts and keep them in labeled folders that are easily accessible to students. You can have students work on the packets at school during a designated time and/or take them home for practicing with a family member.



Fact Fluency Packets

NAME _____ DATE _____

Fact Fluency with 2's Multiplying & Dividing by 2

MULTIPLICATION FACT FLUENCY

Strategy	How It Works	Example
Doubles	To multiply any number by 2, double it.	What is 2 × 8? It's 8 doubled. 2 × 8 = 8 + 8 = 16

1 Multiply each number in the grid by 2. Write each product in the box. The first one is done for you.

5 10	7	3	9	11	8	12	6	2
10	8	11	1	9	5	0	12	4

2 Use the doubles strategy to help solve these combinations.

2 × 23 = _____ 2 × 34 = _____ 2 × 43 = _____ 2 × 52 = _____

$$\begin{array}{r} 28 \\ \times\ 2 \\ \hline \end{array} \qquad \begin{array}{r} 124 \\ \times\ 2 \\ \hline \end{array} \qquad \begin{array}{r} 2{,}300 \\ \times\ \ \ 2 \\ \hline \end{array}$$

3 Use what you know about multiplying by 2 to solve these division problems.

12 ÷ 2 = _____ 20 ÷ 2 = _____ 22 ÷ 2 = _____ 26 ÷ 2 = _____

$2\overline{)18}$ $2\overline{)14}$ $2\overline{)16}$ $2\overline{)24}$

NAME _____ DATE _____

Fact Fluency with 2's Practice Multiplying by 2 & 10

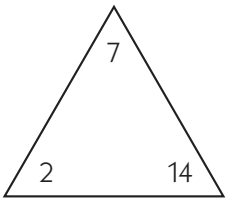
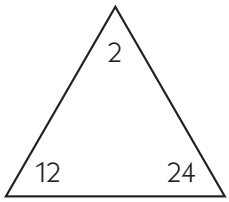
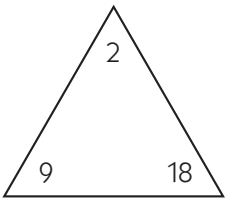
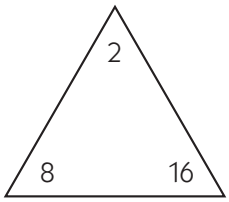
MULTIPLICATION FACT FLUENCY

1 Circle all the doubles (×2) in blue. Then go back and fill in the answers with regular pencil.

2 Circle all the decade facts (×10) in red. Then go back and fill in the answers with regular pencil.

5 × 2	3 × 10	12 × 2	10 × 2	1 × 10	4 × 2	15 × 2
3 × 2	6 × 10	11 × 2	13 × 2	7 × 10	8 × 2	34 × 2
9 × 2	7 × 2	5 × 10	25 × 2	9 × 10	6 × 2	17 × 2

3 Write two multiplication and two division facts for each set of numbers.

example	a	b	c
			
2 × 7 = 14	___ × ___ = ___	___ × ___ = ___	___ × ___ = ___
7 × 2 = 14	___ × ___ = ___	___ × ___ = ___	___ × ___ = ___
14 ÷ 7 = 2	___ ÷ ___ = ___	___ ÷ ___ = ___	___ ÷ ___ = ___
14 ÷ 2 = 7	___ ÷ ___ = ___	___ ÷ ___ = ___	___ ÷ ___ = ___

NAME _____ DATE _____

Fact Fluency with 2's Division Capture 2's & 10's

MULTIPLICATION FACT FLUENCY

You'll need

★ a partner

★ 2 pencils or markers in different colors

★ paperclip and pencil to use as a spinner

Instructions for Division Capture 2's & 10's

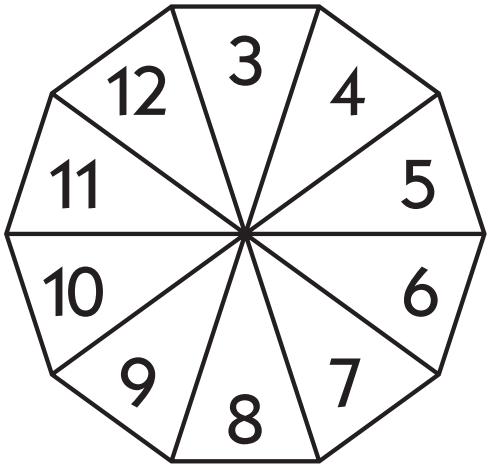
1 Take turns spinning the spinner. The player who gets the higher number goes first.

2 Take turns spinning the spinner. Use the number you spin to fill in the answer to one of the division problems below. Be sure to use your own color pencil.

3 If the box you need is already filled, you lose your turn.

4 Try to capture 3 or 4 boxes in a row: across, up and down, or diagonally. Keep playing until the gameboard is filled or neither player can use the number he or she spins 3 times in a row.

5 Then circle the places on the grid where you got 3 or 4 in a row and add up your scores.



100 ÷ 10	60 ÷ 10	80 ÷ 10	12 ÷ 2	50 ÷ 10	**Scoring** 3 in a Row—1 point 4 in a Row—2 points	
16 ÷ 2	120 ÷ 10	6 ÷ 2	70 ÷ 10	18 ÷ 2		
24 ÷ 2	110 ÷ 10	20 ÷ 2	40 ÷ 10	8 ÷ 2	**Player 1 Points**	**Player 2 Points**
14 ÷ 2	30 ÷ 10	90 ÷ 10	10 ÷ 2	22 ÷ 2		

NAME _____ DATE _____

Fact Fluency with 2's Flashcard Bingo 2's

MULTIPLICATION FACT FLUENCY

You'll need

★ a partner

★ one set of 2's flashcards and your flashcard pocket

★ marker or crayon for each player

Instructions for Flashcard Bingo 2's

1 Mix up one set of flashcards and arrange them so that the multiplication side is facing up on all of them. Put them in the flashcard pocket.

2 Take turns pulling 1 card. Each time, both players color the product on their board or mark it with an x.

3 The first player to get two rows of 4 going horizontally, vertically, or diagonally, wins.

4 Play the game a second time using the division side of your cards.

Game 1 ×

Player 1			
24	2	24	10
14	8	12	18
16	14	6	20
16	22	4	18

Player 2			
2	10	4	8
24	4	12	22
20	2	6	18
6	14	16	8

Game 2 ÷

Player 1			
12	4	12	8
9	11	7	3
1	6	10	11
5	10	2	9

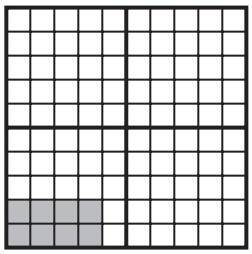
Player 2			
7	4	3	6
12	6	8	11
10	7	5	9
5	2	1	8

Fact Fluency with 2's Flashcards, page 1 of 2

- Cut out this set of 12 flashcards.
- Fold a 3-by-5 index card in half.
- Tape or staple both sides but leave the top open.
- Label this storage pocket with your name and the set number.

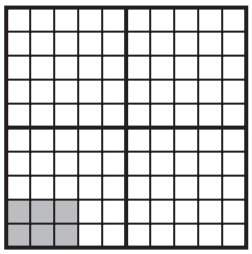
1 × 2 Blackline F 5	2 × 2 Blackline F 5	3 × 2 Blackline F 5	4 × 2 Blackline F 5
5 × 2 Blackline F 5	6 × 2 Blackline F 5	7 × 2 Blackline F 5	8 × 2 Blackline F 5
9 × 2 Blackline F 5	10 × 2 Blackline F 5	11 × 2 Blackline F 5	12 × 2 Blackline F 5

Fact Fluency with 2's Flashcards, page 2 of 2



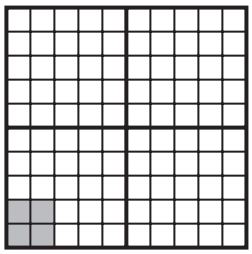
8 ÷ 2

Blackline F 6



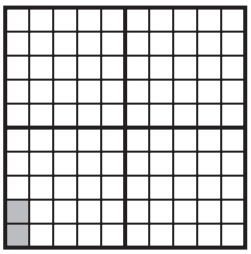
6 ÷ 2

Blackline F 6



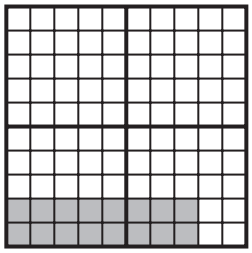
4 ÷ 2

Blackline F 6



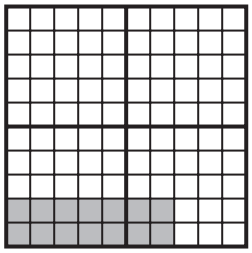
2 ÷ 2

Blackline F 6



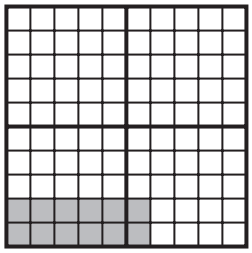
16 ÷ 2

Blackline F 6



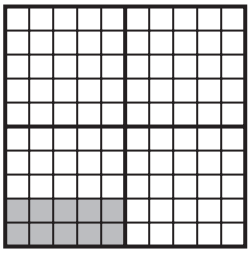
14 ÷ 2

Blackline F 6



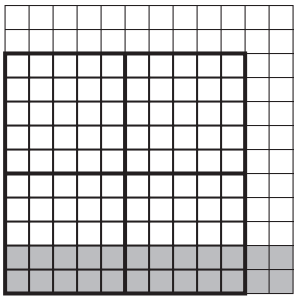
12 ÷ 2

Blackline F 6



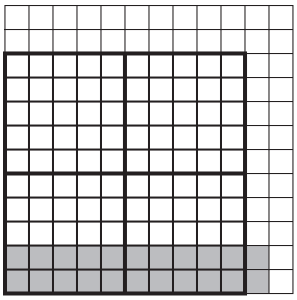
10 ÷ 2

Blackline F 6



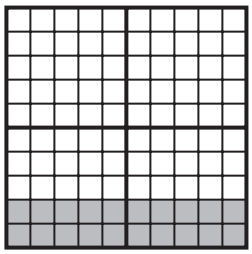
24 ÷ 2

Blackline F 6



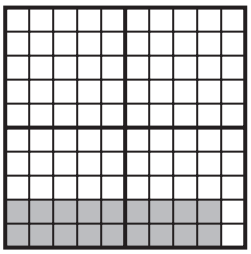
22 ÷ 2

Blackline F 6



20 ÷ 2

Blackline F 6



18 ÷ 2

Blackline F 6

NAME _____ DATE _____

Fact Fluency with 3's Multiplying & Dividing by 3

MULTIPLICATION FACT FLUENCY

Strategy	How It Works	Example
Doubles Plus One Set	To multiply any number by 3, double it and add one more set of that number.	What is 3 × 9? It's 9 doubled plus 9. 3 × 9 = (9 + 9) + 9 = 18 + 9 = 27

1 Multiply each number in the grid by 3. Write each product in the box. The first one is done for you.

5 15	7	3	9	11	8	12	6	2
10	8	11	1	9	5	0	12	4

2 Use the doubles plus one set strategy to help solve these combinations.

3 × 13 = _____ 3 × 24 = _____ 3 × 25 = _____ 3 × 33 = _____

$$\begin{array}{r} 52 \\ \times\ 3 \\ \hline \end{array} \qquad \begin{array}{r} 103 \\ \times\ 3 \\ \hline \end{array} \qquad \begin{array}{r} 310 \\ \times\ 3 \\ \hline \end{array}$$

3 Use what you know about multiplying by 3 to solve these division problems.

36 ÷ 3 = _____ 33 ÷ 3 = _____ 27 ÷ 3 = _____ 15 ÷ 3 = _____

$3\overline{)30}$ $3\overline{)21}$ $3\overline{)24}$ $3\overline{)18}$

NAME _____ DATE _____

Fact Fluency with 3's Practice Multiplying by 3 & 2

MULTIPLICATION FACT FLUENCY

1 Circle all the doubles plus one set facts (×3) in blue. Then go back and fill in the answers with regular pencil.

2 Circle all the doubles (×2) in red. Then go back and fill in the answers with regular pencil.

5 × 3 = ____	3 × 2 = ____	12 × 3 = ____	10 × 2 = ____	9 × 2 = ____	4 × 3 = ____	15 × 3 = ____
3 × 3 = ____	6 × 2 = ____	11 × 3 = ____	13 × 3 = ____	7 × 2 = ____	2 × 3 = ____	21 × 3 = ____
9 × 3 = ____	7 × 3 = ____	5 × 2 = ____	25 × 3 = ____	11 × 2 = ____	6 × 3 = ____	14 × 3 = ____

3 Write two multiplication and two division facts for each set of numbers.

a	b	c	d
3, 12, 36	21, 7, 3	9, 27, 3	3, 8, 24
____ × ____ = ____	____ × ____ = ____	____ × ____ = ____	____ × ____ = ____
____ × ____ = ____	____ × ____ = ____	____ × ____ = ____	____ × ____ = ____
____ ÷ ____ = ____	____ ÷ ____ = ____	____ ÷ ____ = ____	____ ÷ ____ = ____
____ ÷ ____ = ____	____ ÷ ____ = ____	____ ÷ ____ = ____	____ ÷ ____ = ____

NAME _____ DATE _____

Fact Fluency with 3's Division Capture 3's & 2's

MULTIPLICATION FACT FLUENCY

You'll need

★ a partner

★ 2 pencils or markers in different colors

★ paperclip and pencil to use as a spinner

Instructions for Division Capture 3's & 2's

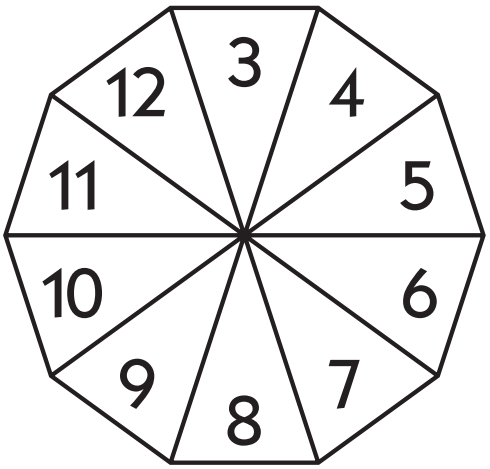
1 Take turns spinning the spinner. The player who gets the higher number goes first.

2 Take turns spinning the spinner. Usethe number you spin to fill in the answerto one of the division problems below. Be sure to use your own color pencil.

3 If the box you need is already filled, you lose your turn.

4 Try to capture 3 or 4 boxes in a row: across, up and down, or diagonally. Keep playing until the gameboard is filled or neither player can use the number he or she spins 3 times in a row.

5 Then circle the places on the grid where you got 3 or 4 in a row and add up your scores.



21 ÷ 3	8 ÷ 2	33 ÷ 3	18 ÷ 2	12 ÷ 3	**Scoring** 3 in a Row—1 point 4 in a Row—2 points	
16 ÷ 2	24 ÷ 3	6 ÷ 2	9 ÷ 3	20 ÷ 2		
18 ÷ 3	24 ÷ 2	36 ÷ 3	10 ÷ 2	30 ÷ 3	**Player 1 Points**	**Player 2 Points**
14 ÷ 2	15 ÷ 3	22 ÷ 2	27 ÷ 3	12 ÷ 2		

NAME _____ DATE _____

Fact Fluency with 3's Flashcard Bingo 3's

MULTIPLICATION FACT FLUENCY

You'll need

★ a partner

★ one set of 3's flashcards and your flashcard pocket

★ marker or crayon for each player

Instructions for Flashcard Bingo 3's

1 Mix up one set of flashcards and arrange them so that the multiplication side is facing up on all of them. Put them in the flashcard pocket.

2 Take turns pulling 1 card. Each time, both players color the product on their board or mark it with an x.

3 The first player to get two rows of 4 going horizontally, vertically, or diagonally, wins.

4 Play the game a second time using the division side of your cards.

Game 1 ×

Player 1			
24	3	36	15
21	12	18	27
36	21	9	30
24	33	6	18

Player 2			
3	15	6	12
36	6	18	33
30	3	9	27
9	21	24	12

Game 2 ÷

Player 1			
7	4	3	6
12	6	8	11
10	7	5	9
5	2	1	8

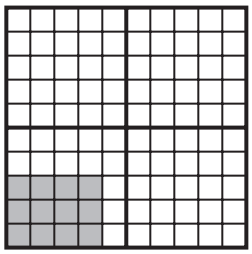
Player 2			
12	4	12	8
9	11	7	3
1	6	10	11
5	10	2	9

Fact Fluency with 3's Flashcards, page 1 of 2

- Cut out this set of 12 flashcards.
- Fold a 3-by-5 index card in half.
- Tape or staple both sides but leave the top open.
- Label this storage pocket with your name and the set number.

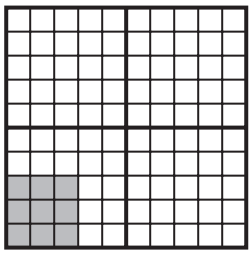
1 × 3 Blackline F 11	2 × 3 Blackline F 11	3 × 3 Blackline F 11	4 × 3 Blackline F 11
5 × 3 Blackline F 11	6 × 3 Blackline F 11	7 × 3 Blackline F 11	8 × 3 Blackline F 11
9 × 3 Blackline F 11	10 × 3 Blackline F 11	11 × 3 Blackline F 11	12 × 3 Blackline F 11

Fact Fluency with 3's Flashcards, page 2 of 2



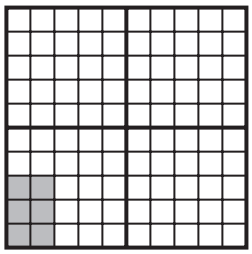
12 ÷ 3

Blackline F 12



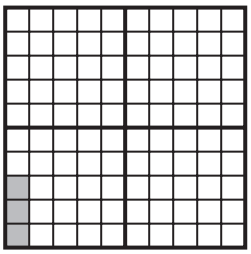
9 ÷ 3

Blackline F 12



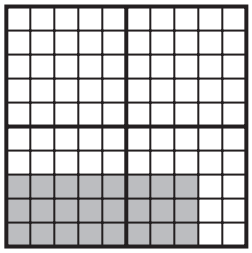
6 ÷ 3

Blackline F 12



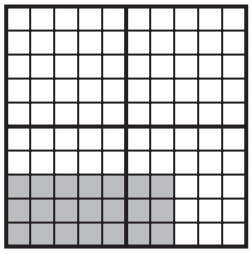
3 ÷ 3

Blackline F 12



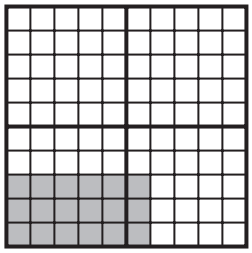
24 ÷ 3

Blackline F 12



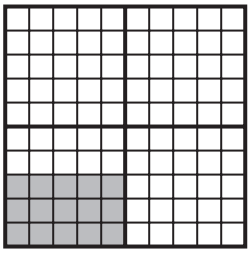
21 ÷ 3

Blackline F 12



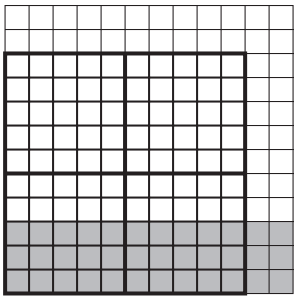
18 ÷ 3

Blackline F 12



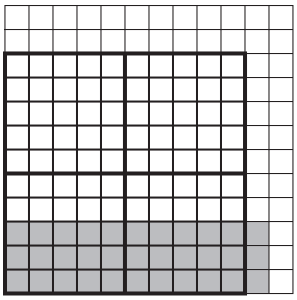
15 ÷ 3

Blackline F 12



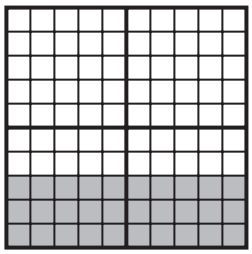
36 ÷ 3

Blackline F 12



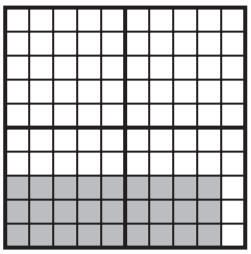
33 ÷ 3

Blackline F 12



30 ÷ 3

Blackline F 12



27 ÷ 3

Blackline F 12

NAME _____ DATE _____

Fact Fluency with 4's Multiplying & Dividing by 4

MULTIPLICATION FACT FLUENCY

Strategy	How It Works	Example
Double-Doubles	To multiply any number by 4, double it and then double the result.	What is 4 × 7? It's 7 doubled twice. Double once: 7 + 7 = 14 Double twice: 14 + 14 = 28

1 Multiply each number in the grid by 4. Write each product in the box. The first one is done for you.

5 20	7	3	9	11	8	12	6	2
10	8	11	1	9	5	0	12	4

2 Use the double-doubles strategy to help solve these combinations.

4 × 14 = _____ 4 × 24 = _____ 4 × 45 = _____ 4 × 50 = _____

$$\begin{array}{r} 25 \\ \times\ 4 \\ \hline \end{array} \qquad \begin{array}{r} 125 \\ \times\ 4 \\ \hline \end{array} \qquad \begin{array}{r} 220 \\ \times\ 4 \\ \hline \end{array}$$

3 Use what you know about multiplying by 4 to solve these division problems.

24 ÷ 4 = _____ 40 ÷ 4 = _____ 36 ÷ 4 = _____ 28 ÷ 4 = _____

$4\overline{)44}$ $4\overline{)20}$ $4\overline{)32}$ $4\overline{)48}$

NAME _____ DATE _____

Fact Fluency with 4's Practice Mulitplying by 4 & 2

MULTIPLICATION FACT FLUENCY

1 Circle all the double-doubles (×4) in blue. Then go back and fill in the answers with regular pencil.

2 Circle all the doubles (×2) in red. Then go back and fill in the answers with regular pencil.

5 × 4 ____	13 × 2 ____	12 × 4 ____	12 × 2 ____	9 × 2 ____	4 × 4 ____	15 × 4 ____
9 × 4 ____	26 × 2 ____	5 × 4 ____	25 × 4 ____	11 × 2 ____	6 × 4 ____	14 × 4 ____
9 × 4 ____	7 × 4 ____	125 × 2 ____	31 × 4 ____	144 × 2 ____	6 × 4 ____	8 × 4 ____

3 Write two multiplication and two division facts for each set of numbers.

a	b	c	d
4, 9, 36	48, 12, 4	8, 4, 32	28, 7, 4
____ × ____ = ____	____ × ____ = ____	____ × ____ = ____	____ × ____ = ____
____ × ____ = ____	____ × ____ = ____	____ × ____ = ____	____ × ____ = ____
____ ÷ ____ = ____	____ ÷ ____ = ____	____ ÷ ____ = ____	____ ÷ ____ = ____
____ ÷ ____ = ____	____ ÷ ____ = ____	____ ÷ ____ = ____	____ ÷ ____ = ____

NAME _____ DATE _____

Fact Fluency with 4's Division Capture 4's & 2's

MULTIPLICATION FACT FLUENCY

You'll need

★ a partner

★ 2 pencils or markers in different colors

★ paperclip and pencil to use as a spinner

Instructions for Division Capture 4's & 2's

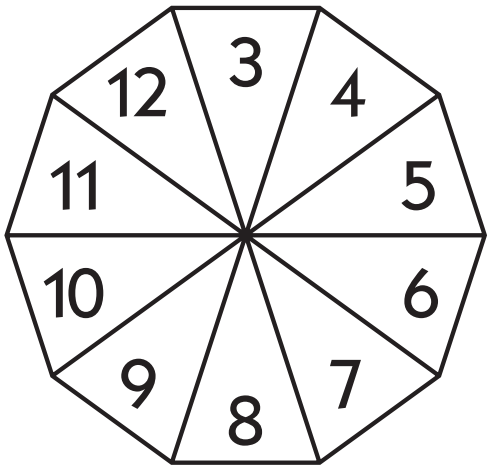
1 Take turns spinning the spinner. The player who gets the higher number goes first.

2 Take turns spinning the spinner. Use the number you spin to fill in the answer to one of the division problems below. Be sure to use your own color pencil.

3 If the box you need is already filled, you lose your turn.

4 Try to capture 3 or 4 boxes in a row: across, up and down, or diagonally. Keep playing until the gameboard is filled or neither player can use the number he or she spins 3 times in a row.

5 Then circle the places on the grid where you got 3 or 4 in a row and add up your scores.



12 ÷ 4	36 ÷ 4	48 ÷ 4	12 ÷ 2	28 ÷ 4	**Scoring** 3 in a Row—1 point 4 in a Row—2 points	
16 ÷ 2	16 ÷ 4	6 ÷ 2	32 ÷ 4	18 ÷ 2		
24 ÷ 2	40 ÷ 4	20 ÷ 2	20 ÷ 4	8 ÷ 2	**Player 1 Points**	**Player 2 Points**
14 ÷ 2	24 ÷ 4	44 ÷ 4	10 ÷ 2	22 ÷ 2		

NAME _____ DATE _____

Fact Fluency with 4's Flashcard Bingo 4's

MULTIPLICATION FACT FLUENCY

You'll need

★ a partner

★ one set of 4's flashcards and your flashcard pocket

★ marker or crayon for each player

Instructions for Flashcard Bingo 4's

1 Mix up one set of flashcards and arrange them so that the multiplication side is facing up on all of them. Put them in the flashcard pocket.

2 Take turns pulling 1 card. Each time, both players color the product on their board or mark it with an x.

3 The first player to get two rows of 4 going horizontally, vertically, or diagonally, wins.

4 Play the game a second time using the division side of your cards.

Game 1 ×

Player 1			
4	20	16	8
48	8	24	44
40	4	12	36
24	28	16	32

Player 2			
24	4	28	40
28	16	12	32
36	24	48	20
32	44	8	36

Game 2 ÷

Player 1			
1	6	10	1
5	10	2	9
12	4	12	8
9	11	7	3

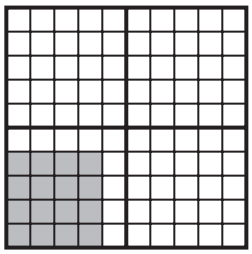
Player 2			
3	6	7	4
8	11	12	6
5	9	10	7
1	8	5	2

Fact Fluency with 4's Flashcards, page 1 of 2

- Cut out this set of 12 flashcards.
- Fold a 3-by-5 index card in half.
- Tape or staple both sides but leave the top open.
- Label this storage pocket with your name and the set number.

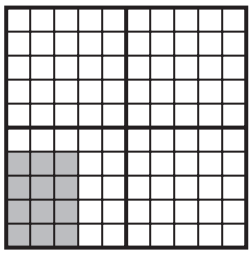
1 × 4 Blackline F 17	2 × 4 Blackline F 17	3 × 4 Blackline F 17	4 × 4 Blackline F 17
5 × 4 Blackline F 17	6 × 4 Blackline F 17	7 × 4 Blackline F 17	8 × 4 Blackline F 17
9 × 4 Blackline F 17	10 × 4 Blackline F 17	11 × 4 Blackline F 17	12 × 4 Blackline F 17

Fact Fluency with 4's Flashcards, page 2 of 2



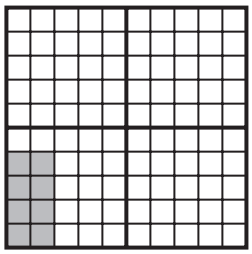
16 ÷ 4

Blackline F 18



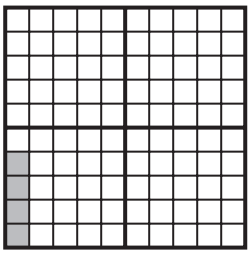
12 ÷ 4

Blackline F 18



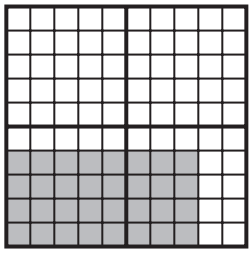
8 ÷ 4

Blackline F 18



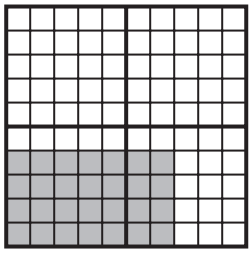
4 ÷ 4

Blackline F 18



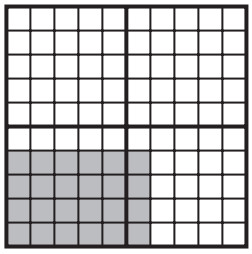
32 ÷ 4

Blackline F 18



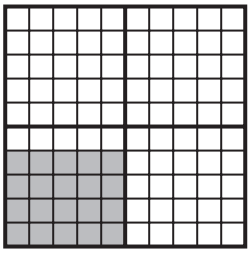
28 ÷ 4

Blackline F 18



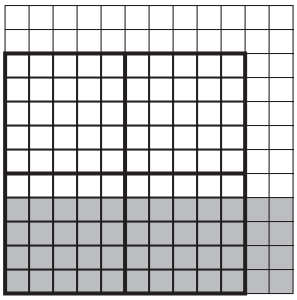
24 ÷ 4

Blackline F 18



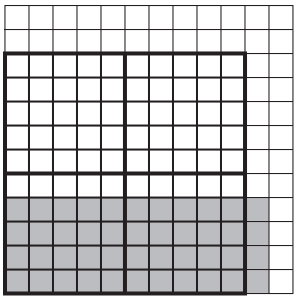
20 ÷ 4

Blackline F 18



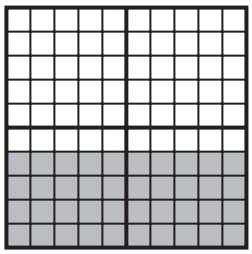
48 ÷ 4

Blackline F 18



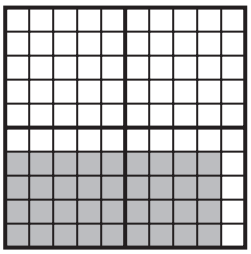
44 ÷ 4

Blackline F 18



40 ÷ 4

Blackline F 18



36 ÷ 4

Blackline F 18

NAME _____ DATE _____

Fact Fluency with 5's Multiplying & Dividing by 5

MULTIPLICATION FACT FLUENCY

Strategy	How It Works	Example
Half-Decade	To multiply any number by 5, multiply it by 10 first and then divide the answer in half.	What is 5 × 8? It's 10 × 8 divided in half. 5 × 8 = (10 × 8) ÷ 2 = 80 ÷ 2 = 40

1 Multiply each number in the grid by 5. Write each product in the box. The first one is done for you.

25 5	7	3	9	11	8	12	6	2
10	8	11	1	9	5	0	12	4

2 Use the half-decade strategy to help solve these combinations.

5 × 15 = _____ 5 × 20 = _____ 5 × 25 = _____ 5 × 45 = _____

$$\begin{array}{r} 30 \\ \times\ 5 \\ \hline \end{array} \qquad \begin{array}{r} 80 \\ \times\ 5 \\ \hline \end{array} \qquad \begin{array}{r} 30 \\ \times\ 5 \\ \hline \end{array}$$

3 Use what you know about multiplying by 5 to solve these division problems.

30 ÷ 5 = _____ 45 ÷ 5 = _____ 55 ÷ 5 = _____ 35 ÷ 5 = _____

$5\overline{)50}$ $5\overline{)40}$ $5\overline{)25}$ $5\overline{)60}$

NAME _____ DATE _____

Fact Fluency with 5's Practice Multiplying by 5 & 10

MULTIPLICATION FACT FLUENCY

1 Circle all the half-decade facts (×5) in blue. Then go back and fill in the answers with regular pencil.

2 Circle all the decade facts (×10) in red. Then go back and fill in the answers with regular pencil.

1 × 5	5 × 5	12 × 10	10 × 5	9 × 10	4 × 10	15 × 10
9 × 5	2 × 5	6 × 5	14 × 5	11 × 5	6 × 10	20 × 5
4 × 5	7 × 5	23 × 5	25 × 10	12 × 10	7 × 10	12 × 5

3 Write two multiplication and two division facts for each set of numbers.

a	b	c	d
5, 8, 40	5, 12, 60	9, 5, 45	7, 5, 35
____ × ____ = ____	____ × ____ = ____	____ × ____ = ____	____ × ____ = ____
____ × ____ = ____	____ × ____ = ____	____ × ____ = ____	____ × ____ = ____
____ ÷ ____ = ____	____ ÷ ____ = ____	____ ÷ ____ = ____	____ ÷ ____ = ____
____ ÷ ____ = ____	____ ÷ ____ = ____	____ ÷ ____ = ____	____ ÷ ____ = ____

NAME _____ DATE _____

Fact Fluency with 5's Division Capture 5's & 10's

MULTIPLICATION FACT FLUENCY

You'll need

★ a partner

★ 2 pencils or markers in different colors

★ paperclip and pencil to use as a spinner

Instructions for Division Capture 5's & 10's

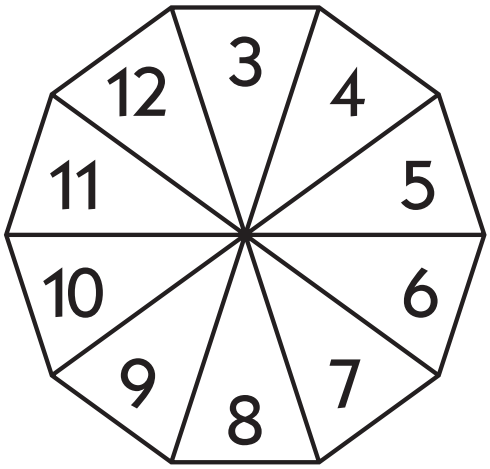
1 Take turns spinning the spinner. The player who gets the higher number goes first.

2 Take turns spinning the spinner. Usethe number you spin to fill in the answer to one of the division problems below. Be sure to use your own color pencil.

3 If the box you need is already filled, you lose your turn.

4 Try to capture 3 or 4 boxes in a row: across, up and down, or diagonally. Keep playing until the gameboard is filled or neither player can use the number he or she spins 3 times in a row.

5 Then circle the places on the grid where you got 3 or 4 in a row and add up your scores.



15 ÷ 5	50 ÷ 5	60 ÷ 5	60 ÷ 10	35 ÷ 5	**Scoring** 3 in a Row—1 point 4 in a Row—2 points	
80 ÷ 10	20 ÷ 5	30 ÷ 10	55 ÷ 5	90 ÷ 10		
120 ÷ 10	40 ÷ 5	100 ÷ 10	30 ÷ 5	40 ÷ 10	**Player 1 Points**	**Player 2 Points**
70 ÷ 10	25 ÷ 5	45 ÷ 5	50 ÷ 5	110 ÷ 10		

NAME _____ DATE _____

Fact Fluency with 5's Flashcard Bingo 5's

MULTIPLICATION FACT FLUENCY

You'll need

★ a partner

★ one set of 5's flashcards and your flashcard pocket

★ marker or crayon for each player

Instructions for Flashcard Bingo 5's

1 Mix up one set of flashcards and arrange them so that the multiplication side is facing up on all of them. Put them in the flashcard pocket.

2 Take turns pulling 1 card. Each time, both players color the product on their board or mark it with an x.

3 The first player to get two rows of 4 going horizontally, vertically, or diagonally, wins.

4 Play the game a second time using the division side of your cards.

Game 1 ×

Player 1			
5	25	20	10
60	10	25	55
50	5	15	45
30	35	20	40

Player 2			
30	5	35	50
35	20	15	40
45	30	60	20
40	55	10	45

Game 2 ÷

Player 1			
3	6	7	4
8	11	12	6
5	9	10	7
1	8	5	2

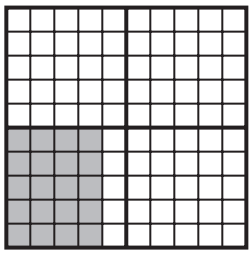
Player 2			
1	6	11	10
5	10	9	2
12	4	8	12
9	11	3	7

Fact Fluency with 5's Flashcards, page 1 of 2

- Cut out this set of 12 flashcards.
- Fold a 3-by-5 index card in half.
- Tape or staple both sides but leave the top open.
- Label this storage pocket with your name and the set number.

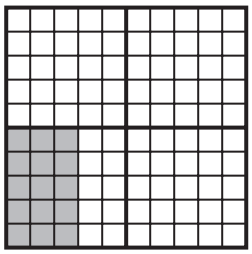
1 × 5 Blackline F 23	2 × 5 Blackline F 23	3 × 5 Blackline F 23	4 × 5 Blackline F 23
5 × 5 Blackline F 23	6 × 5 Blackline F 23	7 × 5 Blackline F 23	8 × 5 Blackline F 23
9 × 5 Blackline F 23	10 × 5 Blackline F 23	11 × 5 Blackline F 23	12 × 5 Blackline F 23

Fact Fluency with 5's Flashcards, page 2 of 2



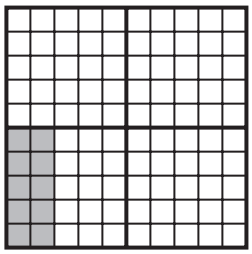
20 ÷ 5

Blackline F 24



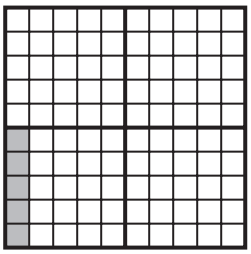
15 ÷ 5

Blackline F 24



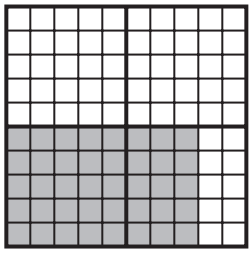
10 ÷ 5

Blackline F 24



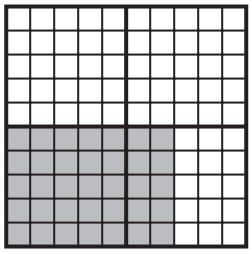
5 ÷ 5

Blackline F 24



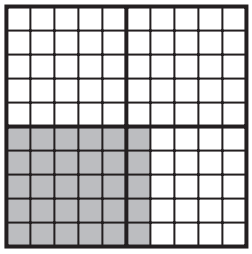
40 ÷ 5

Blackline F 24



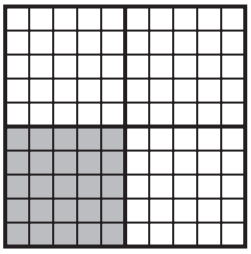
35 ÷ 5

Blackline F 24



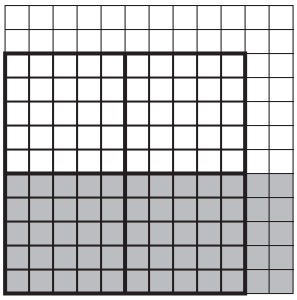
30 ÷ 5

Blackline F 24



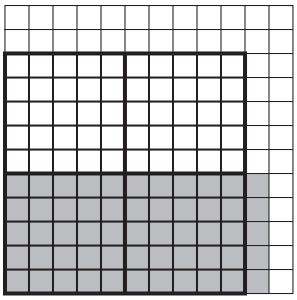
25 ÷ 5

Blackline F 24



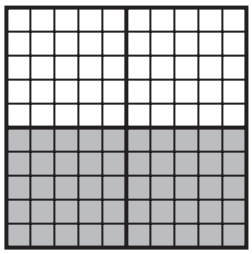
60 ÷ 5

Blackline F 24



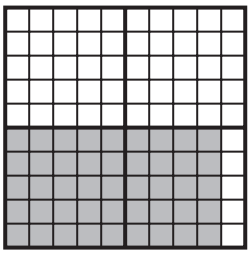
55 ÷ 5

Blackline F 24



50 ÷ 5

Blackline F 24



45 ÷ 5

Blackline F 24

NAME _____ DATE _____

Fact Fluency with 6's Multiplying & Dividing by 6

MULTIPLICATION FACT FLUENCY

Strategy	How It Works	Example
Triple Then Double	To multiply any number by 6, triple the number and then double the answer.	What is 6 × 8? It's 8 tripled, then doubled. Triple first: 8 + 8 + 8 = 24 Then double: 24 + 24 = 48

1 Multiply each number in the grid by 6. Write each product in the box. The first one is done for you.

5 30	7	3	9	11	8	12	6	2
10	8	11	1	9	5	0	12	4

2 Use the triple then double strategy to help solve these combinations.

6 × 15 = _____ 6 × 20 = _____ 6 × 33 = _____ 6 × 50 = _____

$$\begin{array}{r} 25 \\ \times\ 6 \\ \hline \end{array} \qquad \begin{array}{r} 150 \\ \times\ 6 \\ \hline \end{array} \qquad \begin{array}{r} 30 \\ \times\ 6 \\ \hline \end{array}$$

3 Use what you know about multiplying by 6 to solve these division problems.

42 ÷ 6 = _____ 54 ÷ 6 = _____ 36 ÷ 6 = _____ 60 ÷ 6 = _____

$6\overline{)72}$ $6\overline{)48}$ $6\overline{)66}$ $6\overline{)30}$

NAME _____ DATE _____

Fact Fluency with 6's Practice Multiplying by 6 & 5

MULTIPLICATION FACT FLUENCY

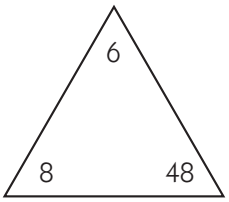
1 Circle all the triple then double facts (×6) in blue. Then go back and fill in the answers with regular pencil.

2 Circle all the half-decade facts (×5) in red. Then go back and fill in the answers with regular pencil.

9 × 6 = ____	2 × 6 = ____	6 × 6 = ____	8 × 6 = ____	11 × 6 = ____	7 × 5 = ____	24 × 5 = ____
2 × 6 = ____	5 × 6 = ____	12 × 6 = ____	10 × 6 = ____	9 × 6 = ____	3 × 6 = ____	12 × 5 = ____
4 × 6 = ____	7 × 6 = ____	9 × 5 = ____	11 × 5 = ____	12 × 6 = ____	7 × 5 = ____	12 × 6 = ____

3 Write two multiplication and two division facts for each set of numbers.

a



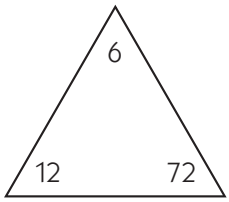
____ × ____ = ____

____ × ____ = ____

____ ÷ ____ = ____

____ ÷ ____ = ____

b



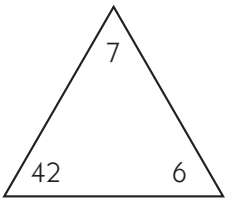
____ × ____ = ____

____ × ____ = ____

____ ÷ ____ = ____

____ ÷ ____ = ____

c



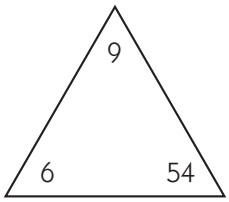
____ × ____ = ____

____ × ____ = ____

____ ÷ ____ = ____

____ ÷ ____ = ____

d



____ × ____ = ____

____ × ____ = ____

____ ÷ ____ = ____

____ ÷ ____ = ____

NAME _____ DATE _____

Fact Fluency with 6's Division Capture 6's & 5's

MULTIPLICATION FACT FLUENCY

You'll need

★ a partner

★ 2 pencils or markers in different colors

★ paperclip and pencil to use as a spinner

Instructions for Division Capture 6's & 5's

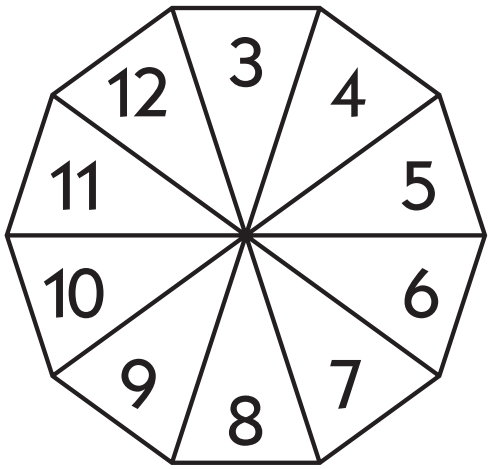
1 Take turns spinning the spinner. The player who gets the higher number goes first.

2 Take turns spinning the spinner. Use the number you spin to fill in the answer to one of the division problems below. Be sure to use your own color pencil.

3 If the box you need is already filled, you lose your turn.

4 Try to capture 3 or 4 boxes in a row: across, up and down, or diagonally. Keep playing until the gameboard is filled or neither player can use the number he or she spins 3 times in a row.

5 Then circle the places on the grid where you got 3 or 4 in a row and add up your scores.



15 ÷ 5	50 ÷ 5	60 ÷ 5	36 ÷ 6	35 ÷ 5	**Scoring** 3 in a Row—1 point 4 in a Row—2 points	
48 ÷ 6	20 ÷ 5	18 ÷ 6	55 ÷ 5	54 ÷ 6		
72 ÷ 6	40 ÷ 5	60 ÷ 6	30 ÷ 5	24 ÷ 6	**Player 1 Points**	**Player 2 Points**
42 ÷ 6	25 ÷ 5	45 ÷ 5	30 ÷ 6	66 ÷ 6		

NAME _____ DATE _____

Fact Fluency with 6's Flashcard Bingo 6's

MULTIPLICATION FACT FLUENCY

You'll need

★ a partner

★ one set of 6's flashcards and your flashcard pocket

★ marker or crayon for each player

Instructions for Flashcard Bingo 6's

1 Mix up one set of flashcards and arrange them so that the multiplication side is facing up on all of them. Put them in the flashcard pocket.

2 Take turns pulling 1 card. Each time, both players color the product on their board or mark it with an x.

3 The first player to get two rows of 4 going horizontally, vertically, or diagonally, wins.

4 Play the game a second time using the division side of your cards.

Game 1 ×

Player 1			
54	30	72	36
48	66	12	54
36	6	42	60
42	24	18	48

Player 2			
24	12	6	30
30	66	72	12
18	54	60	6
42	48	36	18

Game 2 ÷

Player 1			
1	6	11	10
5	10	9	2
12	4	8	12
9	11	3	7

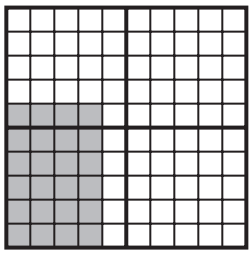
Player 2			
3	6	7	4
8	11	12	6
5	9	10	7
1	8	5	2

Fact Fluency with 6's Flashcards, page 1 of 2

- Cut out this set of 12 flashcards.
- Fold a 3-by-5 index card in half.
- Tape or staple both sides but leave the top open.
- Label this storage pocket with your name and the set number.

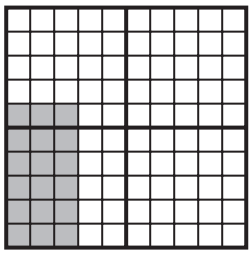
1 × 6 Blackline F 29	2 × 6 Blackline F 29	3 × 6 Blackline F 29	4 × 6 Blackline F 29
5 × 6 Blackline F 29	6 × 6 Blackline F 29	7 × 6 Blackline F 29	8 × 6 Blackline F 29
9 × 6 Blackline F 29	10 × 6 Blackline F 29	11 × 6 Blackline F 29	12 × 6 Blackline F 29

Fact Fluency with 6's Flashcards, page 2 of 2



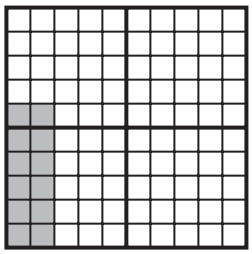
24 ÷ 6

Blackline F 30



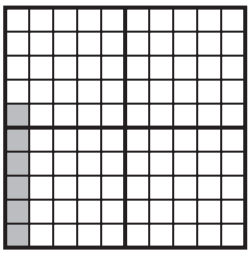
18 ÷ 6

Blackline F 30



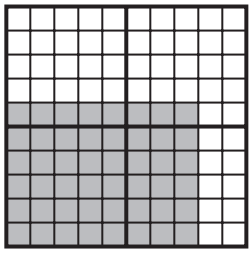
12 ÷ 6

Blackline F 30



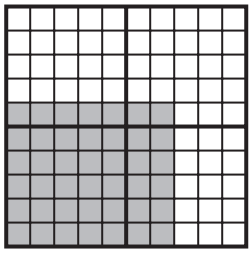
6 ÷ 6

Blackline F 30



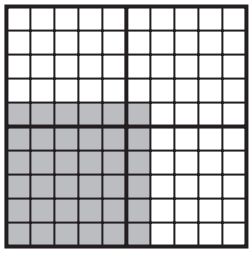
48 ÷ 6

Blackline F 30



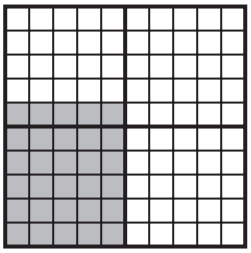
42 ÷ 6

Blackline F 30



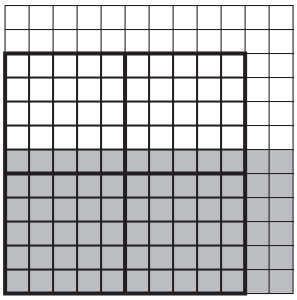
36 ÷ 6

Blackline F 30



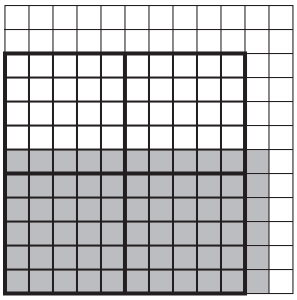
30 ÷ 6

Blackline F 30



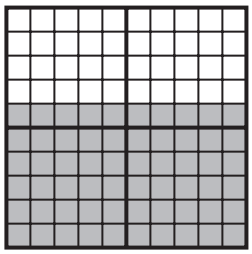
72 ÷ 6

Blackline F 30



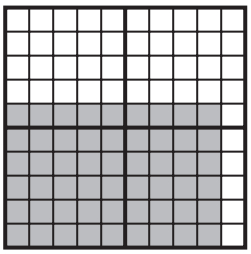
66 ÷ 6

Blackline F 30



60 ÷ 6

Blackline F 30



54 ÷ 6

Blackline F 30

NAME _____ DATE _____

Fact Fluency with 7's Multiplying & Dividing by 7

MULTIPLICATION FACT FLUENCY

Strategy	How It Works	Example
Turn-Around and Learn One More Fact	To multiply any number by 7, remember the other facts you know and turn them around. Remember that $7 \times 4 = 4 \times 7$ $7 \times 9 = 9 \times 7$ and so on. Then learn one more: $7 \times 7 = 49$	What is 7×8? It's exactly the same as 8×7. You can remember the answer or use the double-double-doubles strategy to find it. $7 \times 8 = 8 \times 7$ 8×7 is 7 doubled 3 times. Double once: $7 + 7 = 14$ Double twice: $14 + 14 = 28$ Double three times: $28 + 28 = 56$

1 Multiply each number in the grid by 7. Write each product in the box. The first one is done for you.

5 35	7	3	9	11	8	12	6	2
10	8	11	1	9	5	0	12	4

2 Use what you know about multiplying by 7 to solve these division problems.

$35 \div 7 =$ _____ $28 \div 7 =$ _____ $77 \div 7 =$ _____ $63 \div 7 =$ _____

$21 \div 7 =$ _____ $70 \div 7 =$ _____ $7\overline{)7}$ $7\overline{)56}$

$7\overline{)49}$ $7\overline{)84}$ $7\overline{)42}$ $7\overline{)14}$

NAME _____ DATE _____

Fact Fluency with 7's Practice Multiplying by 7 & 8

MULTIPLICATION FACT FLUENCY

1 Circle all the turn around and learn one more facts (×7) in blue. Then go back and fill in the answers with regular pencil.

2 Circle all the double-double-doubles (×8) in red. Then go back and fill in the answers with regular pencil.

5 × 7 ____	2 × 8 ____	12 × 7 ____	12 × 8 ____	9 × 8 ____	4 × 7 ____	7 × 7 ____
9 × 7 ____	7 × 8 ____	5 × 7 ____	6 × 7 ____	11 × 8 ____	8 × 7 ____	5 × 8 ____
9 × 7 ____	7 × 7 ____	3 × 8 ____	9 × 7 ____	4 × 8 ____	6 × 7 ____	3 × 7 ____

3 Write two multiplication and two division facts for each set of numbers.

a	b	c	d
7, 63, 9	42, 7, 6	8, 56, 7	7, 12, 84
____ × ____ = ____	____ × ____ = ____	____ × ____ = ____	____ × ____ = ____
____ × ____ = ____	____ × ____ = ____	____ × ____ = ____	____ × ____ = ____
____ ÷ ____ = ____	____ ÷ ____ = ____	____ ÷ ____ = ____	____ ÷ ____ = ____
____ ÷ ____ = ____	____ ÷ ____ = ____	____ ÷ ____ = ____	____ ÷ ____ = ____

NAME _____ DATE _____

Fact Fluency with 7's Missing Number Capture 7's & 8's

MULTIPLICATION FACT FLUENCY

You'll need

★ a partner

★ 2 pencils or markers in different colors

★ paperclip and pencil to use as a spinner

Instructions for Missing Number Capture 7's & 8's

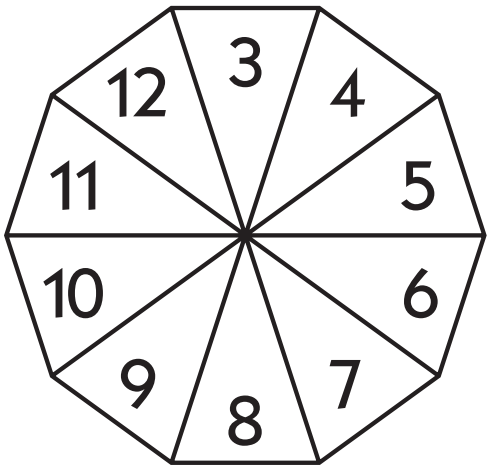
1 Take turns spinning the spinner. The player who gets the higher number goes first.

2 Take turns spinning the spinner. Use the number you spin to complete one of the problems below. Be sure to use your own color pencil.

3 If the box you need is already filled, you lose your turn.

4 Try to capture 3 or 4 boxes in a row: across, up and down, or diagonally. Keep playing until the gameboard is filled or neither player can use the number he or she spins 3 times in a row.

5 Then circle the places on the grid where you got 3 or 4 in a row and add up your scores.



$\square$) 21 (7	$\square$) 70 (7	7 × $\square$ = 84	$\square$) 32 (8	$\square$) 49 (7	**Scoring** 3 in a Row—1 point 4 in a Row—2 points	
$\square$ × 8 = 64	$\square$) 28 (7	8 × $\square$ = 24	$\square$) 77 (7	8 × $\square$ = 72		
$\square$) 48 (8	$\square$) 56 (7	$\square$) 80 (8	$\square$ × 7 = 42	$\square$) 88 (8	**Player 1 Points**	**Player 2 Points**
8 × $\square$ = 96	$\square$) 35 (7	$\square$) 63 (7	$\square$) 40 (8	8 × $\square$ = 56		

NAME _____ DATE _____

Fact Fluency with 7's Flashcard Bingo 7's

MULTIPLICATION FACT FLUENCY

You'll need

★ a partner

★ one set of 7's flashcards and your flashcard pocket

★ marker or crayon for each player

Instructions for Flashcard Bingo 7's

1 Mix up one set of flashcards and arrange them so that the multiplication side is facing up on all of them. Put them in the flashcard pocket.

2 Take turns pulling 1 card. Each time, both players color the product on their board or mark it with an x.

3 The first player to get two rows of 4 going horizontally, vertically, or diagonally, wins.

4 Play the game a second time using the division side of your cards.

Game 1 ×

Player 1			
84	35	63	42
56	77	14	63
42	7	49	70
49	28	21	56

Player 2			
21	14	7	35
35	77	63	14
28	84	70	7
49	56	42	28

Game 2 ÷

Player 1			
8	12	12	4
3	7	9	11
11	10	1	6
9	2	5	10

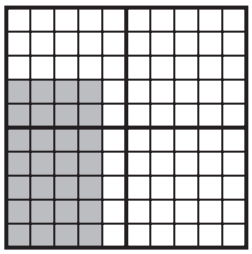
Player 2			
10	7	5	9
5	2	1	8
7	4	3	6
12	6	8	11

Fact Fluency with 7's Flashcards, page 1 of 2

- Cut out this set of 12 flashcards.
- Fold a 3-by-5 index card in half.
- Tape or staple both sides but leave the top open.
- Label this storage pocket with your name and the set number.

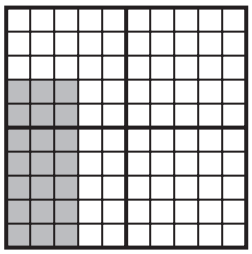
1 × 7 Blackline F 35	2 × 7 Blackline F 35	3 × 7 Blackline F 35	4 × 7 Blackline F 35
5 × 7 Blackline F 35	6 × 7 Blackline F 35	7 × 7 Blackline F 35	8 × 7 Blackline F 35
9 × 7 Blackline F 35	10 × 7 Blackline F 35	11 × 7 Blackline F 35	12 × 7 Blackline F 35

Fact Fluency with 7's Flashcards, page 2 of 2



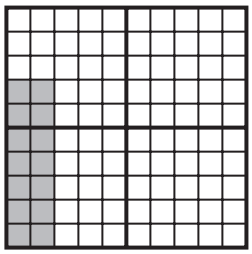
28 ÷ 7

Blackline F 36



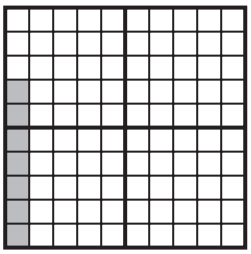
21 ÷ 7

Blackline F 36



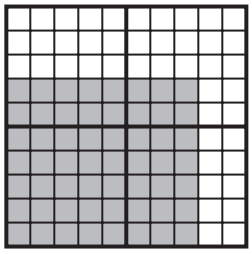
14 ÷ 7

Blackline F 36



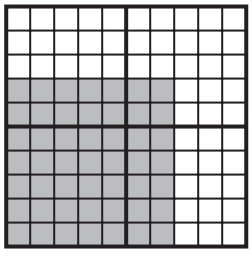
7 ÷ 7

Blackline F 36



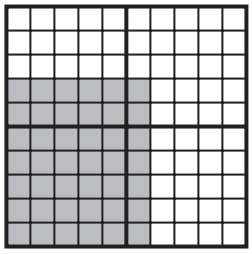
56 ÷ 7

Blackline F 36



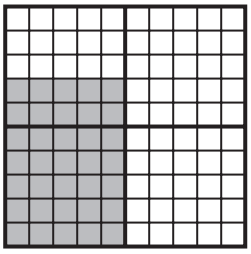
49 ÷ 7

Blackline F 36



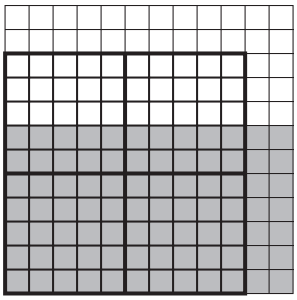
42 ÷ 7

Blackline F 36



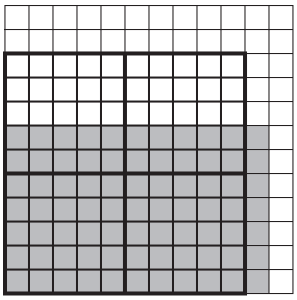
35 ÷ 7

Blackline F 36



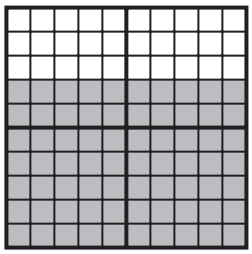
84 ÷ 7

Blackline F 36



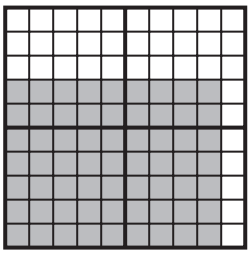
77 ÷ 7

Blackline F 36



70 ÷ 7

Blackline F 36



63 ÷ 7

Blackline F 36

NAME _____ DATE _____

Fact Fluency with 8's Multiplying & Dividing by 8

MULTIPLICATION FACT FLUENCY

Strategy	How It Works	Example
Double-Double-Doubles	To multiply any number by 8, double the number 3 times.	What is 8 × 7? It's 7 doubled 3 times. Double once: 7 + 7 = 14 Double twice: 14 + 14 = 28 Double three times: 28 + 28 = 56

1 Multiply each number in the grid by 8. Write each product in the box. The first one is done for you.

5 40	7	3	9	11	8	12	6	2
10	8	11	1	9	5	0	12	4

2 Use the double-double-doubles strategy to help solve these combinations.

8 × 15 = _____ 8 × 25 = _____ 8 × 35 = _____ 8 × 50 = _____

$$\begin{array}{r} 14 \\ \times\ 8 \\ \hline \end{array} \qquad \begin{array}{r} 150 \\ \times\ 8 \\ \hline \end{array} \qquad \begin{array}{r} 30 \\ \times\ 8 \\ \hline \end{array}$$

3 Use what you know about multiplying by 8 to solve these division problems.

40 ÷ 8 = _____ 88 ÷ 8 = _____ 72 ÷ 8 = _____ 64 ÷ 8 = _____

$8\overline{)80}$ $8\overline{)48}$ $8\overline{)56}$ $8\overline{)96}$

NAME _____ DATE _____

Fact Fluency with 8's Practice Multiplying by 8 & 4

MULTIPLICATION FACT FLUENCY

1 Circle all the double-double-doubles (×8) in blue. Then go back and fill in the answers with regular pencil.

2 Circle all the double-doubles (×4) in red. Then go back and fill in the answers with regular pencil.

9 × 8 ____	3 × 8 ____	6 × 8 ____	8 × 8 ____	11 × 4 ____	7 × 4 ____	9 × 4 ____
2 × 8 ____	5 × 4 ____	12 × 8 ____	10 × 8 ____	9 × 8 ____	3 × 4 ____	5 × 8 ____
4 × 4 ____	7 × 8 ____	6 × 4 ____	11 × 8 ____	9 × 4 ____	4 × 8 ____	8 × 8 ____

3 Write two multiplication and two division facts for each set of numbers.

a	b	c	d
8, 7, 56	9, 8, 72	12, 96, 8	8, 6, 48
____ × ____ = ____	____ × ____ = ____	____ × ____ = ____	____ × ____ = ____
____ × ____ = ____	____ × ____ = ____	____ × ____ = ____	____ × ____ = ____
____ ÷ ____ = ____	____ ÷ ____ = ____	____ ÷ ____ = ____	____ ÷ ____ = ____
____ ÷ ____ = ____	____ ÷ ____ = ____	____ ÷ ____ = ____	____ ÷ ____ = ____

NAME _____ DATE _____

Fact Fluency with 8's Missing Number Capture 8's & 4's

MULTIPLICATION FACT FLUENCY

You'll need

★ a partner

★ 2 pencils or markers in different colors

★ paperclip and pencil to use as a spinner

Instructions for Missing Number Capture 8's & 4's

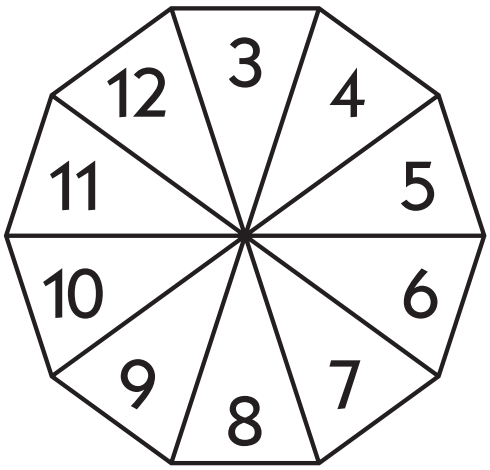
1 Take turns spinning the spinner. The player who gets the higher number goes first.

2 Take turns spinning the spinner. Use the number you spin to complete one of the problems below. Be sure to use your own color pencil.

3 If the box you need is already filled, you lose your turn.

4 Try to capture 3 or 4 boxes in a row: across, up and down, or diagonally. Keep playing until the gameboard is filled or neither player can use the number he or she spins 3 times in a row.

5 Then circle the places on the grid where you got 3 or 4 in a row and add up your scores.



□) 12 (4	□) 40 (4	4 × □ = 48	□ × 8 = 64	□) 28 (4	**Scoring** 3 in a Row—1 point 4 in a Row—2 points	
□) 48 (8	□) 16 (4	8 × □ = 24	□) 44 (4	8 × □ = 72		
8 × □ = 96	□) 32 (4	□) 80 (8	□ × 4 = 24	□) 32 (8	**Player 1 Points**	**Player 2 Points**
8 × □ = 56	□) 20 (4	□) 36 (4	□) 40 (8	□) 88 (8		

NAME _____ DATE _____

Fact Fluency with 8's Flashcard Bingo 8's

MULTIPLICATION FACT FLUENCY

You'll need

★ a partner

★ one set of 8's flashcards and your flashcard pocket

★ marker or crayon for each player

Instructions for Flashcard Bingo 8's

1 Mix up one set of flashcards and arrange them so that the multiplication side is facing up on all of them. Put them in the flashcard pocket.

2 Take turns pulling 1 card. Each time, both players color the product on their board or mark it with an x.

3 The first player to get two rows of 4 going horizontally, vertically, or diagonally, wins.

4 Play the game a second time using the division side of your cards.

Game 1 ×

Player 1			
96	40	72	48
64	88	16	72
48	8	56	80
56	32	24	64

Player 2			
24	16	8	40
40	88	72	16
32	96	80	8
56	64	48	32

Game 2 ÷

Player 1			
12	4	8	12
9	11	3	7
1	6	11	10
5	10	9	2

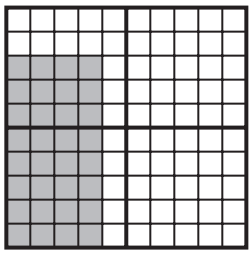
Player 2			
7	4	3	6
12	6	8	11
10	7	5	9
5	2	1	8

Fact Fluency with 8's Flashcards, page 1 of 2

- Cut out this set of 12 flashcards.
- Fold a 3-by-5 index card in half.
- Tape or staple both sides but leave the top open.
- Label this storage pocket with your name and the set number.

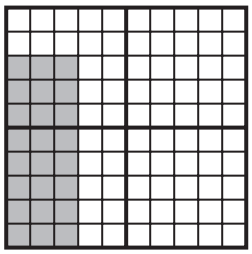
1 × 8 Blackline F 41	2 × 8 Blackline F 41	3 × 8 Blackline F 41	4 × 8 Blackline F 41
5 × 8 Blackline F 41	6 × 8 Blackline F 41	7 × 8 Blackline F 41	8 × 8 Blackline F 41
9 × 8 Blackline F 41	10 × 8 Blackline F 41	11 × 8 Blackline F 41	12 × 8 Blackline F 41

Fact Fluency with 8's Flashcards, page 2 of 2



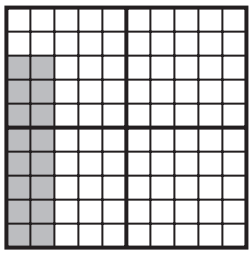
32 ÷ 8

Blackline F 42



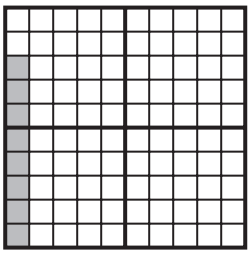
24 ÷ 8

Blackline F 42



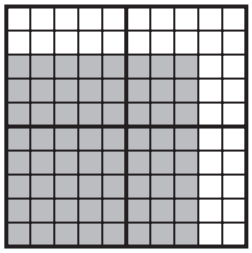
16 ÷ 8

Blackline F 42



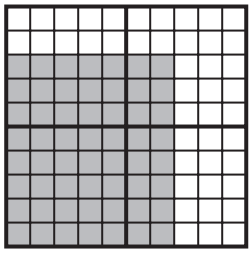
8 ÷ 8

Blackline F 42



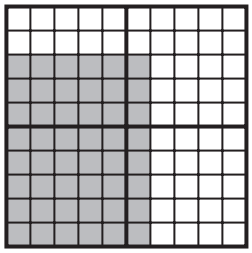
64 ÷ 8

Blackline F 42



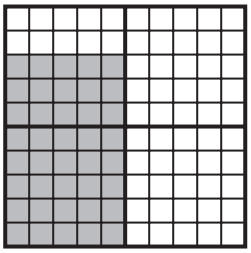
56 ÷ 8

Blackline F 42



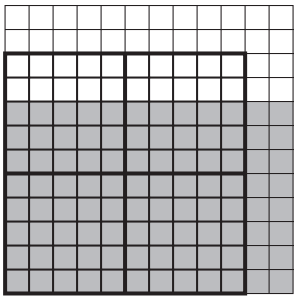
48 ÷ 8

Blackline F 42



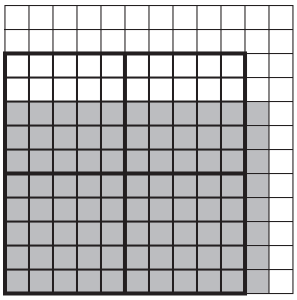
40 ÷ 8

Blackline F 42



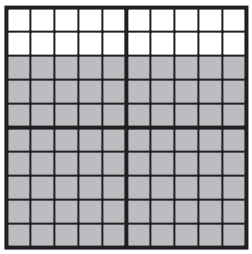
96 ÷ 8

Blackline F 42



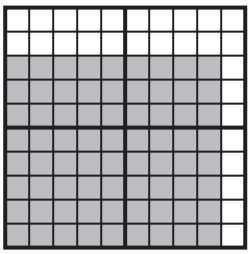
88 ÷ 8

Blackline F 42



80 ÷ 8

Blackline F 42



72 ÷ 8

Blackline F 42

NAME _____ DATE _____

Fact Fluency with 9's Multiplying & Dividing by 9

MULTIPLICATION FACT FLUENCY

Strategy	How It Works	Example
Decade Minus One Set	To multiply any number by 9, think of the related 10's fact and then subtract one set of the number.	What is 9 × 7? It's ten 7's minus 7. 9 × 7 = (10 × 7) – 7 = 70 – 7 = 63

1 Multiply each number in the grid by 9. Write each product in the box. The first one is done for you.

5 45	7	3	9	11	8	12	6	2
10	8	11	1	9	5	0	12	4

2 Use the decade minus one set strategy to help solve these combinations.

9 × 15 = _____ 9 × 25 = _____ 9 × 30 = _____ 9 × 50 = _____

$$\begin{array}{r} 14 \\ \times\ 9 \\ \hline \end{array} \qquad \begin{array}{r} 21 \\ \times\ 9 \\ \hline \end{array} \qquad \begin{array}{r} 40 \\ \times\ 9 \\ \hline \end{array}$$

3 Use what you know about multiplying by 9 to solve these division problems.

99 ÷ 9 = _____ 45 ÷ 9 = _____ 81 ÷ 9 = _____ 108 ÷ 9 = _____

$9\overline{)54}$ $9\overline{)63}$ $9\overline{)72}$ $9\overline{)90}$

NAME _____ DATE _____

Fact Fluency with 9's Practice Multiplying by 9 & 3

MULTIPLICATION FACT FLUENCY

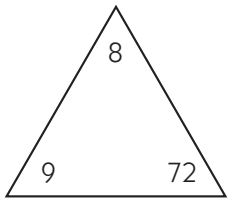
1 Circle all the decade minus one set facts (×9) in blue. Then go back and fill in the answers with regular pencil.

2 Circle all the doubles plus one set facts (×3) in red. Then go back and fill in the answers with regular pencil.

2 × 9	5 × 9	12 × 9	10 × 9	10 × 3	3 × 9	9 × 9
4 × 3	7 × 9	6 × 9	11 × 3	12 × 9	4 × 9	12 × 3
9 × 9	3 × 9	6 × 3	8 × 9	11 × 9	7 × 3	9 × 3

3 Write two multiplication and two division facts for each set of numbers.

a



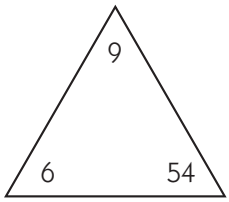
____ × ____ = _____

____ × ____ = _____

____ ÷ ____ = _____

____ ÷ ____ = _____

b



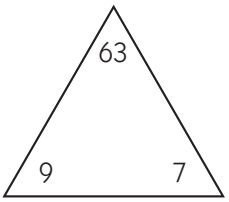
____ × ____ = _____

____ × ____ = _____

____ ÷ ____ = _____

____ ÷ ____ = _____

c



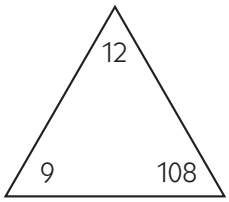
____ × ____ = _____

____ × ____ = _____

____ ÷ ____ = _____

____ ÷ ____ = _____

d



____ × ____ = _____

____ × ____ = _____

____ ÷ ____ = _____

____ ÷ ____ = _____

NAME _____ DATE _____

Fact Fluency with 9's Missing Number Capture 9's & 3's

MULTIPLICATION FACT FLUENCY

You'll need

★ a partner

★ 2 pencils or markers in different colors

★ paperclip and pencil to use as a spinner

Instructions for Missing Number Capture 9's & 3's

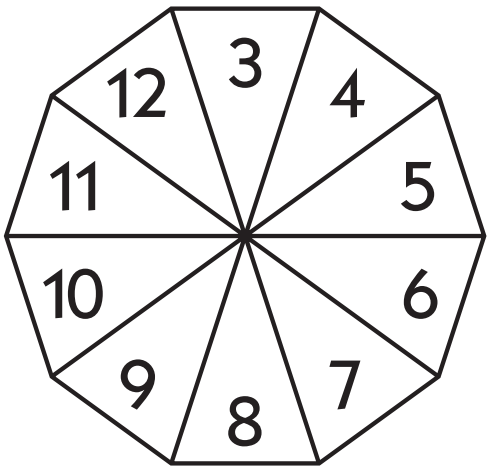
1 Take turns spinning the spinner. The player who gets the higher number goes first.

2 Take turns spinning the spinner. Use the number you spin to complete one of the problems below. Be sure to use your own color pencil.

3 If the box you need is already filled, you lose your turn.

4 Try to capture 3 or 4 boxes in a row: across, up and down, or diagonally. Keep playing until the gameboard is filled or neither player can use the number he or she spins 3 times in a row.

5 Then circle the places on the grid where you got 3 or 4 in a row and add up your scores.



□) 54 (9	□) 12 (3	9 × □ = 27	□) 33 (3	9 × □ = 81	**Scoring** 3 in a Row—1 point 4 in a Row—2 points	
□) 9 (3	□) 30 (3	3 × □ = 36	□ × 9 = 72	□) 21 (3		
9 × □ = 63	□) 15 (3	□) 27 (3	□) 45 (9	□) 99 (9	**Player 1 Points**	**Player 2 Points**
9 × □ = 108	□) 24 (3	□) 90 (9	□ × 3 = 18	□) 36 (9		

NAME _____ DATE _____

Fact Fluency with 9's Flashcard Bingo 9's

MULTIPLICATION FACT FLUENCY

You'll need

★ a partner

★ one set of 9's flashcards and your flashcard pocket

★ marker or crayon for each player

Instructions for Flashcard Bingo 9's

1 Mix up one set of flashcards and arrange them so that the multiplication side is facing up on all of them. Put them in the flashcard pocket.

2 Take turns pulling 1 card. Each time, both players color the product on their board or mark it with an x.

3 The first player to get two rows of 4 going horizontally, vertically, or diagonally, wins.

4 Play the game a second time using the division side of your cards.

Game 1 ×

Player 1			
27	18	9	45
45	99	81	18
36	108	90	9
63	72	54	36

Player 2			
108	45	81	54
72	99	18	81
54	9	63	90
63	36	27	72

Game 2 ÷

Player 1			
12	4	8	12
9	11	3	7
1	6	11	10
5	10	9	2

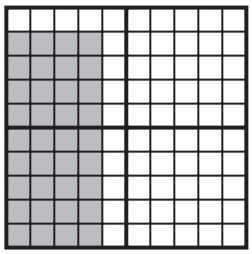
Player 2			
7	4	3	6
12	6	8	11
10	7	5	9
5	2	1	8

Fact Fluency with 9's Flashcards, page 1 of 2

- Cut out this set of 12 flashcards.
- Fold a 3-by-5 index card in half.
- Tape or staple both sides but leave the top open.
- Label this storage pocket with your name and the set number.

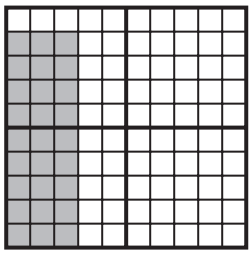
1 × 9 Blackline F 47	2 × 9 Blackline F 47	3 × 9 Blackline F 47	4 × 9 Blackline F 47
5 × 9 Blackline F 47	6 × 9 Blackline F 47	7 × 9 Blackline F 47	8 × 9 Blackline F 47
9 × 9 Blackline F 47	10 × 9 Blackline F 47	11 × 9 Blackline F 47	12 × 9 Blackline F 47

Fact Fluency with 9's Flashcards, page 2 of 2



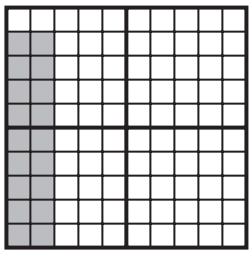
36 ÷ 9

Blackline F 48



27 ÷ 9

Blackline F 48



18 ÷ 9

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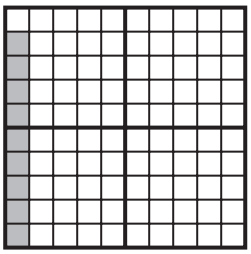

9 ÷ 9

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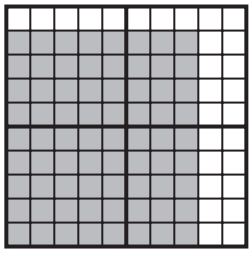
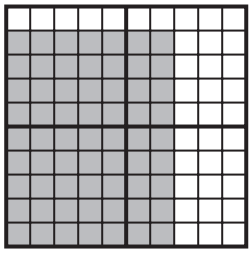


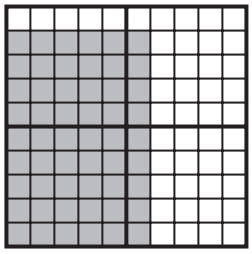
72 ÷ 9

Blackline F 48



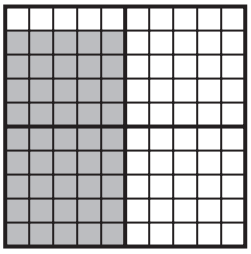
63 ÷ 9

Blackline F 48



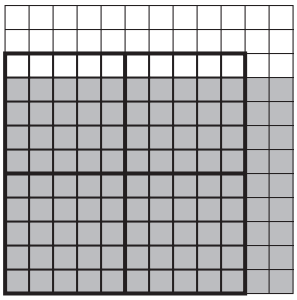
54 ÷ 9

Blackline F 48



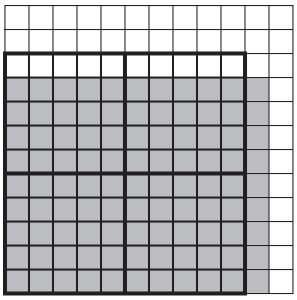
45 ÷ 9

Blackline F 48



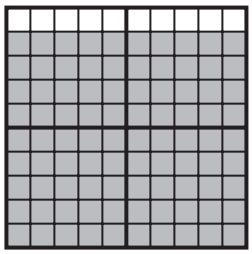
108 ÷ 9

Blackline F 48



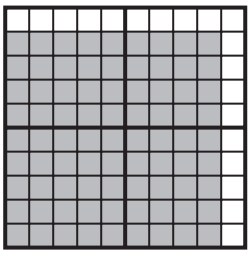
99 ÷ 9

Blackline F 48



90 ÷ 9

Blackline F 48



81 ÷ 9

Blackline F 48

NAME _____ DATE _____

Fact Fluency with 10's Multiplying & Dividing by 10

MULTIPLICATION FACT FLUENCY

Strategy	How It Works	Example
Decades	To multiply any number by 10, count by 10's (or add a zero to the end of the number you're multiplying).	What is 10 × 9? It's 10, 20, 30, 40, 50, 60, 70, 80, 90 *or* 9 with a zero on the end 10 × 9 = 90

1 Multiply each number in the grid by 10. Write each product in the box. The first one is done for you.

5 50	7	3	9	11	8	12	6	2
10	8	11	1	9	5	0	12	4

2 Use the decades strategy to help solve these combinations.

10 × 15 = _____ 10 × 25 = _____ 10 × 31 = _____ 10 × 59 = _____

$$\begin{array}{r} 14 \\ \times\ 10 \\ \hline \end{array} \qquad \begin{array}{r} 20 \\ \times\ 10 \\ \hline \end{array} \qquad \begin{array}{r} 46 \\ \times\ 10 \\ \hline \end{array}$$

3 Use what you know about multiplying by 10 to solve these division problems.

60 ÷ 10 = _____ 110 ÷ 10 = _____ 50 ÷ 10 = _____ 100 ÷ 10 = _____

$10\overline{)120}$ $10\overline{)70}$ $10\overline{)90}$ $10\overline{)80}$

NAME _____ DATE _____

Fact Fluency with 10's Practice Multiplying by 10 & 5

MULTIPLICATION FACT FLUENCY

1 Circle all the decade facts (×10) in blue. Then go back and fill in the answers with regular pencil.

2 Circle all the half-decade facts (×5) in red. Then go back and fill in the answers with regular pencil.

2 × 10	5 × 10	8 × 10	10 × 10	15 × 10	3 × 10	5 × 5
20 × 10	6 × 5	6 × 10	8 × 5	11 × 10	7 × 5	9 × 5
4 × 5	7 × 10	12 × 5	25 × 10	20 × 5	4 × 10	11 × 5

3 Write two multiplication and two division facts for each set of numbers.

a	b	c	d
8, 10, 80	12, 10, 120	9, 10, 90	11, 10, 110
____ × ____ = ____	____ × ____ = ____	____ × ____ = ____	____ × ____ = ____
____ × ____ = ____	____ × ____ = ____	____ × ____ = ____	____ × ____ = ____
____ ÷ ____ = ____	____ ÷ ____ = ____	____ ÷ ____ = ____	____ ÷ ____ = ____
____ ÷ ____ = ____	____ ÷ ____ = ____	____ ÷ ____ = ____	____ ÷ ____ = ____

NAME _____ DATE _____

Fact Fluency with 10's Missing Number Capture 10's & 5's

MULTIPLICATION FACT FLUENCY

You'll need

★ a partner

★ 2 pencils or markers in different colors

★ paperclip and pencil to use as a spinner

Instructions for Missing Number Capture 10's & 5's

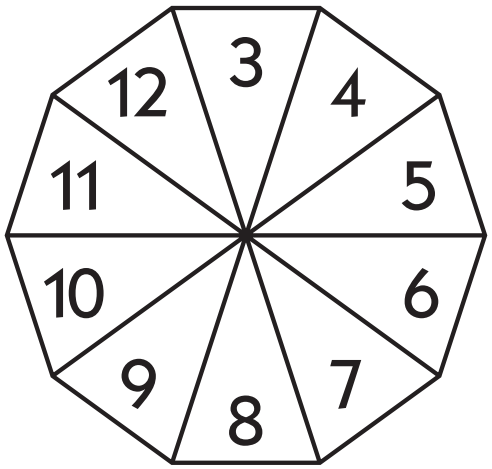
1 Take turns spinning the spinner. The player who gets the higher number goes first.

2 Take turns spinning the spinner. Use the number you spin to complete one of the problems below. Be sure to use your own color pencil.

3 If the box you need is already filled, you lose your turn.

4 Try to capture 3 or 4 boxes in a row: across, up and down, or diagonally. Keep playing until the gameboard is filled or neither player can use the number he or she spins 3 times in a row.

5 Then circle the places on the grid where you got 3 or 4 in a row and add up your scores.



□) 60 (10	□) 20 (5	10 × □ = 30	□) 55 (5	10 × □ = 90	**Scoring** 3 in a Row—1 point 4 in a Row—2 points	
□) 15 (5	□) 50 (5	5 × □ = 60	□ × 10 = 80	□) 35 (5		
10 × □ = 70	□) 25 (5	□) 45 (5	□) 50 (10	□) 110 (10	**Player 1 Points**	**Player 2 Points**
10 × □ = 120	□) 40 (5	□) 100 (10	□ × 5 = 30	□) 40 (10		

NAME _____ DATE _____

Fact Fluency with 10's Flashcard Bingo 10's

MULTIPLICATION FACT FLUENCY

You'll need

★ a partner

★ one set of 10's flashcards and your flashcard pocket

★ marker or crayon for each player

Instructions for Flashcard Bingo 10's

1 Mix up one set of flashcards and arrange them so that the multiplication side is facing up on all of them. Put them in the flashcard pocket.

2 Take turns pulling 1 card. Each time, both players color the product on their board or mark it with an x.

3 The first player to get two rows of 4 going horizontally, vertically, or diagonally, wins.

4 Play the game a second time using the division side of your cards.

Game 1 ×

Player 1			
30	20	10	50
50	110	90	20
40	120	100	10
70	80	60	40

Player 2			
120	50	90	60
80	110	20	90
60	10	70	100
70	40	30	80

Game 2 ÷

Player 1			
7	4	3	6
12	6	8	11
10	7	5	9
5	2	1	8

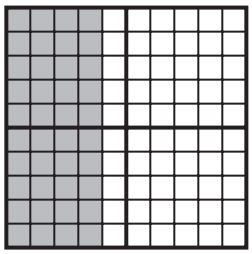
Player 2			
12	4	8	12
9	11	3	7
1	6	11	10
5	10	90	2

Fact Fluency with 10's Flashcards, page 1 of 2

- Cut out this set of 12 flashcards.
- Fold a 3-by-5 index card in half.
- Tape or staple both sides but leave the top open.
- Label this storage pocket with your name and the set number.

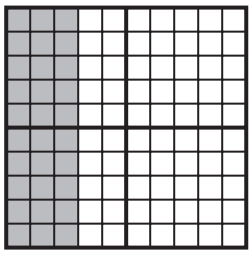
1 × 10 Blackline F 53	2 × 10 Blackline F 53	3 × 10 Blackline F 53	4 × 10 Blackline F 53
5 × 10 Blackline F 53	6 × 10 Blackline F 53	7 × 10 Blackline F 53	8 × 10 Blackline F 53
9 × 10 Blackline F 53	10 × 10 Blackline F 53	11 × 10 Blackline F 53	12 × 10 Blackline F 53

Fact Fluency with 10's Flashcards, page 2 of 2



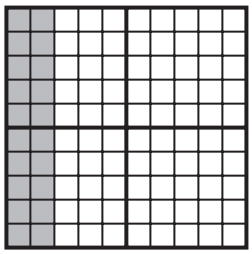
40 ÷ 10

Blackline F 54



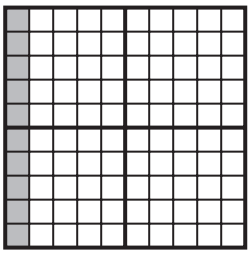
30 ÷ 10

Blackline F 54



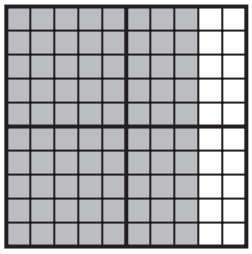
20 ÷ 10

Blackline F 54



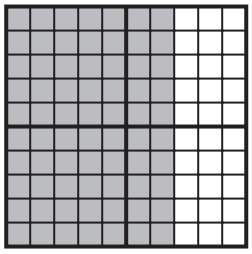
10 ÷ 10

Blackline F 54



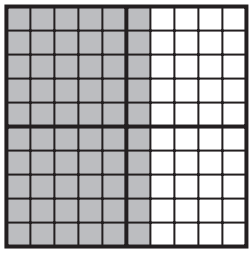
80 ÷ 10

Blackline F 54



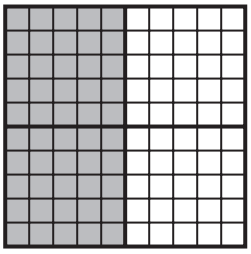
70 ÷ 10

Blackline F 54



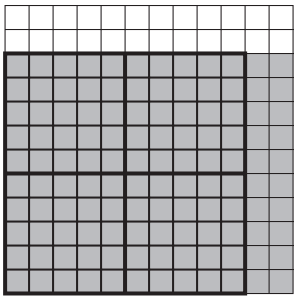
60 ÷ 10

Blackline F 54



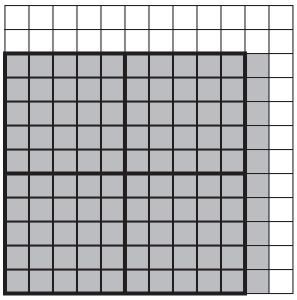
50 ÷ 10

Blackline F 54



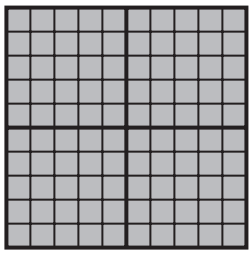
120 ÷ 10

Blackline F 54



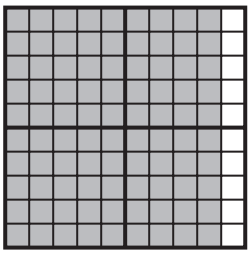
110 ÷ 10

Blackline F 54



100 ÷ 10

Blackline F 54



90 ÷ 10

Blackline F 54

NAME _____ DATE _____

Fact Fluency with 11's Multiplying & Dividing by 11

MULTIPLICATION FACT FLUENCY

Strategy	How It Works	Example
Decade Plus One Set	To multiply any number by 11, multiply by 10 and then add one set of the number.	What is 11 × 9? It's 10 × 9 plus another set of 9. 10 × 9 = 90 90 + 9 = 99

1 Multiply each number in the grid by 11. Write each product in the box. The first one is done for you.

5 55	7	3	9	11	8	12	6	2
10	8	11	1	9	5	0	12	4

2 Use the decade plus one set strategy to help solve these combinations.

11 × 13 = _____ 11 × 20 = _____ 11 × 25 = _____ 11 × 50 = _____

$$\begin{array}{r} 14 \\ \times\ 11 \\ \hline \end{array} \qquad \begin{array}{r} 23 \\ \times\ 11 \\ \hline \end{array} \qquad \begin{array}{r} 40 \\ \times\ 11 \\ \hline \end{array}$$

3 Use what you know about multiplying by 11 to solve these division problems.

132 ÷ 11 = _____ 77 ÷ 11 = _____ 99 ÷ 11 = _____ 88 ÷ 11 = _____

$11\overline{)66}$ $11\overline{)121}$ $11\overline{)55}$ $11\overline{)110}$

NAME _____ DATE _____

Fact Fluency with 11's Practice Multiplying by 11 & 10

MULTIPLICATION FACT FLUENCY

1 Circle all the decade plus one set facts (×11) in blue. Then go back and fill in the answers with regular pencil.

2 Circle all the decade facts (×10) in red. Then go back and fill in the answers with regular pencil.

2 × 11	16 × 10	6 × 11	5 × 10	11 × 11	6 × 10	9 × 11
12 × 10	30 × 10	8 × 11	7 × 10	40 × 10	3 × 11	5 × 11
50 × 10	11 × 10	4 × 11	10 × 11	7 × 11	8 × 10	12 × 11

3 Write two multiplication and two division facts for each set of numbers.

a	b	c	d
11, 10, 110	12, 11, 132	9, 99, 11	11, 11, 121
____ × ____ = ____	____ × ____ = ____	____ × ____ = ____	____ × ____ = ____
____ × ____ = ____	____ × ____ = ____	____ × ____ = ____	____ × ____ = ____
____ ÷ ____ = ____	____ ÷ ____ = ____	____ ÷ ____ = ____	____ ÷ ____ = ____
____ ÷ ____ = ____	____ ÷ ____ = ____	____ ÷ ____ = ____	____ ÷ ____ = ____

NAME _____ DATE _____

Fact Fluency with 11's Missing Number Capture 11's & 10's

MULTIPLICATION FACT FLUENCY

You'll need

★ a partner

★ 2 pencils or markers in different colors

★ paperclip and pencil to use as a spinner

Instructions for Missing Number Capture 11's & 10's

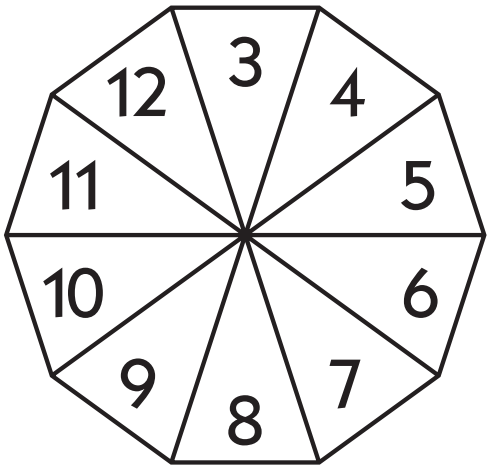
1 Take turns spinning the spinner. The player who gets the higher number goes first.

2 Take turns spinning the spinner. Use the number you spin to complete one of the problems below. Be sure to use your own color pencil.

3 If the box you need is already filled, you lose your turn.

4 Try to capture 3 or 4 boxes in a row: across, up and down, or diagonally. Keep playing until the gameboard is filled or neither player can use the number he or she spins 3 times in a row.

5 Then circle the places on the grid where you got 3 or 4 in a row and add up your scores.



□) 100 (10	□ × 11 = 66	□) 40 (10	10 × □ = 120	□) 88 (11	**Scoring** 3 in a Row—1 point 4 in a Row—2 points	
10 × □ = 30	□) 121 (11	10 × □ = 90	□) 60 (10	□) 44 (11		
5 × □ = 60	□ × 10 = 80	□) 77 (11	□) 33 (11	□) 132 (11	**Player 1 Points**	**Player 2 Points**
□) 99 (11	□) 50 (10	□) 110 (10	10 × □ = 70	□) 55 (11		

NAME _____ DATE _____

Fact Fluency with 11's Flashcard Bingo 11's

MULTIPLICATION FACT FLUENCY

You'll need

★ a partner

★ one set of 11's flashcards and your flashcard pocket

★ marker or crayon for each player

Instructions for Flashcard Bingo 11's

1 Mix up one set of flashcards and arrange them so that the multiplication side is facing up on all of them. Put them in the flashcard pocket.

2 Take turns pulling 1 card. Each time, both players color the product on their board or mark it with an x.

3 The first player to get two rows of 4 going horizontally, vertically, or diagonally, wins.

4 Play the game a second time using the division side of your cards.

Game 1 ×

Player 1			
33	22	11	55
55	121	99	22
44	132	110	11
77	88	66	44

Player 2			
132	55	99	66
88	121	22	99
66	11	77	110
77	44	33	88

Game 2 ÷

Player 1			
7	4	3	6
12	6	8	11
10	7	5	9
5	2	1	8

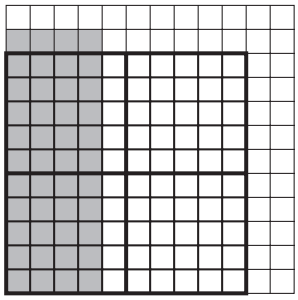
Player 2			
12	4	8	12
9	11	3	7
1	6	11	10
5	10	9	2

Fact Fluency with 11's Flashcards, page 1 of 2

- Cut out this set of 12 flashcards.
- Fold a 3-by-5 index card in half.
- Tape or staple both sides but leave the top open.
- Label this storage pocket with your name and the set number.

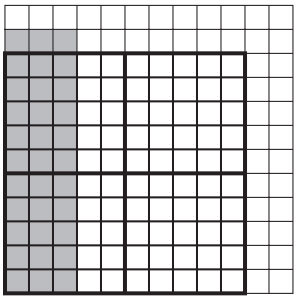
1 × 11 Blackline F 59	2 × 11 Blackline F 59	3 × 11 Blackline F 59	4 × 11 Blackline F 59
5 × 11 Blackline F 59	6 × 11 Blackline F 59	7 × 11 Blackline F 59	8 × 11 Blackline F 59
9 × 11 Blackline F 59	10 × 11 Blackline F 59	11 × 11 Blackline F 59	12 × 11 Blackline F 59

Fact Fluency with 11's Flashcards, page 2 of 2



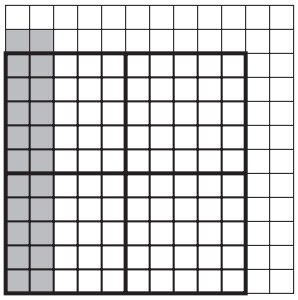
44 ÷ 11

Blackline F 60



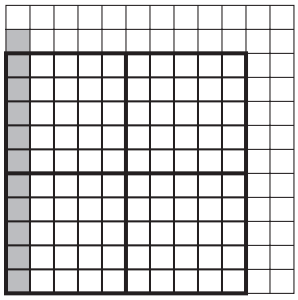
33 ÷ 11

Blackline F 60



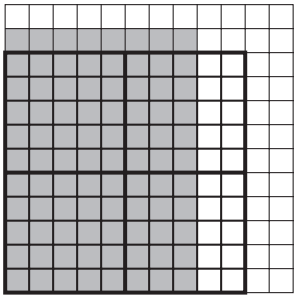
22 ÷ 11

Blackline F 60



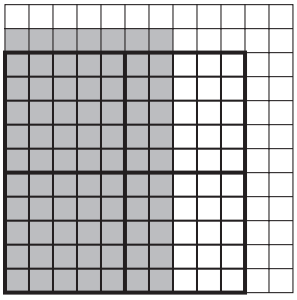
11 ÷ 11

Blackline F 60



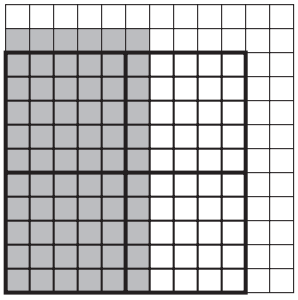
88 ÷ 11

Blackline F 60



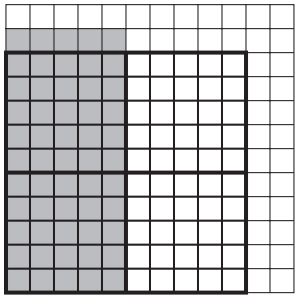
77 ÷ 11

Blackline F 60



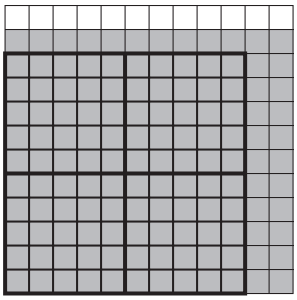
66 ÷ 11

Blackline F 60



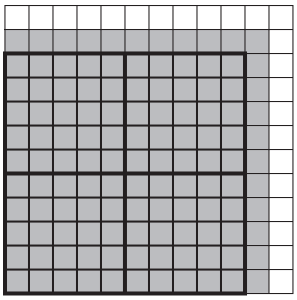
55 ÷ 11

Blackline F 60



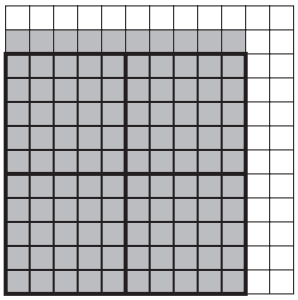
132 ÷ 11

Blackline F 60



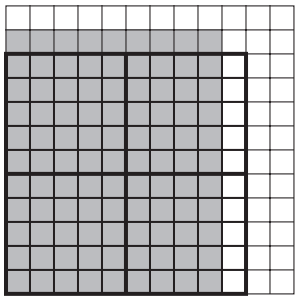
121 ÷ 11

Blackline F 60



110 ÷ 11

Blackline F 60



99 ÷ 11

Blackline F 60

NAME _____ DATE _____

Fact Fluency with 12's Multiplying & Dividing by 12

MULTIPLICATION FACT FLUENCY

Strategy	How It Works	Example
Decade Plus Two Sets	To multiply any number by 12, multiply by 10 and then add two more sets of the number.	What is 12 × 7? It's 10 × 7 plus 2 × 7. 10 × 7 = 70 2 × 7 = 14 70 + 14 = 84

1 Multiply each number in the grid by 12. Write each product in the box. The first one is done for you.

5 60	7	3	9	11	8	12	6	2
10	8	11	1	9	5	0	12	4

2 Use the decade plus two sets strategy to help solve these combinations.

12 × 15 = _____ 12 × 25 = _____ 12 × 30 = _____ 12 × 20 = _____

$$\begin{array}{r} 14 \\ \times\ 12 \\ \hline \end{array} \qquad \begin{array}{r} 24 \\ \times\ 12 \\ \hline \end{array} \qquad \begin{array}{r} 40 \\ \times\ 12 \\ \hline \end{array}$$

3 Use what you know about multiplying by 12 to solve these division problems.

48 ÷ 12 = _____ 60 ÷ 12 = _____ 72 ÷ 12 = _____ 144 ÷ 12 = _____

$12\overline{)84}$ $12\overline{)108}$ $12\overline{)96}$ $12\overline{)120}$

NAME _____ DATE _____

Fact Fluency with 12's Practice Multiplying by 12 & 10

MULTIPLICATION FACT FLUENCY

1 Circle all the decade plus two sets facts (×12) in blue. Then go back and fill in the answers with regular pencil.

2 Circle all the decade facts (×10) in red. Then go back and fill in the answers with regular pencil.

2 × 12	25 × 10	6 × 12	20 × 10	11 × 12	80 × 10	9 × 12
90 × 10	10 × 10	8 × 12	35 × 10	100 × 10	3 × 12	5 × 12
50 × 10	40 × 10	4 × 12	10 × 12	7 × 12	30 × 10	12 × 12

3 Write two multiplication and two division facts for each set of numbers.

a	b	c	d
8, 12, 96	12, 11, 132	12, 108, 9	84, 7, 12
____ × ____ = ____	____ × ____ = ____	____ × ____ = ____	____ × ____ = ____
____ × ____ = ____	____ × ____ = ____	____ × ____ = ____	____ × ____ = ____
____ ÷ ____ = ____	____ ÷ ____ = ____	____ ÷ ____ = ____	____ ÷ ____ = ____
____ ÷ ____ = ____	____ ÷ ____ = ____	____ ÷ ____ = ____	____ ÷ ____ = ____

NAME _____ DATE _____

Fact Fluency with 12's Missing Number Capture 12's & 10's

MULTIPLICATION FACT FLUENCY

You'll need

★ a partner

★ 2 pencils or markers in different colors

★ paperclip and pencil to use as a spinner

Instructions for Missing Number Capture 12's & 10's

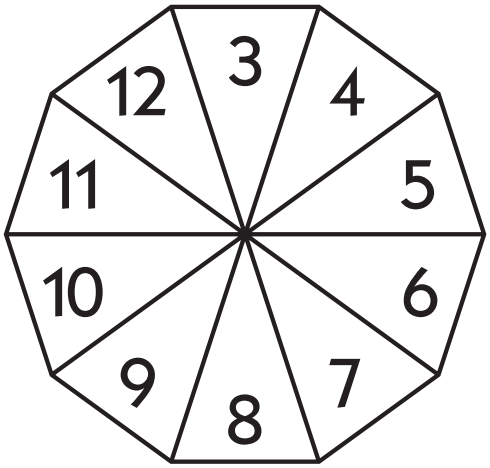
1 Take turns spinning the spinner. The player who gets the higher number goes first.

2 Take turns spinning the spinner. Use the number you spin to complete one of the problems below. Be sure to use your own color pencil.

3 If the box you need is already filled, you lose your turn.

4 Try to capture 3 or 4 boxes in a row: across, up and down, or diagonally. Keep playing until the gameboard is filled or neither player can use the number he or she spins 3 times in a row.

5 Then circle the places on the grid where you got 3 or 4 in a row and add up your scores.



□ 12)84	□ 12)36	□ 12)144	□ 10)50	10 × □ = 30	**Scoring** 3 in a Row—1 point 4 in a Row—2 points	
□ 10)110	10 × □ = 70	□ 12)60	□ 10)60	□ 12)48		
5 × □ = 60	□ × 10 = 80	□ 10)100	□ × 12 = 72	□ 10)40	**Player 1 Points**	**Player 2 Points**
□ 12)108	10 × □ = 120	□ 12)96	□ 12)132	10 × □ = 90		

NAME _____ DATE _____

Fact Fluency with 12's Flashcard Bingo 12's

MULTIPLICATION FACT FLUENCY

You'll need

★ a partner

★ one set of 12's flashcards and your flashcard pocket

★ marker or crayon for each player

Instructions for Flashcard Bingo 12's

1 Mix up one set of flashcards and arrange them so that the multiplication side is facing up on all of them. Put them in the flashcard pocket.

2 Take turns pulling 1 card. Each time, both players color the product on their board or mark it with an x.

3 The first player to get two rows of 4 going horizontally, vertically, or diagonally, wins.

4 Play the game a second time using the division side of your cards.

Game 1 ×

Player 1			
36	24	12	60
60	132	108	24
48	144	120	12
84	96	72	48

Player 2			
144	60	108	72
96	132	24	108
72	12	84	120
84	48	36	96

Game 2 ÷

Player 1			
7	4	3	6
12	6	8	11
10	7	5	9
5	2	1	8

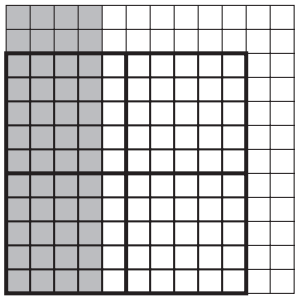
Player 2			
12	4	8	12
9	11	3	7
1	6	11	10
5	10	9	2

Fact Fluency with 12's Flashcards, page 1 of 2

- Cut out this set of 12 flashcards.
- Fold a 3-by-5 index card in half.
- Tape or staple both sides but leave the top open.
- Label this storage pocket with your name and the set number.

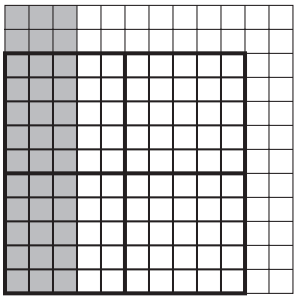
1 × 12 Blackline F 65	2 × 12 Blackline F 65	3 × 12 Blackline F 65	4 × 12 Blackline F 65
5 × 12 Blackline F 65	6 × 12 Blackline F 65	7 × 12 Blackline F 65	8 × 12 Blackline F 65
9 × 12 Blackline F 65	10 × 12 Blackline F 65	11 × 12 Blackline F 65	12 × 12 Blackline F 65

Fact Fluency with 12's Flashcards, page 2 of 2



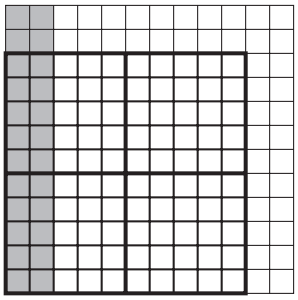
48 ÷ 12

Blackline F 66



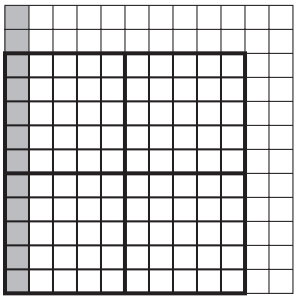
36 ÷ 12

Blackline F 66



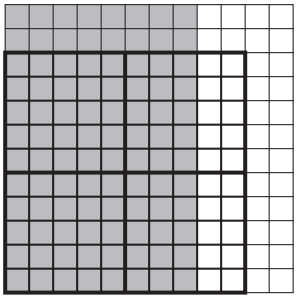
24 ÷ 12

Blackline F 66



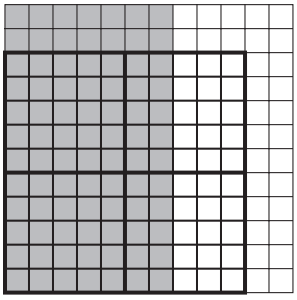
12 ÷ 12

Blackline F 66



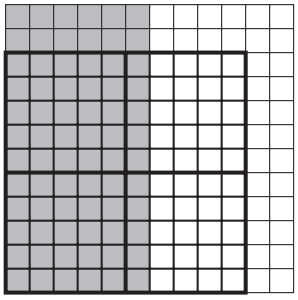
96 ÷ 12

Blackline F 66



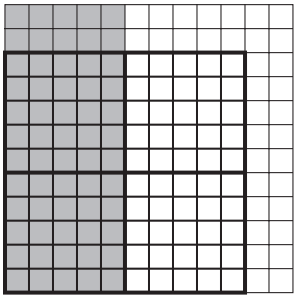
84 ÷ 12

Blackline F 66



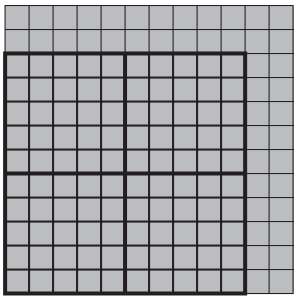
72 ÷ 12

Blackline F 66



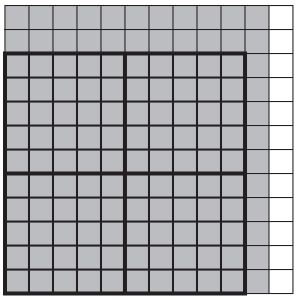
60 ÷ 12

Blackline F 66



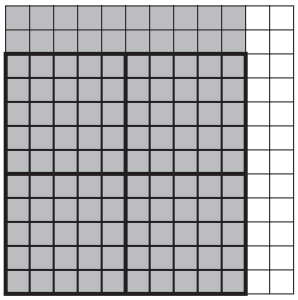
144 ÷ 12

Blackline F 66



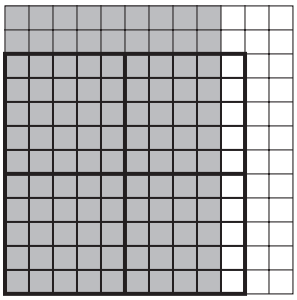
132 ÷ 12

Blackline F 66



120 ÷ 12

Blackline F 66



108 ÷ 12

Blackline F 66

NAME _____ DATE _____

Fact Fluency with 2's–6's Mixed Facts

MULTIPLICATION FACT FLUENCY

1 Solve the multiplication facts below.

2 × 2	3 × 3	4 × 4	11 × 5	8 × 3	8 × 2	7 × 2
5 × 5	12 × 4	4 × 3	9 × 3	9 × 2	6 × 2	7 × 3
12 × 3	12 × 2	3 × 2	9 × 4	5 × 2	6 × 3	9 × 6
6 × 5	10 × 6	12 × 6	7 × 5	6 × 6	8 × 5	10 × 5
5 × 4	6 × 4	11 × 4	7 × 4	8 × 6	9 × 5	12 × 5
11 × 3	10 × 3	11 × 2	4 × 2	5 × 3	8 × 4	7 × 6

2 Solve the division facts below.

2)14	4)24	6)36	4)28	5)30	4)32	3)18
6)42	2)16	3)21	2)18	5)35	3)24	4)36
5)40	6)24	6)48	5)45	3)27	5)60	6)54

NAME _____ DATE _____

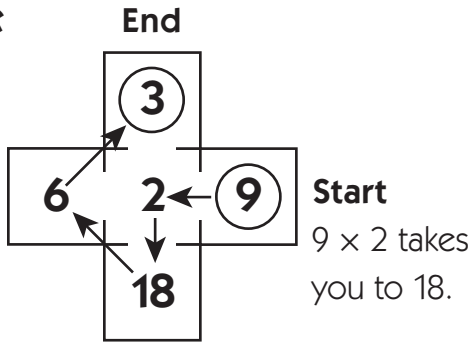
Fact Fluency with 2's–6's Secret Path Problems, Set 1

MULTIPLICATION FACT FLUENCY

- Find a path through all of the numbers in each set by multiplying or dividing to get from one number to the next.
- You have to use each number just one time.
- You can move only 1 space at a time. You can move over, up, down, or diagonally.
- Every path has a start point and an end point. Circle them both.
- You can also go backwards. Try to start at the end point and go back to the start point.

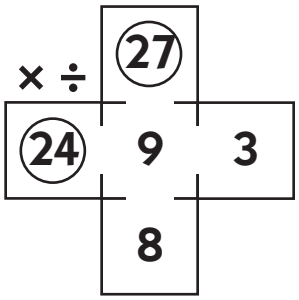
example

Then 18 ÷ 6 takes you to 3, and you're done!



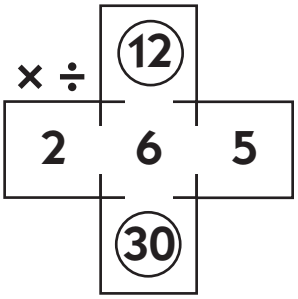
9 × 2 takes you to 18.

Try this one. The start and end points have been marked for you.



The start and end points have been marked on these problems also.

1



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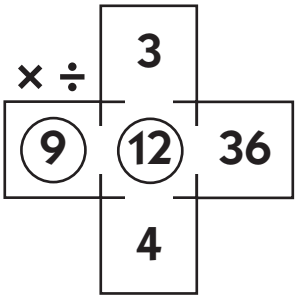

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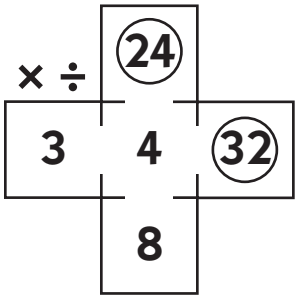
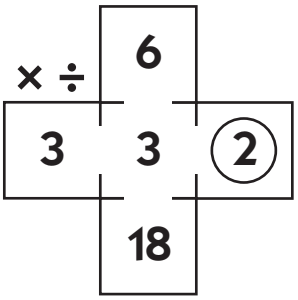


Only the start point has been marked on these problems.

4



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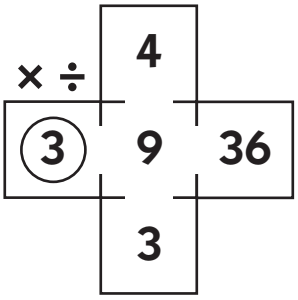

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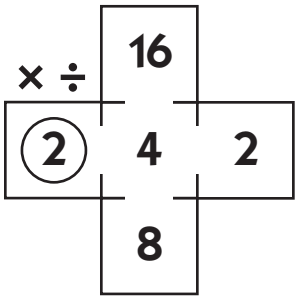


NAME _____ DATE _____

Fact Fluency with 2's–6's Secret Path Problems, Set 2

MULTIPLICATION FACT FLUENCY

- Find a path through all of the numbers in each set by multiplying or dividing to get from one number to the next.
- You have to use each number just one time.
- You can move only 1 space at a time. You can move over, up, down, or diagonally.
- Every path has a start point and an end point. Circle them both.
- You can also go backwards. Try to start at the end point and go back to the start point.

example

Start 6 × 3 takes you to 18.

End 9 × 3 takes you to 27.

18 ÷ 2 takes you to 9.

× ÷

	6	
27	2	3
3	9	18

Try this one. The start and end points have been marked for you.

× ÷

	2	
12	5	6
4	3	30

Only the start point has been marked on these problems.

1

× ÷

	6	
3	18	2
27	3	9

2

× ÷

	4	
3	12	2
5	15	24

3

× ÷

	6	
4	16	2
24	3	8

4

× ÷

	12	
6	6	3
	36	

5

× ÷

	2	
18	9	3
	3	

6

× ÷

	21	
7	3	14
	2	

NAME _____ DATE _____

Fact Fluency with 2's–6's Division Capture

MULTIPLICATION FACT FLUENCY

You'll need

★ a partner

★ 2 pencils or markers in different colors

★ paperclip and pencil to use as a spinner

Instructions for Division Capture 2's–6's

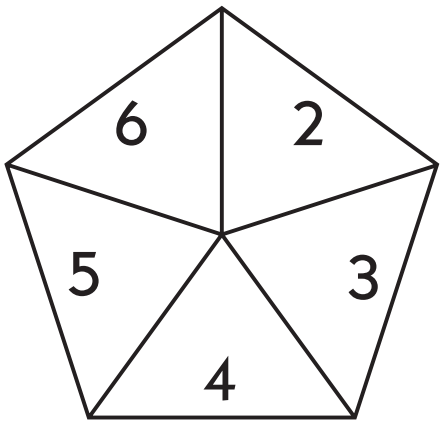
1 Take turns spinning the spinner. The player who gets the higher number goes first.

2 Take turns spinning the spinner. Use the number you spin to complete one of the division problems below. Be sure to use your own color pencil.

3 If the box you need is already filled, you lose your turn.

4 Try to capture 3 or 4 boxes in a row: across, up and down, or diagonally. Keep playing until the gameboard is filled or neither player can use the number he or she spins 3 times in a row.

5 Then circle the places on the grid where you got 3 or 4 in a row and add up your scores.



24 ÷ ☐ = 12	24 ÷ ☐ = 6	36 ÷ ☐ = 9	21 ÷ ☐ = 7
60 ÷ ☐ = 12	18 ÷ ☐ = 9	24 ÷ ☐ = 8	36 ÷ ☐ = 6
45 ÷ ☐ = 9	27 ÷ ☐ = 9	16 ÷ ☐ = 8	54 ÷ ☐ = 9
36 ÷ ☐ = 12	48 ÷ ☐ = 8	35 ÷ ☐ = 7	14 ÷ ☐ = 7
42 ÷ ☐ = 7	32 ÷ ☐ = 8	28 ÷ ☐ = 7	40 ÷ ☐ = 8

Scoring	Player 1 Points	Player 2 Points
3 in a Row—1 point 4 in a Row—2 points		

NAME _____ DATE _____

Fact Fluency with 4's–9's Mixed Facts

MULTIPLICATION FACT FLUENCY

1 Solve the multiplication facts below.

4 × 4	8 × 8	7 × 6	10 × 4	7 × 8	12 × 9	5 × 5
6 × 6	5 × 4	12 × 7	11 × 6	11 × 9	6 × 5	6 × 8
12 × 6	7 × 6	6 × 4	9 × 8	7 × 5	10 × 9	7 × 7
11 × 8	10 × 5	8 × 6	7 × 4	9 × 9	8 × 7	11 × 4
11 × 7	12 × 8	8 × 5	9 × 6	8 × 4	9 × 7	12 × 5
12 × 4	10 × 6	11 × 5	9 × 5	10 × 8	9 × 4	10 × 7

2 Solve the division facts below.

4)32	5)35	6)48	7)42	6)42	5)60	4)36
8)64	9)81	9)72	4)24	5)30	6)54	7)49
4)28	5)40	7)84	6)36	7)63	5)45	4)48

NAME _____ DATE _____

Fact Fluency with 4's–9's Secret Path Problems, Set 1

MULTIPLICATION FACT FLUENCY

- Find a path through all of the numbers in each set by multiplying or dividing to get from one number to the next.
- You have to use each number just one time.
- You can move only 1 space at a time. You can move over, up, down, or diagonally.
- Every path has a start point and an end point. Circle them both.
- You can also go backwards. Try to start at the end point and go back to the start point.

example

× ÷

18	8	4
6	3	24

(6)

6 × 4 takes you to 24.

3 × 6 takes you to 18.

24 ÷ 8 takes you to 3.

Try this one. The start and end points have been marked for you.

× ÷

18	9	6
3	(6)	(54)

(2)

Only the start point has been marked on these problems. You do the rest!

1

× ÷

56	8	12
7	6	48

(4)

2

× ÷

7	4	12
21	(9)	36

(3)

3

× ÷

(36)	12	6
4	9	8

(48)

4

× ÷

7	42	7
6	4	(24)

(6)

5

× ÷

7	49	(3)
3	21	7

(7)

6

× ÷

3	25	5
30	6	5

(10)

NAME _____ DATE _____

Fact Fluency with 4's–9's Secret Path Problems, Set 2

MULTIPLICATION FACT FLUENCY

- Find a path through all of the numbers in each set by multiplying or dividing to get from one number to the next.
- You have to use each number just one time.
- You can move only 1 space at a time. You can move over, up, down, or diagonally.
- Every path has a start point and an end point. Circle them both.
- You can also go backwards. Try to start at the end point and go back to the start point.

example

12 ÷ 6 takes you to 2.

24 ÷ 2 takes you to 12.

End Start

6	2	18
12	24	6
2	8	3

18 ÷ 6 takes you to 3.

3 × 8 takes you to 24.

Try this one. Just the starting point has been marked for you.

4	36	48
4	9	6
16	2	8

Only the start point has been marked on these problems.

1

6	18	2
8	3	9
24	6	4

2

12	5	60
3	9	10
36	4	6

3

6	36	4
6	3	9
9	27	3

4

12	60	6
5	10	6
9	4	36

5

36	6	6
4	72	12
9	8	6

6

56	12	4
7	48	10
8	5	40

NAME _____ DATE _____

Fact Fluency with 4's–9's Division Capture

MULTIPLICATION FACT FLUENCY

You'll need

★ a partner

★ 2 pencils or markers in different colors

★ paperclip and pencil to use as a spinner

Instructions for Division Capture 4's–9's

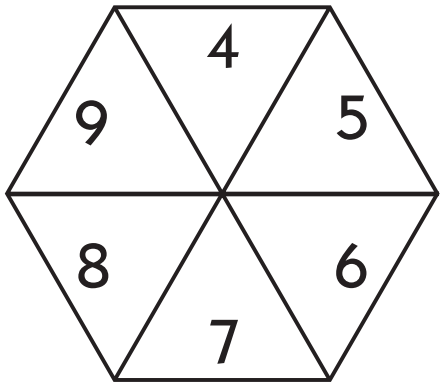
1 Take turns spinning the spinner. The player who gets the higher number goes first.

2 Take turns spinning the spinner. Use the number you spin to complete one of the division problems below. Be sure to use your own color pencil.

3 If the box you need is already filled, you lose your turn.

4 Try to capture 3 or 4 boxes in a row: across, up and down, or diagonally. Keep playing until the gameboard is filled or neither player can use the number he or she spins 3 times in a row.

5 Then circle the places on the grid where you got 3 or 4 in a row and add up your scores.



56 ÷ ☐ = 8	42 ÷ ☐ = 6	48 ÷ ☐ = 8	35 ÷ ☐ = 5
36 ÷ ☐ = 4	36 ÷ ☐ = 9	56 ÷ ☐ = 7	21 ÷ ☐ = 3
72 ÷ ☐ = 12	27 ÷ ☐ = 3	32 ÷ ☐ = 8	54 ÷ ☐ = 9
63 ÷ ☐ = 7	28 ÷ ☐ = 7	96 ÷ ☐ = 12	64 ÷ ☐ = 8
60 ÷ ☐ = 12	81 ÷ ☐ = 9	72 ÷ ☐ = 9	45 ÷ ☐ = 9

Scoring	Player 1 Points	Player 2 Points
3 in a Row—1 point 4 in a Row—2 points		

NAME _____ DATE _____

Fact Fluency with 6's–12's Mixed Facts

MULTIPLICATION FACT FLUENCY

1 Solve the multiplication facts below.

6 × 6	5 × 6	5 × 9	12 × 11	6 × 8	12 × 10	8 × 6
4 × 8	12 × 7	9 × 9	5 × 8	9 × 7	6 × 9	4 × 9
12 × 9	11 × 10	8 × 8	4 × 6	11 × 12	3 × 6	9 × 8
9 × 6	11 × 7	12 × 12	7 × 7	8 × 9	9 × 12	11 × 6
8 × 12	7 × 9	11 × 8	8 × 7	6 × 7	7 × 8	11 × 9
12 × 6	12 × 8	10 × 10	4 × 7	11 × 11	5 × 7	7 × 6

2 Solve the division facts below.

7)49	9)63	9)81	6)48	9)54	9)45	7)56
9)108	8)64	6)36	7)42	6)54	8)72	8)48
7)84	6)42	9)72	8)96	8)56	6)72	7)63

NAME _____ DATE _____

Fact Fluency with 6's–12's Secret Path Problems, Set 1

MULTIPLICATION FACT FLUENCY

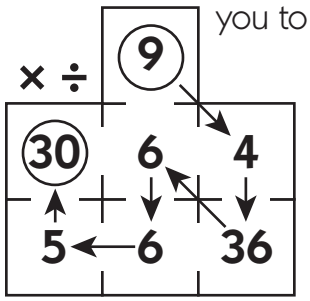
- Find a path through all of the numbers in each set by multiplying or dividing to get from one number to the next.
- You have to use each number just one time.
- You can move only 1 space at a time. You can move over, up, down, or diagonally.
- Every path has a start point and an end point. Circle them both.
- You can also go backwards. Try to start at the end point and go back to the start point.

example

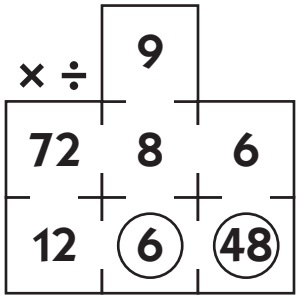
9 × 4 takes you to 36.

6 × 5 takes you to 30.

36 ÷ 6 takes you to 6.

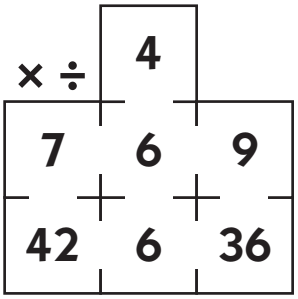


Try this one. The start and end points have been marked for you.



Find your own start and end points, as well as a path through the numbers.

1



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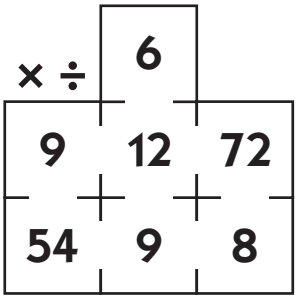

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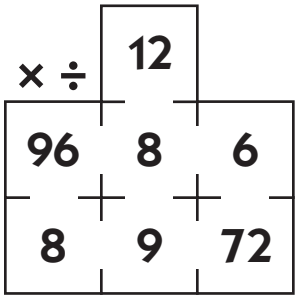

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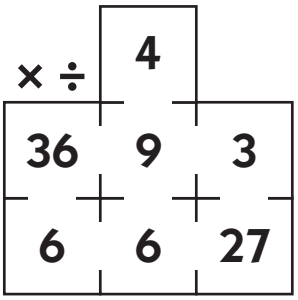

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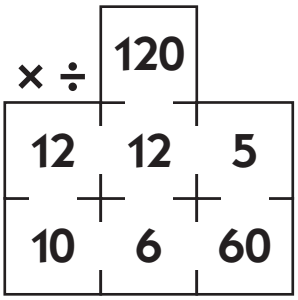

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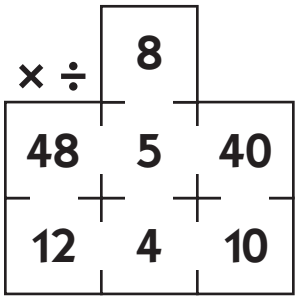


NAME _____ DATE _____

Fact Fluency with 6's–12's Secret Path Problems, Set 2

MULTIPLICATION FACT FLUENCY

- Find a path through all of the numbers in each set by multiplying or dividing to get from one number to the next.
- You have to use each number just one time.
- You can move only 1 space at a time. You can move over, up, down, or diagonally.
- Every path has a start point and an end point. Circle them both.
- You can also go backwards. Try to start at the end point and go back to the start point.

example

12 × 7 takes you to 84.

48 ÷ 4 takes you to 12.

End Start

7	84	36
12	48	6
4	8	6

36 ÷ 6 takes you to 6.

6 × 8 takes you to 48.

Try this one. Just the start point has been marked for you.

12	60	36
5	10	12
6	30	3

The start point has been marked on the first 3 problems.

1

40	10	4
5	6	12
8	9	72

2

81	9	4
42	9	36
7	6	6

3

9	54	56
6	7	8
12	72	9

4

12	6	72
7	8	9
9	63	7

5

63	9	7
7	72	12
9	8	6

6

10	4	6
40	5	12
8	9	72

NAME _____ DATE _____

Fact Fluency with 6's–12's Division Capture

MULTIPLICATION FACT FLUENCY

You'll need

★ a partner

★ 2 pencils or markers in different colors

★ paperclip and pencil to use as a spinner

Instructions for Division Capture 6's–12's

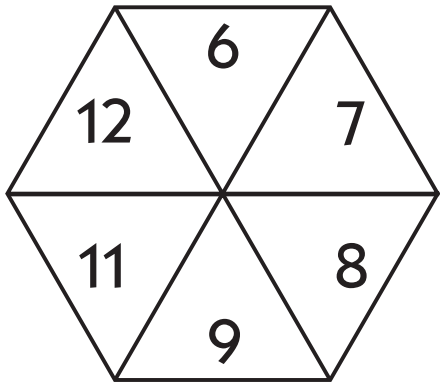
1 Take turns spinning the spinner. The player who gets the higher number goes first.

2 Take turns spinning the spinner. Use the number you spin to complete one of the division problems below. Be sure to use your own color pencil.

3 If the box you need is already filled, you lose your turn.

4 Try to capture 3 or 4 boxes in a row: across, up and down, or diagonally. Keep playing until the gameboard is filled or neither player can use the number he or she spins 3 times in a row.

5 Then circle the places on the grid where you got 3 or 4 in a row and add up your scores.



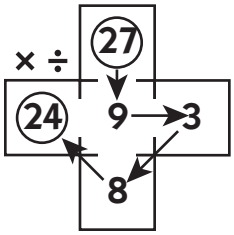
42 ÷ ☐ = 7	81 ÷ ☐ = 9	96 ÷ ☐ = 12	121 ÷ ☐ = 11
63 ÷ ☐ = 7	54 ÷ ☐ = 9	49 ÷ ☐ = 7	72 ÷ ☐ = 8
54 ÷ ☐ = 6	56 ÷ ☐ = 8	72 ÷ ☐ = 6	72 ÷ ☐ = 12
63 ÷ ☐ = 9	108 ÷ ☐ = 9	64 ÷ ☐ = 8	132 ÷ ☐ = 12
144 ÷ ☐ = 12	84 ÷ ☐ = 12	88 ÷ ☐ = 8	56 ÷ ☐ = 7
Scoring 3 in a Row—1 point 4 in a Row—2 points		**Player 1 Points**	**Player 2 Points**

Fact Fluency Secret Path Answer Keys

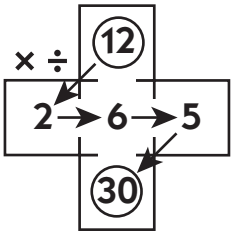
ANSWER KEY

Building Computational Fluency Blackline F 68, Fact Fluency with 2's–6's Secret Path Problems, Set 1

Try this one*



1*



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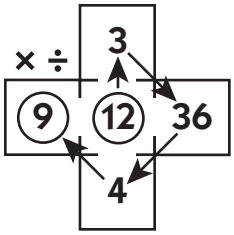

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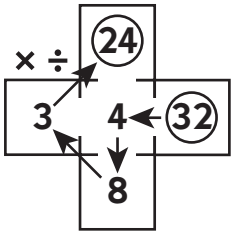

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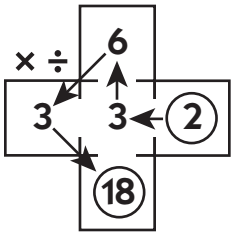

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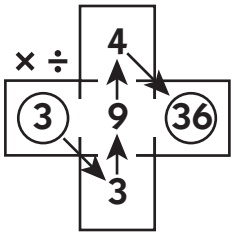

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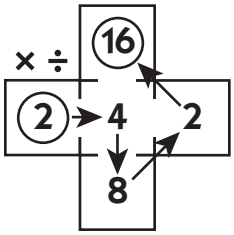
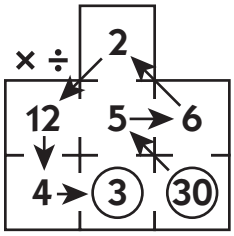


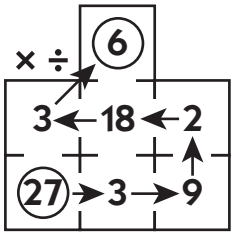
* Paths may be reversed so what is shown as the end point could also be the start point, with the path going in reverse order using the inverse operation each time.

Building Computational Fluency Blackline F 69, Fact Fluency with 2's–6's Secret Path Problems, Set 2

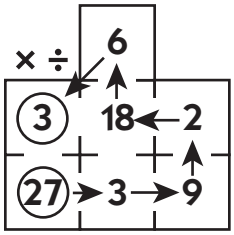
Try this one*



1a



1b



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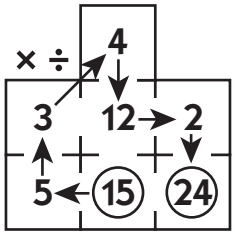

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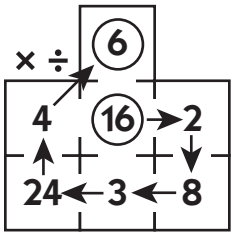

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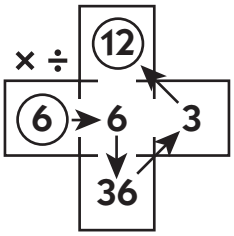

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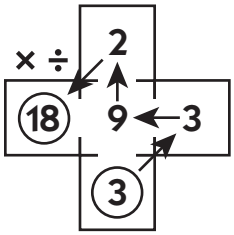

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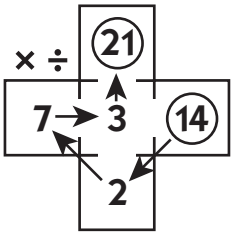
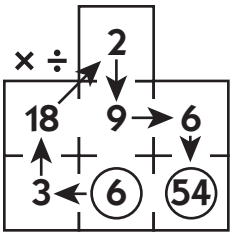


* Paths may be reversed so what is shown as the end point could also be the start point, with the path going in reverse order using the inverse operation each time.

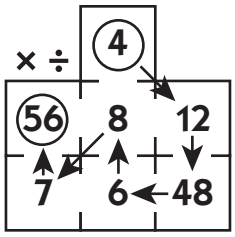
ANSWER KEY

Building Computational Fluency Blackline F 72, Fact Fluency with 4's–9's Secret Path Problems, Set 1

Try this one*



1



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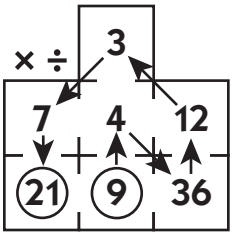

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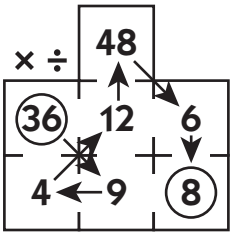

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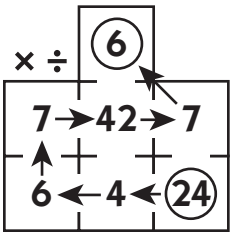
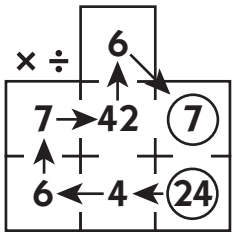


4b



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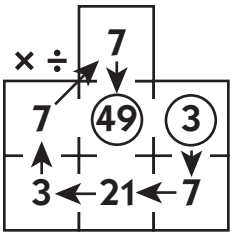

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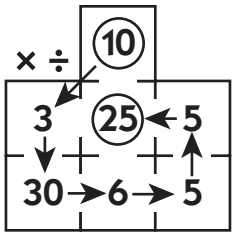
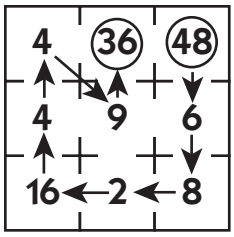


* Paths may be reversed so what is shown as the end point could also be the start point, with the path going in reverse order using the inverse operation each time.

Building Computational Fluency Blackline F 73, Fact Fluency with 4's–9's Secret Path Problems, Set 2

Try this one



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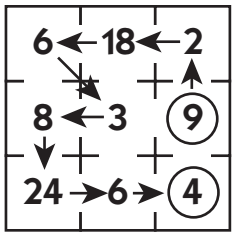

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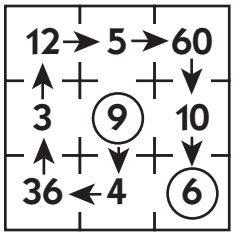
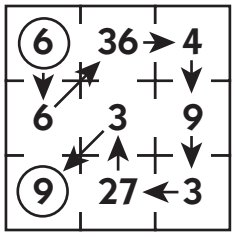
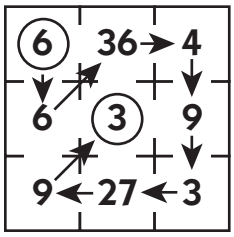


3a



3b



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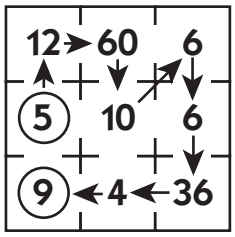

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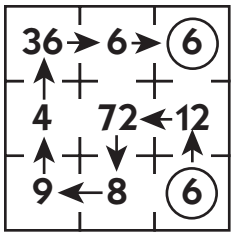

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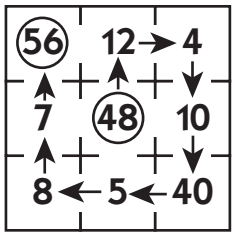
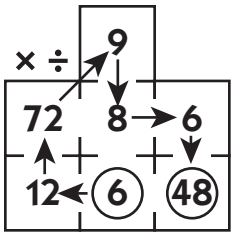


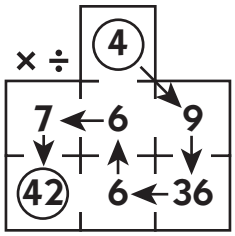
ANSWER KEY

Building Computational Fluency Blackline F 76, Fact Fluency with 6's–12's Secret Path Problems, Set 1

Try this one*



1*



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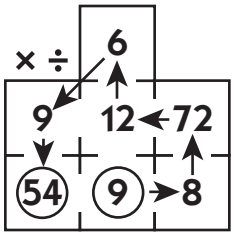

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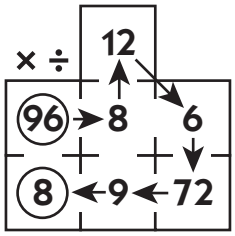

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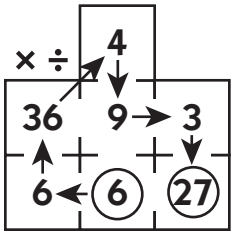

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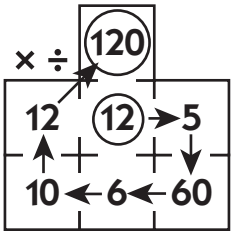
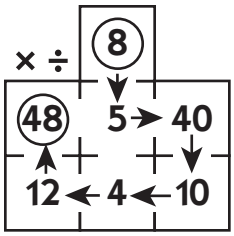


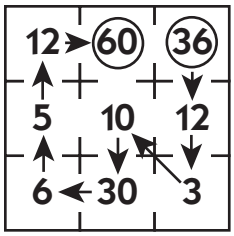
6*



* Paths may be reversed so what is shown as the end point could also be the start point, with the path going in reverse order using the inverse operation each time.

Building Computational Fluency Blackline F 77, Fact Fluency with 6's–12's Secret Path Problems, Set 2

Try this one



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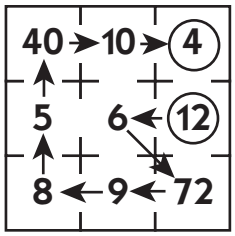
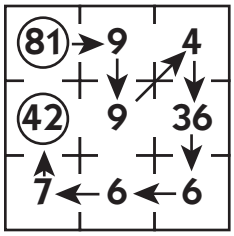
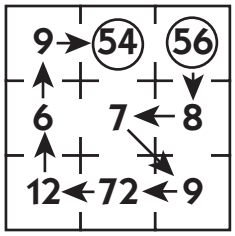


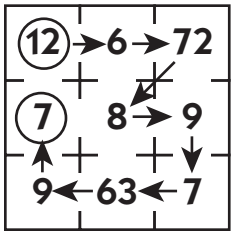
2



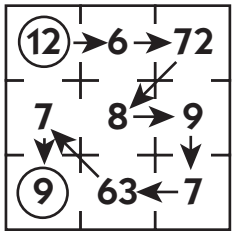
3



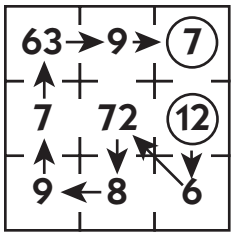
4a*



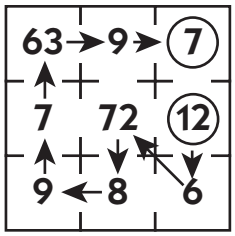
4b*



5*



6*



* Paths may be reversed so what is shown as the end point could also be the start point, with the path going in reverse order using the inverse operation each time.