Building Computational Fluency

Grade 3

BRIDGES BREAKOUT

Excerpts from Bridges in Mathematics

BOBCF3

Building Computational Fluency, Grade 3
A Math Learning Center Publication

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illustrated by Tyson Smith

Other Bridges Breakout Units

- Building Computational Fluency, Grades 5 & 6
- Building Computational Fluency, Grade 4
- 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, Grade 3

Introduction

Section 1 Assessments

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

Section 2 Fact Fluency

Follow copy instructions on blacklines to run as needed.

Section 3: Support Activites

Follow copy instructions on blacklines to run as needed.

Building Computational Fluency, Grade 3 Overview

Building Computational Fluency, Grade 3 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:

- building fluency with addition and subtraction facts to 20
- adding and subtracting multi-digit numbers with and without regrouping
- estimating the results of adding and subtracting 2- and 3-digit numbers
- computing with money
- using words, pictures, visual models, and numbers to represent multiplication
- using models, words, and/or numbers to demonstrate an understanding of multiplication as repeated addition, equal groups of objects, arrays, or skip counting
- developing and applying strategies for multiplication facts through 10×10
- developing an understanding of the relationship between multiplication and division
- exploring division facts through $100 \div 10$

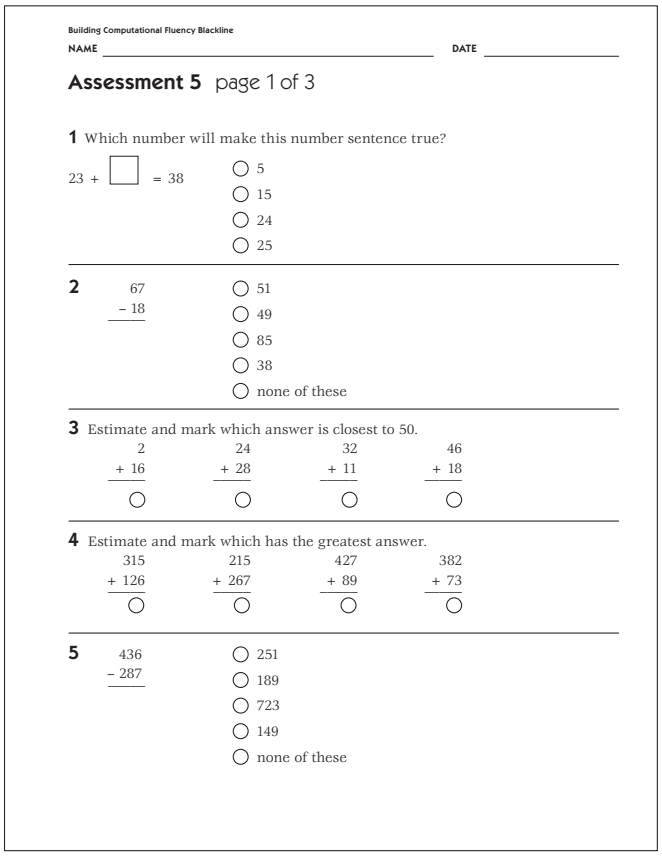
In Section 1, you'll find a set of assessments designed to be administered at key points throughout the school year. These assessments serve as a useful complement to any third grade math program, and may also be helpful to fourth grade teachers seeking to diagnose specific skill deficits among students working below grade level. They also provide tools to check students' proficiency with basic addition, subtraction, and multiplication facts on a regular basis. In Section 2, you'll find a Fact Fluency Supplement that provides the kind of systematic, strategy-based practice students need to master basic addition, subtraction, and multiplication facts. The strategy booklets, worksheets, and take-home activities in this section can be used with selected students or with your entire class. Section 3 is 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. Each section is described in more detail on the following pages.

Section 1 Assessments

The eight 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 a constructed response piece in which students solve addition and subtraction story problems using pictures, numbers, and/or words. This assessment gives you information about students' number sense, their understanding of whole number operations, and how they use computation strategies to solve problems. It is intended for use at the beginning of the school year, although you can use it any time that best suits your instructional needs.

Assessments 2, 3, and 6 are written tests of students' fluency with addition, subtraction, and multiplication facts. The first two are designed to be administered early in the school year, and the third can be given sometime in the middle of the year to provide baseline measures of students' fact fluency. You can re-administer each assessment periodically to gauge students' development through the school year. Alternate test forms and class checklists are provided with each of these assessments to help you track students' progress. You'll find a set of fact strategy booklets, worksheets, and take-home activities in the third section of this packet designed to provide students with opportunities to learn and practice addition, subtraction, and multiplication strategies.

Assessments 4, 5, 7 and 8 are quarterly written 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 a host of other key math skills typically taught in the fall, winter, and spring of the third grade year. These assessments may also be useful to resource room teachers and others working with below-grade-level fourth graders.



Building Computational Fluency Blackline

NAME _____ DATE _____

Assessment 5 page 1 of 3

1 Which number will make this number sentence true?

23 + ☐ = 38

- ○ 5
- ○ 15
- ○ 24
- ○ 25

2

67
– 18

- ○ 51
- ○ 49
- ○ 85
- ○ 38
- ○ none of these

3 Estimate and mark which answer is closest to 50.

2	24	32	46
+ 16	+ 28	+ 11	+ 18
○	○	○	○

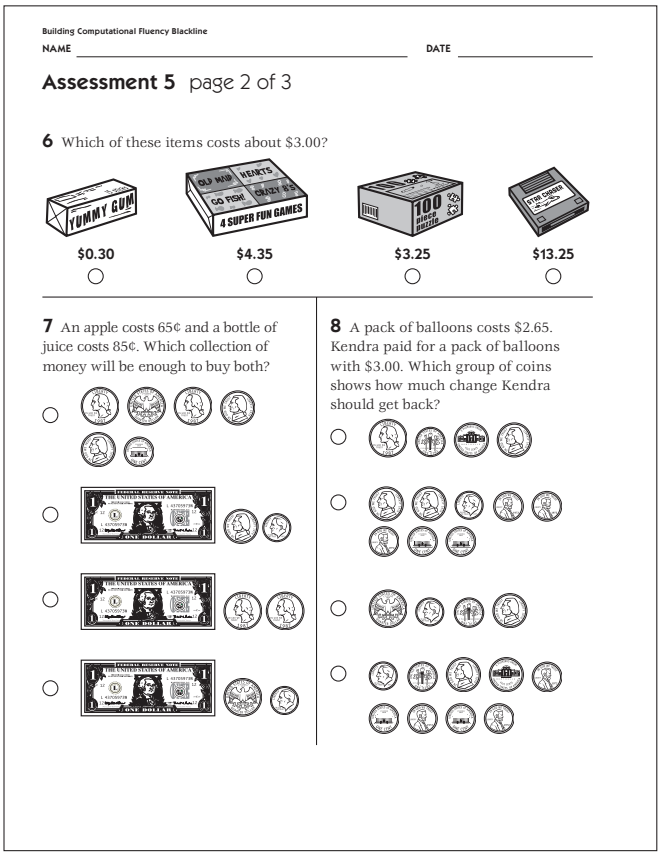
4 Estimate and mark which has the greatest answer.

315	215	427	382
+ 126	+ 267	+ 89	+ 73
○	○	○	○

5

436
– 287

- ○ 251
- ○ 189
- ○ 723
- ○ 149
- ○ none of these



Building Computational Fluency Blackline

NAME _____ DATE _____

Assessment 5 page 2 of 3

6 Which of these items costs about $3.00?

$0.30	$4.35	$3.25	$13.25
○	○	○	○

7 An apple costs 65¢ and a bottle of juice costs 85¢. Which collection of money will be enough to buy both?

8 A pack of balloons costs $2.65. Kendra paid for a pack of balloons with $3.00. Which group of coins shows how much change Kendra should get back?

First two pages of Assessment 5

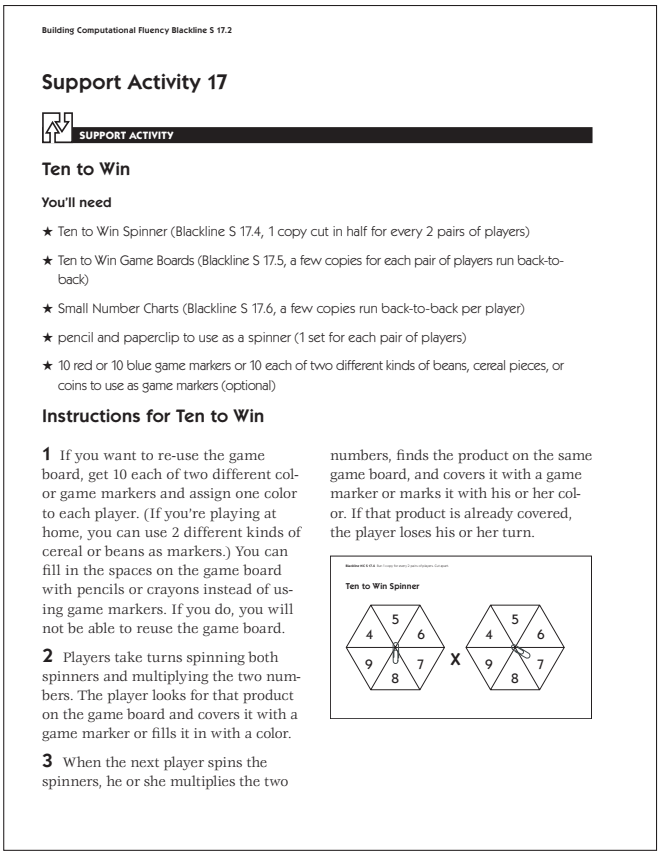
Section 2 Fact Fluency

The Fact Fluency section is designed to be used in conjunction with the assessments in this packet, but also stands alone as a set of materials that can be used to supplement any third grade math program. This section includes 3 illustrated fact strategy booklets to be used with students at school or home, 48 pages of strategy-related fact practice, and several take-home sheets and activities.

Section 3 Support Activities

In the third section of this packet, you'll find a set of 18 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 addition, subtraction, and multiplication fact strategies; multi-digit addition and subtraction with and without regrouping; and computation with money. Most of these games are based around visual models such as ten strips, base 10 pieces,

money value pieces, and hundreds grids, and are intended to help students develop conceptual understanding as well as proficiency.



Building Computational Fluency Blackline S 17.2

Support Activity 17

SUPPORT ACTIVITY

Ten to Win

You'll need

★ Ten to Win Spinner (Blackline S 17.4, 1 copy cut in half for every 2 pairs of players)

★ Ten to Win Game Boards (Blackline S 17.5, a few copies for each pair of players run back-to-back)

★ Small Number Charts (Blackline S 17.6, a few copies run back-to-back per player)

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

★ 10 red or 10 blue game markers or 10 each of two different kinds of beans, cereal pieces, or coins to use as game markers (optional)

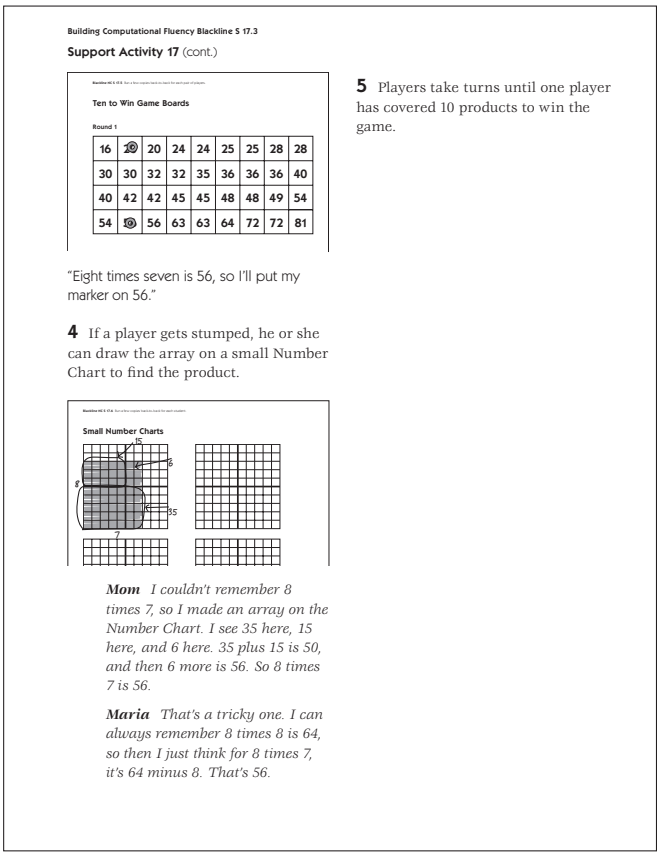
Instructions for Ten to Win

1 If you want to re-use the game board, get 10 each of two different color game markers and assign one color to each player. (If you're playing at home, you can use 2 different kinds of cereal or beans as markers.) You can fill in the spaces on the game board with pencils or crayons instead of using game markers. If you do, you will not be able to reuse the game board.

2 Players take turns spinning both spinners and multiplying the two numbers. The player looks for that product on the game board and covers it with a game marker or fills it in with a color.

3 When the next player spins the spinners, he or she multiplies the two numbers, finds the product on the same game board, and covers it with a game marker or marks it with his or her color. If that product is already covered, the player loses his or her turn.

Ten to Win Spinner



Building Computational Fluency Blackline S 17.3

Support Activity 17 (cont.)

Ten to Win Game Boards

Round 1

16	20	20	24	24	25	25	28	28
30	30	32	32	35	36	36	36	40
40	42	42	45	45	48	48	49	54
54	10	56	63	63	64	72	72	81

"Eight times seven is 56, so I'll put my marker on 56."

4 If a player gets stumped, he or she can draw the array on a small Number Chart to find the product.

Small Number Charts

Mom *I couldn't remember 8 times 7, so I made an array on the Number Chart. I see 35 here, 15 here, and 6 here. 35 plus 15 is 50, and then 6 more is 56. So 8 times 7 is 56.*

Maria *That's a tricky one. I can always remember 8 times 8 is 64, so then I just think for 8 times 7, it's 64 minus 8. That's 56.*

5 Players take turns until one player has covered 10 products to win the game.

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 volunteers, resource or title teachers, and classroom teachers. 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

Assessment 1

ASSESSMENT

Overview

Students solve addition and subtraction story problem using pictures, numbers and/or words. This information is used to assess students' strengths with basic computation in the context of word problems.

Skills & Concepts

★ solving addition and subtraction problems using models and strategies

★ identifying and applying the operation needed for solving a problem

Timing

Early September or any other time of the year that's appropriate for your students

You'll need

★ Assessment 1, pages 1 and 2 (pages 11 and 12, class set plus 1 copy of page 11 on a transparency)

★ Ten-Strips (page 13, class set)

★ game markers or other small counters, 20 per student

Conducting Assessment 1

Having students write about their mathematical thinking provides a learning opportunity for them and an assessment opportunity for you. The process of communicating with pictures, numbers, and/or words requires them to organize and clarify their thoughts and gives you valuable information about what they understand and can do. In this constructed response assessment, you'll see if students can make sense of a mathematical idea and then present their knowledge effectively using some combination of pictures, numbers, and words.

To introduce the assessment, display the overhead copy you made of the first sheet and give each student a copy of both pages. Read the directions and story problems on the overhead out loud, and ask students to follow along on their papers. Make sure everyone understands that they should select one of the two problems, make an X beside it, and then solve the problem in the space provided. Invite students to circle the words on the sheet that tell them what they need to do (choose and solve). You'll want to model this on the overhead.

Assessment 1 (cont.)

Building Computational Fluency Blackline

NAME Mrs. Johnstone DATE September 29

Assessment 1 page 1 of 2

1 Choose one of the two story problems below. Put an **X** beside the one you choose.

__X__ Max had 5 pencils. His mom gave him 8 more.
How many pencils does Max have altogether?

_____ Max had 15 pencils. His mom gave him 18 more.
How many pencils does Max have altogether?

2 Solve the story problem in the space below. Use pictures, numbers, and/or words to show your thinking.

You'll also want to discuss how students might select which problem to solve. Encourage them to choose the problem that is just right for them, not too easy and not too hard. Let students know that they'll do the same thing on the second sheet as well. Also let them know they can show their work using whatever combination of pictures, numbers, and words is most comfortable for them.

Before they begin working, tell students that although you often encourage them to work with others, you'd like everyone to work independently on this task. Let them know, however, that you'll be available to reread the questions for anyone who'd like to hear them again.

Ask students to begin by writing their name and today's date at the tops of both pages. As they work, circulate around the room. Feel free to reread the directions or word problems for students who need assistance, keeping in mind that you're not assessing their reading levels. When they have finished their work, ask them to look it over one more time. Did they show their thinking in a clear way so that someone else could follow along?

Using Information from Assessment 1

Open-ended prompts provide all students with access to the assessment, and as a result each child is able to show what she or he knows about the topic at hand. Students select the prompt they feel is at their independent level—not too hard but not too easy. Offering a choice also motivates students to do their best work.

In addition to choosing the question, we want students to choose their preferred modes of communicating mathematical ideas. Some students will draw pictures to show their thinking. Others may choose to write number sentences, and still others may choose to write a few sentences, a step-by-step explanation of what they did to find the solution to the problem. All three ways are encouraged in a constructed response assessment.

The ways in which each student has chosen to express his or her thinking will provide you with insights about his or her learning preferences. If a stu-

Assessment 1 (cont.)

dent chooses to draw a picture to solve the problem, he may prefer to learn new content through visual models and manipulatives. If a student writes a paragraph about the process, he may prefer to learn new content through discussions, story problems, and literature connections. If a student chooses to record number sentences to show her thinking symbolically, she may prefer to learn new mathematical content with symbols and equations.

This assessment will give you valuable information about students' number sense, their understanding of whole number operations, and how they use computation strategies to solve problems. We recommend that you share students' responses with their families during conferences and/or keep them as portfolio pieces.

Scoring Student Work

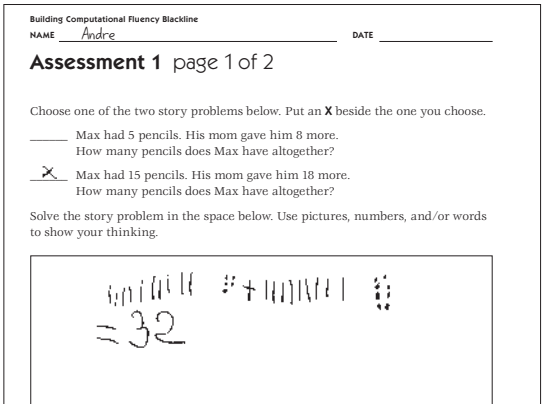
The student work samples that follow are representative of what you might expect at the novice, basic, proficient, and advanced levels.

SCORING RUBRIC				
	4–Advanced	**3–Proficient**	**2–Basic**	**1–Novice**
Understanding of the problem	Identifies all the important elements and shows a complete understanding of the problem.	Identifies the most important elements and shows an understanding of the problem.	Omits a key element and shows an incomplete understanding of the problem.	Omits several key elements and misunderstands the problem.
Accuracy	Accurate computation and/or problem solving. Extensions are correct.	Computation and/or problem solving is accurate.	Computation and/or problem solving has a minor error.	Computation and/or problem solving has major errors.
Presentation	Elegant, coherent, exemplary communication.	Clear and complete explanation.	Unclear or incomplete explanation. Inappropriate or unrelated model.	No explanation given.

Level One—Novice

Andre chose the more challenging addition problem. He drew 10 sticks to represent the 10 and 5 dots to show the 5 in 15. Then he drew 9 sticks and 8 dots for the 18 pencils. As a result, his final answer of 32 was off by 1, and he had no other way of double-checking this result for accuracy. Andre chose the easier subtraction problem and assumed it was an addition problem as well. He added 7 and 15 inaccurately to make the sum 23. His confusion about tens and ones, and the meaning of the difference model for subtraction, are areas of concern. Andre is working at the novice level.

Assessment 1 (cont.)


Building Computational Fluency Blackline
NAME Andre DATE

Assessment 1 page 1 of 2

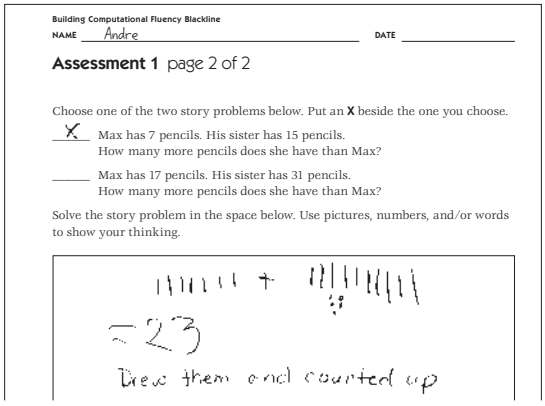
Choose one of the two story problems below. Put an **X** beside the one you choose.

_____ Max had 5 pencils. His mom gave him 8 more.
How many pencils does Max have altogether?

__X__ Max had 15 pencils. His mom gave him 18 more.
How many pencils does Max have altogether?

Solve the story problem in the space below. Use pictures, numbers, and/or words to show your thinking.

=32


Building Computational Fluency Blackline
NAME Andre DATE

Assessment 1 page 2 of 2

Choose one of the two story problems below. Put an **X** beside the one you choose.

__X__ Max has 7 pencils. His sister has 15 pencils.
How many more pencils does she have than Max?

_____ Max has 17 pencils. His sister has 31 pencils.
How many more pencils does she have than Max?

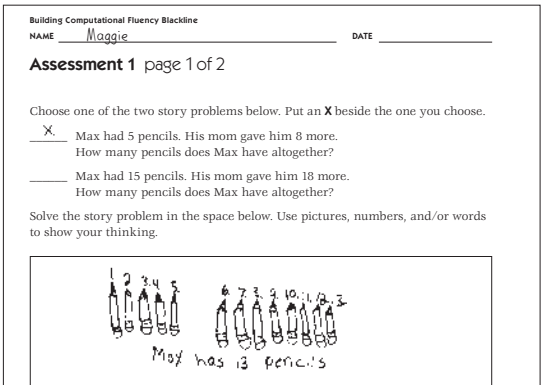
Solve the story problem in the space below. Use pictures, numbers, and/or words to show your thinking.

=23

Drew them and counted up

Level Two—Basic

Maggie chose to make a detailed, literal drawing of Max's 5 pencils and the 8 more his mom gave him. Then she counted them one by one. When Maggie solved the difference problem, she drew 7 sticks for Max and then 15 for his sister. In the set of 15 sticks, she drew a vertical line after 7 to show Max's set of 7 pencils and then counted the remaining sticks to 15. This shows that she understands the model for a difference problem. Her work is very well organized and easy to follow, and she also writes complete sentences to communicate her answers. Maggie's dependency on one-by-one counting for these simple probems is a concern, although she accurately solves addition and subtraction problems using pictures and words. Maggie is working at the basic level.


Building Computational Fluency Blackline
NAME Maggie DATE

Assessment 1 page 1 of 2

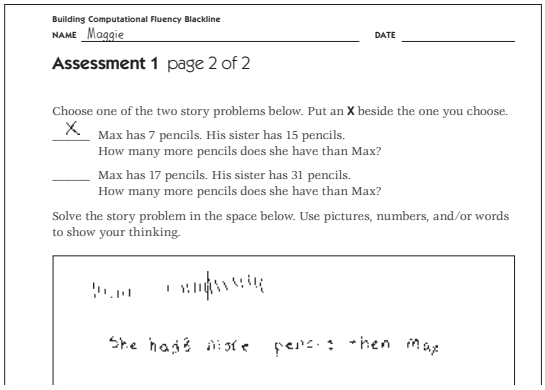
Choose one of the two story problems below. Put an **X** beside the one you choose.

__X__ Max had 5 pencils. His mom gave him 8 more.
How many pencils does Max have altogether?

_____ Max had 15 pencils. His mom gave him 18 more.
How many pencils does Max have altogether?

Solve the story problem in the space below. Use pictures, numbers, and/or words to show your thinking.

Max has 13 pencils


Building Computational Fluency Blackline
NAME Maggie DATE

Assessment 1 page 2 of 2

Choose one of the two story problems below. Put an **X** beside the one you choose.

__X__ Max has 7 pencils. His sister has 15 pencils.
How many more pencils does she have than Max?

_____ Max has 17 pencils. His sister has 31 pencils.
How many more pencils does she have than Max?

Solve the story problem in the space below. Use pictures, numbers, and/or words to show your thinking.

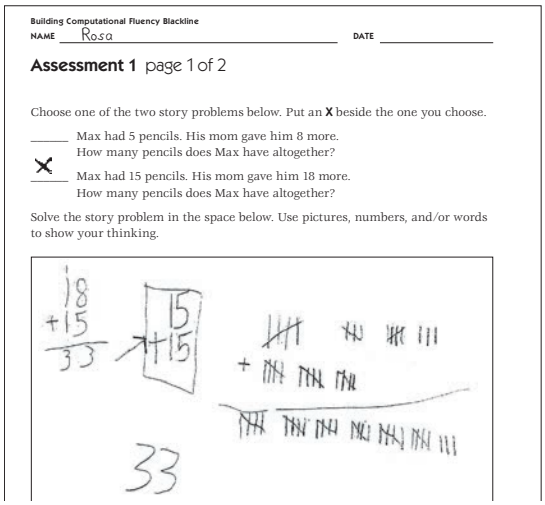
She has 8 more pencils then Max

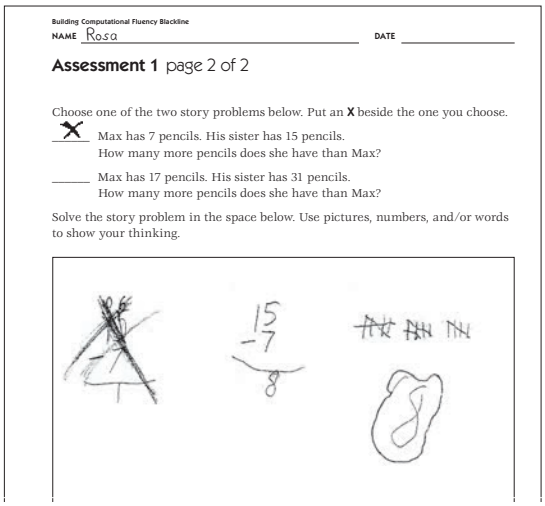
Level Three—Proficient

Rosa chose the more challenging addition problem and the easier subtraction problem in this assessment. This is typical of many third grade students at the beginning of the year. She used the traditional algorithm and also showed her ability to double check her work by chunking 15 + 15. Rosa drew tallies to show the number sets in pictures as well. Rosa tried to use the algorithm for the subtraction problem but crossed it out when she couldn't make sense of what to do. Then she drew 7 tallies and used addition to count up to 15 tallies. She correctly identified the difference as 8 and recorded her answer un-

Assessment 1 (cont.)

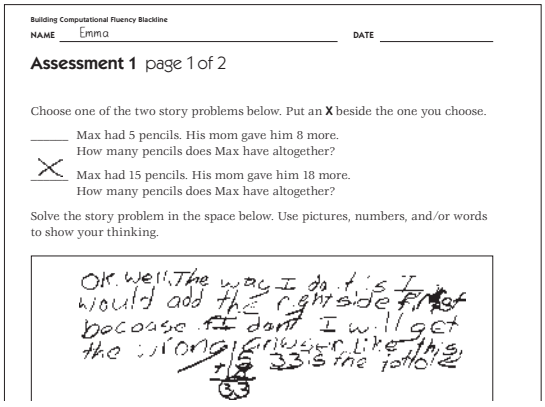
der the vertical notation. Rosa prefers to show her thinking in numbers and tallies. Her work is at a proficient level for early third grade.

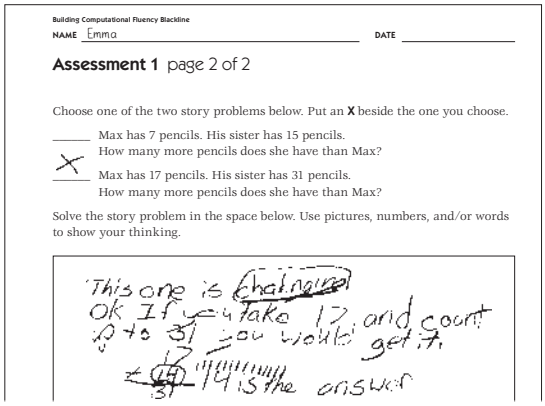

Building Computational Fluency Blackline
NAME Rosa DATE
Assessment 1 page 1 of 2
Choose one of the two story problems below. Put an **X** beside the one you choose.
_____ Max had 5 pencils. His mom gave him 8 more. How many pencils does Max have altogether?
X Max had 15 pencils. His mom gave him 18 more. How many pencils does Max have altogether?
Solve the story problem in the space below. Use pictures, numbers, and/or words to show your thinking.
18 +15 33
15 +15
33


Building Computational Fluency Blackline
NAME Rosa DATE
Assessment 1 page 2 of 2
Choose one of the two story problems below. Put an **X** beside the one you choose.
X Max has 7 pencils. His sister has 15 pencils. How many more pencils does she have than Max?
_____ Max has 17 pencils. His sister has 31 pencils. How many more pencils does she have than Max?
Solve the story problem in the space below. Use pictures, numbers, and/or words to show your thinking.
15 −7 8
8

Level Four—Advanced

Advanced students may go beyond what has been covered in class by selecting a challenging problem, making new connections, or honing their communication skills in pictures, numbers, and/or words. Emma's favorite language is words. She has decided that you must begin adding on the right side first, or you might get the wrong answer. Emma uses the traditional algorithm to find the total. Interestingly enough, when she computed the difference for the subtraction problem, she used addition. Her use of tally marks to show 14 pencils shows how she counted to find the difference. She double-checked her work by using the addition algorithm and confidently reported that 14 is the answer.


Building Computational Fluency Blackline
NAME Emma DATE
Assessment 1 page 1 of 2
Choose one of the two story problems below. Put an **X** beside the one you choose.
_____ Max had 5 pencils. His mom gave him 8 more. How many pencils does Max have altogether?
X Max had 15 pencils. His mom gave him 18 more. How many pencils does Max have altogether?
Solve the story problem in the space below. Use pictures, numbers, and/or words to show your thinking.
Ok. well. The way I do it is I would add the right side first because I dont I will get the wrong answer like this. 33 is the total

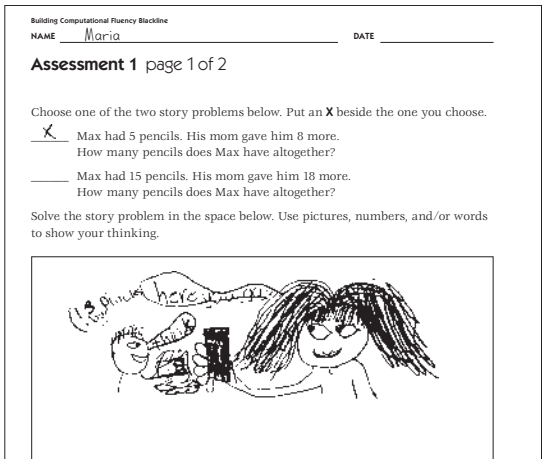

Building Computational Fluency Blackline
NAME Emma DATE
Assessment 1 page 2 of 2
Choose one of the two story problems below. Put an **X** beside the one you choose.
_____ Max has 7 pencils. His sister has 15 pencils. How many more pencils does she have than Max?
X Max has 17 pencils. His sister has 31 pencils. How many more pencils does she have than Max?
Solve the story problem in the space below. Use pictures, numbers, and/or words to show your thinking.
This one is challenging Ok If you take 17 and count up to 31 you would get it. 14 is the answer

A Note about Interviewing Students

If a student has written something that doesn't make sense to you, try to make time for him to explain orally what he wrote. Sometimes spelling gets in the way, and other times, students surprise us by making connections that are way beyond our own thinking or what we expected of them.

Assessment 1 (cont.)

In Maria's work below, she drew a picture of Max and his mom, but did not identify the sum.



Building Computational Fluency Blackline

NAME Maria DATE

Assessment 1 page 1 of 2

Choose one of the two story problems below. Put an **X** beside the one you choose.

X Max had 5 pencils. His mom gave him 8 more.
How many pencils does Max have altogether?

_____ Max had 15 pencils. His mom gave him 18 more.
How many pencils does Max have altogether?

Solve the story problem in the space below. Use pictures, numbers, and/or words to show your thinking.

When we interviewed her, we asked her how many pencils Max had altogether, and she replied, "It's 13." When asked how she knew that the total was 13, she volunteered that she turned the numbers around because 5 + 8 is the same as 8 + 5, and then tapped her foot 5 times to count up to 13. Although we want her to move away from one-by-one counting, we can see that Maria understands the commutative property of addition, a big idea that's key to computational fluency. She also understands that it is more efficient to begin counting on from the larger number (8).

When asked how another person would know her answer, Maria said, "Oh, I'll write 13 pencils now," and she did (see her work above). Maria knew the answer but did not completely communicate her thinking in writing. By interviewing students like Maria, you can encourage them to correct their work and find out what they really know and can do.

NAME _____ DATE _____

Assessment 1 page 1 of 2

1 Choose one of the two story problems below. Put an **X** beside the one you choose.

_____ Max had 5 pencils. His mom gave him 8 more.
How many pencils does Max have altogether?

_____ Max had 15 pencils. His mom gave him 18 more.
How many pencils does Max have altogether?

2 Solve the story problem in the space below. Use pictures, numbers, and/or words to show your thinking.

NAME _____ DATE _____

Assessment 1 page 2 of 2

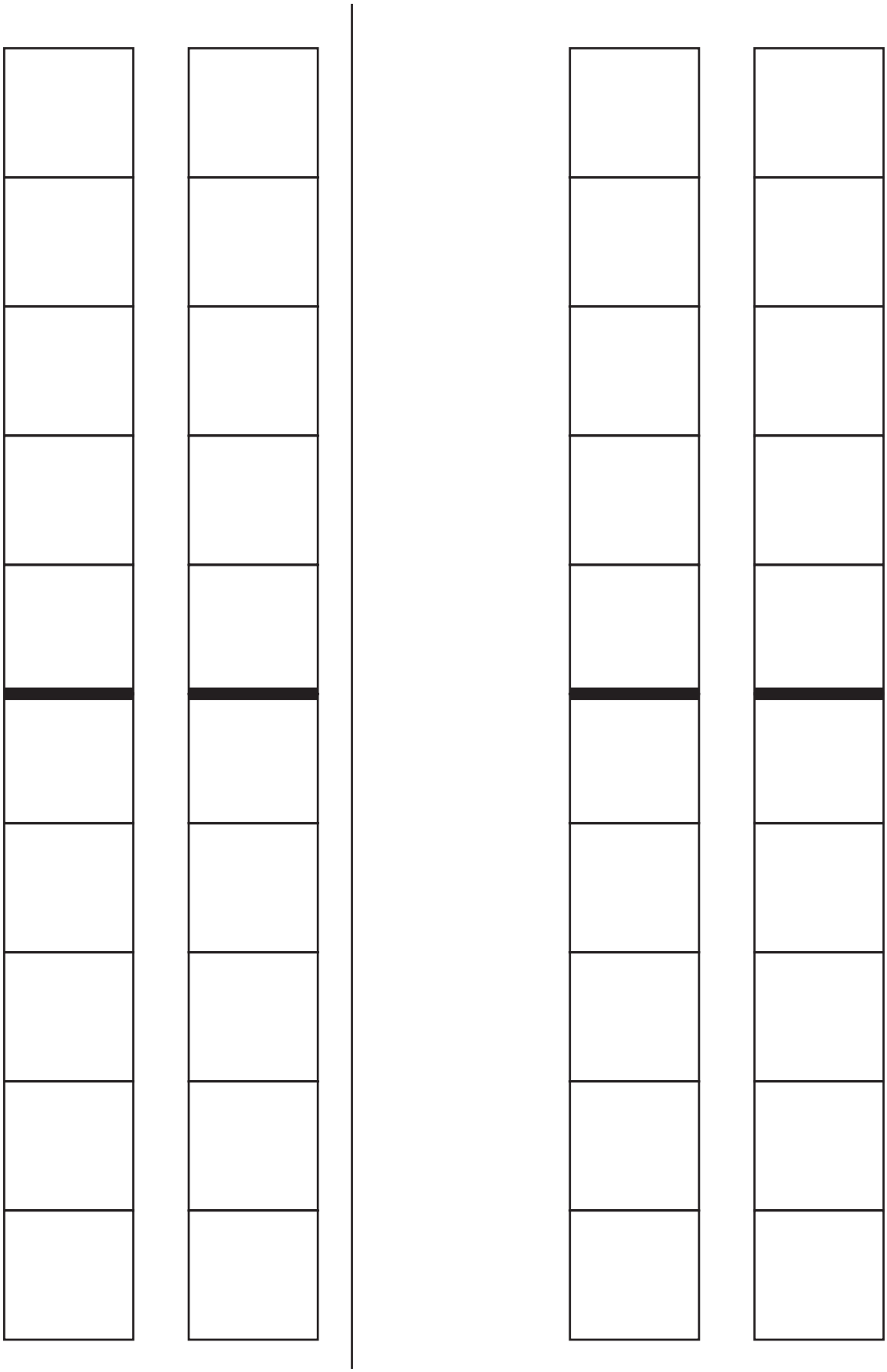
3 Choose one of the two story problems below. Put an **X** beside the one you choose.

_____ Max has 7 pencils. His sister has 15 pencils.
How many more pencils does she have than Max?

_____ Max has 17 pencils. His sister has 31 pencils.
How many more pencils does she have than Max?

4 Solve the story problem in the space below. Use pictures, numbers, and/or words to show your thinking.

Ten-Strips



Assessment 2

ASSESSMENT

Overview
Students are given up to 3 minutes to take a 30-problem addition facts test, working with sums to 20.

Skills & Concepts
★ fluency with addition facts to 20

Timing
Early and late fall

You'll need
★ Assessment 2, Form A (page 19, class set)

★ Assessment 2, Form B (page 20, class set, save for use later in the fall)

★ Addition Facts Class Checklist (page 21, 1 copy, optional)

★ clock or watch with a second hand

Some Thoughts on Timed Testing *We don't advocate the practice of timed testing for instructional purposes. Daily timed practice with random collections of problems is not productive to the development of computational fluency. Students typically continue to reinforce bad habits (e.g., counting on their fingers) when they are under pressure, and many develop a negative disposition towards mathematics because they cannot compete with their peers or can't work fast enough.*

We suggest that you use information from timed tests to guide your instruction, not to generate grades. To meet your students' needs, you'll need information about which facts each child knows and which strategies need to be developed conceptually with explicit practice, number relationship experiences, and word problems. As their number sense and use of strategies are developed, students will become more accurate, flexible, and efficient. When you make time to share the results with students, they will see evidence of their own growth.

Conducting Assessment 2

This assessment will give you some sense of your students' current fluency with addition facts to 20. A student is considered to be fluent if he or she can complete 30 problems in a minute and a half: about 3 seconds per problem. A few students may be able to complete 30 problems in less than 1 minute.

Give each student a copy of Assessment 2. Take a moment to preview the types of problems on the page. Ask volunteers to point out an example of a zero fact, a counting on fact (plus-1, -2, -3), a doubles fact, and a neighbors (doubles plus-1) fact. This preview is very important, because we always want our students to be aware of the strategies they can use to determine the sums they do not automatically recall.

Assessment 2 (cont.)

Ask students to write their names and the date at the top of the page. Explain that they'll have 3 minutes to complete as much of the page as possible. Let them know that they'll have to work quickly and that they may want to skip around to facts they know and then come back to the ones that are challenging. Remind them that when they've finished, they should wait quietly until everyone else has finished too.

Let students know when they can begin. (They will all need to begin at the same time.) You'll have to watch the clock as they go, so pick a starting point that's easy to remember, like when the second hand is on the 12 or the 6. Record the elapsed time in increments of 10 seconds on either the whiteboard or overhead; recording the times on the overhead allows you to watch how students are working (e.g., on their fingers, tapping their feet, etc.). When students are done, they can look at the board or overhead and record the elapsed time in minutes and seconds on their page.

When the last student has finished, or 3 minutes have gone by, collect all their papers. Check students' work later for accuracy and share the results with students as needed. Use this information to set reasonable goals that will help your students achieve fluency.

Using Information from Assessment 2

As you look over students' work, you may want to use the Addition Facts Class Checklist to record notes about what kinds of facts students have mastered and which ones remain challenging. The results will help you monitor their growth so far this year and plan your instruction to meet their evolving needs. Run a copy of the *Solving Addition Facts* Booklet on pages 65–76 if you need to review the different kinds of facts listed on this checklist.

Building Computational Fluency Blackline Run 1 copy to record class results.

Addition Facts Class Checklist

Student Names	Zero Facts (+0)	Counting On (+1, +2, +3)	Doubles (e.g., 6 + 6)	Neighbors (e.g., 6 + 7)	Make Ten Facts (=10)	Fast Tens (+10)	Fast Nines (+9)	Leftover Facts	Comments

Note *You may notice that some third graders occasionally write a numeral backwards. Don't deduct points for this, but it would be a good idea to practice number writing with those students at a later time.*

Assessment 2 (cont.)

Here are some things you'll want to think about as you look over each student's work:

1. Time How much time did it take the child to complete the sheet? If she didn't finish the sheet, how much of it was she able to complete?

Quick, competitive students may memorize the sums and retrieve them quickly without understanding the relationships between numbers well enough to double-check their answers in a flexible way. You may not be able to tell which students are working this way based only on this assessment.

2. Approach What was the child's approach to completing the problems? Did he complete the ones he knew first and then come back to those that were challenging? Did he complete them in order from left to right or top to bottom, or was his approach random?

If a child is completing facts in order from left to right or top to bottom, it's possible that child has command of all the addition facts and doesn't identify any as particularly easy or difficult. However, if the first several rows are nearly complete, but last row or two haven't hasn't been attempted, it could be that the student doesn't understand the idea of skipping around to get more problems finished or doesn't find any of the facts easier than the others. Children who are still counting on with fingers or dots for each problem may have this style.

3. Completed Facts Which facts did the child complete? Did she complete all the zero facts, counting on for plus one and two, doubles, and neighbors? Which kinds of facts seem more challenging for her than others?

The facts that are completed accurately are generally comfortable for the student and can be used as a teaching starting point: you'll want to work from the child's strengths toward new or more challenging facts (e.g., using doubles to master neighbors).

As you look over the students' work as a group, you'll want to identify:

- students who have demonstrated computational fluency by completing all 30 problems in under a minute and a half, with only 1 or 2 errors,
- students who have completed 30 problems in about 3 minutes with more than 2 errors, usually on neighbors, fast tens, and fast nines,
- and students who are unfamiliar with addition computation strategies and needed more than 3 minutes to complete the problems and/or have multiple errors.

Assessment 2 (cont.)

SUPPORT ACTIVITIES

After reviewing students' responses to the items on this checkup, you can assign Support Activities for children to work on at school or at home. Although there are 18 Support Activities in the third section of this packet, the ones listed below are particularly relevant to the items you just tested.

SUPPORT ACTIVITIES

Activity	Name	Topic
Activity 1	Doubles Spin	Basic Addition Facts: Doubles
Activity 2	Spinning Around Addition	Strategies for Basic Addition
Activity 3	Triple Spin & Add	Basic Addition with Multiple Addends
Activity 4	Sorting Addition Facts	Strategies for Addition Facts

You may also want to use some of the worksheets in the Fact Fluency section (pages 63–170) to help support students who need more work with addition facts.

NAME _____ DATE _____

TIME _____

Assessment 2, Form A

0 + 3	0 + 8	4 + 0	9 + 1	1 + 4	1 + 7
5 + 1	2 + 4	2 + 5	2 + 8	3 + 2	6 + 2
4 + 10	4 + 9	10 + 3	9 + 3	10 + 5	9 + 5
9 + 7	10 + 7	2 + 2	3 + 3	4 + 3	4 + 4
5 + 5	5 + 6	5 + 8	7 + 3	6 + 8	6 + 4

NAME _____ DATE _____

TIME _____

Assessment 2, Form B

8 + 1	3 + 7	10 +5	9 +9	7 +7	2 +5
4 + 4	9 + 7	5 + 6	3 + 5	8 + 4	0 + 1
9 + 6	10 + 8	2 + 7	4 + 9	7 + 5	10 + 6
9 + 2	8 + 9	9 + 6	1 + 4	4 + 7	6 + 6
4 + 6	3 + 4	8 + 1	0 + 6	9 + 5	4 + 5

NAME _____ **DATE** _____

Addition Facts Class Checklist

Student Names	Zero Facts (+0)	Counting On (+1, +2, +3)	Doubles (e.g., 6 + 6)	Neighbors (e.g., 6 + 7)	Make Ten Facts (=10)	Fast Tens (+10)	Fast Nines (+9)	Leftover Facts	Comments

Assessment 3

ASSESSMENT

Overview
Students are given 3 minutes to complete a 30-problem subtraction fluency checkup.

Skills & Concepts
- ★ using strategies to demonstrate fluency with subtraction facts with minuends to 20
- ★ using the relationship between addition and subtraction to solve problems

Timing
Early fall, late fall, and a third time in the winter

You'll need
- ★ Assessment 3, Form A (page 27, class set)
- ★ Assessment 3, Form B (page 28, class set, save for use later in the fall)
- ★ Assessment 3, Form C (page 29, class set, save for use in the winter)
- ★ Subtraction Facts Class Checklist (page 30, 1 copy)
- ★ clock or watch with a second hand

Conducting Assessment 3

Give each student a copy of Assessment 3, and take a few minutes to review the kinds of problems on the page. Ask them to find an example of a half fact (12 – 6), a doubles fact (12 – 12), a neighbors fact (17 – 16), a take away tens fact (14 – 10), and a run away ones fact (17 – 7). Identifying a few facts before they begin helps remind students that they have strategies for solving these facts.

Remind students that they can skip around and do the problems that are easiest for them first and then come back to those that are more challenging. Let them know that they'll have up to 3 minutes to work on the problems, and then tell them when to begin. You'll have to watch the clock as they go, so pick a starting point that's easy to remember, like when the second hand is on the 12 or the 6. Record the elapsed time in increments of 10 seconds on either the whiteboard or overhead; recording the times on the overhead allows you to watch how students are working. When students are done, they can look at the board or overhead and record the elapsed time in minutes and seconds on their page.

When the last student has finished or 3 minutes have gone by, collect all their papers. You'll want to check them later for accuracy and record some notes about which strategies students have mastered and which ones still present a challenge.

Assessment 3 (cont.)

Using Information from Assessment 3

As you look over students' work, you may want to use the Subtraction Facts Checklist to record notes about what kinds of facts students have mastered and which ones remain challenging. The results will help you monitor their growth and plan your instruction to best meet their current needs. Run a copy of the *Solving Subtraction Facts* Booklet on pages 79–90 if you need to review the kinds of facts listed on this checklist.

1. Time How much time did it take the child to complete the sheet? If he didn't finish the sheet, how much of it was he able to complete? Students who can complete the sheet in a minute and a half or less (no more than 3 seconds per fact) are considered to have achieved mastery.

2. Approach What was the child's approach to completing the problems? Did she complete the ones she knew first and then come back to those that were challenging? Did she complete them in order from left to right or top to bottom, or was her approach random?

3. Completed Facts Which facts did the child complete? Did he complete all the zero, counting back, half, or doubles facts? Which kinds of facts seem more challenging than others? The up to ten and leftover subtraction facts are likely to be the most difficult for most students. Some third graders also begin to confuse the relationships 0 and 1 have in addition, subtraction, multiplication, and division. You may need to review these facts periodically.

In looking over their work as a group, you'll want to identify:

- students who are computationally fluent and have completed all 30 problems with only 1 or 2 errors in under a minute and a half,
- students who have completed 30 problems in about 3 minutes with minor errors, usually facts with differences between 10 and 20,
- and students who are unfamiliar with subtraction computation strategies and needed more than 3 minutes to complete the problems and/or have multiple errors.

To get more information, you may find that it's helpful to interview students who seem to be lagging behind with their subtraction facts.

> ***Teacher*** *Omar, can you tell me how you would solve the problem 12 minus 8?*
>
> ***Omar*** *I count 8, 9, 10, 11, 12.* (Omar uses his fingers to count starting with 8.) *The answer is 5.*

Omar's answer is 1 away from the correct difference, because he is using his fingers to count the numbers themselves rather than the number of "jumps" it takes to get from 8 to 12.

Assessment 3 (cont.)

Teacher *Okay, how many from 8 to 12? So it sounds like you're starting at 8. Can you put out 8 tile first?*

Omar *Yeah, I'm starting at 8 and then going to 12. So here's 8.*

Teacher *So now what would you do to get to 12?*

Omar *Well, I want to get to 12. So I can add more.*

Teacher *Can you use another color tile to get to 12? That way it will be easy to see what you had to add to 8 to get to 12.*

Omar *It's easy to see. It's 4. Hmm, how did I get 5 before?*

Teacher *When you told me, I remember you went like this 8, 9, 10, 11, 12.* (Counting on her fingers.)

Omar *Oh! I counted that last tile on the 8. 8, 9, 10, 11, 12. I should have started counting at 9.*

Sometimes just a brief interview can clarify students' misconceptions and errors.

SUPPORT ACTIVITIES

After reviewing students' responses to the items on this checkup, you can assign Support Activities for children to work on at school or at home. Although there are 18 Support Activities in the third section of this packet, the ones listed below are particularly relevant to the items you just tested.

SUPPORT ACTIVITIES

Activity	Name	Topic
Activity 5	Make Half	Basic Subtraction Facts: Half Facts
Activity 6	Spinning Around Subtraction	Strategies for Basic Subtraction

You may also want to use some of the worksheets in the Fact Fluency section (pages 63–170) to help support students who need more work with subtraction facts.

NAME _____ DATE _____

TIME _____

Assessment 3, Form A

3 − 0 = ___	8 − 0 = ___	14 − 0 = ___	9 − 0 = ___	4 − 1 = ___	14 − 4 = ___
12 − 1 = ___	5 − 2 = ___	8 − 2 = ___	11 − 3 = ___	7 − 3 = ___	16 − 6 = ___
10 − 10 = ___	10 − 9 = ___	15 − 15 = ___	15 − 14 = ___	4 − 2 = ___	13 − 3 = ___
12 − 6 = ___	12 − 7 = ___	10 − 5 = ___	10 − 6 = ___	8 − 4 = ___	20 − 10 = ___
15 − 10 = ___	15 − 9 = ___	12 − 10 = ___	12 − 9 = ___	18 − 10 = ___	16 − 8 = ___

NAME _____ DATE _____

TIME _____

Assessment 3, Form B

10 − 10	18 − 8	20 − 10	15 − 6	18 −1	9 − 9
15 − 9	13 − 0	12 − 3	12 − 4	12 − 2	12 − 7
3 − 1	1 − 0	10 − 5	18 − 6	13 − 9	19 − 9
11 − 6	16 − 2	13 − 10	10 − 5	15 − 7	8 − 6
6 − 3	18 − 4	9 − 7	7 − 2	14 − 5	14 − 8

NAME _____ DATE _____

TIME _____

Assessment 3, Form C

3 − 0	16 − 3	14 − 7	18 − 8	12 − 9	17 − 6
15 − 2	11 − 10	13 − 6	19 − 12	9 − 3	15 − 5
11 − 2	10 − 4	17 − 10	16 − 9	13 − 11	8 − 7
19 − 8	10 − 5	18 − 4	12 − 0	14 − 12	20 − 13
11 − 1	14 − 9	15 − 8	16 − 14	17 − 15	20 − 7

Subtraction Facts Class Checklist

Student Names	Zero Facts (−0)	Counting Back (−1, −2, −3)	Doubles (e.g., 4 − 4 = 0)	Neighbors (e.g., 5 − 4 = 1, 5 − 3 = 2)	Half Facts (e.g., 4 − 2 = 2)	Take Away Tens (−10)	Run Away Ones (e.g., 16 − 6 = 10)	Up to 10 (e.g., 15 − 8 = 7)	Leftovers	Comments

Assessment 4

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)

Skills & Concepts
- ★ demonstrating fluency with addition and subtraction facts with sums and minuends to 20
- ★ extending numeric patterns
- ★ selecting the most appropriate tool to measure a specified item
- ★ determining elapsed time in minutes

You'll need
- ★ Assessment 4, pages 1 and 2 (pages 33 and 34, class set)
- ★ Assessment 4 Class Checklist (page 35, Run as many copies as you need to record the results for your whole class.)
- ★ Ten-Strips (page 13, class set)
- ★ real or plastic coins available
- ★ student clocks available

Conducting Assessment 4

This assessment focuses on basic addition and subtraction facts; counting mixed coins by 1's, 5's, 10's, and 25's; measuring tools and units; number patterns; and telling time to the minute. Make ten-strips, money kits, and student clocks available while students work on this checkup.

You can use the checklist provided to keep track of your students' performance on each item on the assessment.

SUPPORT ACTIVITIES

After reviewing students' responses to the items on this assessment, you can assign Support Activities for children to work on at school or at home. Although there are 18 Support Activities in the third section of this packet, the ones listed below are particularly relevant to the items you just tested.

Assessment 4 (cont.)

SUPPORT ACTIVITIES		
Activity	**Name**	**Topic**
Activity 1	Doubles Spin	Basic Addition Facts: Doubles
Activity 2	Spinning Around Addition	Strategies for Basic Addition
Activity 3	Triple Spin & Add	Basic Addition with Multiple Addends
Activity 4	Sorting Addition Facts	Strategies for Addition Facts
Activity 5	Make Half	Basic Subtraction Facts: Half Facts
Activity 6	Spinning Around Subtraction	Strategies for Basic Subtraction

We recommend creating a packet that contains the instructions, instructional considerations, and materials for these Support Activities. That way, you can simply provide a helper or instructional assistant with the packet and assign specific activities in the packet for children who need extended practice. If you'd like to send an activity home with a child in need of more practice, simply run a copy of the instructions and materials.

NAME _____ DATE _____

Assessment 4 page 1 of 2

1 Find the sums below.

9	10	7	4	5	6	7	8
+ 8	+ 4	+ 7	+ 6	+ 9	+ 6	+ 3	+ 8
____	____	____	____	____	____	____	____

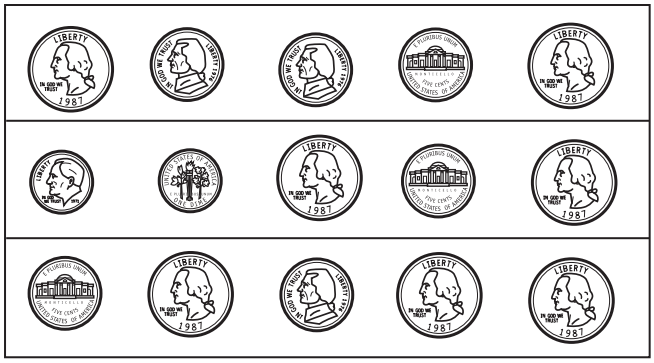
6 + 7 = ____ 8 + 10 = ____ 7 + 9 = ____ 8 + 2 = ____

2 Find the differences below.

12	17	13	8	19	15	18	16
– 6	– 8	– 10	– 7	– 9	– 7	– 9	– 10
____	____	____	____	____	____	____	____

14 – 7 = ____ 16 – 6 = ____ 15 – 9 = ____ 9 – 7 = ____

3 Which of these coin collections shows 85¢?



4 What number is missing in the pattern below?

5, 7, 9, _____ , 13

○ 12 ○ 11 ○ 10 ○ 8

5 What number is missing in the pattern below?

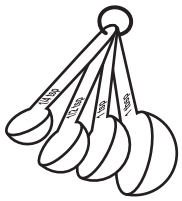
13, 17, 21, _____ , 29

○ 22 ○ 23 ○ 28 ○ 25

NAME _____ DATE _____

Assessment 4 page 2 of 2

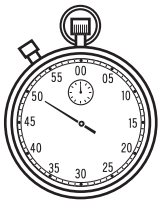
6 Which tool would you use to measure the length of a desk?



○

○

○



○

7 School started at 8:00 a.m. Rosa was 15 minutes late to school. What time did Rosa arrive at school?

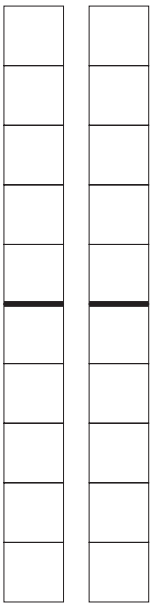
○ 8:15 ○ 7:45 ○ 8:30 ○ 9:15

8 Marc's dad said they would have dinner at 6:00 p.m. The time right now is shown on the clock. How much longer before Marc and his dad have dinner?

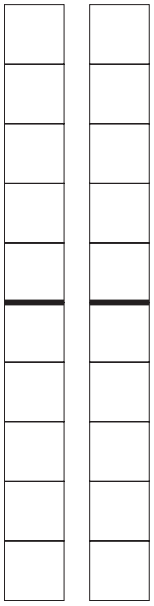
○ 15 minutes
○ 4 minutes
○ 8 minutes
○ 20 minutes

Use the ten-strips to show how you would solve the following problems.

9 8 + 6 = _____



10 14 – 9 = _____



Assessment 4 Class Checklist

	Student Names												
1. at least 9 of 12 addition facts correct													
2. at least 9 of 12 subtraction facts correct													
3. counts collection of mixed coins													
4. completes counting pattern													
5. completes counting pattern													
6. identifies tool to measure length													
7. adds 15 minutes to time													
8. calculates elapsed time													
9. models/explains addition													
10. models/explains subtraction													

Assessment 5

ASSESSMENT

Overview

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

Skills & Concepts

- ★ adding and subtracting 2- and 3-digit numbers with and without regrouping
- ★ using estimation strategies to solve problems and check the accuracy of solutions
- ★ counting, adding, and subtracting money amounts up to $3
- ★ reading and interpreting a bar graph on which each division stands for more than 1 item

Timing

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

You'll need

- ★ Assessment 5, pages 1–3 (pages 39–41, class set)
- ★ Assessment 5 Class Checklist (page 42, as many copies as needed to document results for the class, optional)
- ★ base ten pieces (use pages 43 and 44, to create your own if needed)
- ★ real or paper/plastic money

Conducting Assessment 5

Select a day or two at the end of January or beginning of February to administer this second checkup of the year. Make a variety of manipulatives—such as base ten pieces and money—available to students when they complete this assessment. Remind students that when problems call for estimations, they don't need to find the exact answers and shouldn't spend time doing so.

Using Information from Assessment 5

For your convenience, a class checklist has been provided. Each item on the checklist corresponds to an item on the checkup so that you can record the results for your whole class, item by item, if you like. We have not assigned point values to these items, although you may choose to score the papers that way based on the skills that are emphasized in your state or district standards.

Assessment 5 (cont.)

SUPPORT

Although there are 18 Support Activities in the third section of this packet, the ones listed below are particularly relevant to the items you just tested. After looking over student work, you can assign specific activities for students who need more support. Students can complete these activities with a tutor, educational assistant, or family members.

SUPPORT ACTIVITIES

Activity	Name	Topic
Activity 7	Make 100	2-Digit Addition
Activity 8	Race to 100 & Back	2-Digit Addition & Subtraction
Activity 9	Three Turns to Win	Addition of Money Amounts up to $5
Activity 10	Finish with $4	Addition & Subtraction of Money Amounts up to $4

NAME _____ DATE _____

Assessment 5 page 1 of 3

1 Which number will make this number sentence true?

23 + ☐ = 38

- ◯ 5
- ◯ 15
- ◯ 24
- ◯ 25

2

$$\begin{array}{r} 67 \\ -\ 18 \\ \hline \end{array}$$

- ◯ 51
- ◯ 49
- ◯ 85
- ◯ 38
- ◯ none of these

---

3 Estimate and mark which answer is closest to 50.

$\begin{array}{r} 2 \\ +\ 16 \\ \hline \end{array}$	$\begin{array}{r} 24 \\ +\ 28 \\ \hline \end{array}$	$\begin{array}{r} 32 \\ +\ 11 \\ \hline \end{array}$	$\begin{array}{r} 46 \\ +\ 18 \\ \hline \end{array}$
◯	◯	◯	◯

---

4 Estimate and mark which has the greatest answer.

$\begin{array}{r} 315 \\ +\ 126 \\ \hline \end{array}$	$\begin{array}{r} 215 \\ +\ 267 \\ \hline \end{array}$	$\begin{array}{r} 427 \\ +\ 89 \\ \hline \end{array}$	$\begin{array}{r} 382 \\ +\ 73 \\ \hline \end{array}$
◯	◯	◯	◯

5

$$\begin{array}{r} 436 \\ -\ 287 \\ \hline \end{array}$$

- ◯ 251
- ◯ 189
- ◯ 723
- ◯ 149
- ◯ none of these

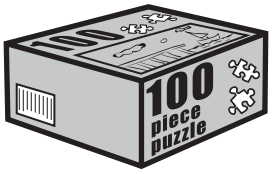
NAME _____ DATE _____

Assessment 5 page 2 of 3

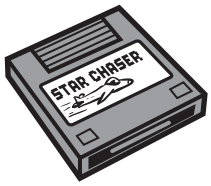
6 Which of these items costs about $3.00?

$0.30

$4.35



$3.25



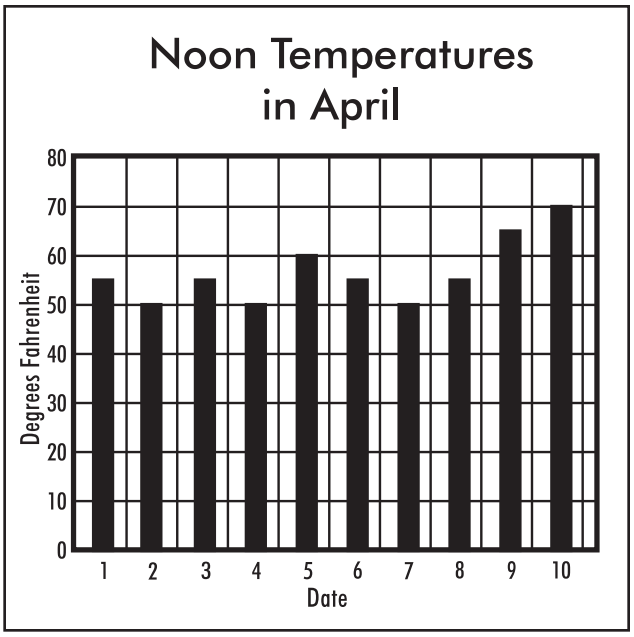
$13.25

7 An apple costs 65¢ and a bottle of juice costs 85¢. Which collection of money will be enough to buy both?

8 A pack of balloons costs $2.65. Kendra paid for a pack of balloons with $3.00. Which group of coins shows how much change Kendra should get back?

NAME _____ DATE _____

Assessment 5 page 3 of 3



9 What was the temperature on April 3?

- ◯ 45
- ◯ 50
- ◯ 55
- ◯ 60

---

10 On how many days was the noon temperature warmer than it was on April 3?

- ◯ 0
- ◯ 2
- ◯ 3
- ◯ 4

---

11 On how many days was the noon temperature warmer than 60˚F?

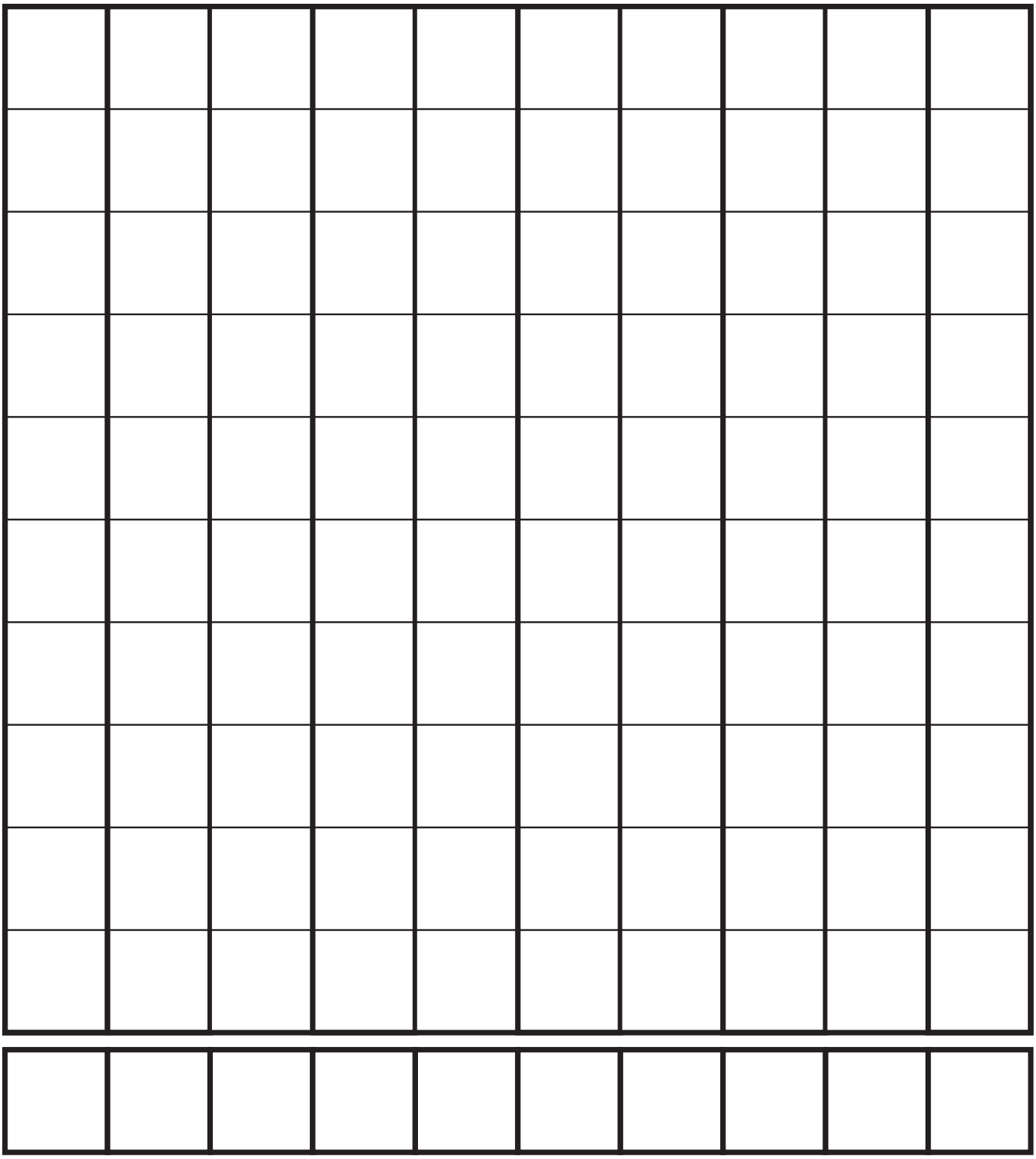
- ◯ 1
- ◯ 2
- ◯ 3
- ◯ 4

Assessment 5 Class Checklist

	Student Names												
1. solves for missing addend													
2. subtracts 2-digit numbers with regrouping													
3. estimates the sums of 2-digit numbers													
4. estimates the sums of 3-digit numbers													
5. subtracts 3-digit numbers with regrouping													
6. rounds money amounts to nearest dollar													
7. adds money amounts													
8. makes change from $3													
9. identifies data point on bar graph													
10. compares data on bar graph													
11. compares data on bar graph													

Base Ten Pieces page 1 of 2

Base Ten Pieces page 2 of 2



Assessment 6

ASSESSMENT

Overview

Students are given up to 3 minutes to take a 30-problem multiplication facts test, working with numbers 0, 1, 2, 5, and 10.

Skills & Concepts

- ★ demonstrating computational fluency with multiplication facts
- ★ recognizing and using the commutative property for multiplication
- ★ recognizing and using the identity and zero property for multiplication

Timing

Winter, early spring, and late spring

You'll need

- ★ Assessment 6, Form A (page 47, class set)
- ★ Assessment 6, Form B (page 48, class set, save for use in the early spring)
- ★ Assessment 6, Form C (page 49, class set, save for use in the late spring)
- ★ Multiplication Facts Class Checklist (page 50, 1 copy)
- ★ clock or watch

Conducting Assessment 6

Give each student a copy of Assessment 6, and take a few minutes to review the kinds of facts on the page. Remind students to use what they know about those facts to help them work quickly and efficiently. They can skip around and do the facts they know first, and then come back to those that are more challenging.

Ask everyone to begin together, and keep track of how much time has passed in 10-second intervals on the overhead as they work (students will record their own times when they finish). When the last student has finished or 3 minutes are up, collect students' papers and check them later for accuracy.

Using Information from Assessment 6

Students who do not group numbers fluently will struggle to count out the answer for each fact and will not have enough time to complete all 30 facts. Which facts did they complete? Did they skip around to get as many done as possible? What mistakes did your students make that might be the focus of a mini-lesson? If you find it helpful, you can use the Multiplication Facts Class Checklist to keep track of the results for your class.

Assessment 6 (cont.)

Many third graders will have picked up multiplication concepts along the way without formal instruction. Students who can complete 30 problems with minimal errors (about 3 seconds per problem) in a minute and a half are considered proficient with these facts. If they have a conceptual understanding of the multiplication process, and fluency with the easier numbers, challenge them to work with the more difficult factors (3, 4, 6, 7, 8, and 9) in the weeks ahead.

SUPPORT ACTIVITIES

After reviewing students' responses to the items on this checkup, you can assign Support Activities for children to work on at school or at home. Although there are 18 Support Activities in the third section of this packet, the ones listed below are particularly relevant to the items you just tested.

SUPPORT ACTIVITIES		
Activity	**Name**	**Topic**
Activity 13	Spinning Around Multiplication	Strategies for Basic Multiplication Facts through 6 x 6
Activity 16	What's Missing? Bingo	Basic Multiplication & Division
Activity 17	Ten to Win	Basic Multiplication
Activity 18	Make Zero	Basic Addition, Subtraction, Multiplication, and Division

You may also want to use some of the worksheets in the Fact Fluency section (pages 63–170) to help support students who need more work with multiplication facts.

NAME _____ DATE _____

Assessment 6, Form A

TIME _____

0×7	1×1	3×0	1×5	0×8	1×8
0×0	5×1	10×1	1×0	1×3	0×2
2×10	5×2	2×3	5×7	3×2	3×5
2×5	8×2	1×2	8×5	5×10	2×7
7×10	8×5	10×2	6×5	10×4	6×10

NAME _____ DATE _____

Assessment 6, Form B

TIME _____

6 × 5	8 × 2	4 × 3	6 × 8	8 × 9	8 × 3
8 × 6	7 × 3	6 × 4	0 × 4	3 × 8	10 × 8
10 × 8	8 × 4	3 × 3	3 × 9	9 × 9	8 × 4
8 × 7	3 × 8	8 × 5	6 × 6	6 × 8	7 × 7
8 × 1	9 × 4	8 × 2	6 × 9	7 × 4	2 × 3

NAME _____ DATE _____

TIME _____

Assessment 6, Form C

3 × 10	1 × 0	9 × 2	7 × 4	5 × 1	8 × 8
8 × 4	9 × 4	10 × 5	9 × 8	7 × 2	5 × 7
7 × 7	7 × 0	6 × 6	6 × 7	8 × 6	9 × 6
3 × 9	5 × 5	2 × 8	4 × 4	1 × 1	6 × 3
3 × 4	9 × 5	10 × 10	9 × 9	3 × 7	8 × 3

Multiplication Facts Class Checklist

Student Names	Zero Facts (x0)	Ones Facts (x1)	Doubles (x2)	Clock Facts (x5)	Decade Facts (x10)	Doubles Plus 1 Set (x3)	Double-Doubles (x4)	Clock Facts Plus 1 Set (x6)	Double-Double-Doubles (x8)	Decade Facts Minus 1 Set (x9)	Comments

Assessment 7

ASSESSMENT

Overview

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

Skills & Concepts

- ★ identifying, modeling, and comparing place value of digits in whole numbers
- ★ adding and subtracting up to 3-digit numbers with and without regrouping using models and a variety of efficient paper/pencil and mental strategies
- ★ developing and using strategies for multiplication facts up to 10 × 10
- ★ using estimation strategies such as rounding and front-end loading to solve problems and check the accuracy of solutions
- ★ developing strategies for determining the perimeter of a rectangle
- ★ telling time on digital clocks and determining elapsed time in minutes and hours
- ★ recognizing 3-dimensional shapes in the environment

Timing

Last week of March or first week of April

You'll need

- ★ Assessment 7, pages 1–3 (pages 53–55, class set)
- ★ Assessment 7 Class Checklist (page 56, as many copies as needed to document results for the class, optional)
- ★ half-class set of student clocks
- ★ half-class set of base ten pieces, optional (Use pages 43 and 44 to create your own if needed.)

Conducting Assessment 7

Select a day or two at the end of March or beginning of April to administer this skills checkup. Make a variety of manipulatives—such as base ten pieces and student clocks—available for those students who would like to use them. Remind students that when problems call for estimations, they don't need to find the exact answer and shouldn't spend time doing so.

Assessment Assessment 7 (cont.)

Using Information from Assessment 7

You may use the class checklist for this checkup to record students' performance item by item if you wish.

SUPPORT

After reviewing students' responses to the items on this assessment, you can assign Support Activities for children to work on at school or home. The activities listed below are most relevant to the items just tested.

SUPPORT ACTIVITIES		
Activity	**Name**	**Topic**
Activity 11	Count Down 400	2- and 3-Digit Subtraction
Activity 12	Faces of a Solid	3-Dimensional Geometry
Activity 13	Spinning Around Multiplication	Strategies for Basic Multiplication

NAME _____ DATE _____

Assessment 7 page 1 of 3

1 6 × 4 =

12 ○ 32 ○ 24 ○ 30 ○

2 3 × 7 =

14 ○ 21 ○ 24 ○ 33 ○

3 Use estimation to choose the closest answer.

$$\begin{array}{r} 328 \\ +\ 867 \\ \hline \end{array}$$

1190 ○ 1000 ○ 550 ○ 1500 ○

4 Use estimation to choose the closest answer.

$$\begin{array}{r} 906 \\ -\ 387 \\ \hline \end{array}$$

500 ○ 600 ○ 700 ○ 800 ○

5 Complete the following problems. Show your thinking with pictures, numbers, and/or words.

a

$$\begin{array}{r} 274 \\ +\ 35 \\ \hline \end{array}$$

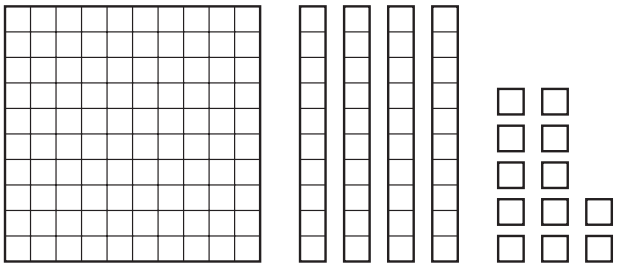
b

$$\begin{array}{r} 183 \\ -\ 43 \\ \hline \end{array}$$

NAME _____ DATE _____

Assessment 7 page 2 of 3

6



is the same as

- ◯ 1 hundred 42 tens
- ◯ 1 hundred 4 tens 2 ones
- ◯ 1 hundred 5 tens 2 ones
- ◯ 1 hundred 5 tens

7 Amber had an appointment to take her dog to the vet at 3:40. She arrived a half-hour early for the appointment. What time did she arrive?

- ◯ 3:00
- ◯ 3:10
- ◯ 4:00
- ◯ 4:10

8 Maria started her homework at the time shown on the clock. She finished 25 minutes later. What time did she finish?

- ◯ 5:00
- ◯ 5:10
- ◯ 8:55
- ◯ 9:45

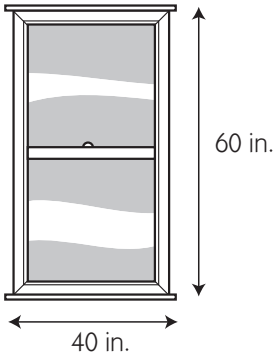
9 Jose's swim class began at 3:30 and ended at 5:10. How long was his swim class?

- ◯ 1 hour and 30 minutes
- ◯ 1 hour and 40 minutes
- ◯ 2 hours and 20 minutes
- ◯ 2 hours and 10 minutes

NAME _____ DATE _____

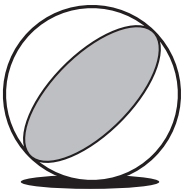
Assessment 7 page 3 of 3

10 What is the perimeter of the window?



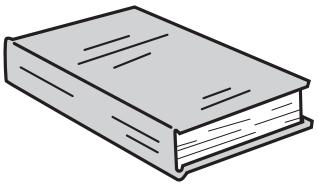
- ◯ 20 inches
- ◯ 100 inches
- ◯ 200 inches
- ◯ 240 inches

11 Which of the following shapes is a cylinder?



◯

◯

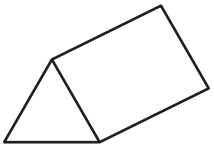


◯

◯

12 Look at the figures below. This triangle could be a face of which of the following figures?

_____



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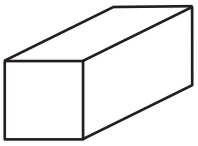

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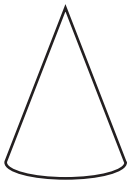

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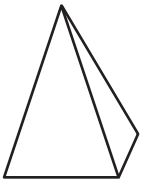


◯

Assessment 7 Class Checklist

	Student Names												
1. finds the product of 6 × 4													
2. finds the product of 3 × 7													
3. estimates the sum of 3-digit numbers													
4. estimates the difference between 3-digit numbers													
5a. adds with regrouping													
5b. subtracts without regrouping													
6. identifies place value model for 3-digit number with regrouping													
7. subtracts 30 minutes from time													
8. adds 25 minutes to time													
9. calculates elapsed time													
10. finds the perimeter of a rectangle													
11. identifies a cylinder													
12. identifies the face of a triangular prism													

Assessment 8

ASSESSMENT

Overview

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

Skills & Concepts

- ★ comparing and ordering 3-digit numbers from least to greatest
- ★ adding and subtracting 2- and 3-digit numbers with regrouping
- ★ adding and subtracting money amounts to $5.00
- ★ identifying visual representations of common fractions
- ★ demonstrating computational fluency with multiplication and division
- ★ multiplying a 2-digit number by a 1-digit number
- ★ drawing conclusions and inferences from tally charts

Timing

Late May or any other time of the year that's appropriate for your students

You'll need

- ★ Assessment 8, pages 1–3 (pages 59–61, class set)
- ★ Assessment 8 Class Checklist (page 62, as many copies as you need to record results for the whole class, optional)
- ★ red and blue colored pencils, markers, or crayons

Conducting Assessment 8

Distribute copies of the assessment and review the tasks as a class before students begin. Some students may find it helpful to color in the spinner on the last page of the assessment, so make red and blue crayons, colored pencils, or markers available to them.

Using Information from Assessment 8

You can use the class checklist to record students' results on this checkup.

Assessment 8 (cont.)

SUPPORT

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 he or she needs to improve. That way, you can simple 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.

SUPPORT ACTIVITIES

Activity	Name	Topic
Activity 14	Show the Sum	3-Digit Addition
Activity 15	Show the Difference	3-Digit Subtraction
Activity 16	What's Missing? Bingo	Basic Multiplication & Division
Activity 17	Ten to Win	Basic Multiplication
Activity 18	Make Zero	Basic Addition, Subtraction, Multiplication & Division

NAME _____ DATE _____

Assessment 8 page 1 of 3

1

$$\begin{array}{r} 123 \\ +\ 88 \\ \hline \end{array}$$

- ○ 211
- ○ 201
- ○ 2011
- ○ 212

2 \$3.69 + \$1.23 =

- ○ \$5.02
- ○ \$4.02
- ○ \$4.92
- ○ \$4.82

3

$$\begin{array}{r} 304 \\ -\ 187 \\ \hline \end{array}$$

- ○ 127
- ○ 121
- ○ 111
- ○ 117

4 \$5.00 – \$3.72 =

- ○ \$1.38
- ○ \$1.28
- ○ \$2.38
- ○ \$2.28

5 In the spaces below, write the following numbers in order from least to greatest.

2045 123 254 1023

_____ _____ _____ _____

least *greatest*

NAME _____ DATE _____

Assessment 8 page 2 of 3

6 $3 \times 7 =$

- ○ 24
- ○ 21
- ○ 14
- ○ 28

7

$$\begin{array}{r} 200 \\ \times\ 5 \\ \hline \end{array}$$

- ○ 195
- ○ 100
- ○ 1000
- ○ 205

8

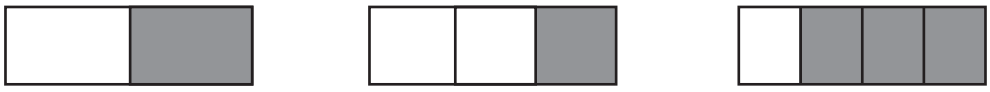
$$\begin{array}{r} 14 \\ \times\ 6 \\ \hline \end{array}$$

- ○ 84
- ○ 74
- ○ 64
- ○ 20

9 $24 \div 6 =$

- ○ 5
- ○ 12
- ○ 4
- ○ 3

10 Which shows the fraction $^1/_3$?



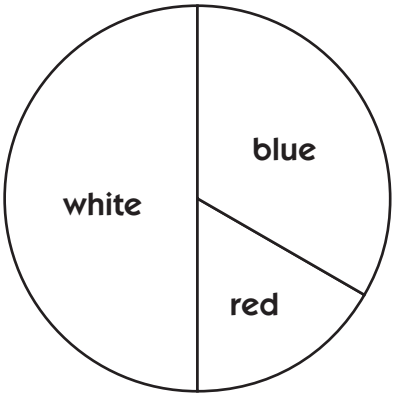
○ ○ ○

11 Which shows a fraction that is equal to $^1/_3$?

○ ○ ○

NAME _____ DATE _____

Assessment 8 page 3 of 3



12 a Circle the chart that probably shows the results of 24 spins on the spinner above.

white	blue	red
𝍸	𝍸	𝍸
|||	|||	|||

white	blue	red
𝍸	𝍸	𝍸
𝍸 |	|||	

white	blue	red
𝍸	||	𝍸
𝍸 |||		||||

b How did you know?

_____

_____

_____

_____

_____

Assessment 8 Class Checklist

	Student Names												
1. adds with regrouping													
2. adds money amounts with regrouping													
3. subtracts with regrouping													
4. subtracts money amounts with regrouping													
5. orders multi-digit numbers													
6. multiplies 3×7													
7. multiplies 200×5													
8. multiplies 14×6													
9. divides $24 \div 6$													
10. identifies area model for $^1/_3$													
11. identifies fraction equivalent to $^1/_3$													
12a. identifies most probable results for spinner experiment													
12b. explains reasoning													

fact fluency

Fact Fluency Addition, Subtraction & Multiplication

There is a considerable body of research to support the idea that teaching basic fact strategies helps students move from less to more efficient methods and is more effective than asking children to memorize facts by rote. In a seminal article written for *Teaching Children Mathematics* magazine (Vol.5 Number 9, May 1999, pp. 508–515) researchers Andrew C. Isaacs and William M. Carroll suggest that teachers propose and model basic fact strategies as well as asking students to share their own. Teachers are also encouraged to supplement class discussions with games and exercises designed to facilitate more sophisticated strategies.

The materials in the first part of this section are designed to help third graders build on and extend the addition and subtraction strategies listed on the two charts below.

ADDITION STRATEGIES	
Name of Strategy	**Examples**
Zero Facts (+0)	7 + 0 = 7 0 + 14 = 14
Counting On (+1, +2, +3)	6 + 1 = 7 4 + 2 = 6 3 + 8 = 11
Doubles	7 + 7 = 14 3 + 3 = 6
Neighbors (also called Doubles +1)	3 + 4 = 7 7 + 8 = 15
Make Ten (=10)	7 + 3 = 10 6 + 4 = 10
Fast Tens (+10)	10 + 5 = 15 8 + 10 = 18
Fast Nines (+9)	9 + 5 = 14 7 + 9 = 16

SUBTRACTION STRATEGIES	
Name of Strategy	**Examples**
Zero Facts (–0)	7 – 0 = 7 15 – 0 = 15
Counting Back (–1, –2, –3)	6 – 1 = 5 9 – 2 = 7 15 – 3 = 12
Doubles	7 – 7 = 0 12 – 12 = 0
Neighbors (1 or 2 apart)	4 – 3 = 1 8 – 6 = 2
Halves	10 – 5 = 5 16 – 8 = 8
Take Away Tens (–10)	19 – 10 = 9 14 – 10 = 4
Run Away Ones	19 – 9 = 10 14 – 4 = 10
Up to Ten	15 – 8 = 7 17 – 9 = 8 13 – 5 = 8 12 – 7 = 5

Once children become comfortable with these strategies, there aren't many facts left to learn. If you examine all the addition facts for numbers through 20, for instance, you'll find that there are only 16 combinations that aren't covered by one of these strategies, and 8 of them are reverse of the others (3 + 5, 3 + 6, 3 + 8, 4 + 7, 4 + 8, 5 + 7, 5 + 8, 6 + 8, and their reverses). The picture is slightly more complex for subtraction, but the strategies above cover most of the facts to 20 and also help students understand the relationship between addition and subtraction.

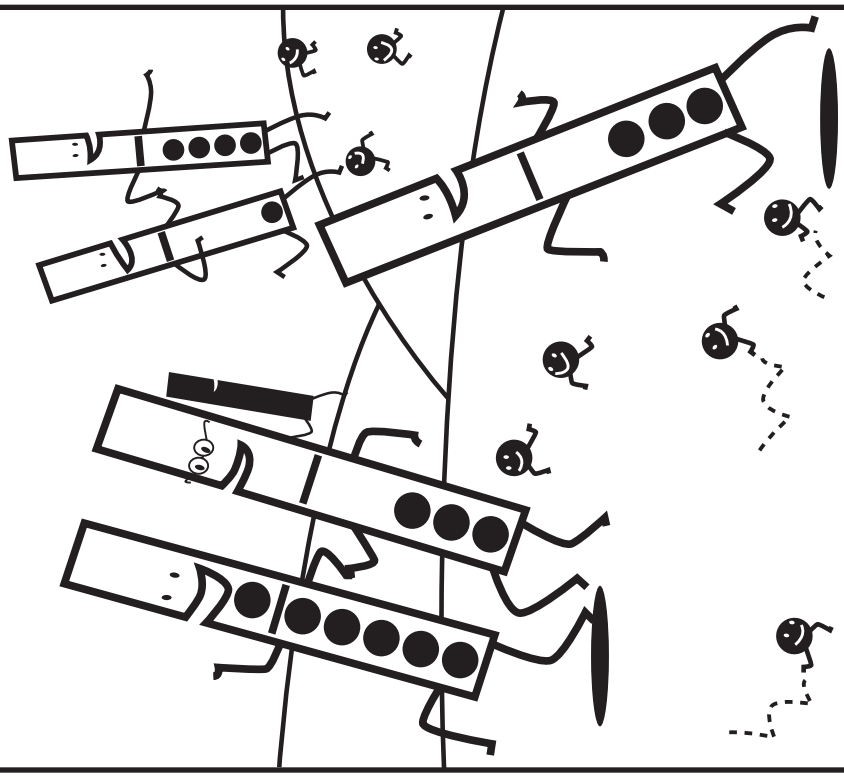
The use of strategies can be equally effective in helping students develop fluency with basic multiplication facts. When students focus on strategies, they become increasingly aware of important patterns and relationships, and are able to build on the "easy facts" (2's, 5's, and 10's) to help learn more challenging facts. The multiplication sheets and activities in the second part of this Fact Fluency section are built around the strategies listed on the next page.

Fact Fluency Addition, Subtraction & Multiplication (cont.)

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	When you multiply any number by 2, simply double that number.
× 3	doubles plus 1 set facts	3 × 6 = 18 9 × 3 = 27	When you 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	When you 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	clock facts	5 × 7 = 35 8 × 5 = 40	Because students are familiar with the analog clock face, they can use positions on the clock to multiply by 5. For example, "I know 5 times 7 is 35 because it is 35 minutes past the hour when the minute hand is on the 7."
× 6	clock facts plus 1 set	6 × 7 = 42 8 × 6 = 48	When multiplying a number by 6, think of the related clock fact and then add the number being multiplied. For example, 6 × 7 = (5 × 7) + 7, and 35 + 7 = 42.
× 8	double-double-doubles	4 × 8 = 32 8 × 7 = 96	When you multiply any number by 8, double the number 3 times. For example, 8 × 7 = (2(2(2 × 7))). 2 × 7 = 14, 2 × 14 = 28, and 2 × 28 = 56.
× 9	decade minus 1 set facts	9 × 7 = 63 9 × 9 = 81	When you 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.

The Fact Fluency section includes three fact strategy booklets: Solving Addition Facts, Solving Subtraction Facts, and Solving Multiplication Facts. You can use these at school or send them home for students to share with their families at any time of the year that best suits your instructional needs. Each booklet describes the strategies listed above, gives examples, and asks students to both solve and pose their own related story problems. If you choose to send these booklets home, you'll find a letter to accompany each one on pages 77, 91, and 143. There is also a collection of practice worksheets in which students identify the strategies they're using as they work with various sets of facts. Like all the materials in the Building Computational Fluency packet, you can use these with some or all of your students at your discretion. Finally, there are several games and related worksheets designed for use at home. Each take-home activity is accompanied by a note of explanation to families if you choose to use these as homework assignments, but any of the three could be used in class if you prefer.

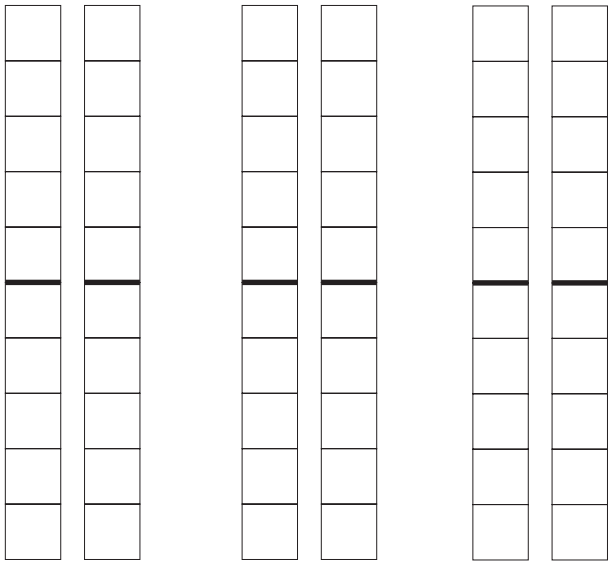
Solving Addition Facts



NAME _____

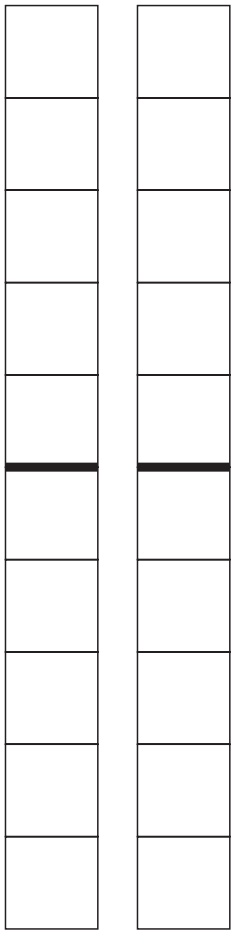
Solving Leftovers

How do you solve the leftovers? Can you show your thinking on the ten-strips? Can you show your thinking with a number sentence or two? Can you make a story problem about a leftover fact?



What Are Ten-Strips?

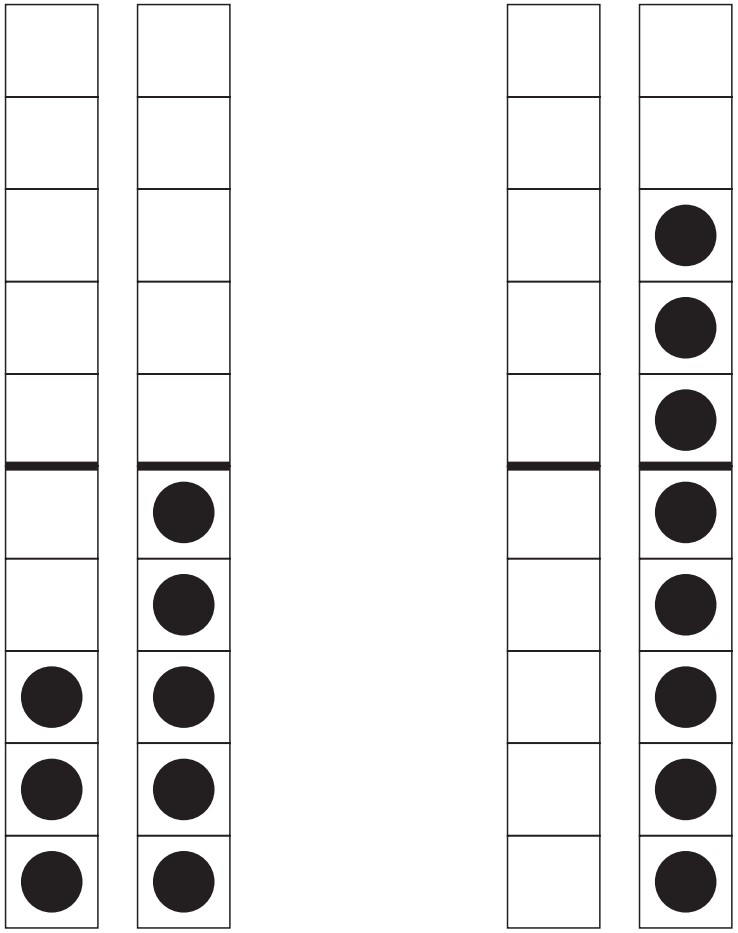
Ten-strips are models we use to see numbers. They help us see groups, instead of counting one by one. Where do you see groups of 2 in the ten-strips? How about groups of 5 or 10?



Building Computational Fluency Blackline Run pages 65–76 back to back, fold all together to make booklet.

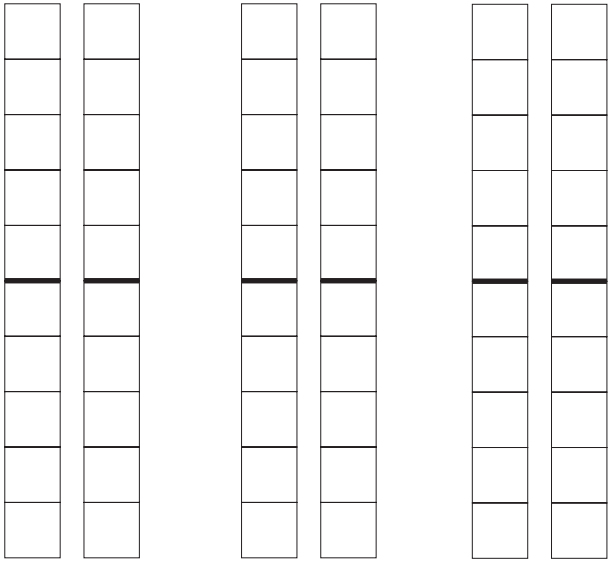
Using the Ten-Strips

How many dots do you see on each pair of ten-strips? How are they the same? How are they different?



Solving Leftovers

How do you solve the leftovers? Can you show your thinking on the ten-strips? Can you show your thinking with a number sentence or two? Can you make a story problem about a leftover fact?

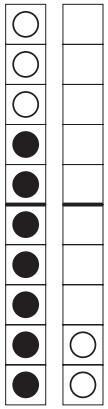


Leftovers

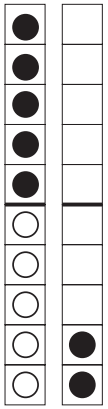
We call these facts leftovers. These last ten facts can be solved in many ways. Knowing doubles, neighbors, and make ten facts can really help.

7 + 4 = 11	4 + 7 = 11
7 + 5 = 12	5 + 7 = 12
8 + 4 = 12	4 + 8 = 12
8 + 5 = 13	5 + 8 = 13
8 + 6 = 14	6 + 8 = 14

For 7 + 5, some people might think, "7 plus 3 is 10. Then 10 plus 2 is 12." Someone else might think, "5 plus 5 is 10, and then 2 more is 12." How do you think about some of these facts?



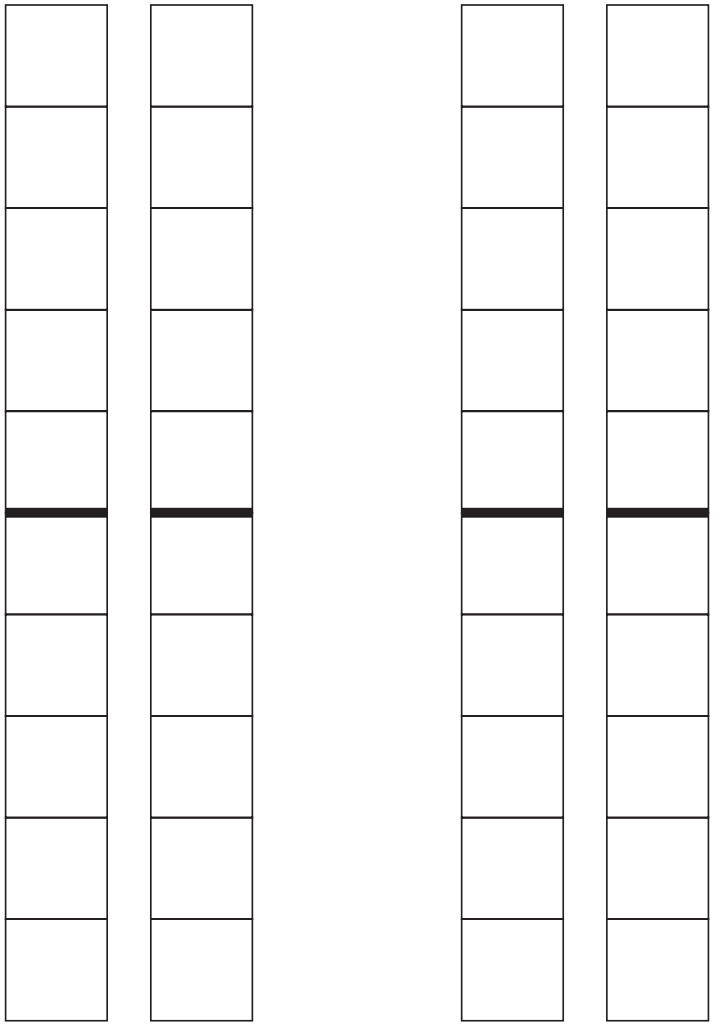
$$\begin{array}{r} 7 \\ +\ 3 \\ \hline 10 \end{array} \qquad \begin{array}{r} 10 \\ +\ 2 \\ \hline 12 \end{array}$$



$$\begin{array}{r} 5 \\ +\ 5 \\ \hline 10 \end{array} \qquad \begin{array}{r} 10 \\ +\ 2 \\ \hline 12 \end{array}$$

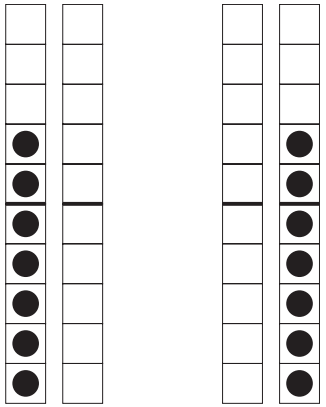
Using the Ten-Strips

Choose a number to show on these ten-strips. Can you show the number in more than one way?



Zero Facts

When you add 0 to any number, the sum (the answer) is always that number.



7 + 0 = 7 0 + 7 = 7

This works with larger numbers too!

26 + 0 = 26 0 + 387 = 387

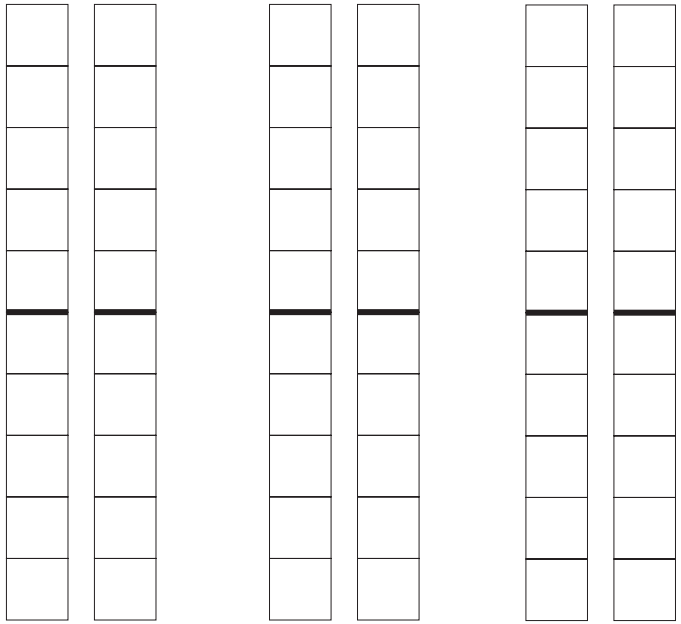
Zero Facts Story Problems

1 If you had 7 cookies and someone gave you 0 cookies, how many cookies would you have in all?

2 If you had 0 cookies and someone gave you 6 cookies, how many cookies would you have in all?

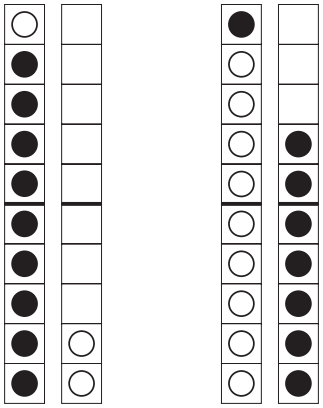
Your Fast Nines

What are some other fast nine facts you know? Can you draw them and/or show them using number sentences? Can you make a story problem about a fast nine fact?



Fast Nines

When you know how to make ten and do fast tens, adding 9 is a snap! If the fact is 9 + 4, you can think about making ten (9 + 1 = 10) and then adding 3 more. 9 + 4 is the same as 10 + 3. Where do you see the make tens and fast tens on the ten-strips below?



9 + 3 = 12 8 + 9 = 17

Do you ever use fast nines with larger numbers? If so, can you think of some examples and explain how?

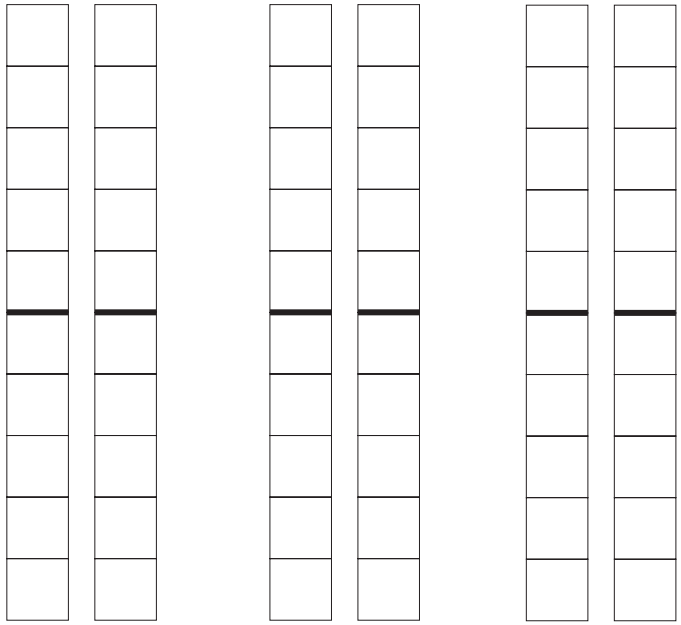
Fast Nine Story Problems

1 If you had 9 pencils in your case, and got 5 more, how many pencils would you have in all?

2 If you had 7 pencils in your case and got 9 more, how many pencils would you have in all?

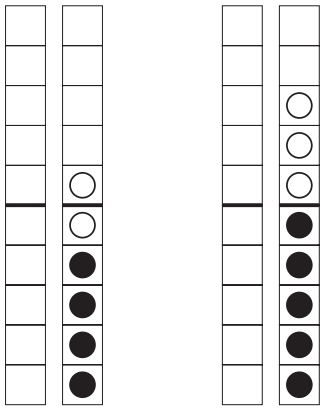
Your Zero Facts

What are some other zero facts you know? Can you draw them and/or show them using number sentences? Can you make a story problem about a zero fact?



Counting On

You can count on when you add just 1, 2, or 3 to another number. Start with the larger number and count up.



4 + 2 = 6 3 + 5 = 8

No matter how big the number, if you add 1, 2, or 3, it's fast to count up!

27 + 2 = 29 3 + 95 = 98

391 + 1 = 392

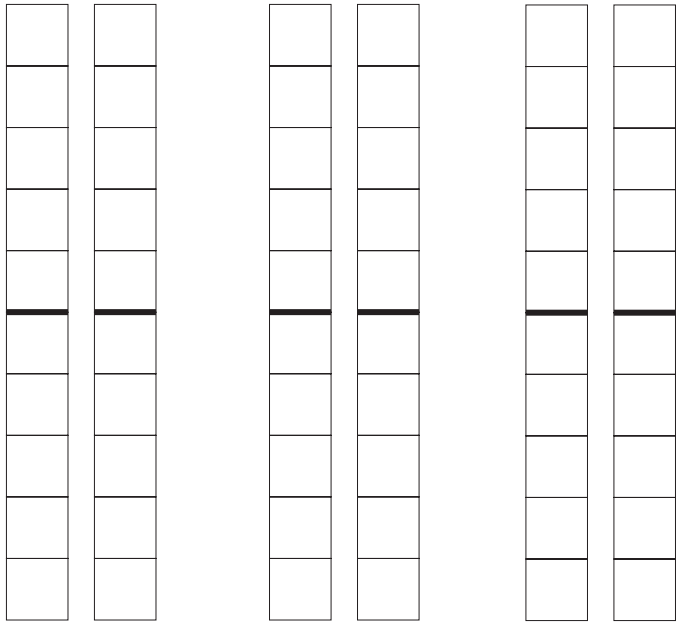
Counting On Story Problems

1 If you had 4 cookies and someone gave you 2 cookies, how many would you have in all?

2 If you had 3 cookies and someone gave you 5 cookies, how many would you have in all?

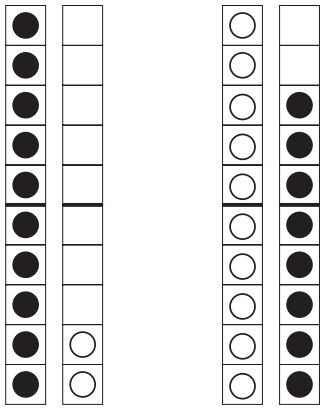
Your Fast Tens

What are some other fast ten facts you know? Can you draw them and/or show them using number sentences? Can you make a story problem about a fast ten fact?



Fast Tens

It's fast to add 10 to any single-digit number. You'll always get a teen number!



10 + 2 = 12 8 + 10 = 18

You can apply fast tens to larger numbers too.

29 + 10 = 39 247 + 10 = 257

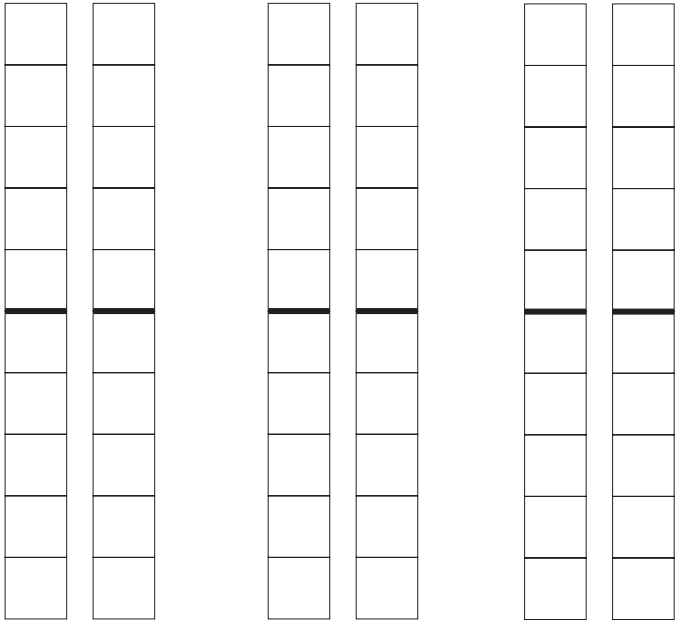
Fast Tens Story Problems

1 If I have 10 playing cards and you give me 4 more, how many will I have in all?

2 If you have 9 playing cards and I give you 10 more, how many will you have in all?

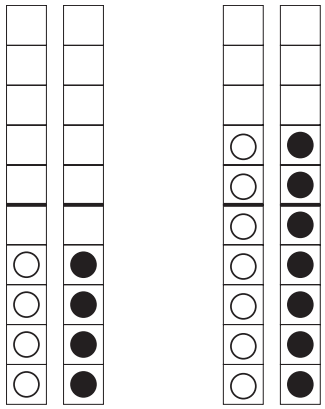
Your Counting On Facts

What are some other counting on facts you know? Can you draw them and/or show them using number sentences? Can you make a story problem about a counting on fact?



Doubles

When you add a number to itself, it's a double! Doubles are always even. Can you see why when you look at the ten-strips below?



4 + 4 = 8 7 + 7 = 14

Doubles can work with larger numbers like these. Maybe you can think of some more doubles with large numbers.

30 + 30 = 60 400 + 400 = 800

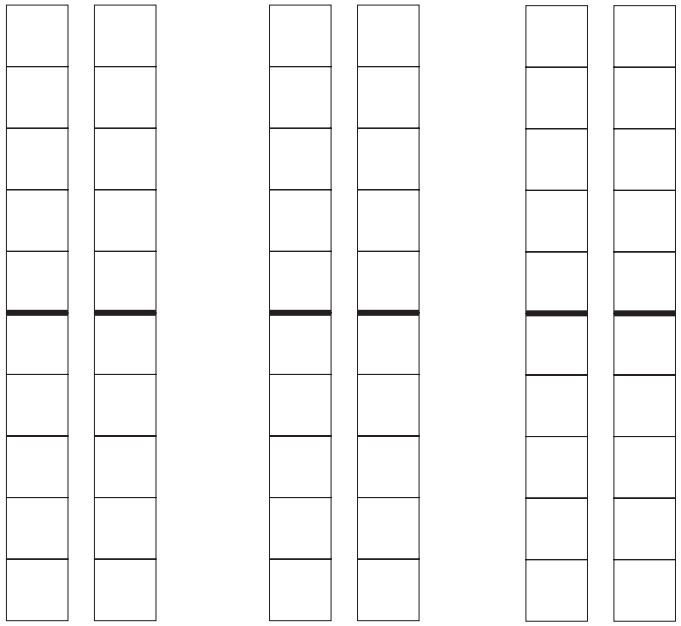
Doubles Story Problems

1 If you had 6 eggs and someone gave you 6 more, how many eggs would you have in all?

2 If you had 9 bouncy balls and someone gave you 9 more, how many would you have in all?

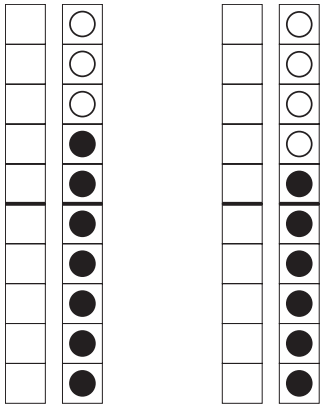
Your Make Ten Facts

What are some other make ten facts you know? Can you draw them and/or show them using number sentences? Can you make a story problem about a make ten fact?



Make Ten Facts

These pairs of numbers make ten: 9 + 1, 8 + 2, 7 + 3, 6 + 4, and 5 + 5. These are important facts because they help us think in groups of 10. What do you notice when you see make ten facts on the ten-strips?



7 + 3 = 10 4 + 6 = 10

When we work with larger numbers, make tens can help. For example 20 + 80 = 100. That's a make 100 fact! And 300 + 700 = 1000. What would you call that fact?

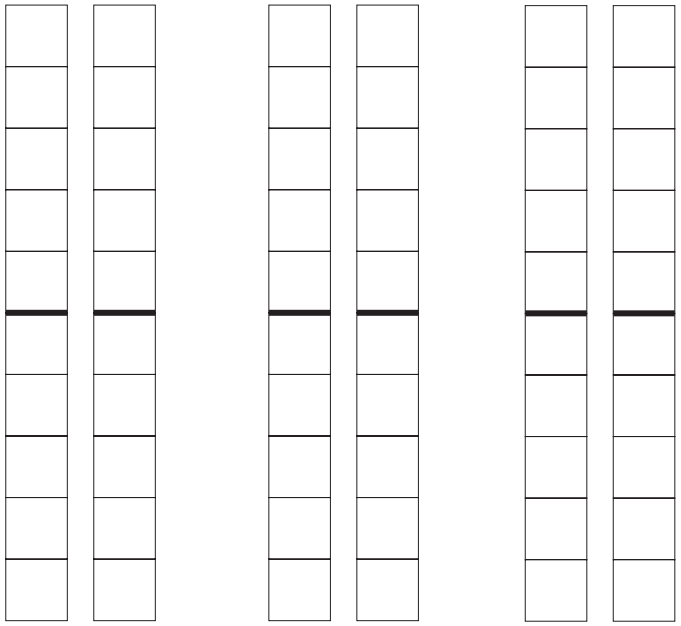
Make Ten Story Problems

1 If I had 8 cookies and you gave me 2 more, how many would I have in all?

2 If you had 3 cookies and I gave you 7 more, how many would you have in all?

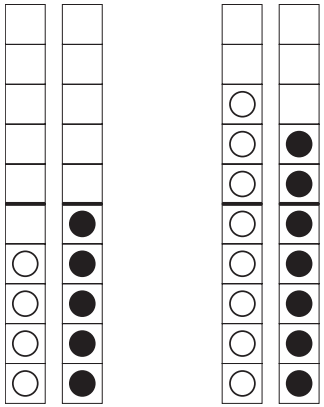
Your Doubles

What are some other doubles you know? Can you draw them and/or show them using number sentences? Can you make a story problem about a doubles fact?



Neighbors

When two numbers are right next to each other, we call them neighbors. When you know the doubles, neighbors are easy. Just double the smaller number and add 1 more. Or double the larger number and take 1 away.



4 + 5 = 9 8 + 7 = 15

Neighbors like these can be easy when you understand place value.

30 + 40 = 70 500 + 400 = 900

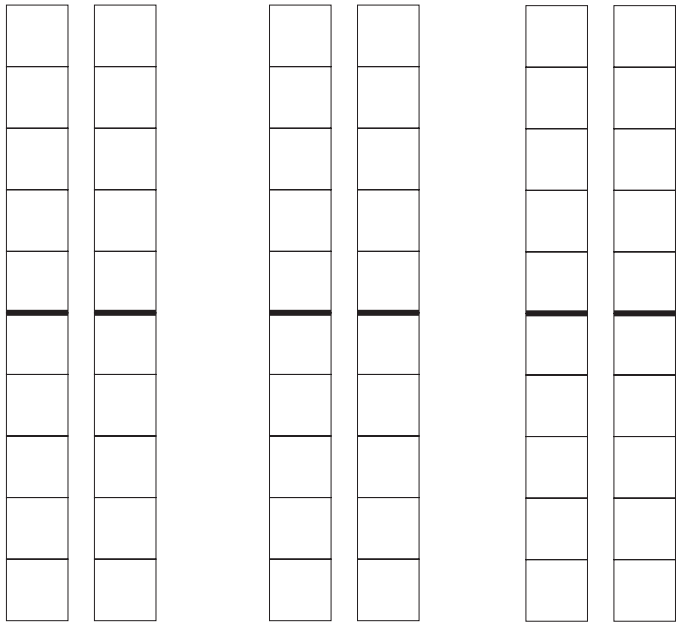
Neighbors Story Problems

1 If I had 4 cookies and you gave me 5 more, how many would I have in all?

2 If you had 7 flowers and I gave you 8 more, how many flowers would you have in all?

Your Neighbors

What are some other neighbors facts you know? Can you draw them and/or show them using number sentences? Can you make a story problem about a neighbors fact?



Fact Fluency Addition

FACT FLUENCY ADDITION – NOTE TO FAMILIES

As a classroom teacher, I appreciate the role families play in their children's success at school. When you take the time to review your child's schoolwork, talk about your child's day, and practice concepts and skills, you play a very important part in your child's education.

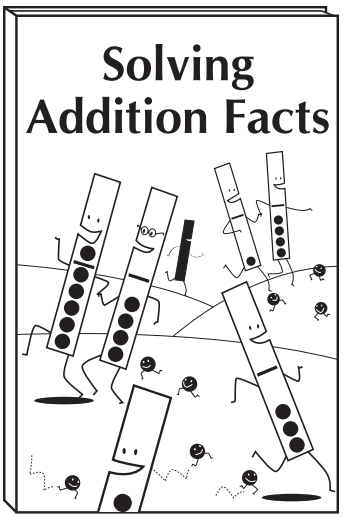
Please read with your child the booklet he or she brought home called *Solving Addition Facts*. This booklet is about some different ways to solve basic addition facts. Many of us learned our addition facts by memorizing them and then practicing them while playing card games and board games with dice. Over the past 20 years or so, research has found that many students do better when they see pictures of the facts and think about specific ways to solve them. Your child may have already mastered these addition facts or have other ways of thinking about them. In that case, thinking about new ways to solve the facts helps your child be flexible. These ways of adding numbers can also help children work with larger numbers.

Please keep this booklet in a safe place in your home so that you can refer to it in the coming weeks. If you have any questions, please contact me at school.

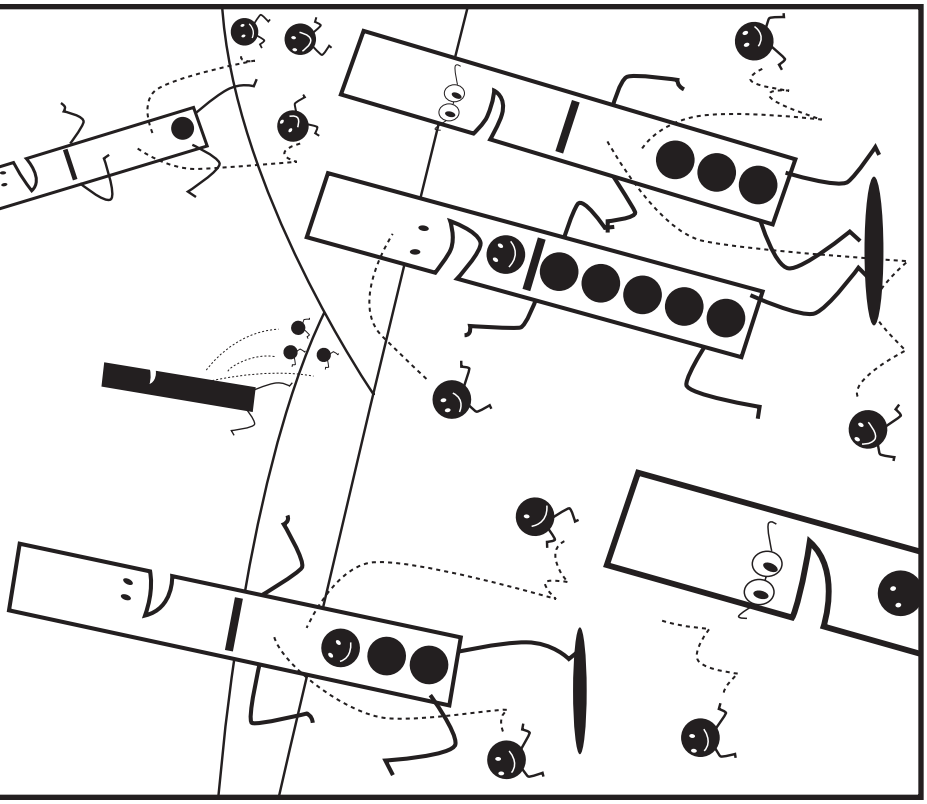
Instructions for *Solving Addition Facts* Booklet

Please read the booklet *Solving Addition Facts* with your child. The booklet invites you and your child to think of addition facts and draw them or write word problems about them. These activities are meant to get you and your child involved and talking with each other about mathematics. Please sign and return this sheet when you have read the booklet.

Sign here:_____ Date:_____



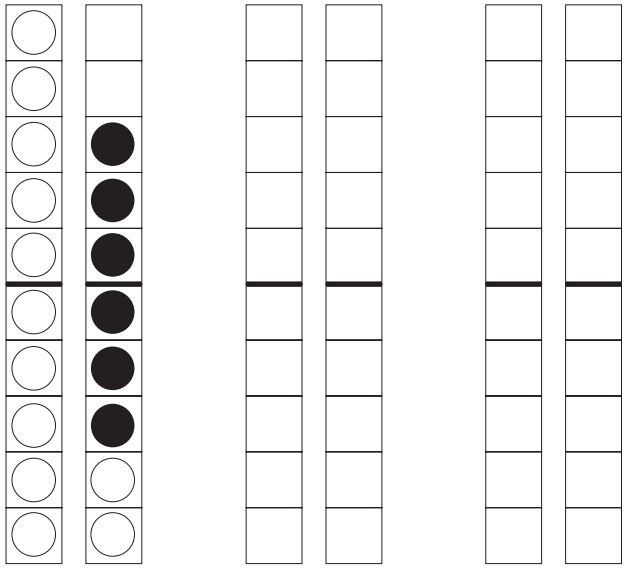
Solving Subtraction Facts



NAME _____

Leftovers

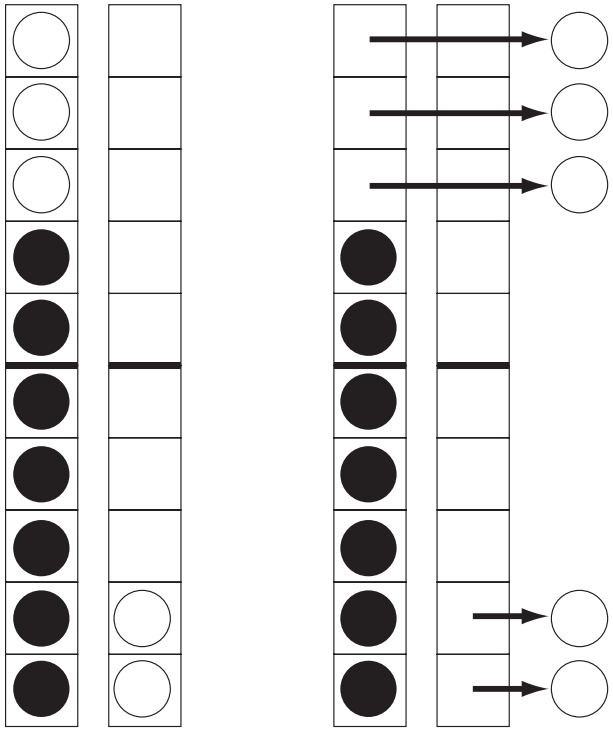
There are many leftover subtraction facts. These leftover facts can be solved using a combination of strategies. For example, to solve 18 – 12 some people may think, “10 minus 10 is 0, and 8 minus 2 is 6, so 18 – 12 is 6.” Other people may think, “12 plus what would make 18?” Someone else could count up from 12 to 18. The answer is the same, but the strategies we choose depend on how we like to think about the numbers. How would you solve 18 – 12? Show how you would solve the other two facts on the ten-strips.



18 – 12 = 6 17 – 4=_____ 16 – 11=_____

The Take-Away Model for Subtraction

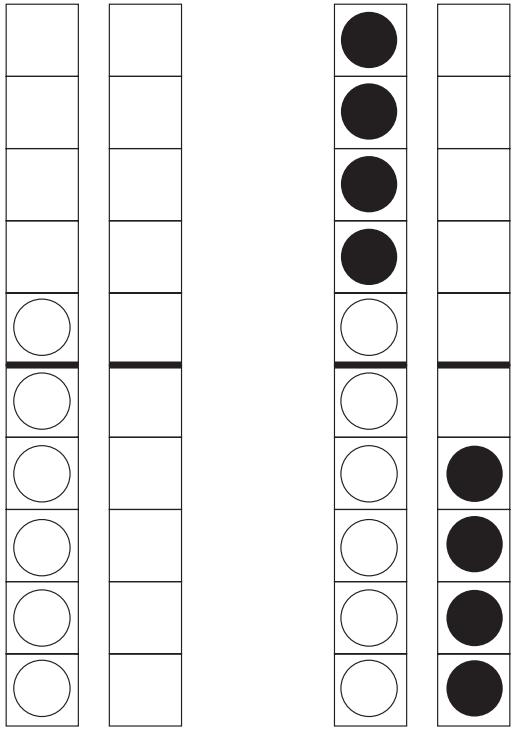
One way to think about subtraction is to think about taking one group away from another. For example, if you have the problem 12 – 5, you could think about taking 5 away from 12 as shown below. The difference is what’s left over. Can you see the difference between 12 and 5?



12 12 – 5 = _____

The Adding Up or Difference Model for Subtraction

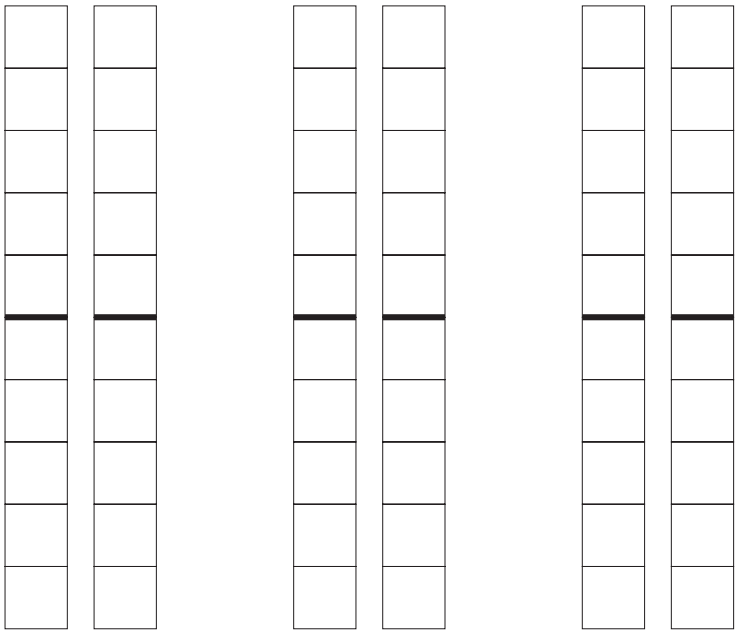
Another way to think about subtraction is to think about what you need to add to the smaller number to get to the larger number. In the example below, what do you need to add to 6 to get to 14? The amount you added is the difference between 14 and 6.



6 6 + _____ = 14

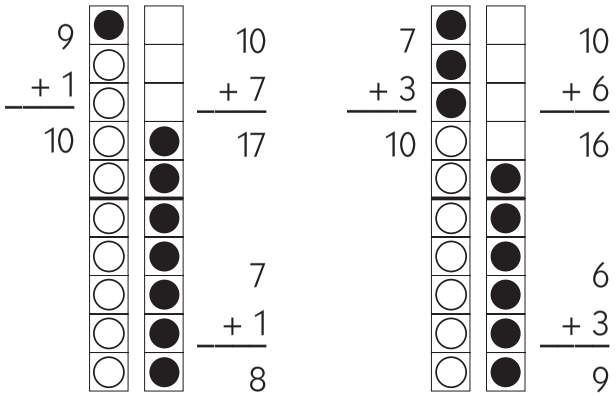
Your Up to Ten Facts

What are some other up to ten facts you know? Can you draw them and/or show them using number sentences? Can you make a story problem about an up to ten fact?



Up to Ten

When you know how to make ten, up to ten can be a snap. If the fact is 17 – 9, you can think about making a ten (9 + 1 = 10) and then adding 7 more to get to 17 (10 + 7 = 17). The difference is the total amount you added (1 + 7 = 8 so 17 – 9 = 8). When you go up to ten, you are using addition to find the difference between the two numbers.



17 – 9 = 8 16 – 7 = 9

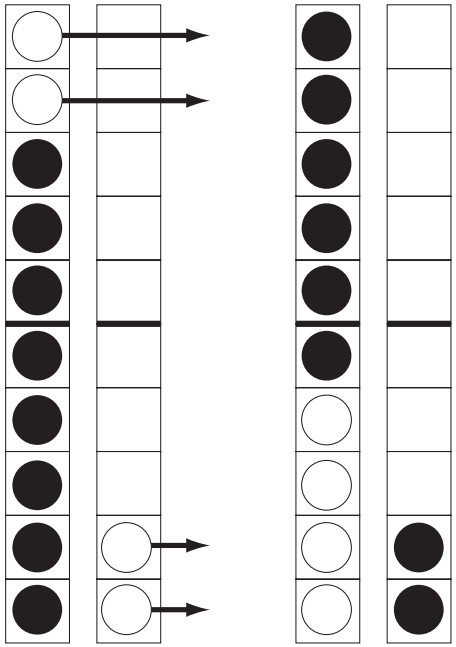
Up to Ten Story Problems

1 Sam had 8 cards in his collection. He got some more for his birthday and now he has 15. How many cards did Sam get for his birthday?

2 We need 16 points to win the game. We only have 7 points right now. How many more points do we need to win?

The Pictures in This Book

The pictures in this book will show both the take-away and difference models for subtraction. One group is shown in white, and the rest is shown in black. You could imagine taking away all the white dots, or you could add on the black dots to see the difference.



12 – 4 = 8 12 – 4 = 8

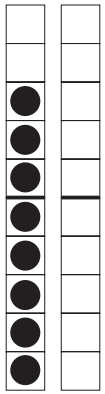
Begin with 12 dots. Take away the 4 white dots. You have 8 black dots left.

If you begin with the 4 white dots, you must add 8 black dots to get up to 12.

Building Computational Fluency Blackline Run pages 79–90 back to back, fold all together to make booklet.

Zero Facts

When you subtract 0 from any number, the difference or answer is always the number you started with.



8 – 0 = 8

This works with larger numbers too!

35 – 0 = 35 467 – 0 = 467

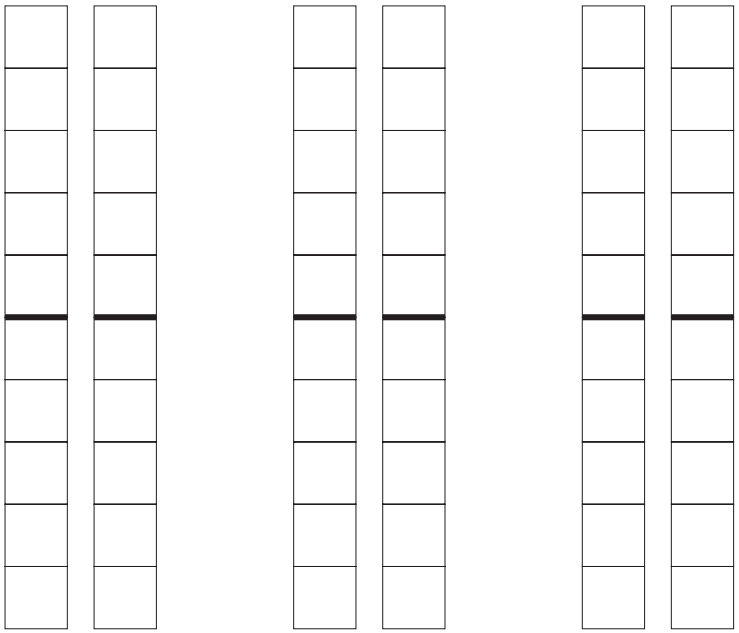
Zero Facts Story Problems

1 If you had 8 cookies and you didn't eat any of them, how many cookies would you have left?

2 If your team had 0 points, and the other team had 8 points, how many points would your team need to score to tie the game?

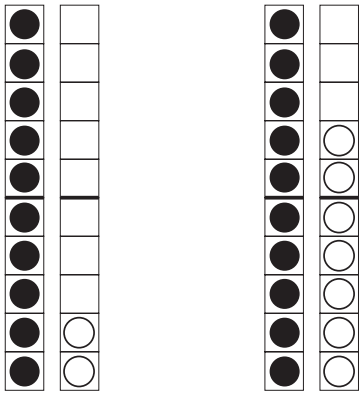
Your Run Away Ones Facts

What are some other run away ones you know? Can you draw them and/or show them using number sentences? Can you make a story problem about a run away one fact?



Run Away Ones

When you take all the ones away from a teen number, all you have left is 10.



12 – 2 = 10 17 – 7 = 10

When we work with larger numbers, we can use run away ones too.

509 – 9 = 500 868 – 8 = 860

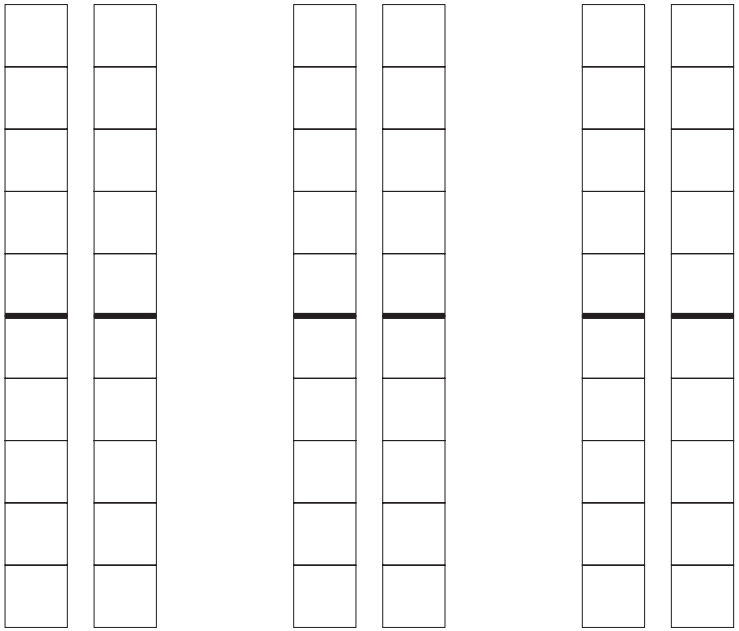
Run Away Ones Story Problems

1 I bought 12 eggs but 2 of them broke on the way home. How many are not broken?

2 I need 17 points to win the soccer ball. I have 7 already. How many more points do I need to win the ball?

Your Zero Facts

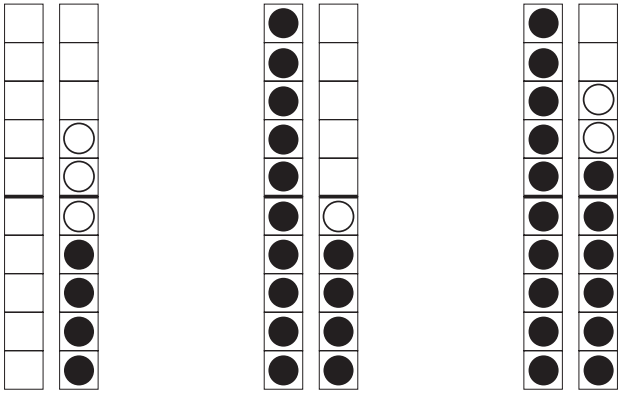
What are some other zero facts you know? Can you draw them and/or show them using number sentences? Can you make a story problem about a zero fact?



Building Computational Fluency Blackline Run pages 79–90 back to back, fold all together to make booklet.

Counting Back

You can count back when you subtract 1, 2, or 3 from another number. Start with the larger number and count back.



7 – 3 = 4 15 – 1 = 14 18 – 2 = 16

No matter how big the number, if you subtract 1, 2, or 3, it's fast to count back!

27 – 2 = 25 98 – 3 = 95 391 – 1 = 390

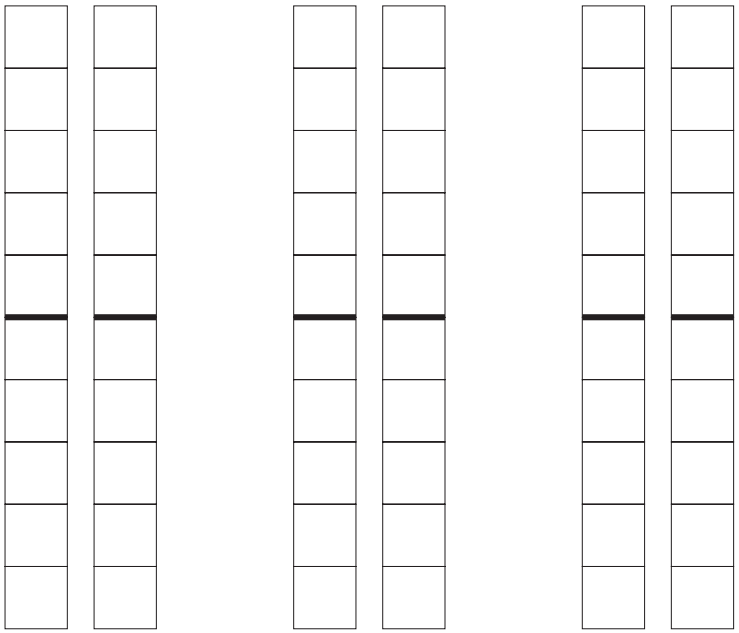
Counting Back Story Problems

1 If you had 7 cookies and someone ate 3 of them, how many would you have left?

2 If you had 2 cookies and your sister had 18, how many more cookies would you need to have the same number of cookies as your sister?

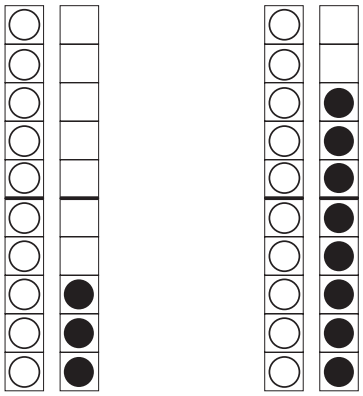
Your Take Away Tens

What are some other take away tens you know? Can you draw them and/or show them using number sentences? Can you make a story problem about a take away ten fact?



Take Away Tens

Remember how easy the fast tens were for you in addition? Well, take away tens are fast too. Just think about taking away the whole ten, and all you have left is the group in the ones column. What do you notice when you look at the ten-strips below?



13 – 10 = 3 18 – 10 = 8

When we work with larger numbers, take away tens can help.

736 – 10 = 726 419 – 10 = 409

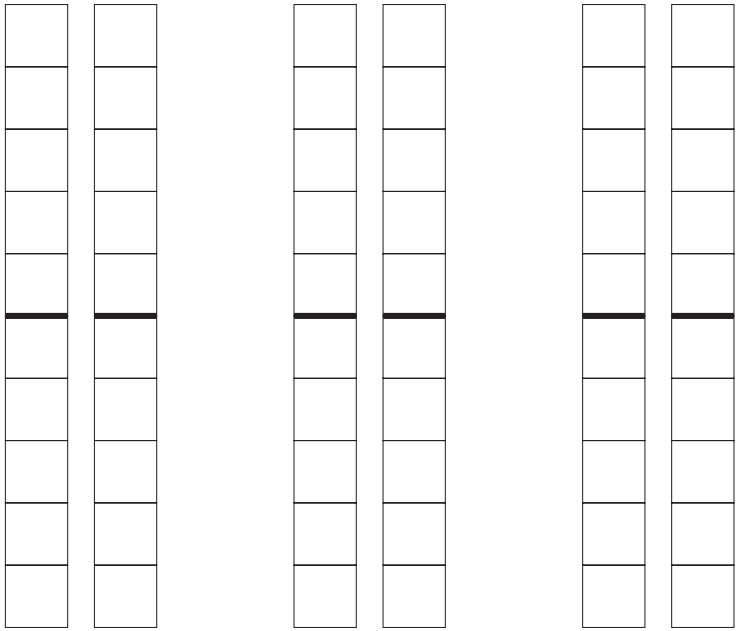
Take Away Tens Story Problems

1 I have 13 pencils. I put 10 of them in my supply box. How many do I have left?

2 I need 18 pencils. I have 10 right now. How many more do I need?

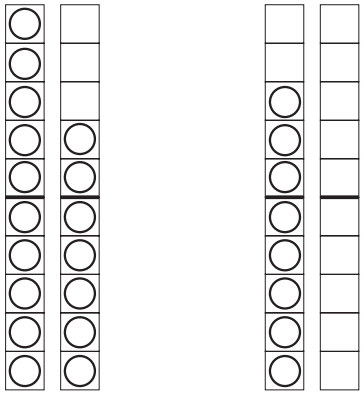
Your Counting Back Facts

What are some other counting back facts you know? Can you draw them and/or show them using number sentences? Can you make a story problem about a counting back fact?



Doubles

When you see a number minus itself, the answer is always 0! If you took away all of the white dots, how many would be left?



17 – 17 = 0 8 – 8 = 0

Doubles work with larger numbers like these. Can you think of some more doubles with larger numbers?

58 – 58 = 0 208 – 208 = 0

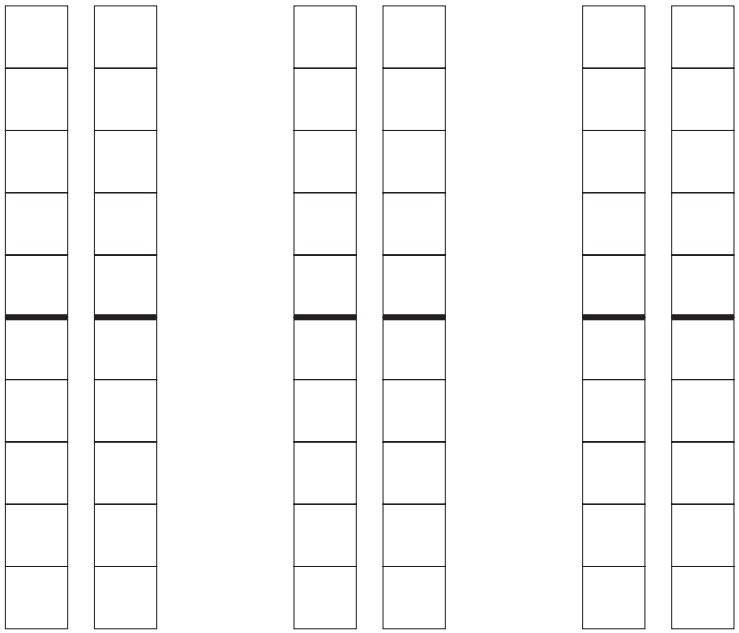
Doubles Story Problems

1 If you had 17 eggs and someone bought all of them, how many eggs would you have left?

2 If there were 8 boys in the club and 8 girls, what's the difference between the number of boys and girls?

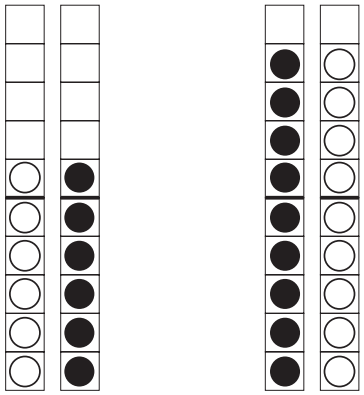
Your Half Facts

What are some other half facts you know? Can you draw them and/or show them using number sentences? Can you make a story problem about a half fact?



Half Facts

When the smaller number is half of the larger number, it's a half fact! For example, 12 – 6 is a half fact, because 6 is half of 12. Can you see what the difference is?



12 – 6 = 6 18 – 9 = 9

Half facts work with larger numbers too. Can you think of some more?

100 – 50 = 50 200 – 100 = 100 250 – 125 = 125

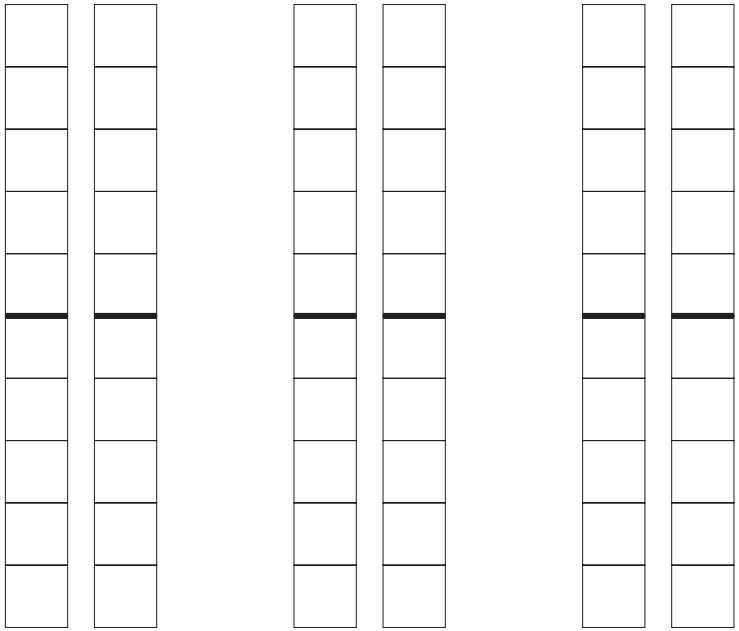
Half Facts Story Problems

1 If you had 14 apples and you gave 7 to your neighbor, how many apples would you have left?

2 If your team had 8 points and you needed 16 points total to win the game, how many more points would your team need to score?

Your Doubles

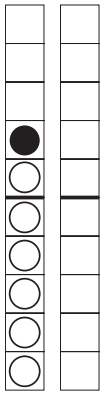
What are some other doubles you know? Can you draw them and/or show them using number sentences? Can you make a story problem about a doubles fact?



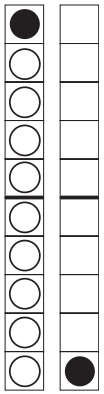
Building Computational Fluency Blackline Run pages 79–90 back to back, fold all together to make booklet.

Neighbors

Your neighbors live close to you. In subtraction, neighbors are just 1 or 2 away from each other. One example is 7 – 6. If you are counting, 6 comes right before 7. Another example is 11 – 9. You might say 9 is really close to 11, because you count 9, 10, 11. For neighbors, the difference is always 1 or 2.



7 – 6 = 1



11 – 9 = 2

Neighbors work with larger numbers too.

371 – 370 = 1 854 – 852 = 2

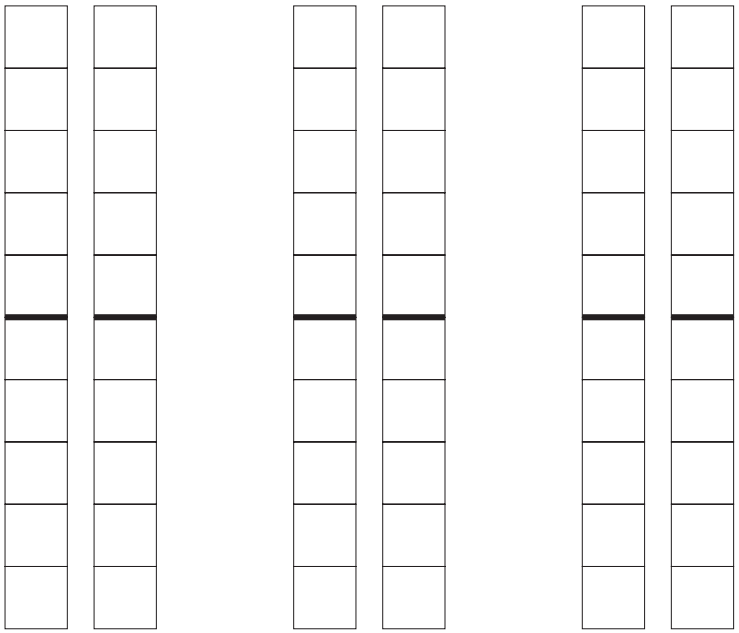
Neighbors Story Problem

1 If you had 7 toys and gave away 6, how many would you have left?

2 If you had 11 fish and your friend had 9 fish, how many more fish would you have than your friend?

Your Neighbors

What are some other neighbor facts you know? Can you draw them and/or show them using number sentences? Can you make a story problem about a neighbor fact?



Fact Fluency Subtraction

FACT FLUENCY SUBTRACTION – NOTE TO FAMILIES

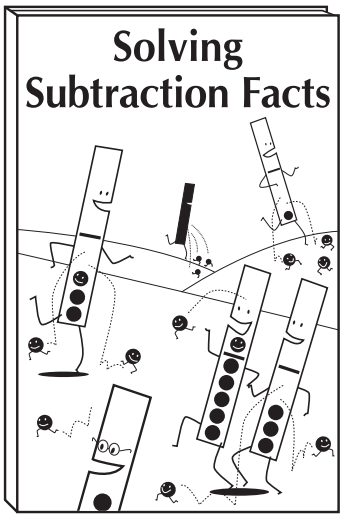
As a classroom teacher, I appreciate the role families play in their children's success at school. When you take the time to review your child's schoolwork, talk about your child's day, and practice concepts and skills, you play a very important part in your child's education.

Please read the booklet *Solving Subtraction Facts* with your child. You could read it aloud to your child, or your child might read it aloud to you. You could read half the booklet one night and half another night if it seems too long for one sitting. This booklet explains the ways we've been solving subtraction facts in class. Subtraction is more difficult than addition for most primary students, and we find that talking about ways to solve subtraction problems is very helpful.

Instructions for *Solving Subtraction Facts* Booklet

The activities in the booklet are designed to get you and your child talking about how you solve subtraction problems. Work through the tasks with your child as you have time. Please keep this booklet in a safe place so that you and your child can refer to it while he or she works on the basic subtraction facts. Please sign and date here when you have read the booklet.

Signature_____ Date_____



NAME _____ DATE _____

FACT FLUENCY

Scout Them Out 1, Addition

1. Circle all the zero facts (+0's) in blue. Then take a pencil and go back and do them.
2. Circle all the +1's (counting on) in red. Then take a pencil and go back and do them.

7 + 1	6 + 1	9 + 0	10 + 1	0 + 4	1 + 8	5 + 1
1 + 3	12 + 1	0 + 13	17 + 0	0 + 4	11 + 1	1 + 1
2 + 1	14 + 0	1 + 15	13 + 1	1 + 4	13 + 1	1 + 9

Scout Them Out 1, Subtraction

1. Circle all the zero facts (–0's) in blue. Then take a pencil and go back and do them.
2. Circle all the –1's (counting back) in red. Then take a pencil and go back and do them.

7 – 1	5 – 1	9 – 0	10 – 1	12 – 0	6 – 1	7 – 1
9 – 1	4 – 0	18 – 0	17 – 1	14 – 1	8 – 1	12 – 1
3 – 1	15 – 1	1 – 1	13 – 0	6 – 0	11 – 1	8 – 1

NAME _____ DATE _____

FACT FLUENCY

Scout Them Out 2, Addition

1. Circle all the +2's (counting on) in blue. Then take a pencil and go back and do them.
2. Circle all the fast tens (+10's) in red. Then take a pencil and go back and do them.

7 + 2 = ___	2 + 6 = ___	9 + 10 = ___	10 + 1 = ___	2 + 4 = ___	2 + 8 = ___	5 + 2 = ___
10 + 3 = ___	10 + 4 = ___	6 + 10 = ___	10 + 7 = ___	2 + 8 = ___	11 + 2 = ___	2 + 2 = ___
7 + 2 = ___	10 + 0 = ___	2 + 15 = ___	10 + 8 = ___	3 + 2 = ___	10 + 5 = ___	2 + 9 = ___

Scout Them Out 2, Subtraction

1. Circle all the –2's (counting back) in blue. Then take a pencil and go back and do them.
2. Circle all the takeaway tens (–10's) in red. Then take a pencil and go back and do them.

7 – 2 = ___	5 – 2 = ___	19 – 10 = ___	14 – 10 = ___	12 – 10 = ___	6 – 2 = ___	9 – 2 = ___
11 – 2 = ___	13 – 10 = ___	18 – 10 = ___	17 – 10 = ___	14 – 2 = ___	8 – 2 = ___	16 – 10 = ___
3 – 2 = ___	15 – 2 = ___	2 – 2 = ___	20 – 10 = ___	6 – 2 = ___	11 – 10 = ___	8 – 2 = ___

NAME _____ DATE _____

FACT FLUENCY

Scout Them Out 3, Addition

1. Circle all the doubles in blue. Then take a pencil and go back and do them.
2. Circle all the neighbors in red. Then take a pencil and go back and do them.

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

Scout Them Out 3, Subtraction

1. Circle all the doubles in red. Then take a pencil and go back and do them. (like 7 – 7)
2. Circle all the neighbors in red. Then take a pencil and go back and do them. (like 5–4 or 8–7)

7 – 7	5 – 4	10 – 10	14 – 14	12 – 11	6 – 6	9 – 8
11 – 11	13 – 12	8 – 8	10 – 9	3 – 2	8 – 7	16 – 16
6 – 5	15 – 14	2 – 2	20 – 20	9 – 9	11 – 11	7 – 6

NAME _____ DATE _____

FACT FLUENCY

Scout Them Out 4, Addition

1. Circle all the doubles in blue. Then take a pencil and go back and do them.
2. Circle all the neighbors in red. Then take a pencil and go back and do them.

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

Scout Them Out 4, Subtraction

1. Circle all the halves in blue. Then take a pencil and go back and do them. (like 4–2 or 10–5)
2. Circle all the doubles in red. Then take a pencil and go back and do them. (like 6–6 or 3–3)

6 – 3	6 – 6	10 – 5	10 – 10	12 – 6	12 – 12	9 – 9
4 – 4	4 – 2	18 – 9	18 – 18	8 – 4	8 – 8	2 – 1
14 – 7	14 – 14	12 – 6	20 – 10	16 – 8	16 – 16	15 – 15

NAME _____ DATE _____

FACT FLUENCY

Scout Them Out 5, Addition

1. Circle all the fast tens (+10's) in blue. Then take a pencil and go back and do them.
2. Circle all the fast nines (+9's) in red. Then take a pencil and go back and do them.

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

Scout Them Out 5, Subtraction

1. Circle all the take away tens in blue. Then take a pencil and go back and do them. (like 18–10)
2. Circle all the run away ones in red. Then take a pencil and go back and do them. (like 16–6)

16 – 10	16 – 6	15 – 10	15 – 5	13 – 10	13 – 3	9 – 9
11 – 10	11 – 1	17 – 10	17 – 7	10 – 10	14 – 10	16 – 10
15 – 5	16 – 6	12 – 2	20 – 10	19 – 9	12 – 10	19 – 10

NAME _____ DATE _____

FACT FLUENCY

Scout Them Out 6, Addition

1. Circle all the +0's in blue. Then take a pencil and go back and do them.
2. Circle all the +1's in red. Then take a pencil and go back and do them.
3. Circle all the +2's in green. Then take a pencil and go back and do them.

0 + 6	9 + 2	9 + 1	1 + 3	2 + 7	10 + 2	4 + 2
2 + 6	1 + 7	0 + 5	15 + 1	8 + 0	2 + 12	4 + 0
17 + 1	8 + 2	1 + 5	2 + 5	16 + 0	18 + 2	0 + 9

Scout Them Out 6, Subtraction

1. Circle all the –0's in blue. Then take a pencil and go back and do them.
2. Circle all the –1's in red. Then take a pencil and go back and do them.
3. Circle all the –2's in green. Then take a pencil and go back and do them.

16 – 0	7 – 2	4 – 0	9 – 2	10 – 2	8 – 2	9 – 1
5 – 1	11 – 1	6 – 2	7 – 1	5 – 2	15 – 1	17 – 0
8 – 1	6 – 0	12 – 2	19 – 1	16 – 2	14 – 1	15 – 0

NAME _____ DATE _____

FACT FLUENCY

Scout Them Out 7, Addition

1. Circle all the doubles in blue. Then take a pencil and go back and do them.
2. Circle all the neighbors in red. Then take a pencil and go back and do them.

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

Scout Them Out 7, Subtraction

1. Circle all the doubles in blue. Then take a pencil and go back and do them. (like 4–4)
2. Circle all the neighbors in red. Then take a pencil and go back and do them. (like 5–4 or 11–10)

10 – 10	7 – 7	11 – 10	9 – 9	8 – 8	3 – 2	6 – 6
12 – 11	20 – 20	5 – 5	5 – 4	6 – 5	7 – 6	1 – 0
14 – 14	8 – 7	9 – 8	15 – 14	12 – 12	4 – 4	4 – 3

NAME _____ DATE _____

FACT FLUENCY

Scout Them Out 8, Addition

1. Circle all the +2's (counting on) in blue. Then take a pencil and go back and do them.
2. Circle all the doubles in red. Then take a pencil and go back and do them.
3. Circle all the neighbors in green. Then take a pencil and go back and do them.

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

Scout Them Out 8, Subtraction

1. Circle all the –2's (counting back) in blue. Then take a pencil and go back and do them.
2. Circle all the doubles in red. Then take a pencil and go back and do them. (like 6–6)
3. Circle all the halves in purple. Then take a pencil and go back and do them. (like 10–5)

16 – 8	10 – 5	10 – 10	12 – 6	12 – 12	12 – 2	8 – 4
8 – 8	6 – 2	18 – 9	18 – 18	6 – 3	6 – 6	4 – 2
4 – 4	16 – 8	16 – 16	20 – 10	9 – 2	10 – 2	15 – 2

NAME _____ DATE _____

FACT FLUENCY

Scout Them Out 9, Addition

1. Circle all the fast tens (+10's) in blue. Then take a pencil and go back and do them.
2. Circle all the fast nines (+9's) in red. Then take a pencil and go back and do them.

10 + 6	9 + 2	9 + 10	10 + 3	10 + 7	10 + 3	9 + 3
7 + 10	9 + 7	9 + 6	10 + 10	9 + 9	4 + 10	4 + 9
10 + 1	9 + 4	1 + 9	3 + 9	10 + 3	10 + 5	5 + 9

Scout Them Out 9, Subtraction

1. Circle all the take away tens in blue. Then take a pencil and go back and do them. (like 18–10)
2. Circle all the run away ones in red. Then take a pencil and go back and do them. (like 16 –6)

16 – 10	17 – 7	10 – 10	12 – 2	12 – 10	13 – 3	13 – 10
11 – 10	11 – 1	18 – 10	18 – 8	15 – 5	15 – 10	17 – 10
14 – 4	16 – 6	12 – 2	20 – 10	19 – 9	11 – 1	16 – 6

NAME _____ DATE _____

FACT FLUENCY

Scout Them Out 10, Addition

1. Circle all the fast tens (+10's) in blue. Then take a pencil and go back and do them.
2. Circle all the fast nines (+9's) in red. Then take a pencil and go back and do them.

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

Scout Them Out 10, Subtraction

1. Circle all the take away tens in blue. Then take a pencil and go back and do them. (like 18–10)
2. Circle all the run away ones in red. Then take a pencil and go back and do them. (like 16–6)

17 – 10	17 – 7	10 – 10	14 – 4	12 – 10	12 – 2	19 – 9
11 – 10	11 – 1	18 – 10	18 – 8	13 – 3	14 – 10	16 – 10
15 – 5	16 – 6	12 – 8	13 – 10	19 – 9	11 – 10	15 – 10

NAME _____ DATE _____

FACT FLUENCY

Double It!

Sarah has 4 cookies. Matt has twice that many. How many cookies does Matt have?

_____

How many cookies do Matt and Sarah have in all?

_____

Add these doubles.

2	20	200	3	30	300	4
+ 2	+ 20	+ 200	+ 3	+ 30	+ 300	+ 4
40	400	5	50	500	6	60
+ 40	+ 400	+ 5	+ 50	+ 500	+ 6	+ 60
7	70	8	80	9	90	100
+ 7	+ 70	+ 8	+ 80	+ 9	+ 90	+ 100

Now try doubles plus 1 more (we call them "neighbors").

2	3	4	3	7	6	1
+ 3	+ 2	+ 3	+ 4	+ 6	+ 7	+ 2

NAME _____ DATE _____

FACT FLUENCY

Double It! (cont.)

2	3	4	3	7	6	1
+ 3	+ 2	+ 3	+ 4	+ 6	+ 7	+ 2

Here's little bit ofmultiplication.

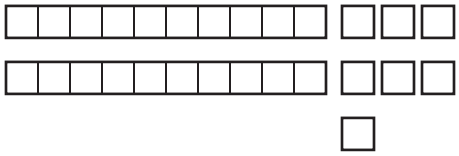
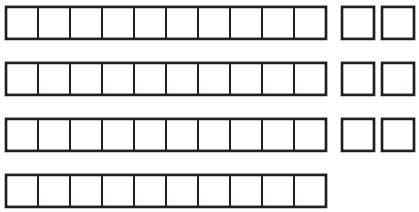
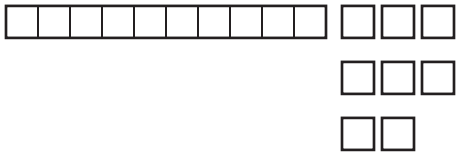
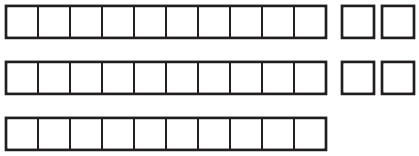
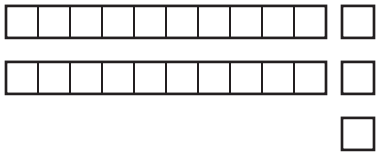
2 × 3 = _____	2 × 5 = _____	2 × 7 = _____	2 × 9 = _____
2 × 0 = _____	2 × 2 = _____	2 × 4 = _____	2 × 6 = _____
2 × 8 = _____	2 × 10 = _____		

NAME _____ DATE _____

FACT FLUENCY

Adding & Subtracting 10

Subtract

 27 −10	 33 −10
 25 −10	 46 −10
 18 −10	 34 −10
 23 −10	 31 −10

What happens every time you subtract 10 from a number?

_____

_____

_____

Practice adding tens.

24	35	17	65	28	30	12
+ 10	+ 10	+ 10	+ 10	+ 10	+ 10	+ 10

NAME _____ DATE _____

FACT FLUENCY

Cutting Numbers in Half

Let's see what happens when we "cut" some numbers in half.

What's half of 2? _____ What's half of 6? _____ What's half of 10? _____

What's half of 20? _____ What's half of 60? _____ What's half of 100? _____

What's half of 200?_____ What's half of 600? _____ What's half of 1,000? _____

What makes it pretty easy to divide these numbers in half?

_____

_____

_____

Try these subtract halves.

10	100	8	80	12	120	40
– 5	– 50	– 4	– 40	– 6	– 60	– 20
___	___	___	___	___	___	___

10	100	8	80	12	120	40
– 5	– 50	– 4	– 40	– 6	– 60	– 20
___	___	___	___	___	___	___

Now try these.

12	13	12	16	15	16	16
– 6	– 6	– 7	– 8	– 8	– 9	– 7
___	___	___	___	___	___	___

NAME _____ DATE _____

FACT FLUENCY

Double It or Cut It in Half

Add.

10 + 10	20 + 20	30 + 30	40 + 40	50 + 50	60 + 60	70 + 70
11 + 11	22 + 22	33 + 33	44 + 44	55 + 55	25 + 25	35 + 35
12 + 12	13 + 13	14 + 14	15 + 15	16 + 16	21 + 21	23 + 23
15 + 15	16 + 16	25 + 25	26 + 26	35 + 35	36 + 36	100 + 100

Subtract.

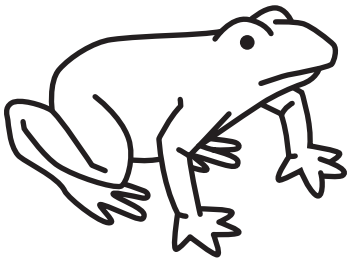
20 – 10	40 – 20	60 – 30	80 – 40	100 – 50	120 – 60	140 – 70
20 – 10	40 – 20	60 – 30	80 – 40	100 – 50	120 – 60	140 – 70
24 – 12	26 – 13	28 – 14	30 – 15	32 – 16	42 – 21	46 – 23

NAME _____ DATE _____

FACT FLUENCY

Leapfrog Subtraction page 1 of 2

See how fast you can leapfrog around this sheet and the next with your crayons and pencil to practice the different subtraction strategies we've learned.



Circle with blue all the –2's on the sheet. Then take your pencil and go back and do them. (Example 16 – 2)

Circle with red all the halves on the sheet. Then take your pencil and go back and do them. (Example 12 – 6 or 14 – 7)

Circle with green all the take away tens on the sheet. Then take your pencil and go back and do them. (Example 14 – 10 or 19 – 10)

Circle in purple all the run away ones on the sheet. Then take your pencil and go back and do them. (Example 13 – 3 or 17 – 7)

And now—see if you can use the ones you've circled and solved to help you figure out the rest!

10	15	14	14	14	13	19
– 2	– 2	– 7	– 6	– 8	– 3	– 9
11	15	16	17	18	17	19
– 2	– 5	– 8	– 8	– 8	– 10	– 2
13	18	14	10	11	18	19
– 2	– 9	– 4	– 5	– 5	– 10	– 10

NAME _____ DATE _____

FACT FLUENCY

Leapfrog Subtraction page 2 of 2

16	16	14	14	12	12	20
– 8	– 9	– 10	– 9	– 10	– 9	– 10
___	___	___	___	___	___	___

15	15	12	16	12	12	10
– 10	– 9	– 3	– 6	– 6	– 7	– 5
___	___	___	___	___	___	___

Home Connection A ★ Activity

NOTE TO FAMILIES

This assignment includes a card game called Addition Facts Challenge and a worksheet called Addition & Subtraction Fact Families. As you work with your child, encourage him or her to use the ten-strips on the back of this page.

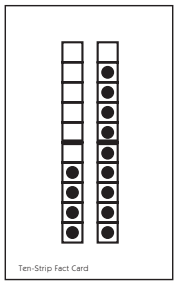
Note that each one contains two columns of 10 and that the horizontal black bar makes it easy to see the groups of 5 as well. We encourage students to use these strips to see relationships between numbers and to think about groups of 5 and 10 as they add numbers.

You'll need the Ten-Strip Fact Cards, the ten-strips on the back of this page, and something to write with. Cut the game cards apart if your child has not already cut them apart in school.

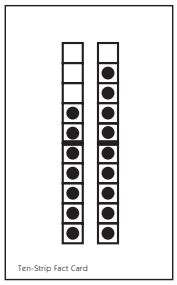
Instructions for Addition Facts Challenge

1 Mix the cards up. Place them in a stack face down. Draw one card from the top of the pile and have your child do the same.

2 You and your child should each add the quantities shown in the ten-strips on your own cards.



Maggie 4 + 9 = 13



Dad 7 + 9 = 16

3 Ask your child to describe how she or he found the sum on each card. How do you see it? Share your ideas. Your child may want to fill in the ten-strips on the back of this page to show how he or she thinks about some of the addition facts.

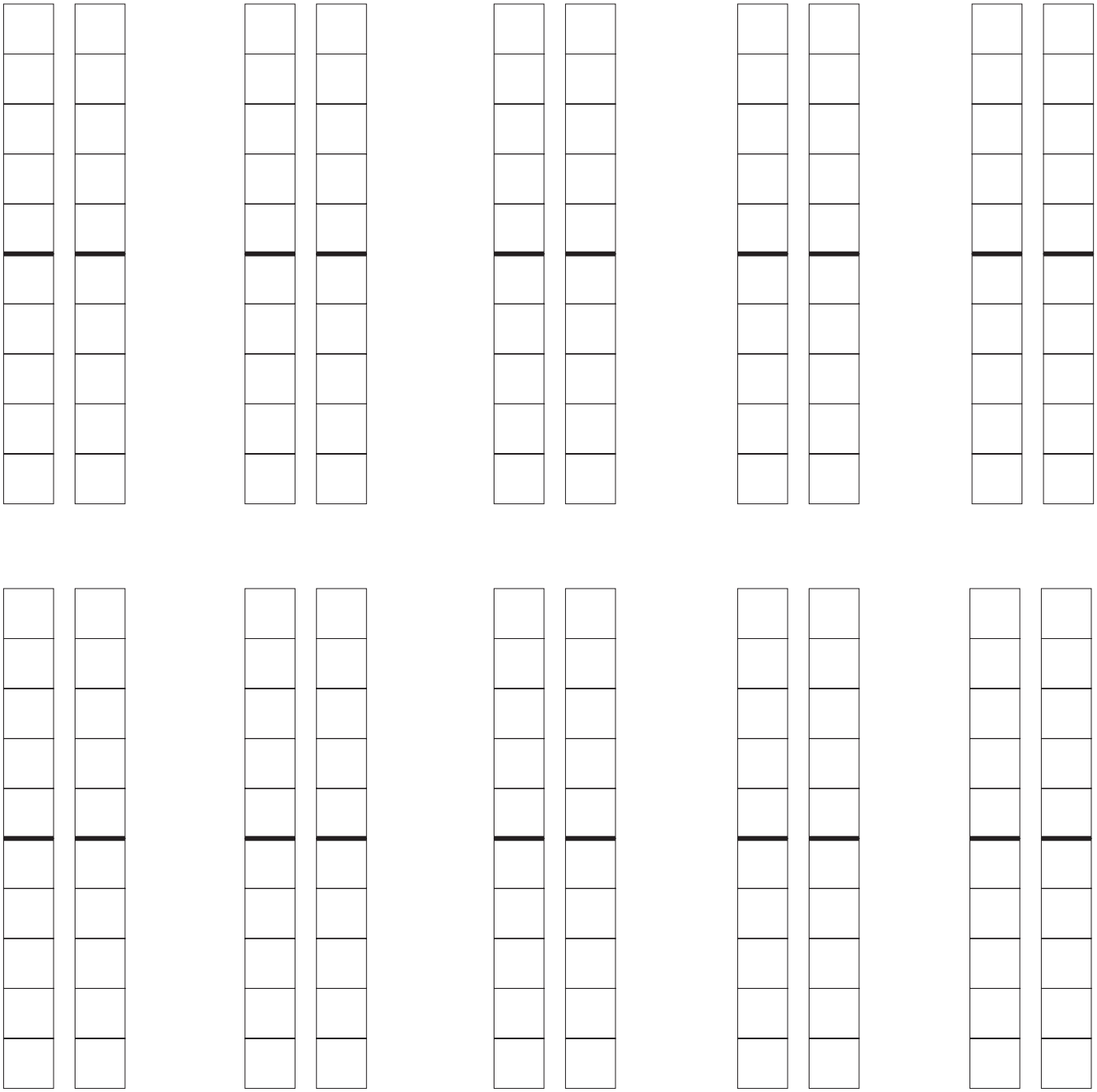
4 Compare sums with your child. The high value wins. In the case of a tie, you'll each need to draw another card. The winner of that round wins all 4 cards.

5 Take turns drawing cards and playing until you are out of cards. Then count your cards. The person with the most cards wins the game.

6 When you have completed the game, ask your child to complete the worksheet and bring it back to school.

Home Connection A Activity (cont.)

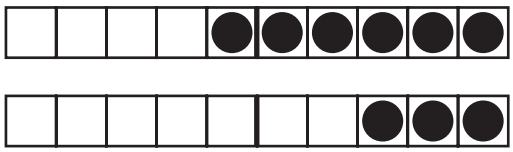
Ten-Strips



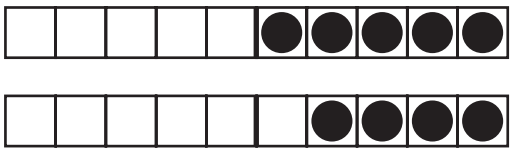
Home Connection A Activity (cont.)

Ten-Strip Fact Cards page 1 of 4

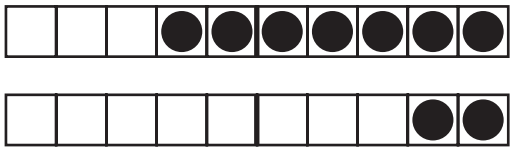
Cut out cards along solid lines.



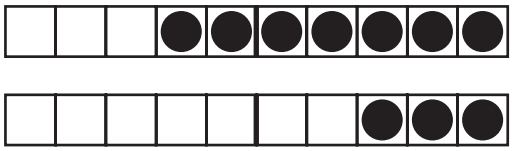
Ten-Strip Fact Card



Ten-Strip Fact Card



Ten-Strip Fact Card



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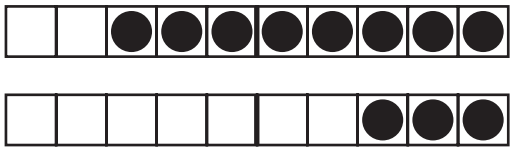
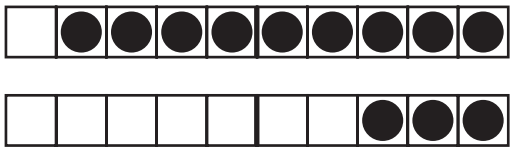


Ten-Strip Fact Card

Ten-Strip Fact Card



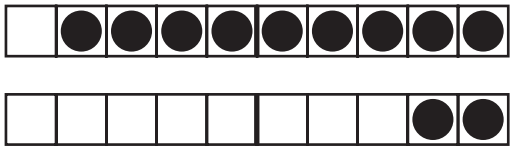
Ten-Strip Fact Card

Ten-Strip Fact Card

Home Connection A Activity (cont.)

Ten-Strip Fact Cards page 2 of 4

Cut out cards along solid lines.



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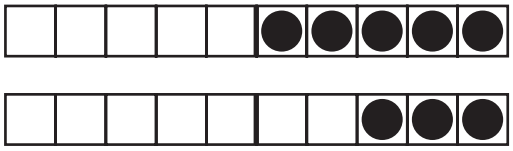

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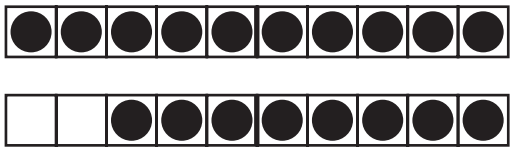

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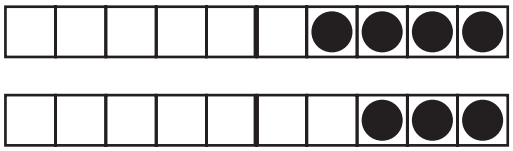

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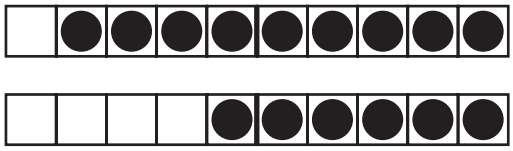

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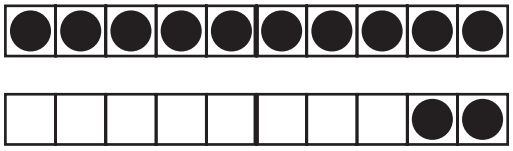

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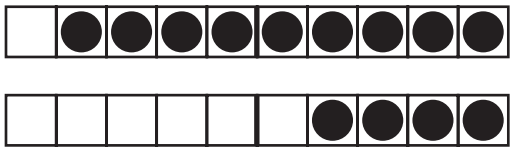
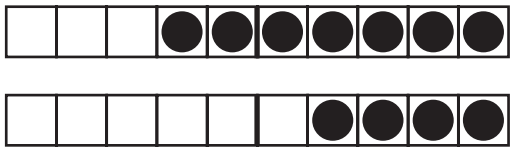


Ten-Strip Fact Card

Home Connection A Activity (cont.)

Ten-Strip Fact Cards page 3 of 4

Cut out cards along solid lines.



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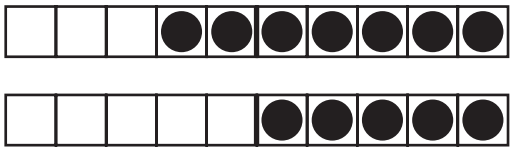

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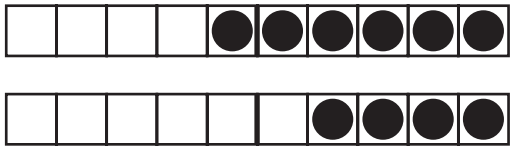

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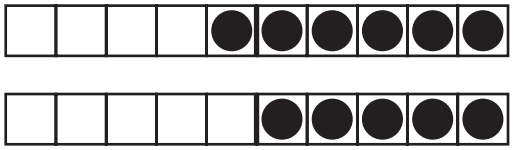

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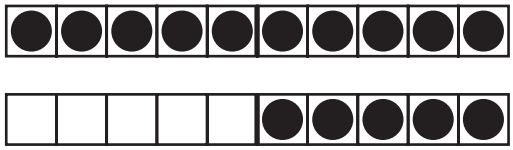

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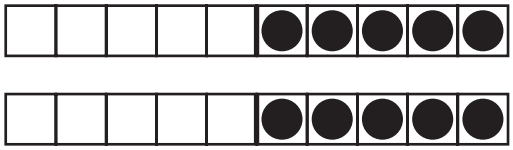

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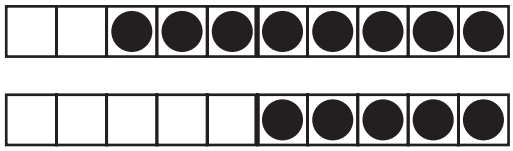

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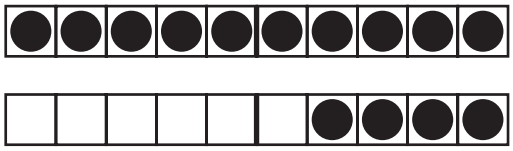
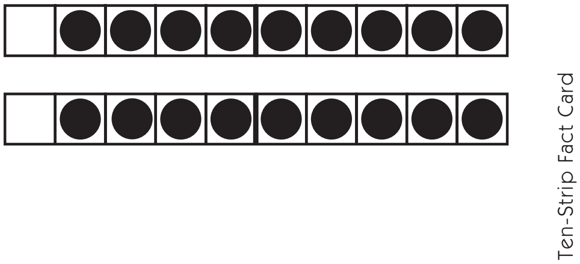


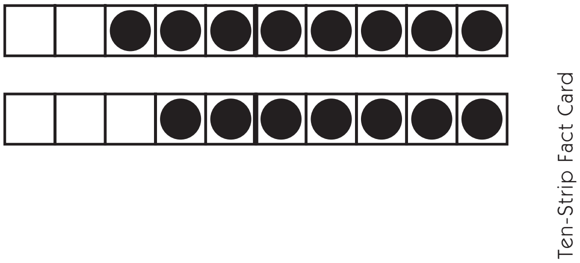
Ten-Strip Fact Card

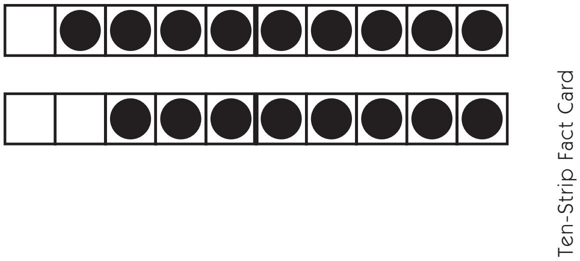
Home Connection A Activity (cont.)

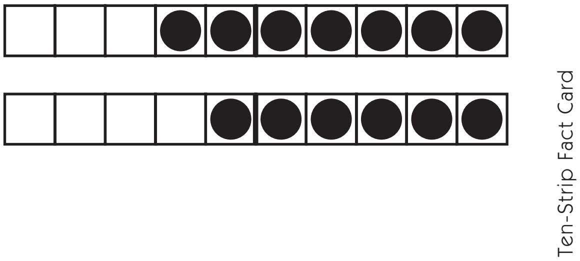
Ten-Strip Fact Cards page 4 of 4

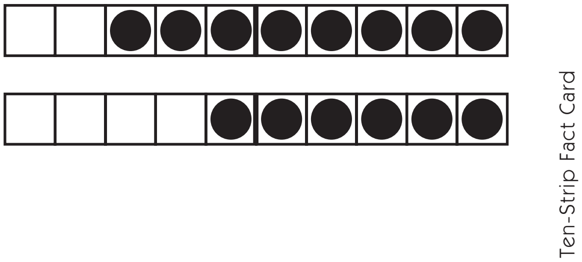
Cut out cards along solid lines.

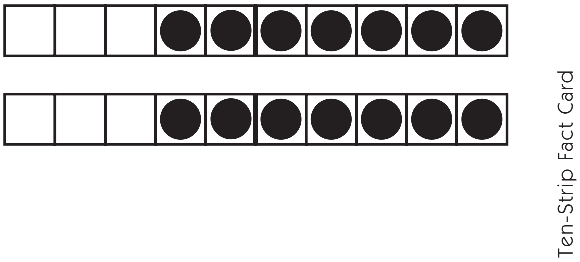


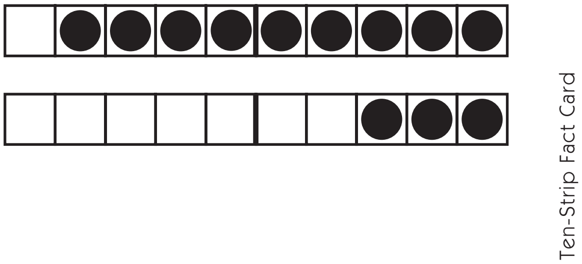


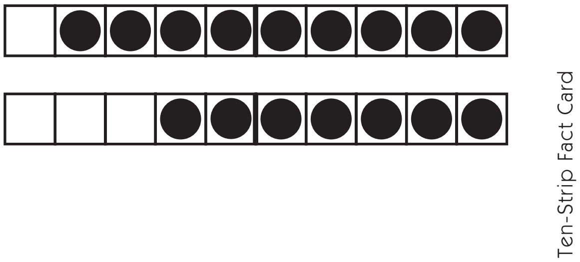












NAME _____ DATE _____

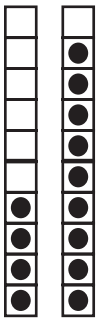
Home Connection A ★ Worksheet

NOTE TO FAMILIES

This worksheet is designed to give your child the chance to explore the relationship between addition and subtraction using a visual model and number sentences.

Addition & Subtraction Fact Families

Write all the number sentences for the fact family shown in each pair of ten-strips. Remember that there will be just 2 facts for fact families with doubles.



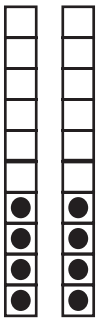
example

4 + 9 = 13

9 + 4 = 13

13 − 9 = 4

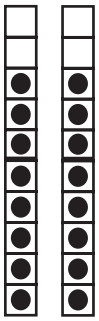
13 − 4 = 9



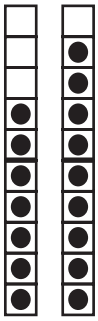
example

4 + 4 = 8

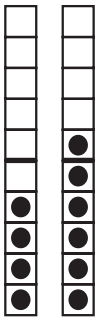
8 − 4 = 4



a



b



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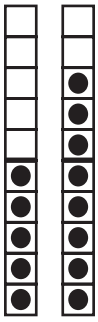


d

CHALLENGE

Write a story problem on the back of this page using one of these facts. Bring it to school to share.

NAME _____ DATE _____

Home Connection B ★ Worksheet

NOTE TO FAMILIES

Knowing the basic subtraction facts can make it easier for students to solve similar problems with larger numbers. For example, run away ones (e.g., 18 – 8 = 10) can be applied to compute 78 – 8 = 70. Take away tens (e.g., 18 – 10 = 8) can be applied to compute 78 – 10 = 68. Encourage your child to use run away ones and take away tens to solve the problems below.

Subtraction Facts

1 Run Away Ones

37	42	65	91	87	53	29
– 7	– 2	– 5	– 1	– 7	– 3	– 9
___	___	___	___	___	___	___

109	132	154	186	193	118	165
– 9	– 2	– 4	– 6	– 3	– 8	– 5
___	___	___	___	___	___	___

2 Take Away Tens

28	49	61	77	85	33	52
– 10	– 10	– 10	– 10	– 10	– 10	– 10
___	___	___	___	___	___	___

118	147	184	136	185	171	153
– 10	– 10	– 10	– 10	– 10	– 10	–10
___	___	___	___	___	___	___

CHALLENGE

3 On another sheet of paper, write at least ten more examples of how you can use take away tens and run away ones with larger numbers.

Home Connection C ★ Activity

NOTE TO FAMILIES

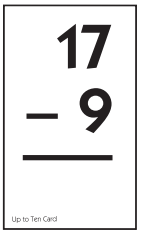
This Home Connection is a game called Up to Ten that provides practice with a collection of subtraction facts we call the up to ten facts.

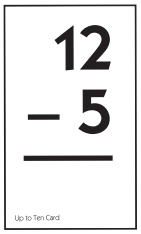
Before you begin, you'll need 20 each of two kinds of small items (e.g., beans, buttons, pieces of cereal). Throughout the game, ask your child to build the smaller number in one item on the ten-strips and then use the other item to build up to ten first and then up to the larger number to find the difference. We've shown some examples in the instructions below.

Instructions for Up to Ten

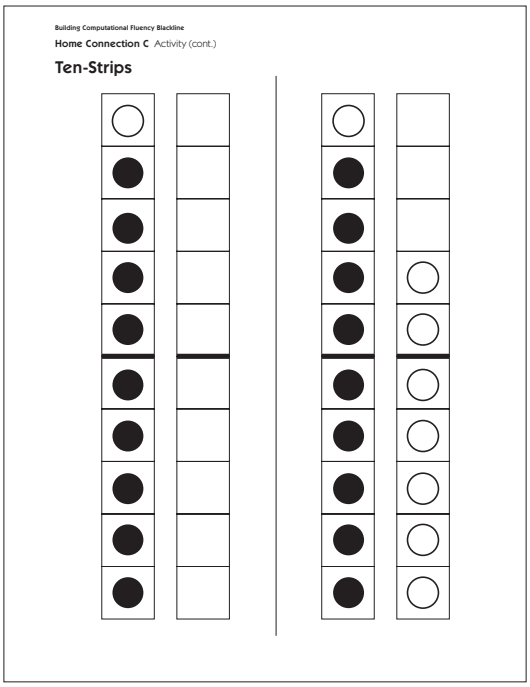
1 To play, you'll need the Up to Ten Game Board, Up to Ten Cards, paperclip, pencil or pen, 2 different kinds of small objects, and ten-strips. Shuffle the cards and place them face down between you and your partner.

2 Draw 1 card from the top of the pile and have your partner do the same.





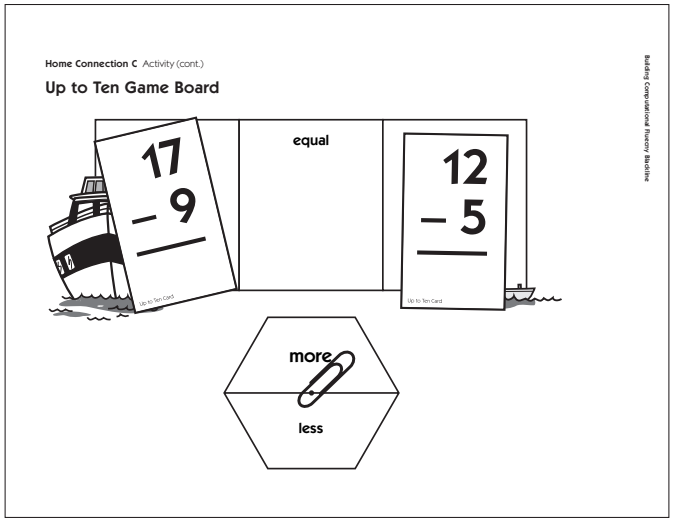
3 Find the difference for both cards using the up to ten strategy. You can confirm your answer using another strategy if you like. You can build the facts on your ten-strips with 2 different kinds of markers to show how you can find the difference.



9 + 1 = 10 → 10 + 7 = 17
1 + 7 = 8 so 17 – 9 = 8

4 Place your cards where they belong on the game board—one card in the more box and one card in the less box. Remember you are comparing the answers, the differences for each

fact. If the differences on the two cards are equal, place them in the equal box. Then draw one more card each. Determine which is more and which is less, and place them in the correct boxes.



5 Spin the more or less spinner on the game board to decide who will get both cards. (If you have cards in the equal box, the winner will get all four cards.) If the spinner lands on more, the person who had the card with the greatest difference gets to take both cards. If it lands on less, the person who drew the card with the smaller difference gets both cards.

6 Take turns drawing cards, computing the differences, and then comparing the results.

7 When you are out of cards, count your cards. The player with the most cards will put her stack in the more box and the player with the fewest will put his stack in the less box. Spin the spinner once again to decide who wins the game.

Home Connection C Activity (cont.)

Up to Ten Cards page 1 of 3

Cut out cards along solid lines.

12 − 5 = Up to Ten Card	14 − 6 = Up to Ten Card
12 − 4 = Up to Ten Card	14 − 9 = Up to Ten Card
11 − 8 = Up to Ten Card	13 − 4 = Up to Ten Card
11 − 7 = Up to Ten Card	13 − 8 = Up to Ten Card

Up to Ten Cards page 2 of 3

Cut out cards along solid lines.

16 − 7 = ___ Up to Ten Card	12 − 7 = ___ Up to Ten Card
15 − 8 = ___ Up to Ten Card	17 − 9 = ___ Up to Ten Card
15 − 6 = ___ Up to Ten Card	17 − 8 = ___ Up to Ten Card
14 − 8 = ___ Up to Ten Card	16 − 9 = ___ Up to Ten Card

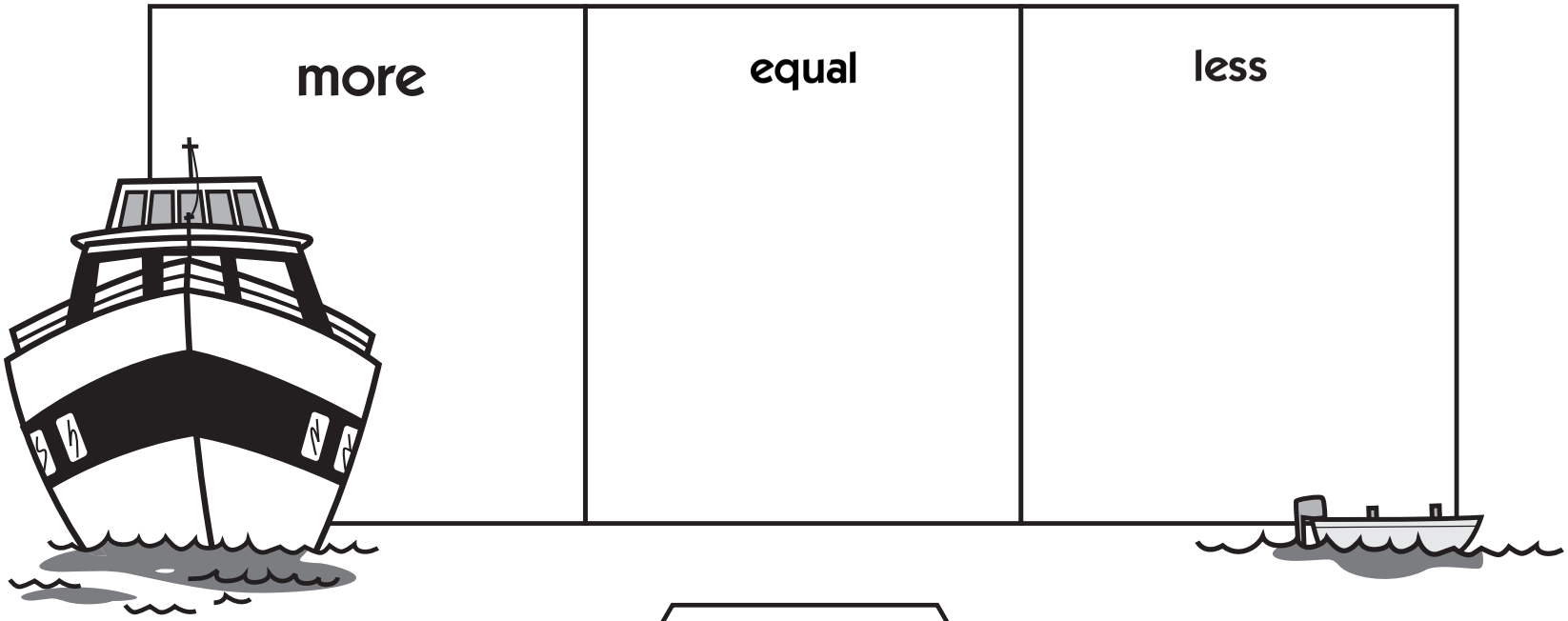
Up to Ten Cards page 3 of 3

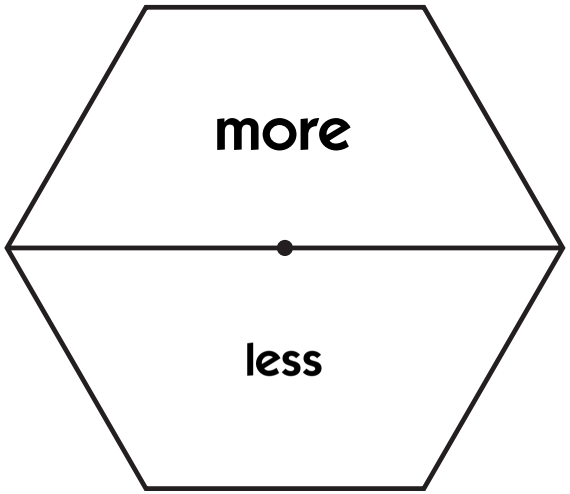
Cut out cards along solid lines.

11 – 5 Up to Ten Card	
15 – 9 Up to Ten Card	
14 – 5 Up to Ten Card	
13 – 6 Up to Ten Card	

Home Connection C Activity (cont.)

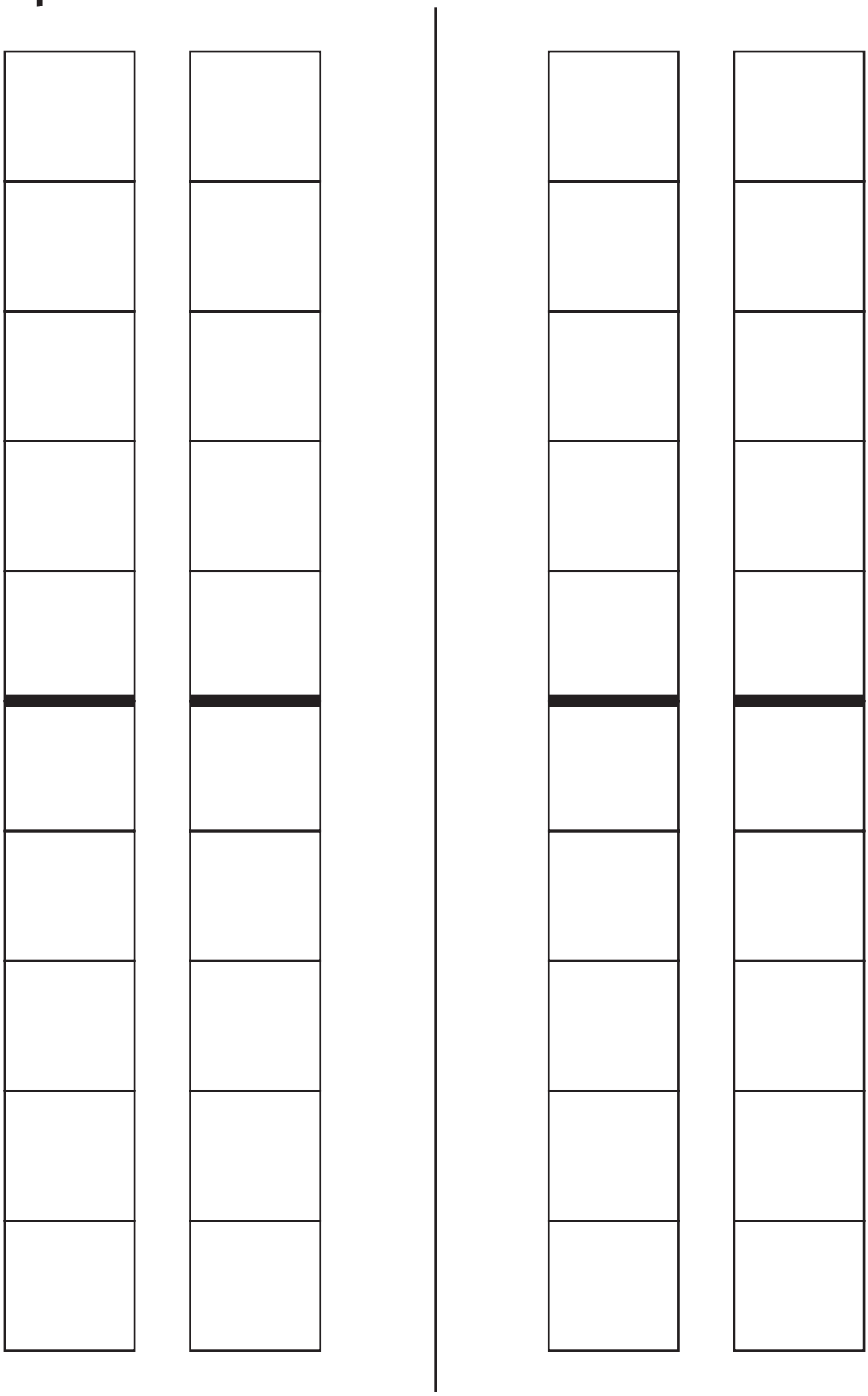
Up to Ten Game Board





Home Connection C Activity (cont.)

Ten-Strips



NAME _____ DATE _____

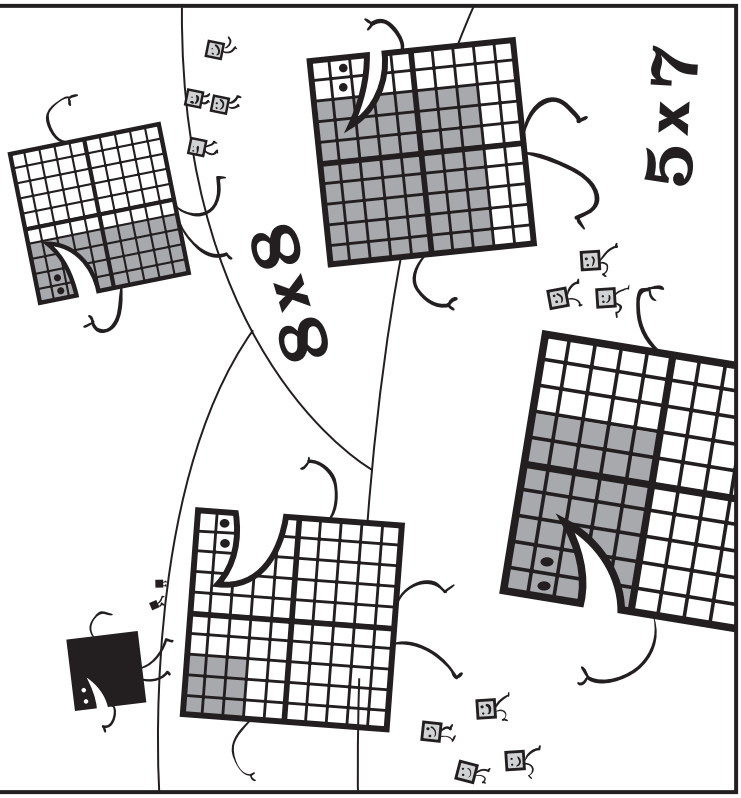
Home Connection C ★ Worksheet

Up to Ten

Solve the following subtraction facts using the *up to ten* strategy or another strategy that works for you.

13 − 8 = ___	15 − 9 = ___	11 − 5 = ___	16 − 9 = ___	17 − 8 = ___	12 − 4 = ___
16 − 7 = ___	11 − 8 = ___	15 − 6 = ___	14 − 9 = ___	14 − 8 = ___	17 − 9 = ___
13 − 4 = ___	14 − 6 = ___	12 − 7 = ___	11 − 7 = ___	14 − 5 = ___	12 − 5 = ___
15 − 8 = ___	13 − 6 = ___				

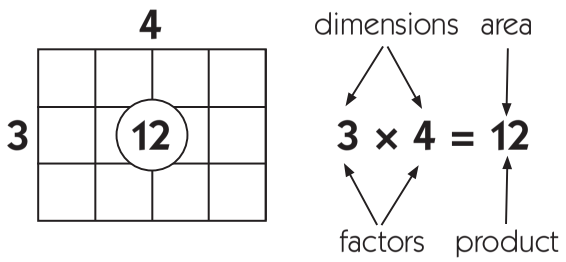
Solving Multiplication Facts



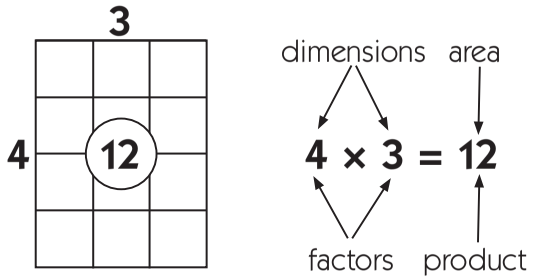
NAME _____

The Area Model of Multiplication

In third grade, we have been using the area model to think about multiplication. In the area model, the height and length (the *dimensions*) of a rectangle (also called an *array*) represent the *factors*, the two numbers being multiplied together. The *product*, which is the number you get when you multiply the two factors, is represented by the total *area* of the array.

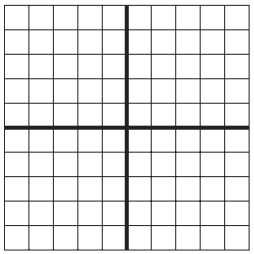


You'll notice that the orientation of the rectangle or array and the order of the factors do not change the product.

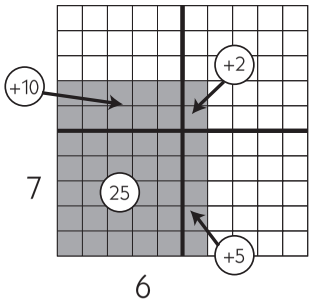


Using a Grid to Show Area

We use the following 10-by-10 grid to show the area models for different multiplication facts. The heavy lines break the grid into quadrants and make it easier to determine the dimensions and area of each array. What do you notice about this grid? Do you see groups of 5, 10, 25, and 50?



We can quickly see that the array below is 7 units tall and 6 units wide. We can also see that the area of this 7-by-6 array is 42, because 1 full quadrant is 25, then add 15 more, and then add the 2 in the top corner.

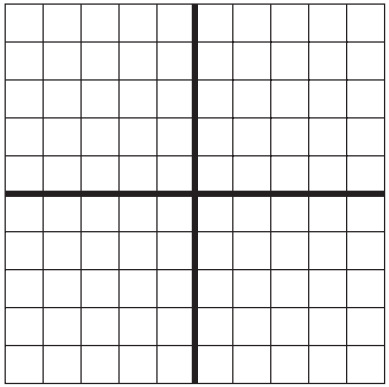


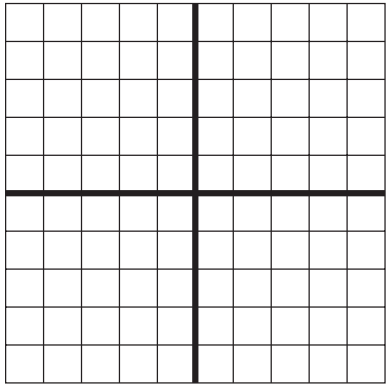
$7 \times 6 = 42$

$25 + (10 + 5) + 2 = 42$

Your Decade Minus 1 Set Facts

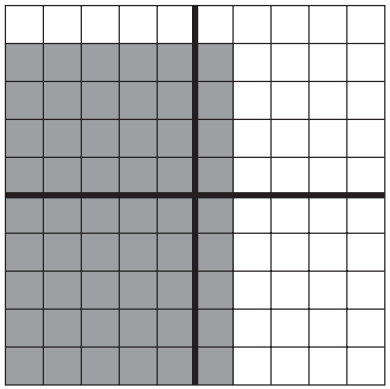
What are some other decade minus 1 set facts you know? Can you draw them or show them using number sentences? Can you write a story problem about a decade minus 1 set fact?



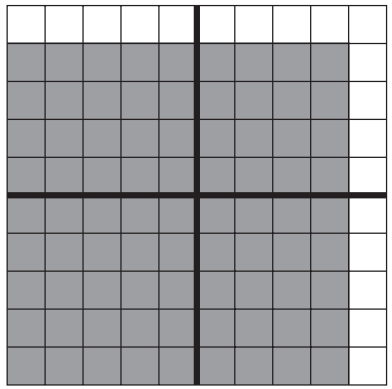


Decade Minus 1 Set Facts

When one of the factors is 9, you can multiply by 10 and then subtract 1 set. For 9 × 6 think 10 × 6 = 60 and then subtract 6 from 60 to get 54.



9 × 6
10 × 6 = 60
60 – 6 = 54



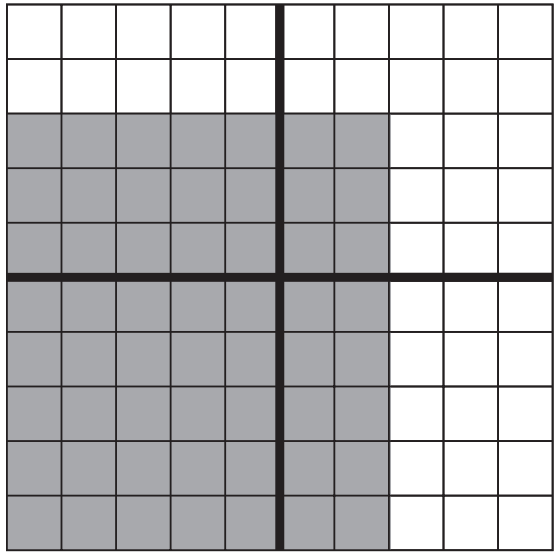
9 × 9
9 × 10 = 90
90 – 9 = 81

Decade Minus 1 Set Story Problems

1 There were 7 teams in the league. Each team had 9 players. How many players were in the league?

2 There are 9 tables in the classroom. 4 students sit at each table. How many students are in the class?

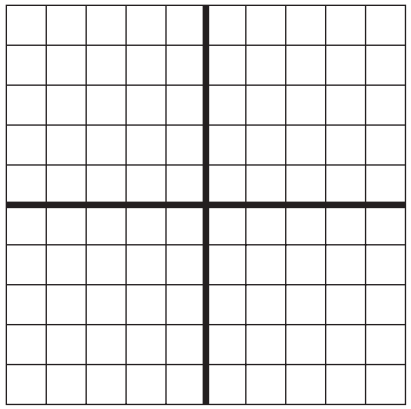
What are the dimensions and area of the array shown below? Talk to each other about how you know.



Building Computational Fluency Blackline Run pages 129–142 back to back, fold all together to make booklet.

Zero Facts

Zero times any number is zero.



$0 \times 8 = 0$

This works with larger numbers like $345 \times 0 = 0$ and $0 \times 237 = 0$.

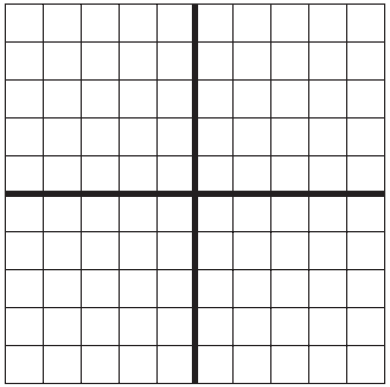
Zero Facts Story Problems

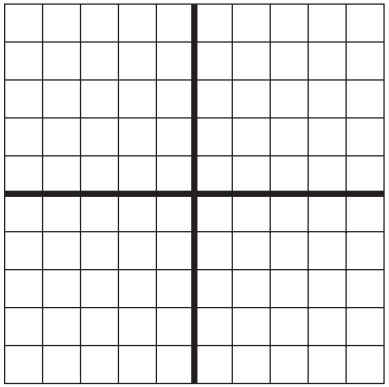
1 If I had 5 bags with no candy in any of the bags, how many pieces of candy did I have?

2 If you had no horses to shoe, how many horseshoes would you need?

Your Double-Double-Doubles Facts

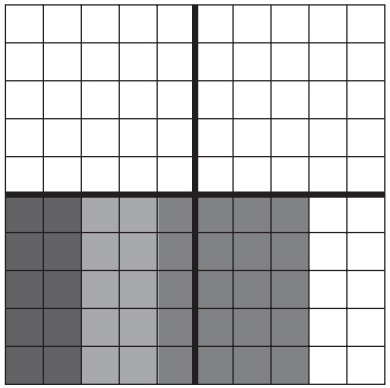
What are some other double-double-doubles facts you know? Can you draw them or show them using number sentences? Can you write a story problem about a double-double-doubles fact?



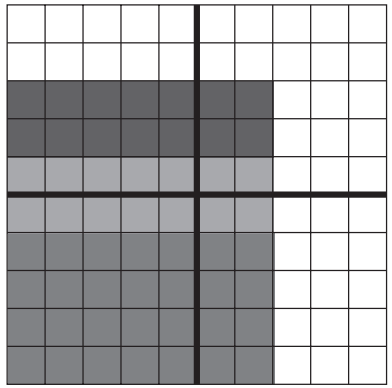


Double-Double-Doubles Facts

When one of the factors is 8, double the other factor, double the result, and then double again. When you look at the arrays below, can you see why this works? Where do you see the doubling three times?



5×8
$5 \times 2 = 10$
$10 \times 2 = 20$
$20 \times 2 = 40$



8×7
$2 \times 7 = 14$
$2 \times 14 = 28$
$2 \times 28 = 56$

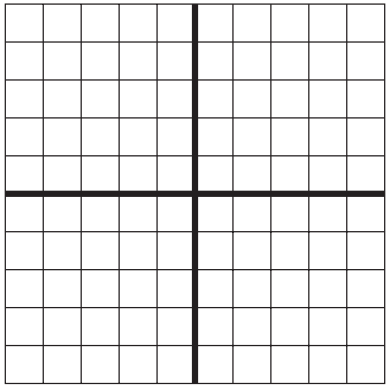
Double-Double Doubles Story Problems

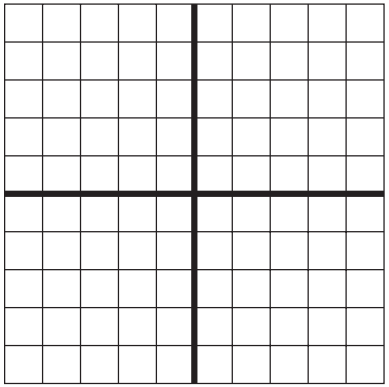
1 6 children were on each relay team. There were 8 teams. How many children altogether?

2 8 beetles were crawling up the stalk. How many legs were crawling altogether?

Your Zero Facts

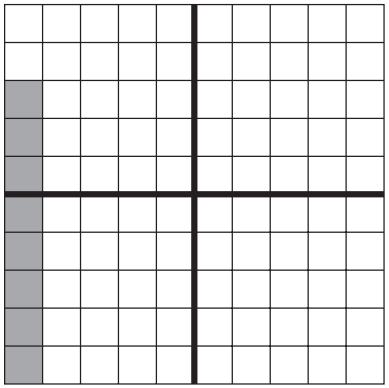
What are some other zero facts you know? Can you draw them or show them using number sentences? Can you write a story problem about a zero fact?



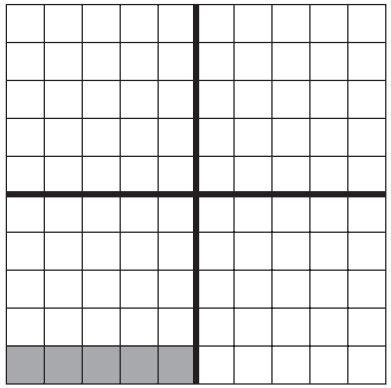


Ones Facts

When one of the factors is 1, the product is always equal to the other factor.



$8 \times 1 = 8$



$1 \times 5 = 5$

No matter how big the number, if you multiply it by 1, you'll get the same number.

$498 \times 1 = 498$ $\quad$ $1 \times 763 = 763$

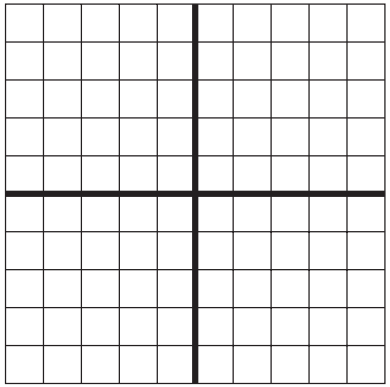
Ones Facts Story Problems

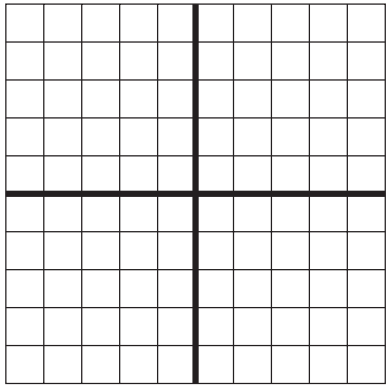
1 If I had 1 package of party invitations with 8 cards, how many invitations would I have in all?

2 If you had 1 set of 427 baseball cards, how many cards would you have altogether?

Your Clock Plus 1 Set Facts

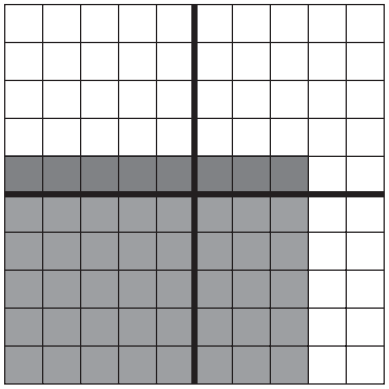
What are some other clock plus 1 set facts you know? Can you draw them or show them using number sentences? Can you write a story problem about a clock plus 1 set fact?



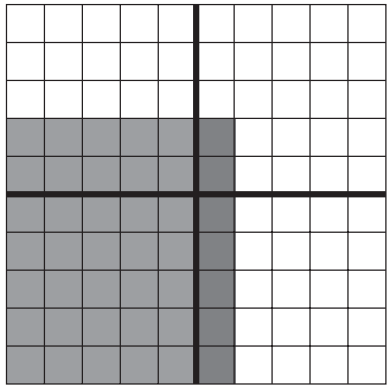


Clock Plus 1 Set Facts

When one of the factors is 6, recall a clock fact and then add 1 more set of the number being multiplied by 6. To solve 6 × 8, first think 5 × 8 and then add 1 more set of 8. Can you see why this works when you look at the arrays below?



6×8
$(5 \times 8) + 8$
$40 + 8 = 48$



7×6
$(7 \times 5) + 7$
$35 + 7 = 42$

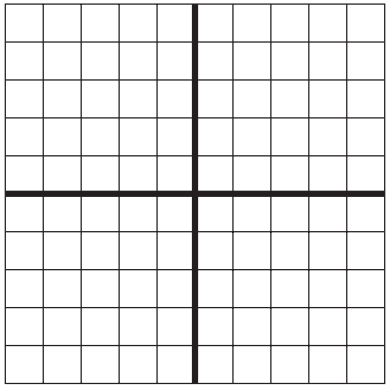
Clock Plus 1 Set Facts Story Problems

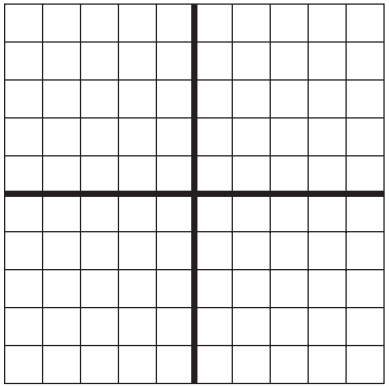
1 Six children were on each relay team. There were 7 teams. How many children were running the relay altogether?

2 Eight ants were marching down the sidewalk. How many legs were marching altogether?

Your Ones Facts

What are some other ones facts you know? Can you draw them or show them using number sentences? Can you write a story problem about a ones fact?

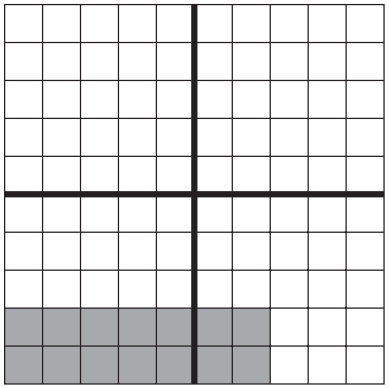




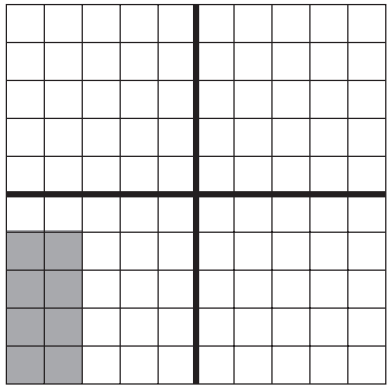
Building Computational Fluency Blackline Run pages 129–142 back to back, fold all together to make booklet.

Doubles

When one of the factors is 2, just think of the addition doubles like 7 + 7. Doubles products are always even numbers. When you look at the arrays, can you see why?



$2 \times 7 = 14$
$7 + 7 = 14$



$4 \times 2 = 8$
$4 + 4 = 8$

Doubles work with larger numbers like these:

$40 \times 2 = 80$ $\quad$ $2 \times 60 = 120$

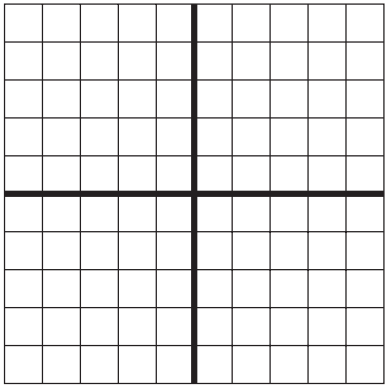
Doubles Story Problems

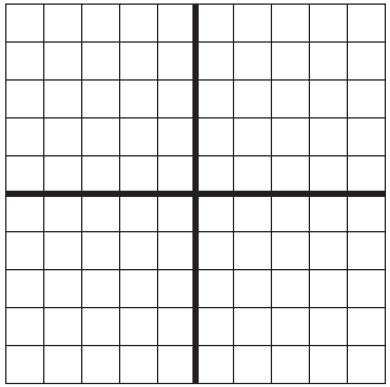
1 There were 9 players on each team. How many players were on both teams altogether?

2 If everyone in the class lined up in 2 lines and there were 10 students in each line, how many students were in the class altogether?

Your Double-Doubles Facts

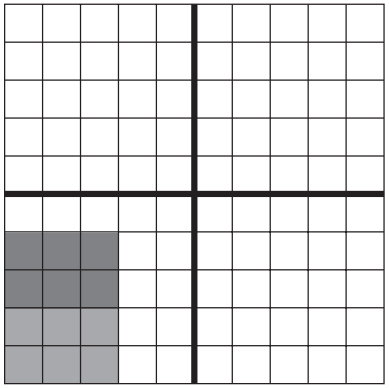
What are some other double-doubles facts you know? Can you draw them or show them using number sentences? Can you write a story problem about a double-doubles fact?



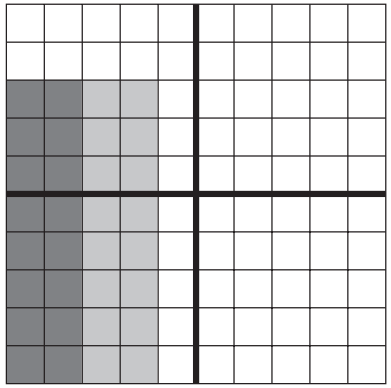


Double-Doubles Facts

When one of the factors is 4, you can double the other factor and then double again. Can you see why this works when you look at the arrays below?



$4 \times 3 = 12$
$2 \times 3 = 6$
$2 \times 6 = 12$



$8 \times 4 = 32$
$8 \times 2 = 16$
$16 \times 2 = 32$

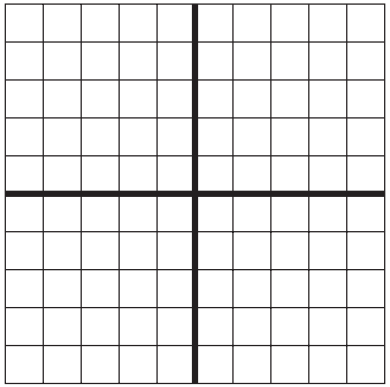
Double-Doubles Story Problems

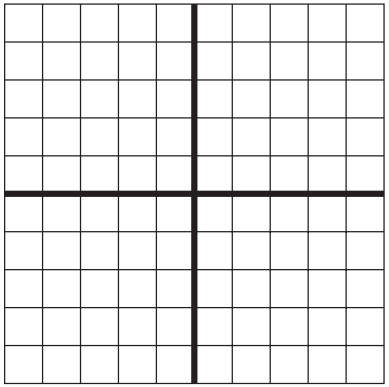
1 There are 4 candies in each package. I have 6 packages. How many candies do I have?

2 There were 7 ladybugs with 4 spots each. How many spots were on the ladybugs altogether?

Your Doubles Facts

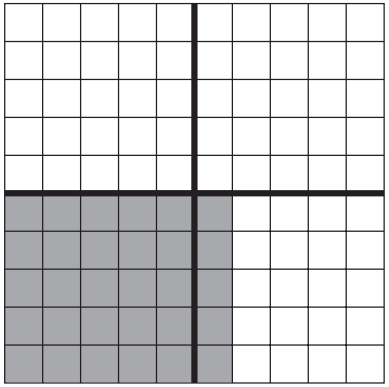
What are some other doubles facts you know? Can you draw them or show them using number sentences? Can you write a story problem about a doubles fact?



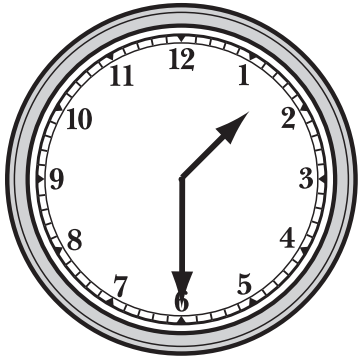


Clock Facts

When one of the factors is 5, you can think about the minutes on a clock face. If you can't remember a product, you can count by fives.



5 × 6 = 30



When the minute hand is on the 6, it is 30 minutes past the hour.

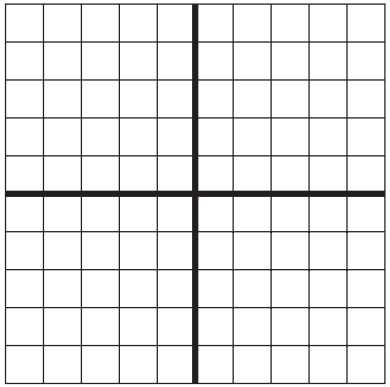
Clock Facts Story Problems

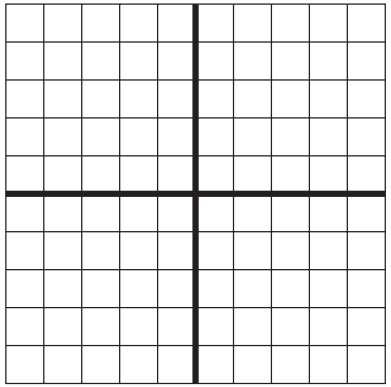
1 Joe had 7 nickels in his pocket. How much money did he have?

2 If Suzie bought 9 baskets with 5 peaches in each basket, how many peaches did she buy?

Your Doubles Plus 1 Set Facts

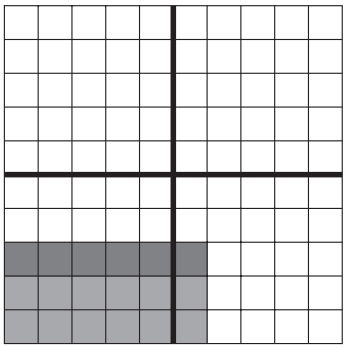
What are some other doubles plus 1 set facts you know? Can you draw them or show them using number sentences? Can you write a story problem about a doubles plus 1 set fact?



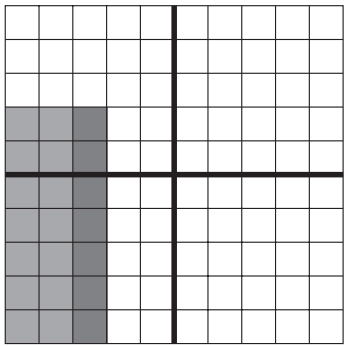


Doubles Plus 1 Set

When one of the factors is 3, you can think about the doubles fact, and then add 1 more set of the number being doubled. For example, 6 × 3 is 6 doubled (12) plus another set of 6.



$3 \times 6 = 18$
$(2 \times 6) + 6$
$12 + 6 = 18$



$7 \times 3 = 21$
$(7 \times 2) + 7$
$14 + 7 = 21$

You can use this strategy with larger numbers too.

$3 \times 25 = 75$ $\qquad$ $150 \times 3 = 450$

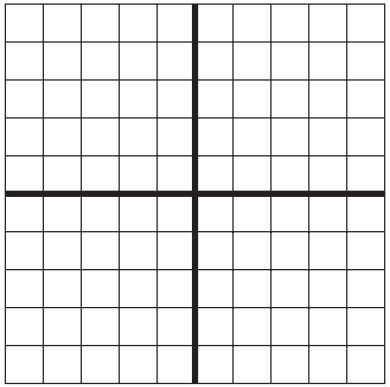
Doubles Plus 1 Set Story Problems

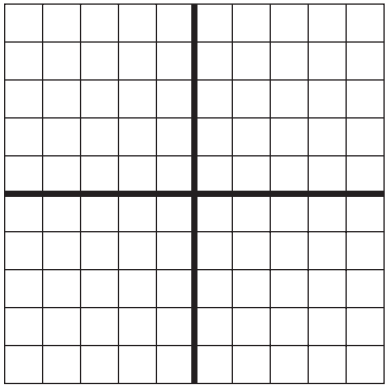
1 If you had 2 boxes of 8 crayons, and your teacher gave you another box of 8 crayons, how many crayons would you have?

2 You bought 2 bags of 5 apples. You already had 1 bag of 5 apples at home. How many apples do you have altogether?

Your Clock Facts

What are some other clock facts you know? Can you draw them or show them using number sentences? Can you write a story problem about a clock fact?

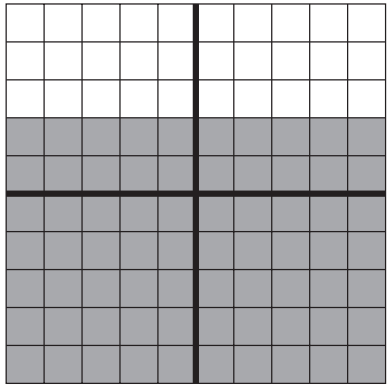




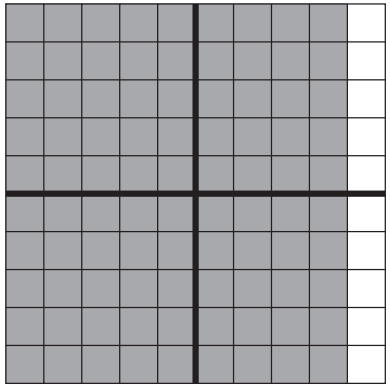
Building Computational Fluency Blackline Run pages 129–142 back to back, fold all together to make booklet.

Decade Facts

Multiplying is easy when one of the factors is 10! We call these decade facts, because a decade is a group of 10. Where do you see the groups of 10 in the arrays below?



$7 \times 10 = 70$



$10 \times 9 = 90$

When you understand place value, multiplying larger numbers by 10 can be easy too.

$10 \times 25 = 250$ $670 \times 10 = 6700$

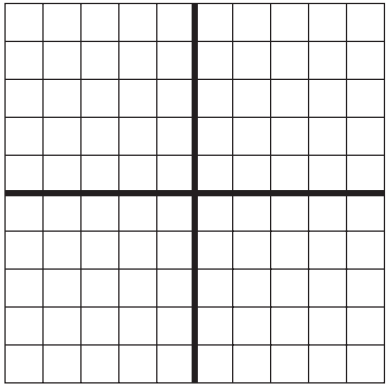
Decade Facts Story Problems

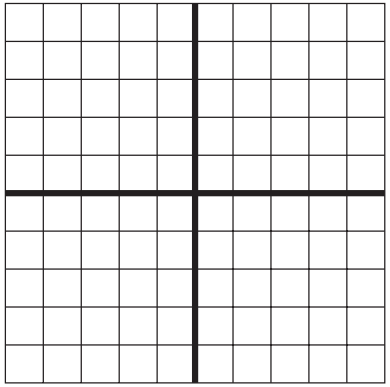
1 Max had 6 dimes in his pocket. How much money did he have?

2 If Jan bought 10 baskets with 5 apples in each basket, how many apples did she buy?

Your Decade Facts

What are some other decade facts you know? Can you draw them or show them using number sentences? Can you write a story problem about a decade fact?





Home Connection D ★ Activity

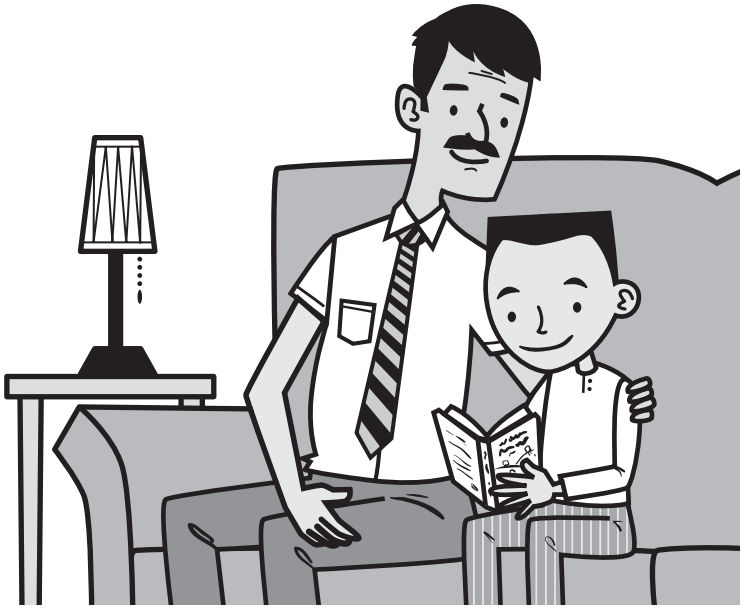
NOTE TO FAMILIES

For the past few weeks, we've been working on our basic multiplication facts at school. Instead of just memorizing the facts, we have been making sense of them by thinking about situations when we use multiplication in daily life. We have also been exploring strategies for remembering how to solve multiplication facts. In the booklet *Solving Multiplication Facts*, you'll see story problems and strategies that can help your child make sense of and master the basic multiplication facts. As always, these strategies are shown in picture form too, using the rectangular array model that is explained at the beginning of the book.

Instructions for *Solving Multiplication Facts* Booklet

Please read the booklet *Solving Multiplication Facts* with your child. If your child is not able to read it, you can certainly read it aloud to him or her. The booklet invites you and your child to think of multiplication facts and sketch illustrations or write problems about them. These activities are meant to get you and your child involved and talking with each other about math. We encourage you to do them with your child and keep the booklet at home for future reference. Please sign and return this sheet when you have finished reading the booklet.

Signature_____ Date_____



NAME _____ DATE _____

Home Connection E ★ Worksheet

NOTE TO FAMILIES

This worksheet is intended to give your child some practice multiplying by 2, 3, 4, and 8. You can refer to your *Solving Multiplication Facts* booklet for reminders about different strategies for solving multiplication facts.

Multiplying by 2, 3, 4 & 8

1 Circle all the doubles (×2) in blue. Then go back and do them.

2 Circle all the doubles plus 1 set facts (×3) in red. Then go back and do them.

4 × 2 = ____	3 × 3 = ____	2 × 3 = ____	6 × 2 = ____	2 × 9 = ____
5 × 2 = ____	3 × 10 = ____	8 × 3 = ____	0 × 2 = ____	1 × 3 = ____
5 × 3 = ____	2 × 1 = ____	8 × 2 = ____	3 × 9 = ____	2 × 2 = ____
6 × 3 = ____	10 × 2 = ____	3 × 7 = ____	4 × 3 = ____	7 × 2 = ____

3 Solve the following division problems if you like. Can you use what you know about multiplication to help?

9 ÷ 3 =	16 ÷ 8 =	21 ÷ 7 =	14 ÷ 7 =	10 ÷ 5 =
12 ÷ 4 =	20 ÷ 10 =	15 ÷ 5 =	24 ÷ 8 =	6 ÷ 3 =

Continued on back.

Home Connection E Worksheet (cont.)

4 Circle all the double-doubles (×4) in blue. Then go back and do them.

5 Circle all the double-double-doubles (×8) in red. Then go back and do them.

8 × 3 = ____	4 × 9 = ____	10 × 4 = ____	5 × 8 = ____	2 × 4 = ____
0 × 4 = ____	8 × 1 = ____	7 × 8 = ____	3 × 4 = ____	10 × 8 = ____
4 × 5 = ____	6 × 4 = ____	8 × 8 = ____	7 × 4 = ____	6 × 8 = ____
9 × 8 = ____	8 × 4 = ____	4 × 4 = ____	8 × 3 = ____	2 × 8 = ____

6 Solve the following division problems if you like. Can you use what you know about multiplication to help?

24 ÷ 3 =	16 ÷ 4 =	32 ÷ 4 =	56 ÷ 7 =	24 ÷ 6 =
48 ÷ 6 =	40 ÷ 10 =	28 ÷ 7 =	16 ÷ 2 =	40 ÷ 5 =

NAME _____ DATE _____

FACT FLUENCY

Scout Them Out 2 & 5, Multiplication

1 Circle all the doubles (×2) in blue. Then go back and do them.

2 Circle all the clock facts (×5) in red. Then go back and do them.

2 × 10	5 × 2	2 × 3	5 × 7	3 × 5	5 × 0
9 × 5	8 × 2	1 × 2	8 × 5	5 × 10	2 × 7
5 × 4	4 × 2	6 × 5	2 × 6	2 × 4	9 × 2

Scout Them Out 2 & 5, Division

3 Solve the following division problems if you like. Can you use what you know about multiplication to help?

18 ÷ 2 = _____	10 ÷ 2 = _____	6 ÷ 2 = _____	30 ÷ 5 = _____
14 ÷ 2 = _____	15 ÷ 5 = _____	20 ÷ 5 = _____	16 ÷ 2 = _____
2 ÷ 2 = _____	40 ÷ 5 = _____	50 ÷ 5 = _____	8 ÷ 2 = _____

NAME _____ DATE _____

FACT FLUENCY

Scout Them Out 5 & 10, Multiplication

1 Circle all the clock facts (×5) in blue. Then go back and do them.

2 Circle all the decade facts (×10) in red. Then go back and do them.

9 × 10 = ____	7 × 5 = ____	10 × 4 = ____	9 × 5 = ____	5 × 5 = ____	6 × 10 = ____
8 × 5 = ____	5 × 3 = ____	10 × 10 = ____	10 × 8 = ____	4 × 5 = ____	6 × 10 = ____
3 × 10 = ____	5 × 7 = ____	4 × 10 = ____	5 × 10 = ____	8 × 10 = ____	7 × 10 = ____

Scout Them Out 5 & 10, Division

3 Solve the following division problems if you like. Can you use what you know about multiplication to help?

80 ÷ 10 = ____	40 ÷ 10 = ____	70 ÷ 10 = ____	30 ÷ 5 = ____
45 ÷ 5 = ____	100 ÷ 10 = ____	40 ÷ 5 = ____	30 ÷ 10 = ____
25 ÷ 5 = ____	80 ÷ 10 = ____	10 ÷ 5 = ____	60 ÷ 10 = ____

NAME _____ DATE _____

FACT FLUENCY

Scout Them Out 2 & 4, Multiplication

1 Circle all the doubles (×2) in blue. Then go back and do them.

2 Circle all the double-doubles (×4) in red. Then go back and do them.

2 × 6	10 × 4	2 × 3	8 × 4	2 × 8	4 × 7
6 × 4	4 × 3	2 × 7	4 × 4	2 × 0	9 × 4
2 × 9	5 × 2	10 × 2	5 × 4	4 × 2	9 × 2

Scout Them Out 2 & 4, Division

3 Solve the following division problems if you like. Can you use what you know about multiplication to help?

8 ÷ 2 = ____	18 ÷ 2 = ____	20 ÷ 4 = ____	4 ÷ 4 = ____
40 ÷ 4 = ____	12 ÷ 2 = ____	16 ÷ 4 = ____	6 ÷ 2 = ____
32 ÷ 4 = ____	12 ÷ 4 = ____	20 ÷ 2 = ____	36 ÷ 4 = ____

NAME _____ DATE _____

FACT FLUENCY

Scout Them Out 4 & 8, Multiplication

1 Circle all the double-doubles (×4) in blue. Then go back and do them.

2 Circle all the double-double-doubles (×8) in red. Then go back and do them.

9 × 4	8 × 2	4 × 3	8 × 4	8 × 9	8 × 3
8 × 6	10 × 4	6 × 4	0 × 4	8 × 8	10 × 8
9 × 8	5 × 8	4 × 7	5 × 4	8 × 7	4 × 4

Scout Them Out 4 & 8, Division

3 Solve the following division problems if you like. Can you use what you know about multiplication to help?

56 ÷ 8 = _____	40 ÷ 4 = _____	8 ÷ 8 = _____	64 ÷ 8 = _____
36 ÷ 4 = _____	24 ÷ 4 = _____	24 ÷ 8 = _____	32 ÷ 4 = _____
16 ÷ 4 = _____	8 ÷ 4 = _____	16 ÷ 8 = _____	12 ÷ 4 = _____

NAME _____ DATE _____

FACT FLUENCY

Scout Them Out 5 & 6, Multiplication

1 Circle all the clock facts (×5) in blue. Then go back and do them.

2 Circle all the clock plus 1 set facts (×6) in red. Then go back and do them.

5 × 3 = ____	2 × 5 = ____	6 × 3 = ____	10 × 6 = ____	6 × 6 = ____	6 × 9 = ____
7 × 6 = ____	5 × 8 = ____	5 × 5 = ____	6 × 2 = ____	7 × 5 = ____	6 × 5 = ____
6 × 0 = ____	10 × 5 = ____	9 × 5 = ____	5 × 4 = ____	6 × 8 = ____	6 × 4 = ____

Scout Them Out 5 & 6, Division

3 Solve the following division problems if you like. Can you use what you know about multiplication to help?

45 ÷ 5 = ____	15 ÷ 5 = ____	18 ÷ 6 = ____	50 ÷ 5 = ____
10 ÷ 5 = ____	6 ÷ 6 = ____	25 ÷ 5 = ____	40 ÷ 5 = ____
42 ÷ 6 = ____	12 ÷ 6 = ____	24 ÷ 6 = ____	35 ÷ 5 = ____

NAME _____ DATE _____

FACT FLUENCY

Scout Them Out 2 & 3, Multiplication

1 Circle all the doubles (×2) in blue. Then go back and do them.

2 Circle all the doubles plus 1 set facts (×3) in red. Then go back and do them.

2 × 4 = ____	3 × 5 = ____	3 × 3 = ____	9 × 2 = ____	3 × 8 = ____	2 × 8 = ____
7 × 2 = ____	3 × 0 = ____	3 × 4 = ____	7 × 3 = ____	6 × 2 = ____	2 × 9 = ____
3 × 2 = ____	2 × 10 = ____	1 × 3 = ____	6 × 3 = ____	2 × 5 = ____	9 × 3 = ____

Scout Them Out 2 & 3, Division

3 Solve the following division problems if you like. Can you use what you know about multiplication to help?

9 ÷ 3 = ____	27 ÷ 3 = ____	6 ÷ 3 = ____	18 ÷ 3 = ____
12 ÷ 3 = ____	2 ÷ 2 = ____	20 ÷ 2 = ____	12 ÷ 2 = ____
21 ÷ 3 = ____	14 ÷ 2 = ____	18 ÷ 2 = ____	4 ÷ 2 = ____

NAME _____ DATE _____

FACT FLUENCY

Scout Them Out 10 & 9, Multiplication

1 Circle all the decade facts (×10) in blue. Then go back and do them.

2 Circle all the decade minus 1 set facts (×9) in red. Then go back and do them.

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

Scout Them Out 10 & 9, Division

3 Solve the following division problems if you like. Can you use what you know about multiplication to help?

100 ÷ 10 = _____	45 ÷ 9 = _____	63 ÷ 9 = _____	80 ÷ 10 = _____
9 ÷ 9 = _____	18 ÷ 9 = _____	72 ÷ 9 = _____	70 ÷ 10 = _____
50 ÷ 10 = _____	20 ÷ 10 = _____	27 ÷ 9 = _____	54 ÷ 9 = _____

NAME _____ DATE _____

FACT FLUENCY

Scout Them Out 8 & Square Number Facts, Multiplication

1 Circle all the double-double-doubles (×8) in blue. Then go back and do them.

2 Circle all the square facts (like 6×6) in red. Then go back and do them.

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

Scout Them Out 8 & Square Number Facts, Division

3 Solve the following division problems if you like. Can you use what you know about multiplication to help?

24 ÷ 8 = ____	48 ÷ 8 = ____	49 ÷ 7 = ____	40 ÷ 8 = ____
72 ÷ 8 = ____	9 ÷ 3 = ____	36 ÷ 6 = ____	100 ÷ 10 = ____
16 ÷ 4 = ____	56 ÷ 8 = ____	81 ÷ 9 = ____	16 ÷ 8 = ____

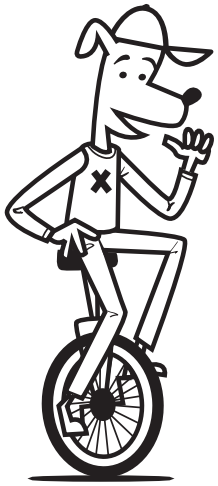
NAME _____ DATE _____

FACT FLUENCY

Practice 0's, 1's, 2's and 3's Multiplication

Zero Facts (×0), Ones Facts (×1), Doubles (×2), and Doubles Plus 1 Set (×3)

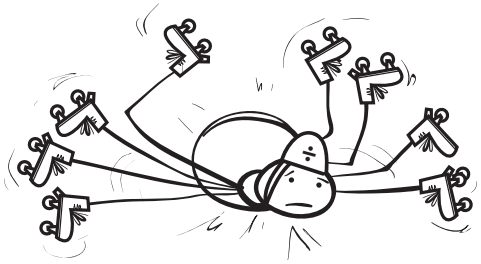
7 × 2	3 × 6	0 × 7	6 × 2	8 × 0
10 × 0	3 × 8	1 × 1	2 × 3	7 × 3
2 × 2	6 × 1	1 × 4	3 × 0	2 × 4
3 × 3	0 × 5	7 × 1	1 × 10	4 × 3



Practice 0's, 1's, 2's and 3's Division

Use what you know about multiplication to complete these division facts.

12 ÷ 3 =____ 12 ÷ 2 =____ 21 ÷ 3 =____ 8 ÷ 2 =____ 0 ÷ 3 =____



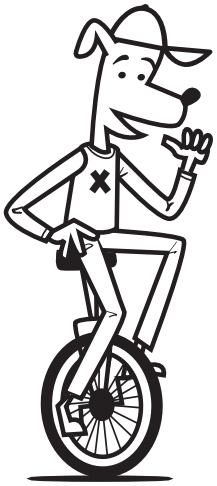
NAME _____ DATE _____

FACT FLUENCY

Practice 2's, 3's, 5's and 6's Multiplication

Doubles (×2), Doubles Plus 1 Set (×3), Clock Facts (×5), and Clock Facts Plus 1 Set (×6)

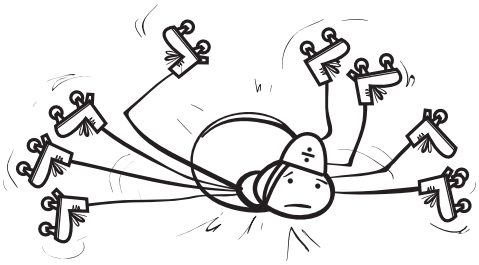
6 × 6	5 × 3	6 × 2	5 × 5	2 × 9
4 × 6	8 × 2	7 × 3	8 × 3	5 × 6
5 × 2	3 × 6	4 × 2	6 × 5	9 × 3
3 × 3	2 × 6	6 × 3	2 × 7	4 × 5



Practice 2's, 3's, 5's and 6's Division

Use what you know about multiplication to complete these division facts.

16 ÷ 2 =____ 15 ÷ 5 =____ 27 ÷ 3 =____ 48 ÷ 6 =____ 45 ÷ 5 =____



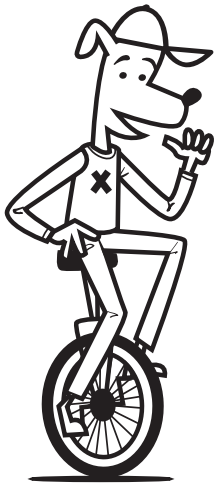
NAME _____ DATE _____

FACT FLUENCY

Practice 4's, 5's, 6's and 8's Multiplication

Clock Facts (×5), Clock Facts Plus 1 Set (×6), Double-Doubles (×4), and Double-Double-Doubles (×8)

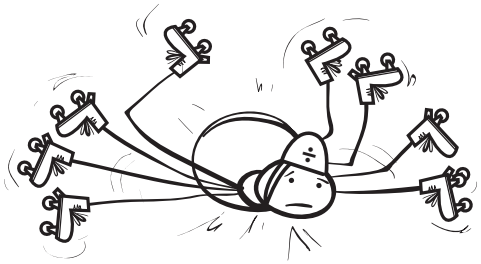
7 × 8	5 × 5	4 × 4	9 × 6	6 × 8
6 × 5	8 × 6	5 × 9	4 × 3	8 × 4
5 × 8	6 × 6	7 × 4	4 × 6	8 × 8
8 × 3	7 × 5	4 × 8	6 × 7	5 × 6



Practice 4's, 5's, 6's and 8's Division

Use what you know about multiplication to complete these division facts.

$5\overline{)30}$ $4\overline{)28}$ $8\overline{)56}$ $6\overline{)48}$ $8\overline{)40}$



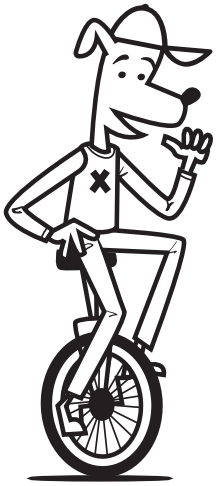
NAME _____ DATE _____

FACT FLUENCY

Practice 4's, 8's, 9's and 10's Multiplication

Double-Doubles (×4), Double-Double-Doubles (×8), Decade Minus 1 Set (×9), and Decade Facts (×10)

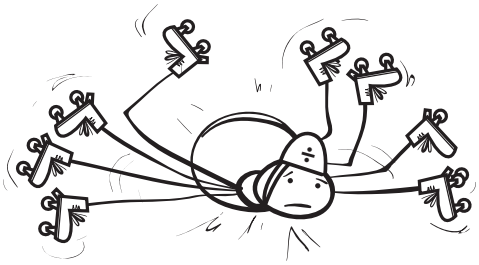
7 × 4	4 × 10	8 × 9	10 × 6	8 × 6
0 × 4	8 × 10	9 × 4	9 × 6	8 × 8
7 × 8	9 × 9	8 × 4	7 × 9	10 × 7
4 × 9	8 × 1	10 × 9	4 × 6	9 × 8



Practice 4's, 8's, 9's and 10's Division

Use what you know about multiplication to complete these division facts.

$10\overline{)70}$ $9\overline{)81}$ $8\overline{)48}$ $4\overline{)36}$ $9\overline{)54}$



Home Connection F ★ Activity

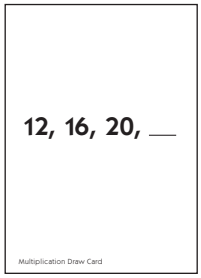
NOTE TO FAMILIES

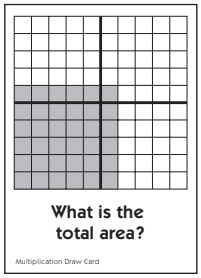
This card game gives students practice with their multiplication facts. The game uses a variety of models for multiplication including the array model, counting patterns, and equal groups. Remind your child to complete the worksheet and return it to school.

Instructions for Multiplication Draw

1 Shuffle the cards and place them face down between both players.

2 Each player draws a card and figures out the solution. The solution might be the solution to a multiplication fact, a missing number in a counting pattern, the total area of an array, or the total number of objects in equal groups.





3 Make sure both partners agree on the solutions.

4 The player whose solution is greater takes both cards.

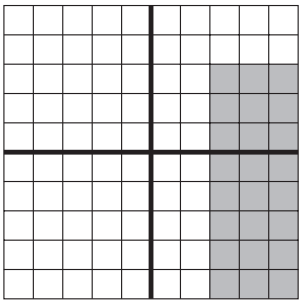
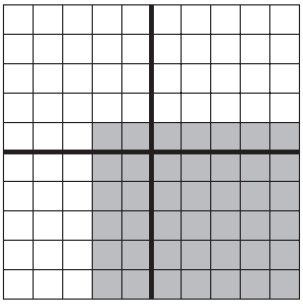
Midori *Mom, your solution is 24, because it's adding 4 each time. The area of my array is 36, so I win!*

5 Continue drawing cards until there are no cards left. Then determine how many cards each player has. Can you count the cards by 2's or 3's to make it faster? The player with the most cards wins!

Home Connection F Activity (cont.)

Multiplication Draw Cards page 1 of 3

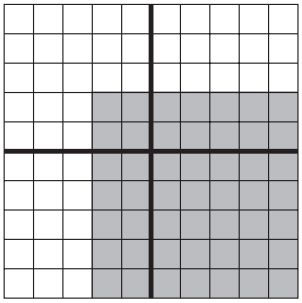
Cut out cards along solid lines.

9, 12, 15, ___, 21 Multiplication Draw Card	24, 32, ___, 48 Multiplication Draw Card
12, 16, 20, ___ Multiplication Draw Card	21, 28, ___, 42 Multiplication Draw Card
18, 24, ___, 36 Multiplication Draw Card	 What is the total area? Multiplication Draw Card
18, 27, ___, 45 Multiplication Draw Card	 What is the total area? Multiplication Draw Card

Home Connection F Activity (cont.)

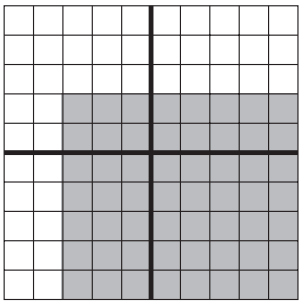
Multiplication Draw Cards page 2 of 3

Cut out cards along solid lines.



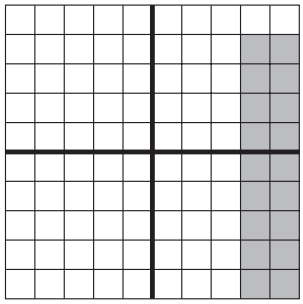
What is the total area?

Multiplication Draw Card



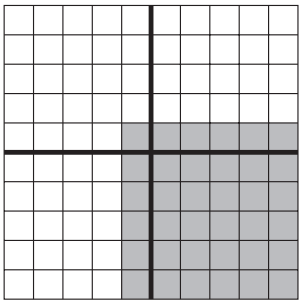
What is the total area?

Multiplication Draw Card



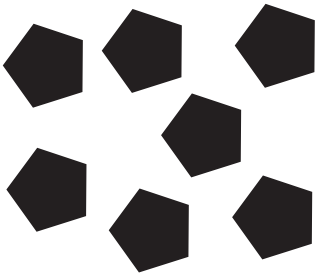
What is the total area?

Multiplication Draw Card



What is the total area?

Multiplication Draw Card



How many sides?

Multiplication Draw Card

insects	legs
1	6
2	12
3	___
4	24
5	30

Multiplication Draw Card

dogs	ears
1	2
2	4
3	6
4	8
5	___

Multiplication Draw Card

chairs	legs
1	4
2	8
3	___
4	16

Multiplication Draw Card

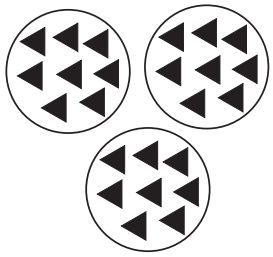
Home Connection F Activity (cont.)

Multiplication Draw Cards page 3 of 3

Cut out cards along solid lines.

How many legs?

Multiplication Draw Card

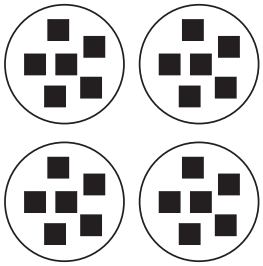


How many triangles?

Multiplication Draw Card

How many eyes?

Multiplication Draw Card

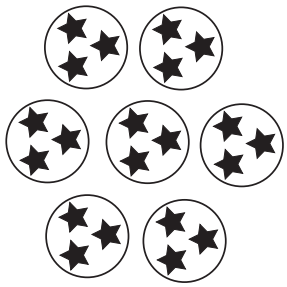


How many squares?

Multiplication Draw Card

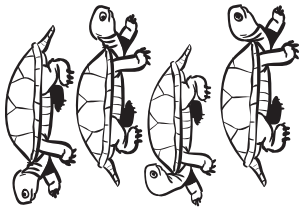
How many sides?

Multiplication Draw Card



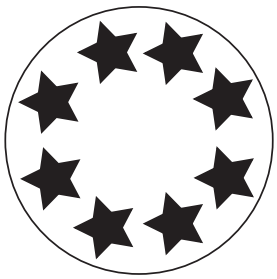
How many stars?

Multiplication Draw Card



How many legs?

Multiplication Draw Card



How many stars?

Multiplication Draw Card

NAME _____ DATE _____

Home Connection G ★ Worksheet

NOTE TO FAMILIES

This worksheet gives students practice with some of the more difficult multiplication facts. You could encourage your child to use the ×5 facts to help solve the ×6 facts on this page and the ×10 facts to help solve the ×9 facts on the back. Refer to your *Solving Multiplication Facts* booklet if you need to review how these strategies work. The worksheet also provides some challenge with division facts if your child wants to try division, but students are not required to complete the division problems.

Multiplying by 5, 6, 9 & 10

1 Circle all the clock facts (×5) in blue. Then go back and do them.

2 Circle all the clock facts plus 1 set facts (×6) in red. Then go back and do them.

10 × 6 = ____	6 × 6 = ____	0 × 5 = ____	6 × 0 = ____	10 × 5 = ____	9 × 5 = ____
1 × 6 = ____	7 × 6 = ____	5 × 8 = ____	6 × 8 = ____	5 × 5 = ____	5 × 3 = ____
6 × 4 = ____	6 × 9 = ____	5 × 4 = ____	6 × 2 = ____	7 × 5 = ____	6 × 5 = ____

CHALLENGE

3 Solve the following division problems if you like. Use what you know about multiplication to help.

6 ÷ 6 = ____	12 ÷ 6 = ____	5 ÷ 5 = ____	10 ÷ 5 = ____
18 ÷ 6 = ____	24 ÷ 6 = ____	40 ÷ 5 = ____	48 ÷ 6 = ____
20 ÷ 5 = ____	30 ÷ 5 = ____	36 ÷ 6 = ____	42 ÷ 6 = ____

Continued on back.

Home Connection G Worksheet (cont.)

4 Circle all the decade facts (×10) in blue. Then go back and do them.

5 Circle all the decade minus 1 set facts (×9) in red. Then go back and do them.

9 × 8	7 × 10	9 × 6	10 × 10	9 × 4	10 × 1
5 × 10	3 × 10	9 × 7	4 × 10	9 × 9	10 × 6
10 × 8	0 × 9	2 × 9	9 × 5	9 × 10	9 × 3

CHALLENGE

6 Solve the following division problems if you like. Use what you know about multiplication to help.

100 ÷ 10 = ____	45 ÷ 9 ____	9 ÷ 9 = ____	18 ÷ 9 = ____
36 ÷ 9 ____	40 ÷ 10 = ____	50 ÷ 10 = ____	20 ÷ 10 = ____
27 ÷ 9 ____	60 ÷ 10 ____	72 ÷ 9 = ____	81 ÷ 9 = ____

NAME _____ DATE _____

Home Connection H ★ Worksheet

NOTE TO FAMILIES

This worksheet below will provide students with a chance to practice some multiplication facts.

Quick Facts Multiplication

1 Multiply each of the numbers below by 5. Write the product in the box. In the example, the number 5 was multiplied by 7, so the product 35 is written in the box.

7 35	5	3	1	4	8
4	6	0	5	9	10
3	10	2	7	3	6
6	9	8	5	0	9

Continued on back.

Home Connection H Worksheet (cont.)

2 Multiply each of the numbers below by 3. Write the product in the box.

7 21	5	3	1	4	8
4	6	0	5	9	10
3	10	2	7	3	6
6	9	8	5	0	9

3 Multiply each of the numbers below by 4. Write the product in the box.

7 28	5	3	1	4	8
4	6	0	5	9	10
3	10	2	7	3	6
6	9	8	5	0	9

support activities

Support Activities

The Support Activities are listed by skill in the table below, and are designed to supplement any third grade math program. There are 18 games in the collection. Most are intended for partners or small groups, although some can be adapted for use with an entire class. Most involve the use of visual models and strategies, and will 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.

STRATEGIES FOR BASIC ADDITION FACTS		
Activity	**Name**	**Support Blackline Number**
Support Activity 1	Doubles Spin	S 1.1–1.8
Support Activity 2	Spinning Around Addition	S 2.1–2.5
Support Activity 3	Triple Spin & Add	S 3.1–3.5
Support Activity 4	Sorting Addition Facts	S 4.1–4.8

STRATEGIES FOR BASIC SUBTRACTION FACTS		
Activity	**Name**	**Support Blackline Number**
Support Activity 5	Make Half	S 5.1–5.2
Support Activity 6	Spinning Around Subtraction	S 6.1–6.6

MULTI-DIGIT ADDITION		
Activity	**Name**	**Support Blackline Number**
Support Activity 7	Make 100	S 7.1–7.7
Support Activity 8	Race to 100 & Back	S 8.1–8.7
Support Activity 14	Show the Sum	S 14.1–14.3

MULTI-DIGIT SUBTRACTION		
Activity	**Name**	**Support Blackline Number**
Support Activity 8	Race to 100 & Back	S 8.1–8.7
Support Activity 11	Count Down 400	S 11.1–11.4
Support Activity 15	Show the Difference	S 15.1–15.3

COMPUTATION WITH MONEY		
Activity	**Name**	**Support Blackline Number**
Support Activity 9	Three Turns to Win	S 9.1–9.6
Support Activity 10	Finish with $4	S 10.1–10.4

Support Activities (cont.)

2- AND 3-DIMENSIONAL GEOMETRY		
Activity	**Name**	**Support Blackline Number**
Support Activity 12	Faces of a Solid	S 12.1–12.4

STRATEGIES FOR BASIC MULTIPLICATION		
Activity	**Name**	**Support Blackline Number**
Support Activity 13	Spinning Around Multiplication	S 13.1–13.6

PRACTICE OF BASIC ADDITION, SUBTRACTION, MULTIPLICATION, OR DIVISION FACTS		
Activity	**Name**	**Support Blackline Number**
Support Activity 16	What's Missing? Bingo	S 16.1– 16.6
Support Activity 17	Ten to Win	S 17. 1–17.6
Support Activity 18	Make Zero	S 18.1–18.4

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 all the game 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 and spinners on cardstock, you'll find that paper copies of the game components work nearly as well for short-term use. Students are generally instructed to use a paperclip and pencil arrangement in lieu of more involved spinner arrows, and we encourage you to have the children cut out their own game cards. 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. A few of the activities call for game markers, but beans, pieces of macaroni, or other small objects will also work.

Support Activity 1 ★ Instructional Considerations

SUPPORT ACTIVITY

Doubles Spin

Overview

Players take turns spinning a number from 1 to 10. They double the number and cover it on their half of the game board. The first player to cover all the doubles sums from 2 to 20 wins.

Skills & Concepts

★ using models for doubles addition facts with sums from 2 to 20

★ fluency with the doubles strategy in addition

You'll need

★ Doubles Spin & Make Half Game Board (Blacklines S 1.3 and 1.4, 1 copy of each, taped together, per pair of players)

★ Doubles & Halves Spinner (Blackline S 1.5, 1 copy for every 2 pairs of players)

★ Ten-Strips (Blackline S 1.6, 1 copy per student, optional)

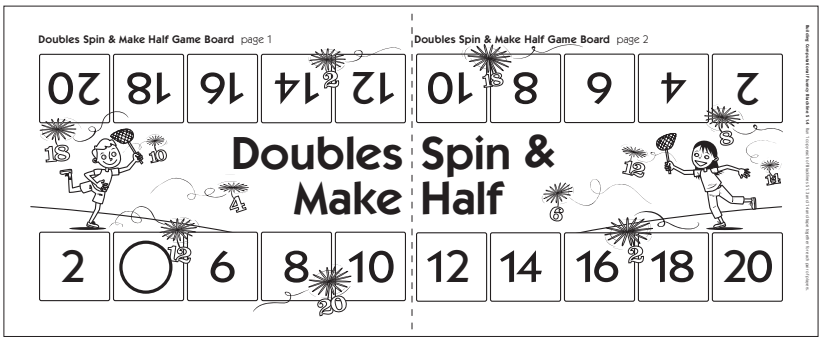
★ 10 game markers per player

★ paperclip and a pencil to use as a spinner (one set per pair of players)

Note If you are not familiar with the ten-strip model or the addition strategies used in *Bridges*, please review Blacklines S 1.7 and 1.8 before playing this game with students.

The doubles strategy for addition is key to fluency with neighbors facts and leftover facts as well. If you have students who are really struggling with doubling numbers, encourage them to build each double using game markers on the ten-strips.

Students may recall that doubles sums are always even, and they might notice that the numbers on the game board increase by 2 each time. These are big ideas that involve algebraic thinking and promote computational fluency. You'll want them to come from the students, though, so don't push it if they're not making these generalizations yet.



Support Activity 1

SUPPORT ACTIVITY

Doubles Spin

You'll need

★ Doubles Spin & Make Half Game Board (Blacklines NC S 1.3 and 1.4, 1 copy of each, taped together, per pair of players)

★ Doubles & Halves Spinner (Blackline S 1.5, 1 copy for every 2 pairs of players)

★ Ten-Strips (Blackline S 1.6, 1 copy per student, optional)

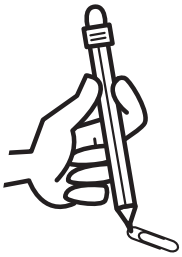
★ 10 game markers per player

★ paperclip and a pencil to use as a spinner (one set per pair of players)

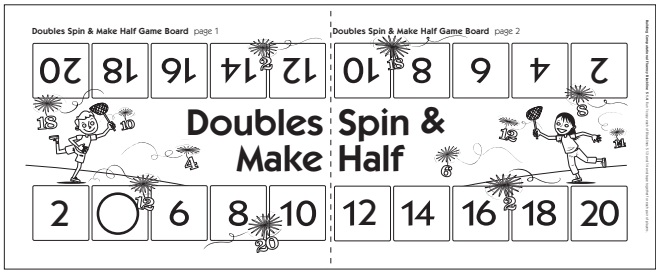
Instructions for Doubles Spin

1 Get a partner and sit on opposite sides of the game board.

2 You'll need to use a pencil and paperclip to create a spinner as shown below.



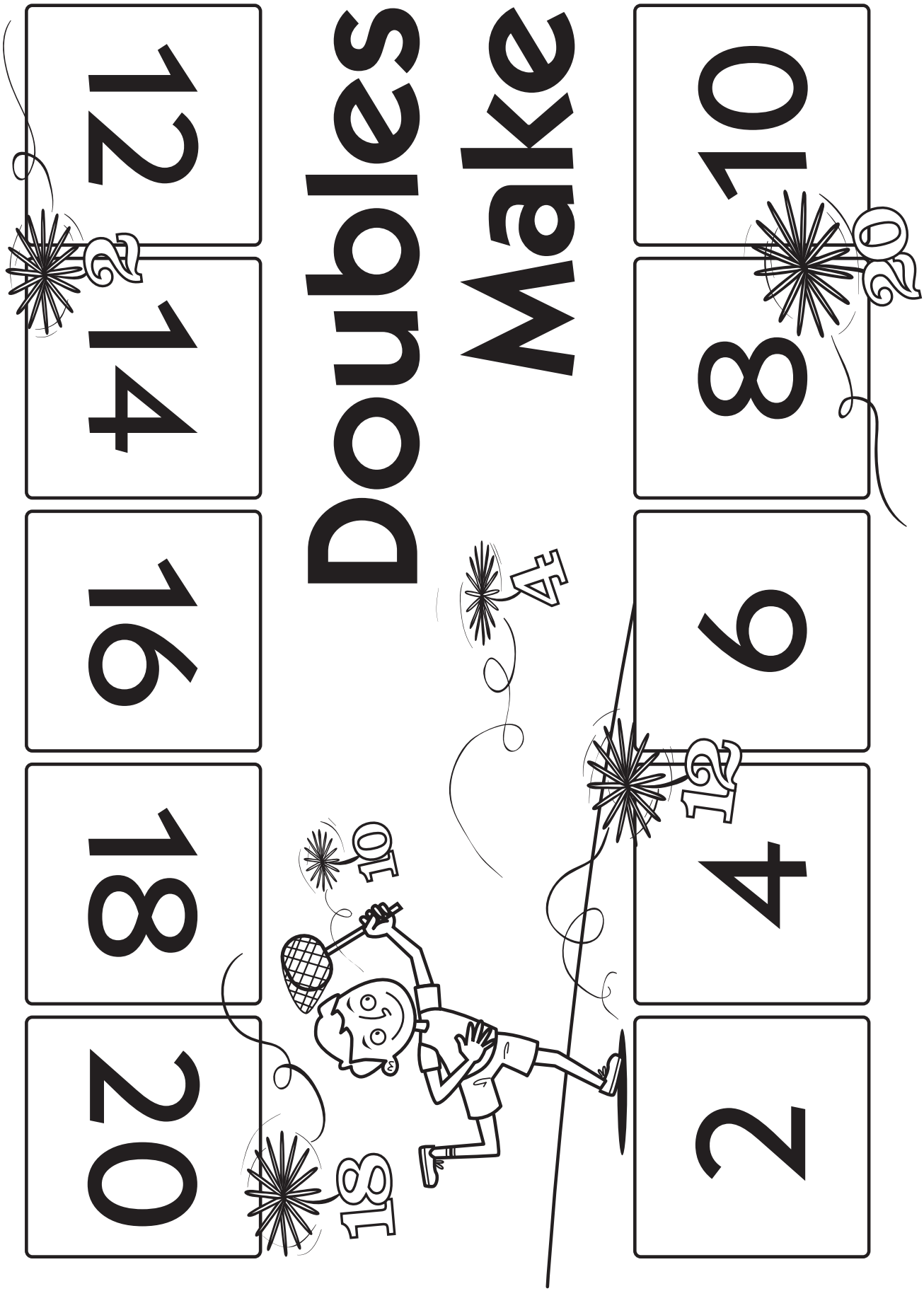
Take turns spinning the spinner. Double the number you got and cover the sum. For instance, if you got a 2, you'll say, "Two plus two equals four," and cover the 4 on your side of the game board with a marker.



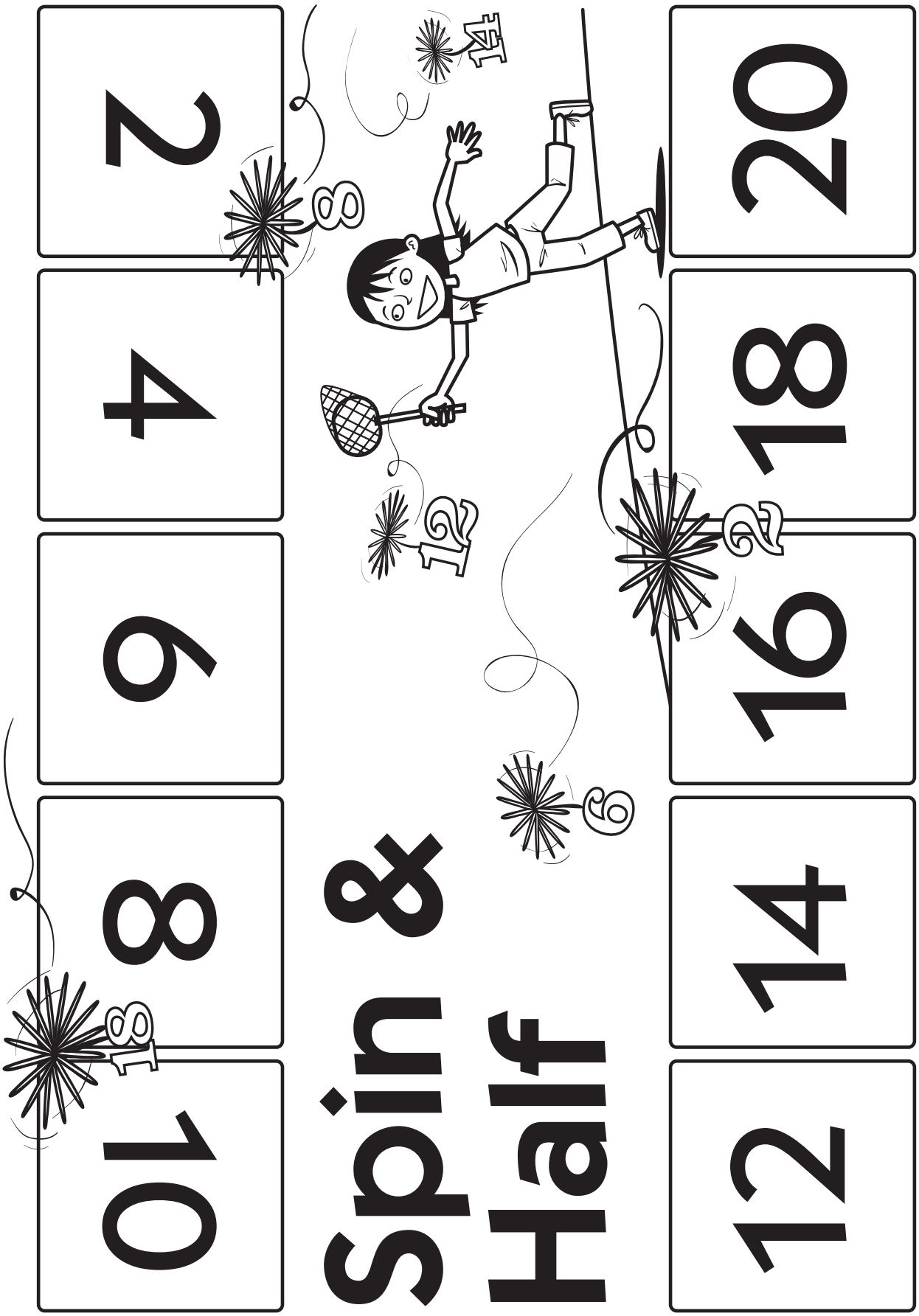
3 If you get a sum that is already covered, you'll have to pass.

4 The player who covers all ten numbers on his or her side first is the winner.

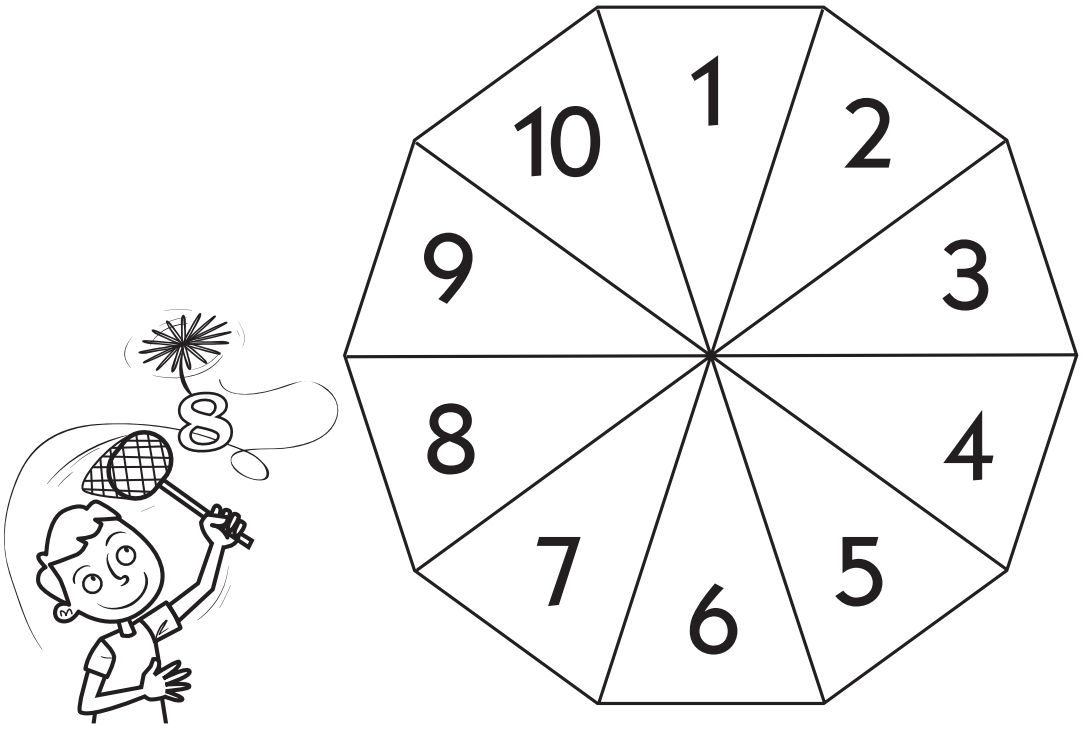
Doubles Spin & Make Half Game Board page 1



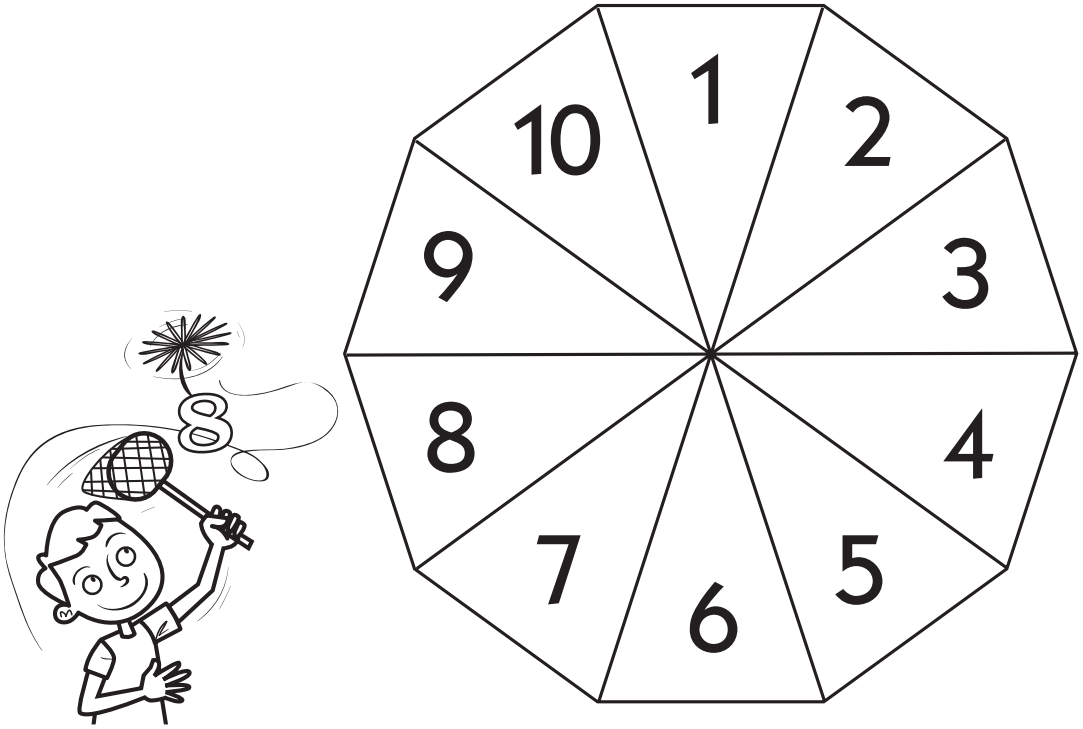
Doubles Spin & Make Half Game Board page 2



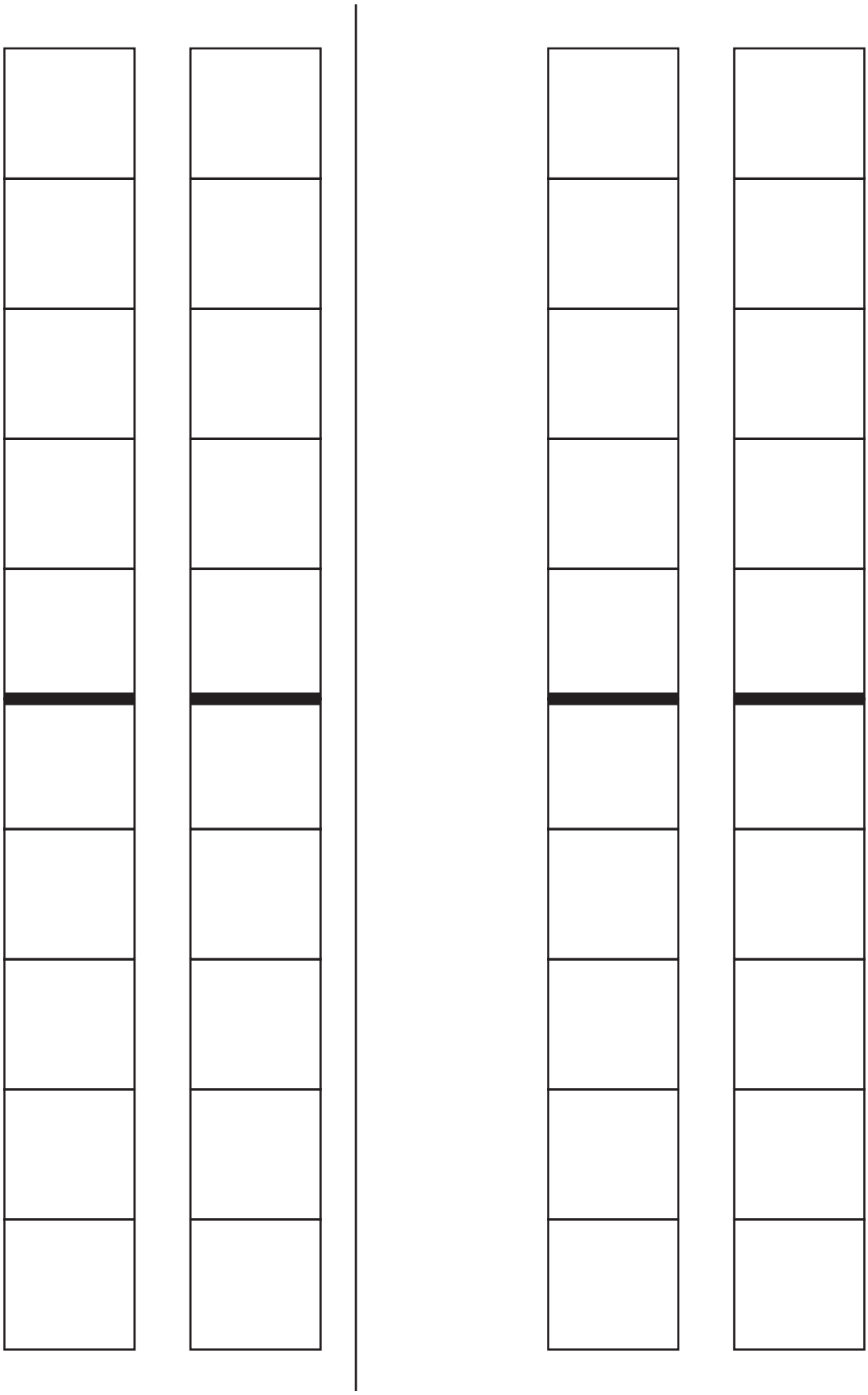
Doubles & Halves Spinner



Doubles & Halves Spinner

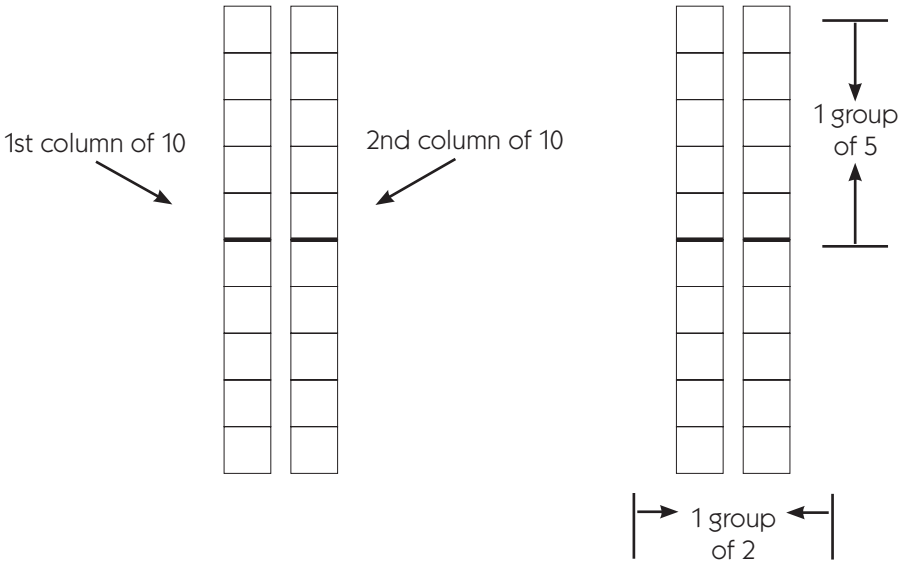


Ten-Strips



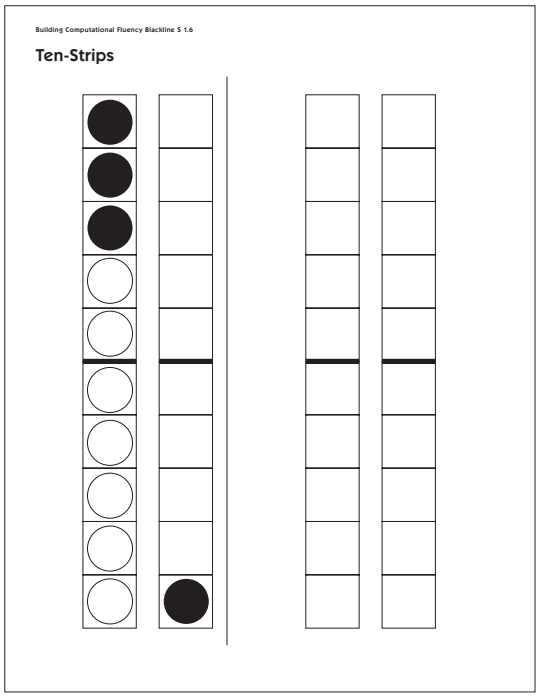
The Ten-Strips Model

Students who have had *Bridges* in years past will recognize the ten-strips and will probably be comfortable using them. You'll notice that each pair of ten-strips has two columns of 10 squares. Both columns are cut in half with a horizontal bar. This model is an effective way to encourage students to think in chunks of 5's and 2's and to use 10 as a landmark number.



In the support games for addition, students may find it helpful to show their thinking on the ten-strips, using colored game markers to add numbers.

> ***Erica*** *Hmm, 7 plus 4? I can put 7 red markers down and then I'll add 3 more blue ones. That's 10. Then 1 more blue marker makes 11. See?*



Addition Strategies

Many of the Support Activities encourage students to identify the specific strategies they can use to solve addition facts. Students have reviewed these strategies and used them in second and third grade *Bridges*, but we realize that some of the strategies, or at least their titles, may be new to you. Encourage students to explain the strategies to you as they work, and consult this table to refresh your memory.

Most of the strategies are self-explanatory, and the examples on the table should provide some insight about them. The *make ten facts* are simply combinations whose sum is 10. The *fast tens* are fast, because when you add 10 to any single-digit number, you get a teen number, as in 10 + 6 = 16. The *fast nines* are a little trickier for some third graders, but once they know their fast tens, adding 9 becomes faster. For example, when you know that 10 plus 7 is 17, you can see quickly that 9 plus 7 must be 16, because it's just 1 less than 10 plus 7.

ADDITION STRATEGIES	
Name of Strategy	**Examples**
Zero Facts (+0)	7 + 0 = 7 0 + 14 = 14
Counting On (+1, +2, +3)	6 + 1 = 7 4 + 2 = 6 9 + 3 = 12
Doubles	7 + 7 = 14 3 + 3 = 6
Neighbors (also called Doubles +1)	3 + 4 = 7 8 + 7 = 15
Make Ten (=10)	7 + 3 = 10 6 + 4 = 10
Fast Tens (+10)	10 + 5 = 15 8 + 10 = 18
Fast Nines (+9)	9 + 5 = 14 7 + 9 = 16

Support Activity 2 ★ Instructional Considerations

SUPPORT ACTIVITY

Spinning Around Addition

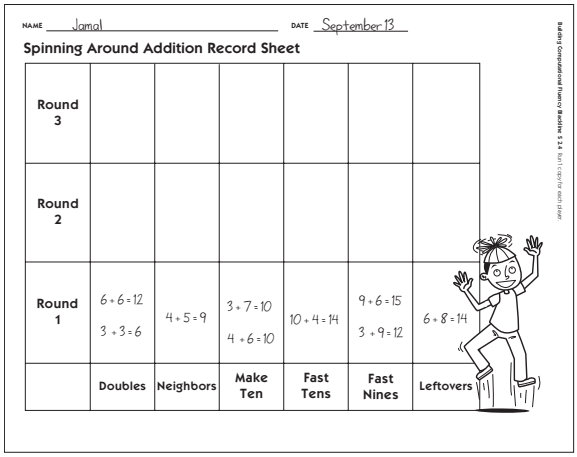
Overview

Players take turns spinning addition facts and naming the strategies that could be used to solve them. They pick one strategy for each fact and write a number sentence in the column labeled with that strategy name. The first player to record at least one fact in each column wins.

Skills & Concepts

★ using models for addition sums to 20

★ fluency with the doubles, neighbors, make ten, fast tens, and fast nines strategies for addition



NAME Jamal DATE September 13

Spinning Around Addition Record Sheet

Round 3						
Round 2						
Round 1	6 + 6 = 12 3 + 3 = 6	4 + 5 = 9	3 + 7 = 10 4 + 6 = 10	10 + 4 = 14	9 + 6 = 15 3 + 9 = 12	6 + 8 = 14
	Doubles	Neighbors	Make Ten	Fast Tens	Fast Nines	Leftovers

Building Computational Fluency Blackline S 2.4 © 2011 The Math Learning Center

You'll need

★ Ten-Strips (Blackline S 1.6, 1 copy per player)

★ Spinning Around Addition Record Sheet (Blackline S 2.4, 1 copy per player)

★ Spinning Around Addition Spinner (Blackline S 2.5, 1 copy for every 2 pairs of players)

★ 20 game markers per player

★ paperclip and a pencil to use as a spinner (one set per pair of players)

Note If you are not familiar with the ten-strip model or the addition strategies used in *Bridges*, please review Blacklines NC S 1.7 and 1.8 before playing this game with students.

Four of the strategies in this activity are generally comfortable for third graders: doubles, neighbors, make ten, and fast tens. The fast nines and leftovers tend to present more of a challenge. We included some of the easier facts to provide students with opportunities for success and to help students use the facts they do know to think about those they don't know yet. For example, if a student is comfortable with fast tens, she can begin to use her fast ten facts to help master the fast nines: "I know 7 plus 10 is 17, so 7 plus 9 is 1 less than that. 7 plus 9 must be 16."

Before finding the sum, students determine what kind of fact they have spun. Then they use the strategy to compute the sum. Guided practice focusing on strategy retrieval will build students' computational fluency and is consistent with best practice for helping students develop number sense and master the basic facts.

Students will also connect the facts to their symbolic notation when they record number sentences on their record sheets. They may also use the ten-strip model to show the facts, connecting the concrete model to the abstract symbolic notation.

Support Activity 2

SUPPORT ACTIVITY

Spinning Around Addition

You'll need

★ Ten-Strips (Blackline S 1.6, 1 copy per player)

★ Spinning Around Addition Record Sheet (Blackline S 2.4, 1 copy per player)

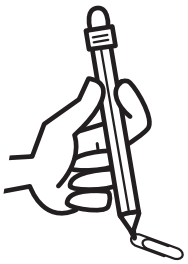
★ Spinning Around Addition Spinner (Blackline S 2.5, 1 copy for every 2 pairs of players)

★ 20 game markers per player

★ paperclip and a pencil to use as a spinner (one set per pair of players)

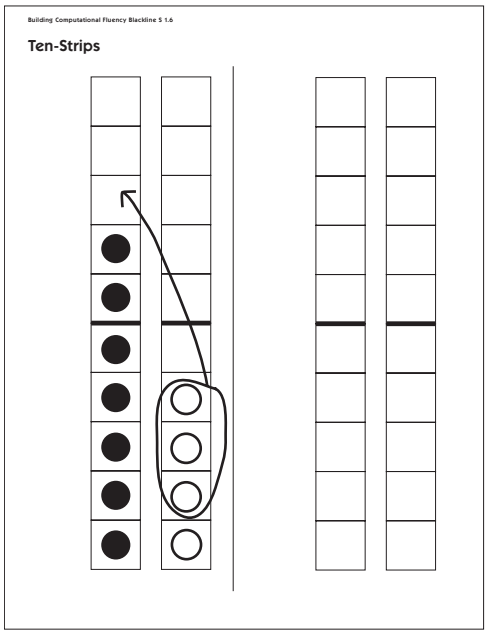
Instructions for Spinning Around Addition

1 You and your partner should each get your ten-strips, game markers, and a record sheet ready. You'll share a pair of numbered spinners.



2 Spin the first and second spinners. Figure out what kind of fact you have spun. For instance, if it's 5 + 5, it's a double. If it's 4 + 7, it's a leftover.

3 Use the game markers to build the fact on your ten-strips. Explain to your partner how you would find the sum.



"I put down 7 markers. Then I added 4 more. It's easy to see that it's 11. 7 plus 3 makes 10, and then there's just 1 more."

Support Activity 2 (cont.)

4 Write the number sentence in the appropriate column on your record sheet. Don't forget to include the sum. Some facts might be more than one kind of fact. For example, 5 + 5 is a doubles fact and a make ten fact. You can choose the column in which you want to write these kinds of facts.

5 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 Jamal DATE September 13

Spinning Around Addition Record Sheet

Round 3						
Round 2						
Round 1	6 + 6 = 12 3 + 3 = 6	4 + 5 = 9	3 + 7 = 10 4 + 6 = 10	10 + 4 = 14	9 + 6 = 15 3 + 9 = 12	6 + 8 = 14
	Doubles	**Neighbors**	**Make Ten**	**Fast Tens**	**Fast Nines**	**Leftovers**

Building Computational Fluency Blackline S 2.4 Run 1 copy for each player

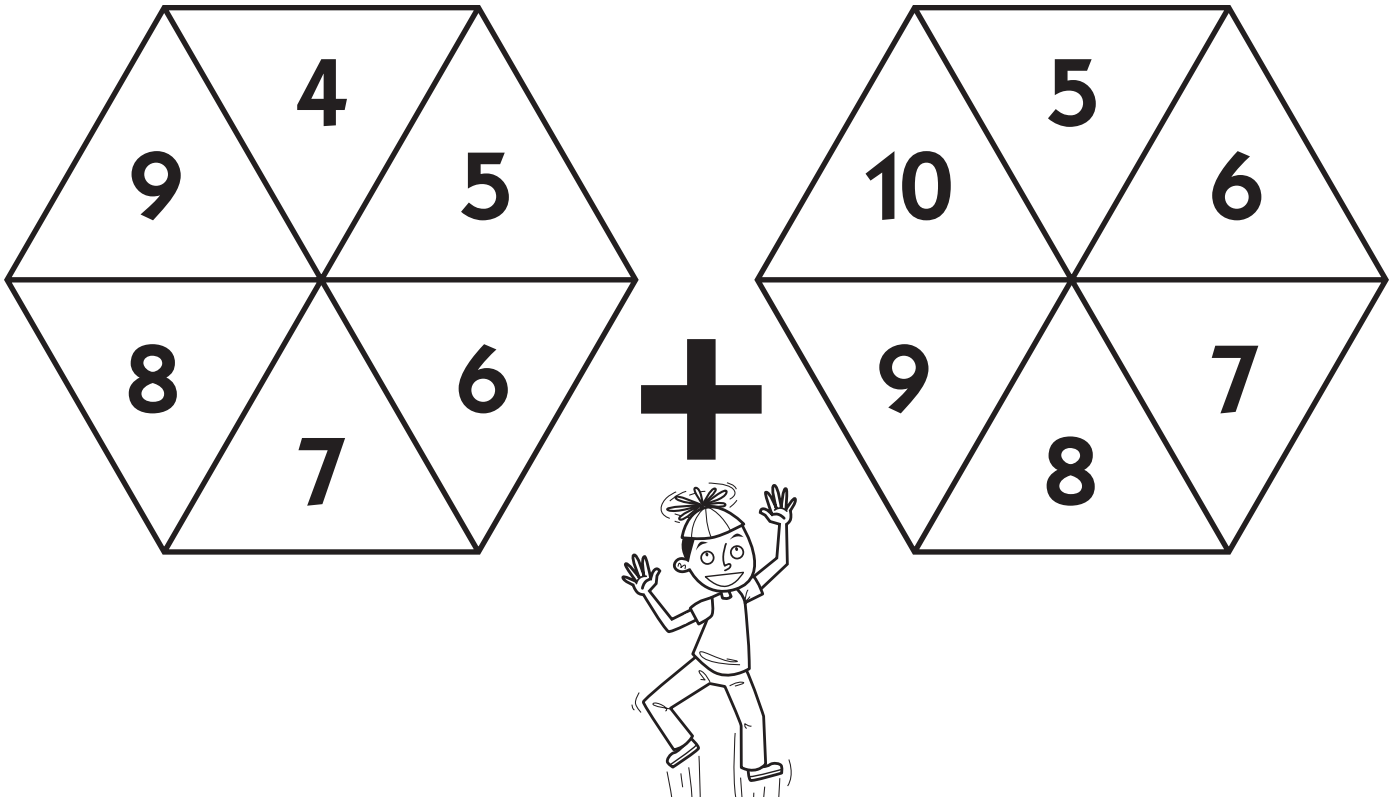
6 Play 3 rounds.

NAME _____ DATE _____

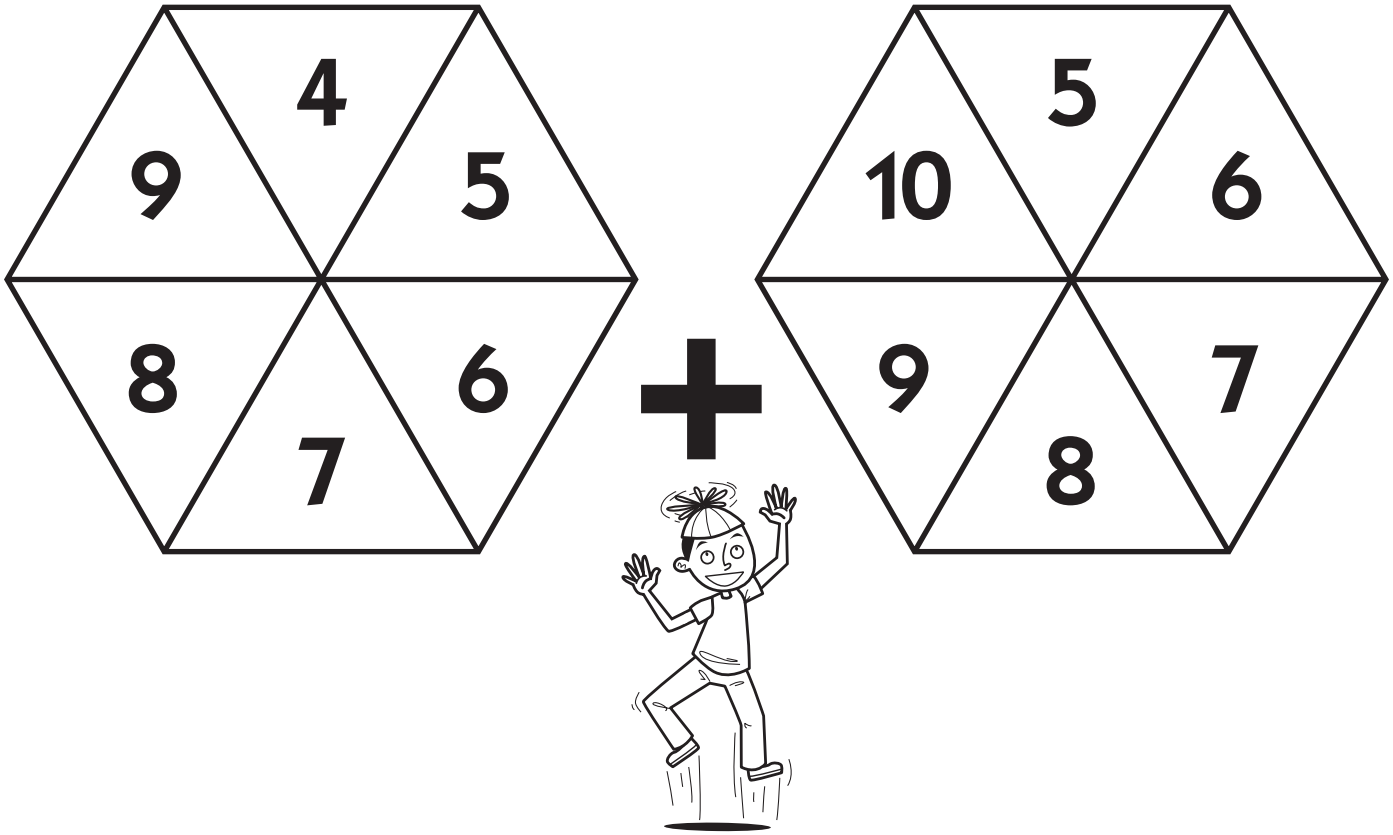
Spinning Around Addition Record Sheet

Round 3						
Round 2						
Round 1						
	Doubles	Neighbors	Make Ten	Fast Tens	Fast Nines	Leftovers

Spinning Around Addition Spinner



Spinning Around Addition Spinner



Support Activity 3 ★ Instructional Considerations

SUPPORT ACTIVITY

Triple Spin & Add

Overview

Students take turns spinning 3 spinners and adding the numbers shown on the spinners. Both players record a number sentence to show the sum of the 3 numbers. If the sum is even, they write the number sentence in the *even* column. If the sum is odd, they write the number sentence in the *odd* column.

Skills & Concepts

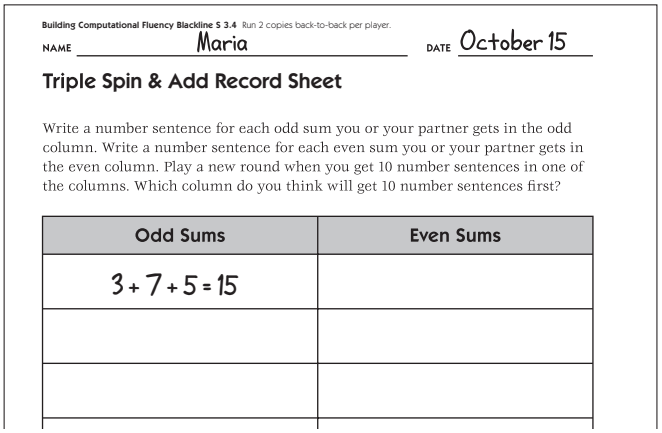
- ★ using strategies for addition facts with sums to 20
- ★ using models, words, and/or numbers to demonstrate the meaning of addition
- ★ identifying odd and even numbers
- ★ recording number sentences
- ★ evaluating the likelihood of specific outcomes for an experiment

You'll need

- ★ Triple Spin & Add Record Sheet (Blackline S 3.4, 2 copies per player, run back-to-back)
- ★ Ten-Strips (Blackline S 1.6, 1 copy per player)
- ★ Triple Spin & Add Spinner (Blackline S 3.5, 1 copy for every 2 pairs of players)
- ★ 20 game markers per player
- ★ paperclip and a pencil to use as a spinner (one set per pair of players)

This game presents the challenge of finding efficient ways to add 3 numbers. For example, if a player spun a 3, 4, and 6 she might want to make a 10 with the 4 and 6, and then use fast tens to add 10 and 3.

You might also ask students to consider which column will fill faster. That is, are they more likely to get an even sum or an odd sum with each spin? Can they explain their thinking?



Building Computational Fluency Blackline S 3.4 Run 2 copies back-to-back per player.

NAME Maria DATE October 15

Triple Spin & Add Record Sheet

Write a number sentence for each odd sum you or your partner gets in the odd column. Write a number sentence for each even sum you or your partner gets in the even column. Play a new round when you get 10 number sentences in one of the columns. Which column do you think will get 10 number sentences first?

Odd Sums	Even Sums
3 + 7 + 5 = 15	

Support Activity 3

SUPPORT ACTIVITY

Triple Spin & Add

You'll need

★ Triple Spin & Add Record Sheet (Blackline S 3.4, 2 copies per player, run back-to-back)

★ Ten-Strips (Blackline S 1.6, 1 copy per player)

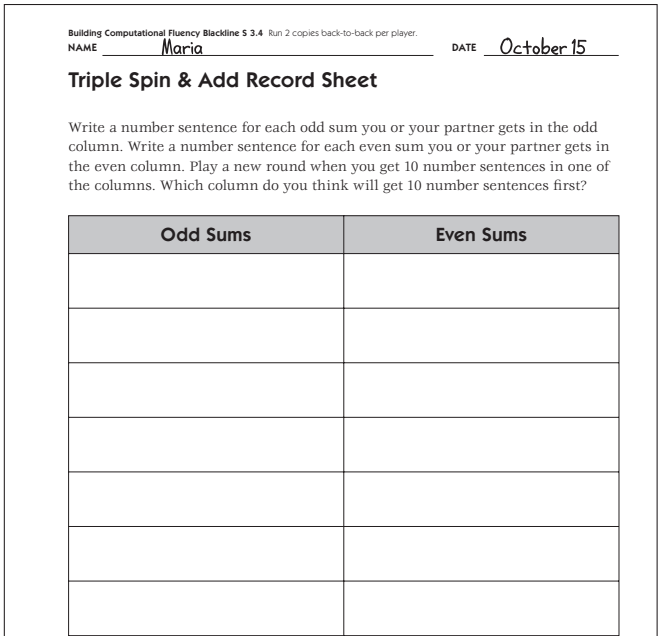
★ Triple Spin & Add Spinner (Blackline S 3.5, 1 copy for every 2 pairs of players)

★ 20 game markers per player

★ paperclip and a pencil to use as a spinner (one set per pair of players)

Instructions for Triple Spin & Add

1 Pick a partner. You should each write your name and today's date at the top of a record sheet.



Building Computational Fluency Blackline S 3.4 Run 2 copies back-to-back per player.
NAME Maria DATE October 15

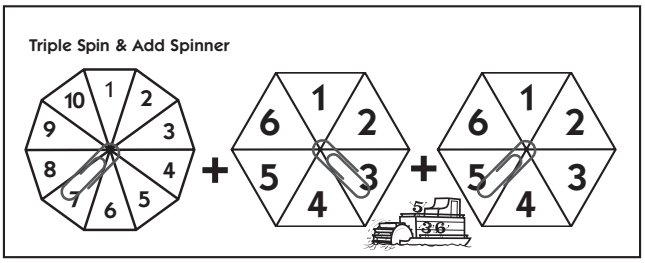
Triple Spin & Add Record Sheet

Write a number sentence for each odd sum you or your partner gets in the odd column. Write a number sentence for each even sum you or your partner gets in the even column. Play a new round when you get 10 number sentences in one of the columns. Which column do you think will get 10 number sentences first?

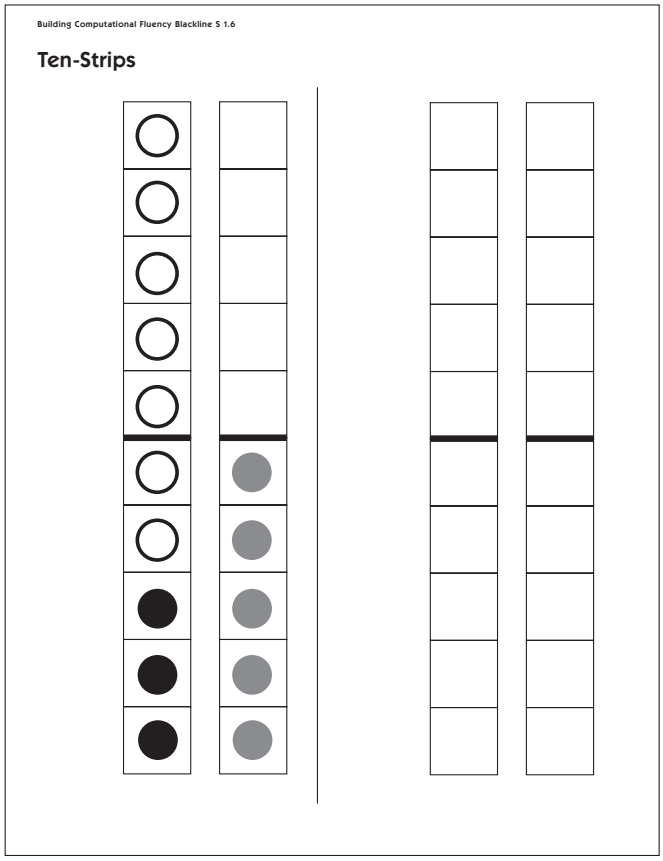
Odd Sums	Even Sums

2 Take turns spinning a spinner. The player with the lowest number begins.

3 The first player spins all 3 spinners. Both players find the sum of the 3 numbers shown and talk to each other about their strategies. Players can show their thinking using game markers on the ten-strips.

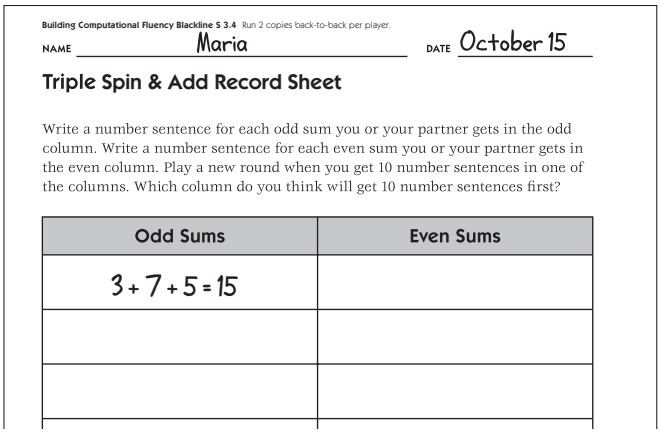


Support Activity 3 (cont.)



"I added 3 plus 7 to make 10. Then I added 10 plus 5 to get 15. That was a fast ten."

4 If the sum is odd, both partners record a number sentence in the odd column. If the sum is even, both partners record a number sentence in the even column.



Building Computational Fluency Blackline S 3.4 Run 2 copies back-to-back per player.

NAME Maria DATE October 15

Triple Spin & Add Record Sheet

Write a number sentence for each odd sum you or your partner gets in the odd column. Write a number sentence for each even sum you or your partner gets in the even column. Play a new round when you get 10 number sentences in one of the columns. Which column do you think will get 10 number sentences first?

Odd Sums	Even Sums
3 + 7 + 5 = 15	

5 Players take turns spinning all 3 spinners. For each spin, both players find the sum and record a number sentence in the correct column. Play continues until one column has 10 number sentences.

6 If there's time, players can turn their pages over to a fresh record sheet and play again.

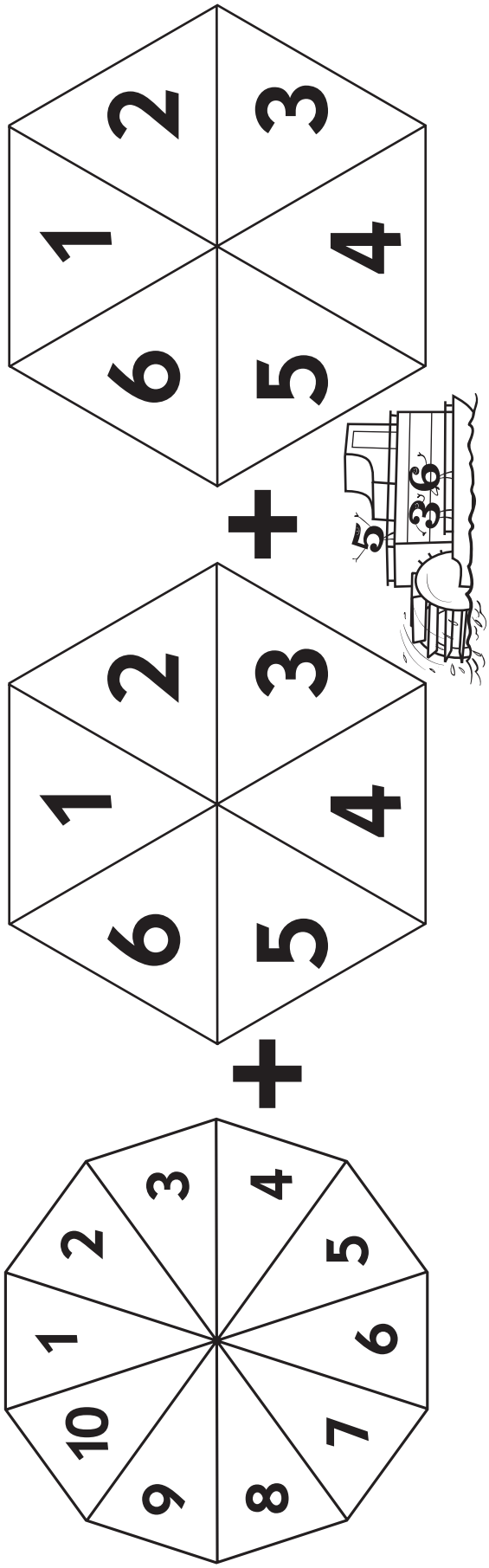
NAME _____ **DATE** _____

Triple Spin & Add Record Sheet

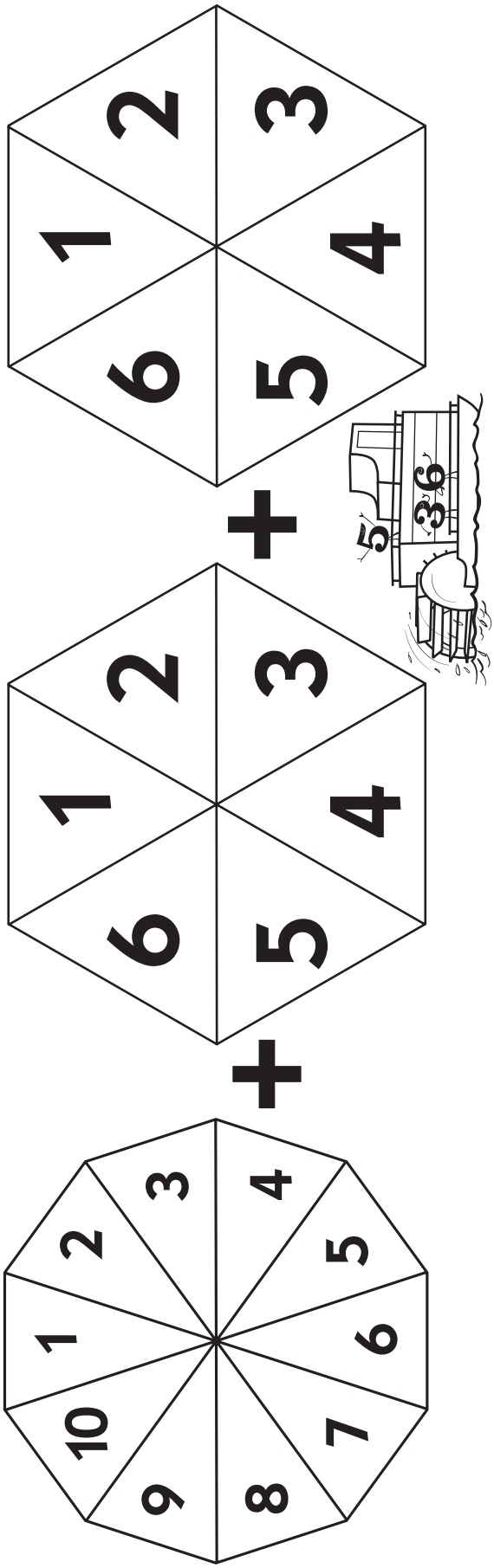
Write a number sentence for each odd sum you or your partner gets in the odd column. Write a number sentence for each even sum you or your partner gets in the even column. Play a new round when you get 10 number sentences in one of the columns. Which column do you think will get 10 number sentences first?

Odd Sums	Even Sums

Triple Spin & Add Spinner



Triple Spin & Add Spinner



Support Activity 4 ★ Instructional Considerations

SUPPORT ACTIVITY

Sorting Addition Facts

Overview

Players take turns drawing cards showing addition facts and sorting them by strategy. When they have sorted all the cards, they go back and practice the facts on all the cards.

Skills & Concepts

★ using strategies to develop and demonstrate computational fluency with addition facts to 20

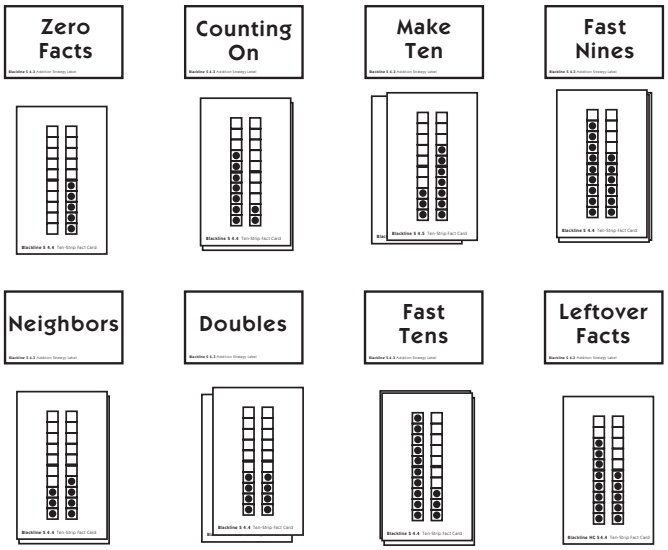
You'll need

★ Addition Strategy Labels (Blackline S 4.3, 1 copy for each pair of players, cut apart and stored in an envelope)

★ Ten-Strip Fact Cards (Blacklines S 4.4–4.8, 1 copy for each pair of players, cut apart and stored in an envelope)

You can adjust this activity to meet students' individual needs by removing the Strategy Labels and Ten-Strip Fact Cards for the facts with which they don't need as much practice or that are still too difficult for them. For example, if a student is frustrated by fast nines and leftovers, you could remove those two Strategy Labels and the corresponding Ten-Strip Fact Cards, allowing the child to focus on doubles, neighbors, make ten, and fast tens until they become more fluent.

Once students are comfortable with this activity, we like to suggest it for homework practice. Many families have a set of flashcards at home, and students can complete this activity using flashcards in place of Ten-Strip Fact Cards. If they don't have flashcards at home, send along a copy of the Ten-Strip Fact Cards. You'll probably want to have students cut out the cards before sending them home. (We like to have students cut out the cards and store them in a large re-sealable plastic bag that also contains the activity instructions, Strategy Labels, and a few copies of the Ten-Strips blackline.) If you do send Sorting Addition Facts home, be sure to send along a copy of Blacklines S 1.7 and 1.8 so parents can refer to them when helping their children.



Support Activity 4

SUPPORT ACTIVITY

Sorting Addition Facts

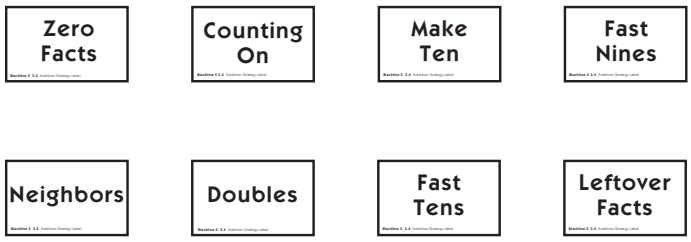
You'll need

★ Addition Strategy Labels (Blackline S 4.3, 1 copy for each pair of players, cut apart and stored in an envelope)

★ Ten-Strip Fact Cards (Blacklines S 4.4–4.8, 1 copy for each pair of players, cut apart and stored in an envelope)

Instructions for Sorting Addtion Facts

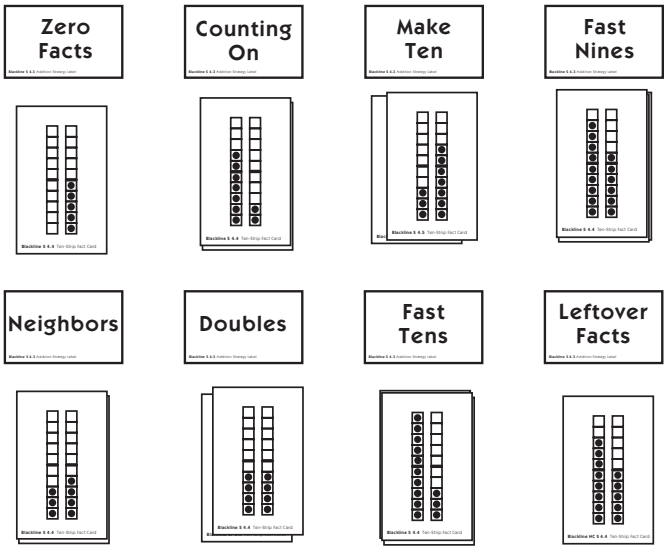
1 Get a deck of Ten-Strip Fact Cards to share, and set out the eight strategy labels.



2 Pick one of the Ten-Strip Fact Cards from the top of the deck. Determine what kind of fact it is and find the sum. Then place the card under the label that shows what kind of fact it is.

Talk it over with your partner. Does he or she have another way of thinking about that fact? For example, you might think of 5 + 5 as a double, but your partner might think of it as a make ten fact.

3 Repeat this process until you have gone through all of the cards. You'll end up with many cards beneath each label.



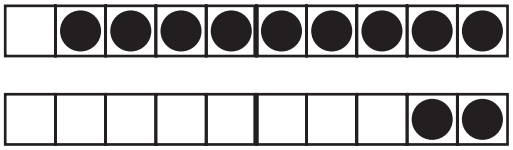
4 When all the cards have been sorted, go back and practice all the cards under each strategy label. Make sure you say each fact out loud, for example, "9 plus 6 equals 15."

Addition Strategy Labels

Zero Facts **Blackline S 4.3** Addition Strategy Label	Counting On **Blackline S 4.3** Addition Strategy Label
Make Ten **Blackline S 4.3** Addition Strategy Label	Fast Nines **Blackline S 4.3** Addition Strategy Label
Neighbors **Blackline S 4.3** Addition Strategy Label	Doubles **Blackline S 4.3** Addition Strategy Label
Fast Tens **Blackline S 4.3** Addition Strategy Label	Leftover Facts **Blackline S 4.3** Addition Strategy Label

Building Comptational Fluency Blackline S 4.4 Run 1 copy for each pair of players. Cut out along lines and store in an envelope.

Ten-Strip Fact Cards page 1 of 5



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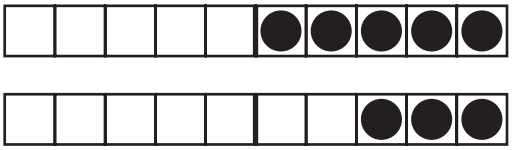

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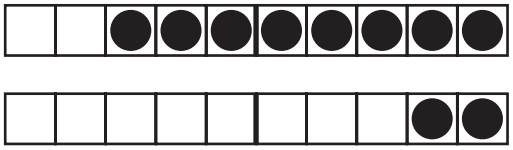

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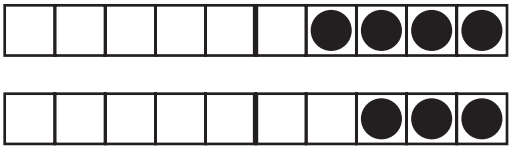

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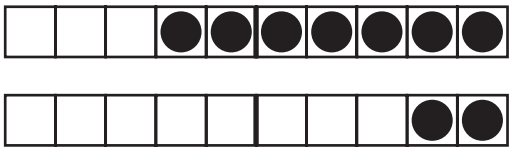

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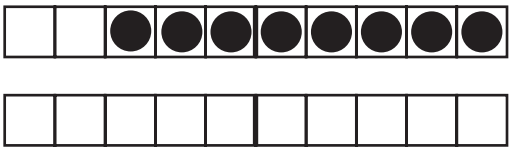

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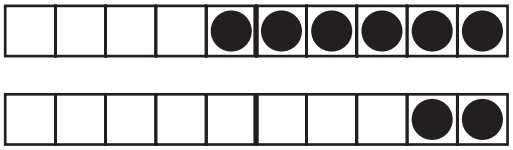

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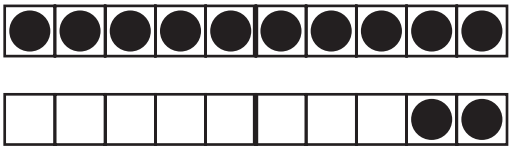
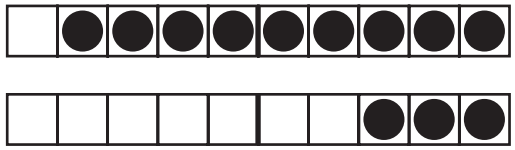


Blackline S 4.4 Ten-Strip Fact Card

Building Comptational Fluency Blackline S 4.5 Run 1 copy for each pair of players. Cut out along lines and store in an envelope.

Ten-Strip Fact Cards page 2 of 5



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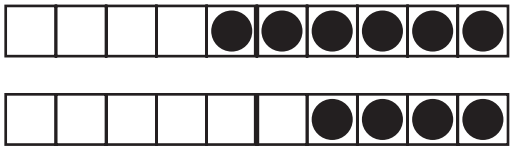

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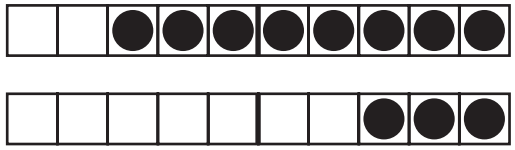

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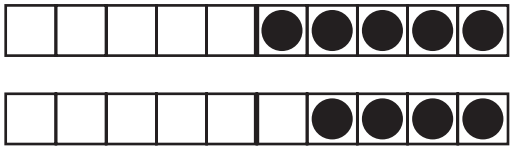

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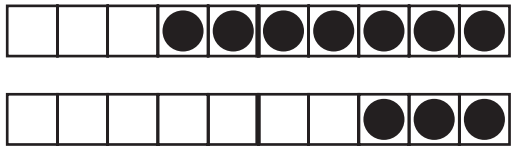

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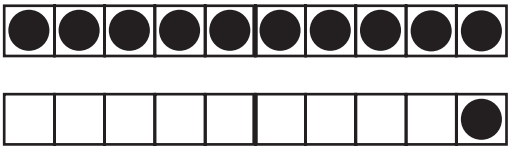

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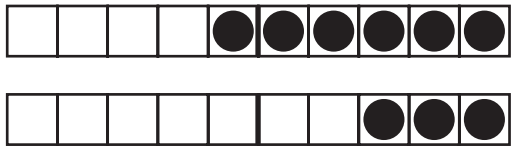

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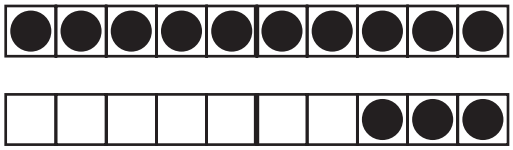
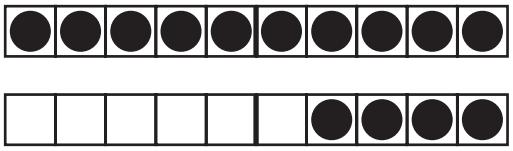


Blackline S 4.5 Ten-Strip Fact Card

Ten-Strip Fact Cards page 3 of 5



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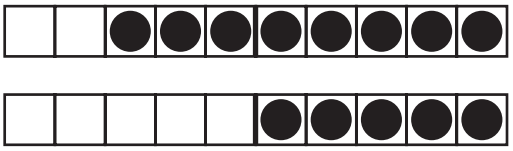

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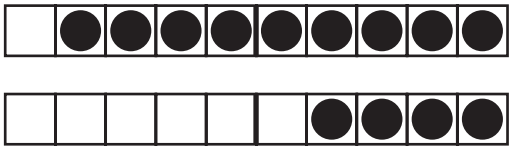

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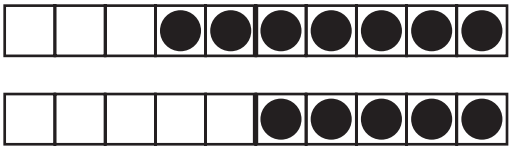

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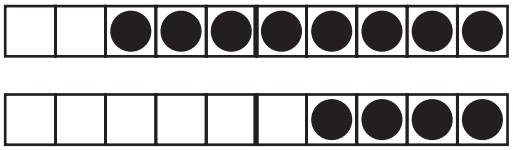

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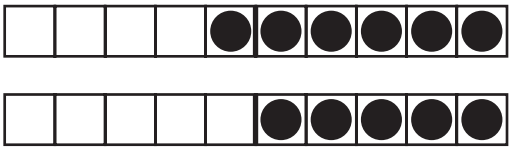

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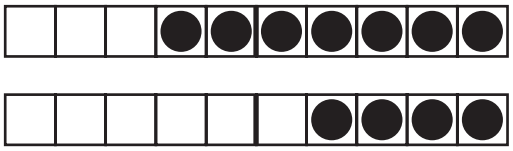

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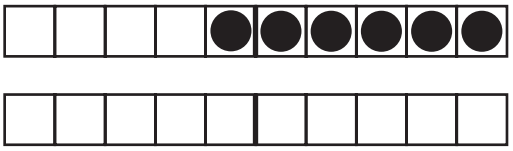
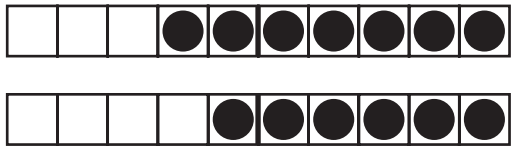


Blackline S 4.6 Ten-Strip Fact Card

Ten-Strip Fact Cards page 4 of 5



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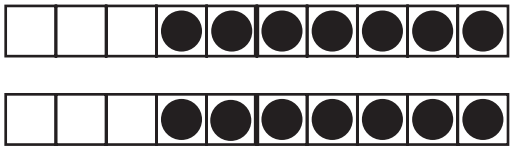

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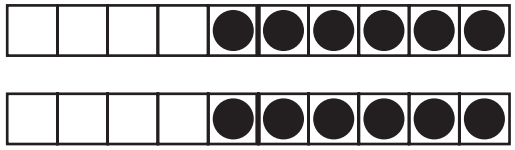

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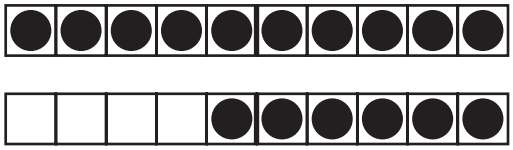

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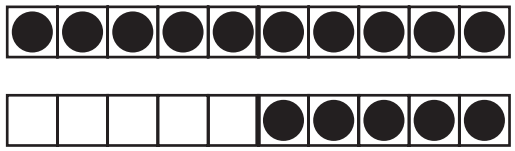

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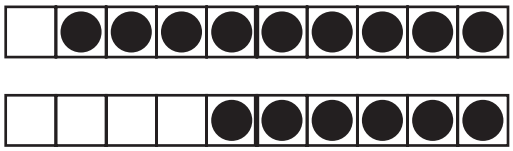

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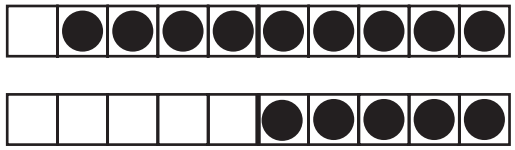

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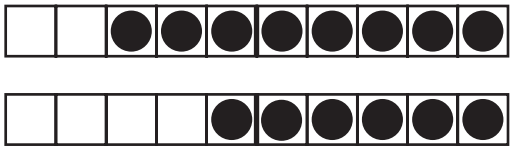
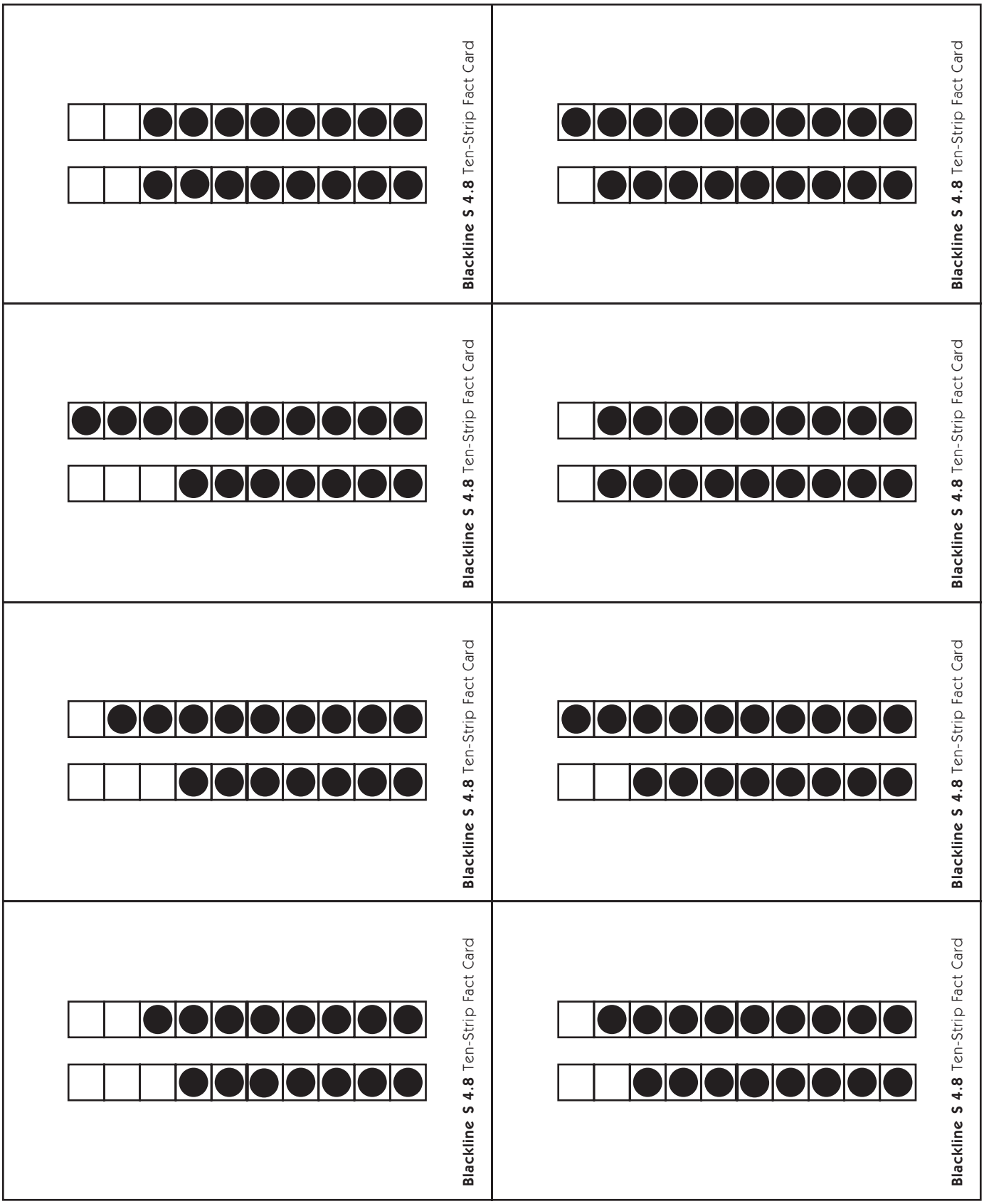


Blackline S 4.7 Ten-Strip Fact Card

Ten-Strip Fact Cards page 5 of 5



Support Activity 5 ★ Instructional Considerations

SUPPORT ACTIVITY

Make Half

Overview

Players take turns spinning a number from 1 to 10. They determine what number that number is half of and then uncover that number on their side of the game board. The first player to uncover all the even numbers from 2 to 20 wins.

Skills & Concepts

★ using models for subtraction combinations

★ fluency with the subtraction half facts

You'll need

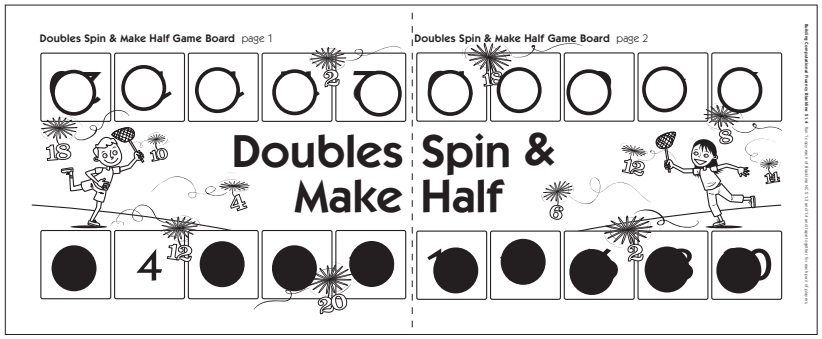
★ Doubles Spin & Make Half Game Board (Blacklines S 1.3 and 1.4, 1 copy of each, taped together, per pair of players)

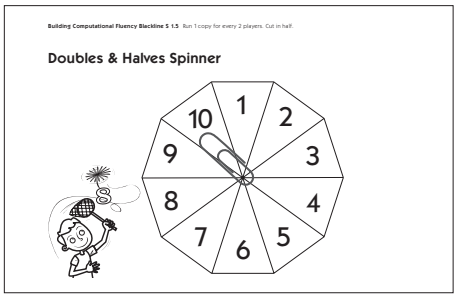
★ Doubles & Halves Spinner (Blackline S 1.5, 1 copy for every 2 pairs of players)

★ 10 game markers per player

★ paperclip and a pencil to use as a spinner (one set per pair of players)

Students' fluency with half facts relies on their understanding of doubles. If you find this game frustrating for students, have them go back to Doubles Roll for a warm-up.





Support Activity 5

SUPPORT ACTIVITY

Make Half

You'll need

★ Doubles Spin & Make Half Game Board (Blacklines S 1.3 and 1.4, 1 copy of each, taped together, per pair of players)

★ Doubles & Halves Spinner (Blackline S 1.5, 1 copy for every 2 pairs of players)

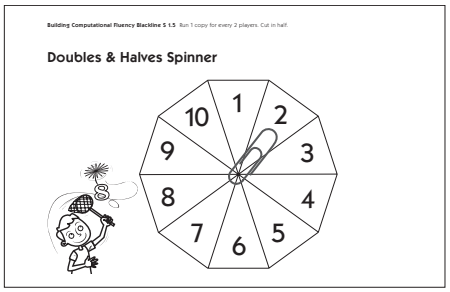
★ 10 game markers per player

★ paperclip and a pencil to use as a spinner (one set per pair of players)

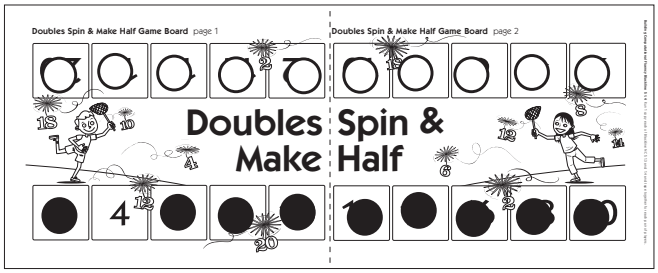
Instructions for Make Half

1 Get a partner and sit on opposite sides of the game board. Put a marker on each number on your side of the game board.

2 Take turns spinning the spinner. Identify the number as half of one of the numbers on your game board, and take the marker off that number. If the number is already uncovered, you'll have to pass.



For example, if you got a 2, you'd say, "Two is half of four," and uncover the 4 on your side of the game board. If you had already removed the marker from the 4, you would pass, and your partner would get his or her turn.



3 The player who uncovers all of his or her numbers first is the winner.

Support Activity 6 ★ Instructional Considerations

SUPPORT ACTIVITY

Spinning Around Subtraction

Overview

Players take turns spinning subtraction facts and naming the strategies that could be used to solve them. They pick one strategy for each fact and write a number sentence in the column labeled with that strategy name. The first player to record at least one fact in each column wins.

Skills & Concepts

★ using models to solve subtraction facts with minuends to 20

★ fluency with the half facts, run away ones, up to ten, and leftover subtraction facts

You'll need

★ Ten-Strips (Blackline S 1.6, 1 copy per player)

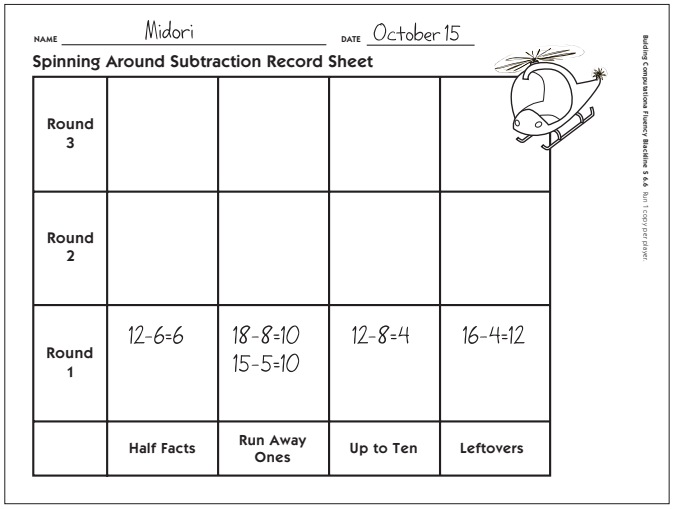
★ Spinning Around Subtraction Record Sheet (Blackline S 6.6, 1 copy per player)

★ Spinning Around Subtraction Spinner (Blackline S 6.5, 1 copy for every 2 pairs of players)

★ 20 game markers per player

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

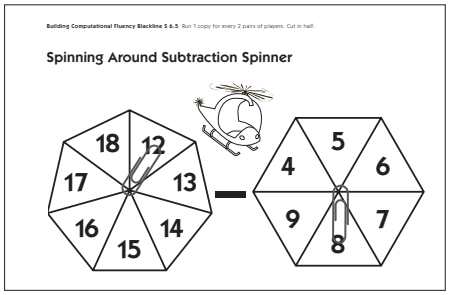
While they play, encourage students to show how they found the differences using game markers on the ten-strips, especially for up to ten and leftover facts. When students focus on the strategies they're using to solve these subtraction facts and connect those strategies to the visual model, they become increasingly aware of the relationships between numbers. This focused practice builds computational fluency and flexibility.


NAME Midori DATE October 15

Spinning Around Subtraction Record Sheet

Round 3				
Round 2				
Round 1	12-6=6	18-8=10 15-5=10	12-8=4	16-4=12
	Half Facts	Run Away Ones	Up to Ten	Leftovers

Building Computational Fluency Blackline S 6.6 Run 1 copy per player.



The game of Spinning Around Subtraction focuses on four groups of subtraction facts: half facts, run away ones, up to ten facts, and leftover facts. Students may be familiar with these groups of facts, but we've included the following descriptions of them for your information.

Support Activity 6 Instructional Considerations (cont.)

Half Facts

A half fact is any fact in which the number being subtracted is half of the larger number. For example, 10 – 5 = 5 is a half fact, because 5 is half of 10. 12 – 6 = 6 is another half fact because 6 is half of 12. Students will begin to notice that with half facts, the difference and the number being taken away are equal.

Run Away Ones

These are facts in which the ones are subtracted from a teen number. The difference is always 10. Some examples of run away ones facts are 13 – 3 = 10 and 17 – 7 = 10.

Up to Ten

An up to ten fact is any fact in which 4, 5, 6, 7, 8, or 9 is subtracted from a number that is equal to or greater than 10. It capitalizes on children's natural inclination to count upward from the number being subtracted to find the answer. Counting up to ten and then on to the larger number is most useful when the number in the ones place of the minuend (the larger number) is less than the subtrahend (the smaller number). The following are both examples of up to ten facts:

$$\begin{array}{r} 12 \\ -\ 7 \\ \hline 5 \end{array}$$

"If I go up from 7 to 10, that's 3. Then 2 more gets me to 12. So I added 5 altogether. 12 minus 7 is 5."

$$\begin{array}{r} 15 \\ -\ 8 \\ \hline 7 \end{array}$$

"If I go up from 8 to 10, that's 2. Then 5 more gets me to 15. So I added 7 altogether. 15 minus 8 is 7."

Leftover Facts

The leftover facts are facts that don't fit into the categories above. Students will use their own strategies or combinations of familiar strategies to solve them.

Support Activity 6

SUPPORT ACTIVITY

Spinning Around Subtraction

You'll need

★ Ten-Strips (Blackline S 1.6, 1 copy per player)

★ Spinning Around Subtraction Record Sheet (Blackline S 6.6, 1 copy per player)

★ Spinning Around Subtraction Spinner (Blackline S 6.5, 1 copy for every 2 pairs of players)

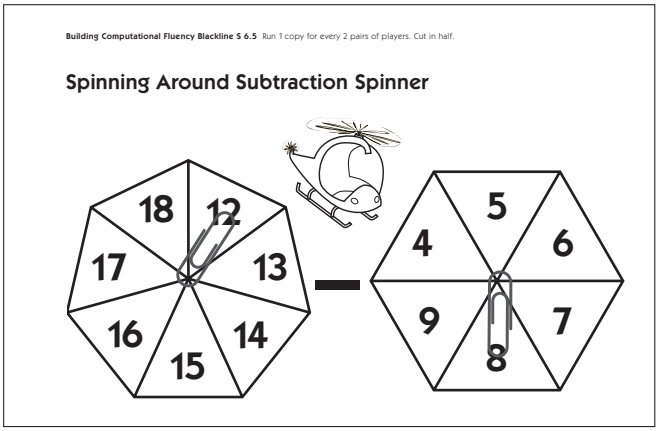
★ 20 game markers per player

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

Instructions for Spinning Around Subtraction

1 Each player needs a copy of the ten-strips, game markers, and a record sheet with his or her name and today's date.

2 The first player spins both spinners and figures out what kind of subtraction fact is shown. Players can help each other if they can't remember what kind of fact it is.

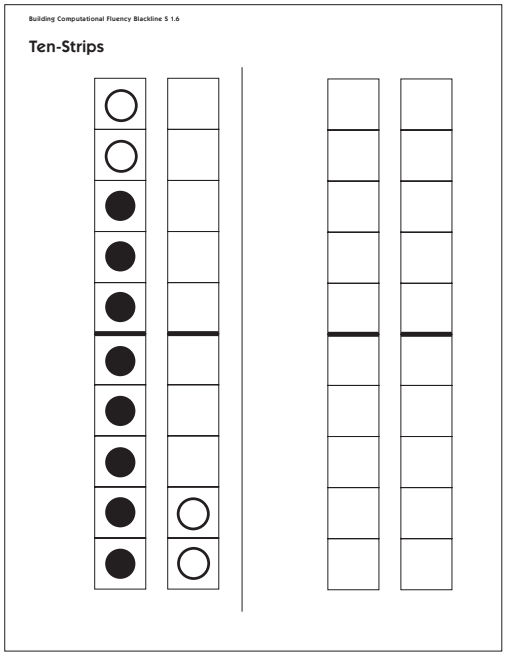


Omar *12 minus 8. Hmm, I think that's an up to ten fact. Those are hard to remember, though.*

Leela *I think you're right Omar. We'll go from 8 up to 10 and then from 10 to 12.*

The player uses game markers to build the fact on his ten-strips and explains to his partner how he would find the difference.

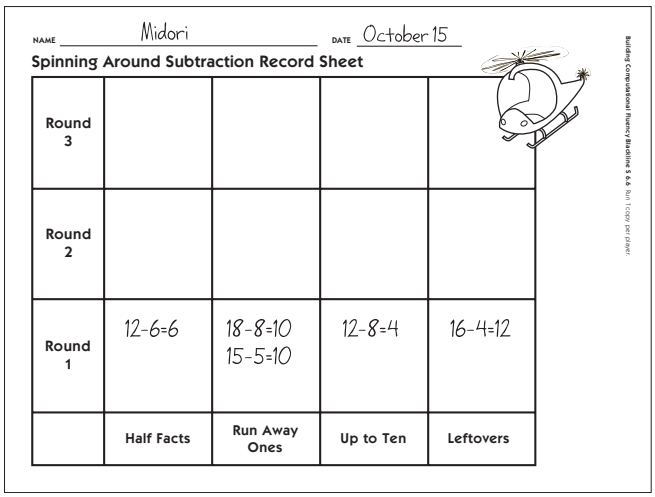
Support Activity 6 (cont.)



Omar *I put down 8 markers and then I added 2 more. 8 plus 2 makes 10, and then I need just 2 more to equal 12. See, the 8 is blue, and then the red markers show what the difference is. It's 4. So 12 minus 8 is 4.*

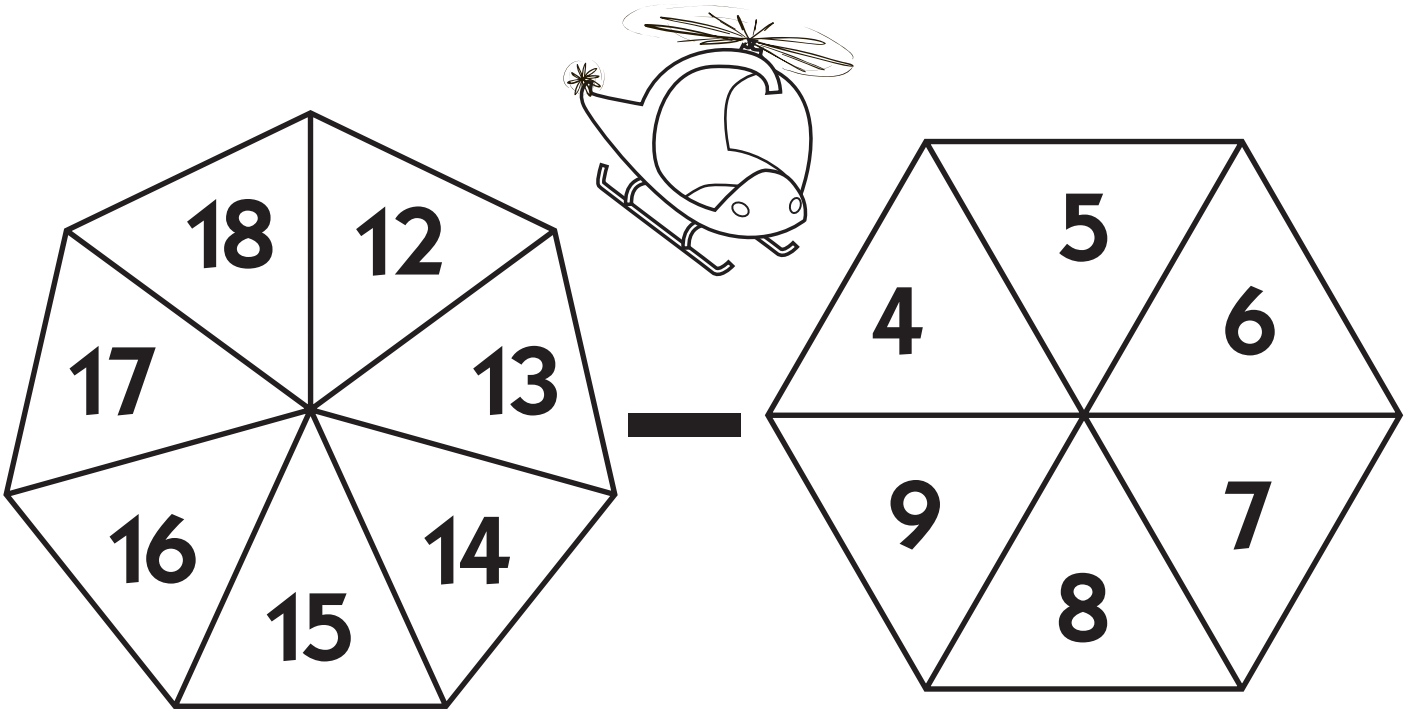
3 The player writes the number sentence for that fact in the appropriate column. Some facts might be more than one kind of fact. For example, 12 – 6 could be a half fact or an up to ten fact. Players can choose the column in which they want to write those facts.

4 The player who completes a row across first wins. A player might have more than one fact in each box before she is able to write at least one fact in every box.

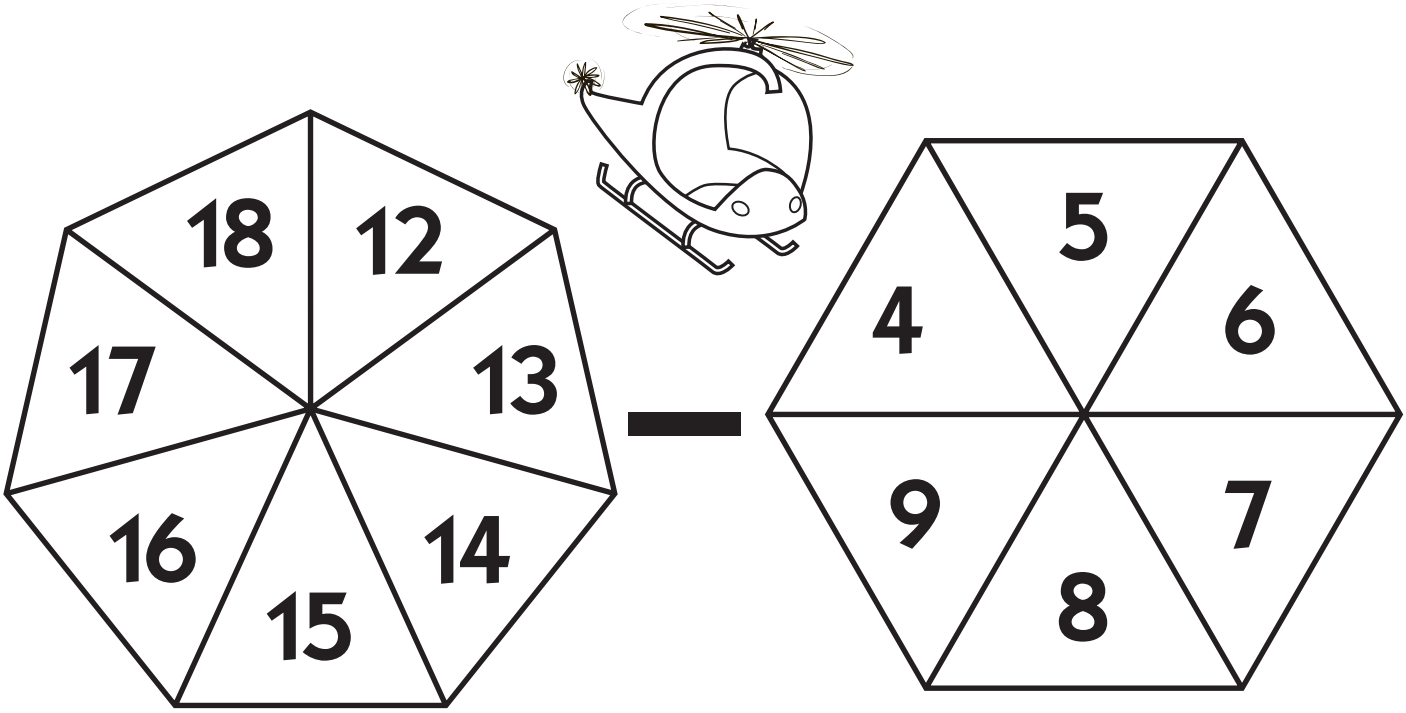


5 Play 3 rounds.

Spinning Around Subtraction Spinner

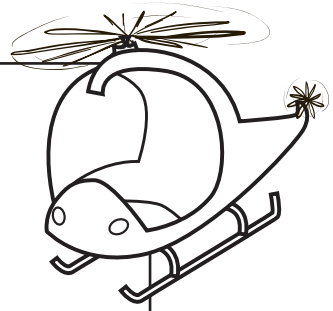


Spinning Around Subtraction Spinner



NAME _____ DATE _____

Spinning Around Subtraction Record Sheet



Round 3				
Round 2				
Round 1				
	Half Facts	Run Away Ones	Up to Ten	Leftovers

Support Activity 7 ★ Instructional Considerations

SUPPORT ACTIVITY

Make 100

Overview

Players take turns drawing cards showing double-digit numbers and coloring the numbers on a Number Chart. Each player can draw no more than 3 cards. Players find their sums, and the player closest to 100 (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

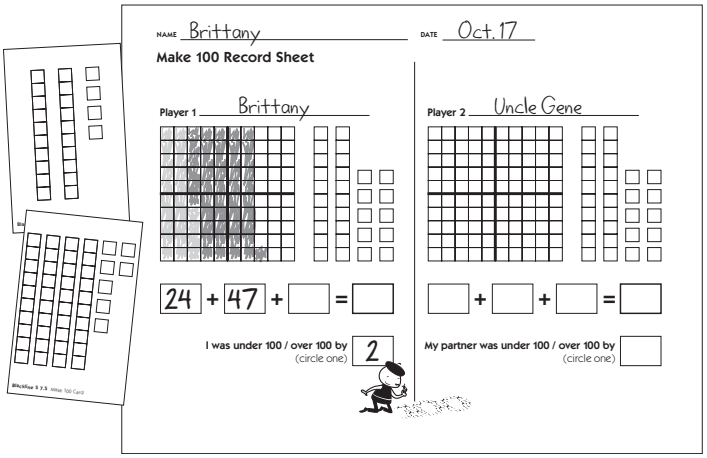
★ Make 100 Record Sheet (Blackline S 7.4, 2 copies run back-to-back per player)

★ Make 100 Cards, pages 1–3 (Blacklines S 7.5–7.7, 1 copy, cut apart, for each pair of players)

★ crayons

Make 100 provides students with more opportunities to add 2-digit numbers and use a visual model to find the difference between 100 and other numbers. Students also 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, we prefer to model coloring 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 7

SUPPORT ACTIVITY

Make 100

You'll need

★ Make 100 Record Sheet (Blackline S 7.4, 2 copies run back-to-back per player)

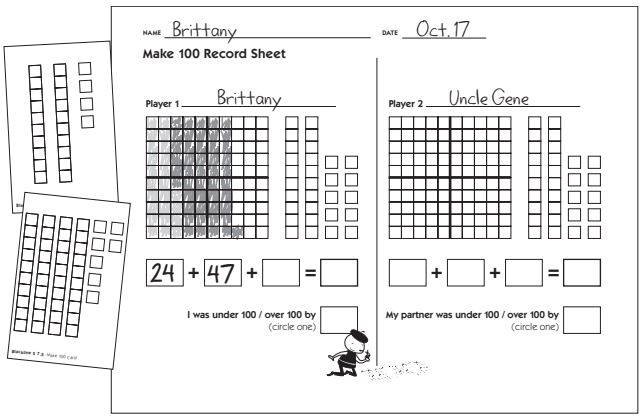
★ Make 100 Cards, pages 1–3 (Blacklines S 7.5–7.7, 1 copy, cut apart, for each pair of players)

★ 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 should 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.



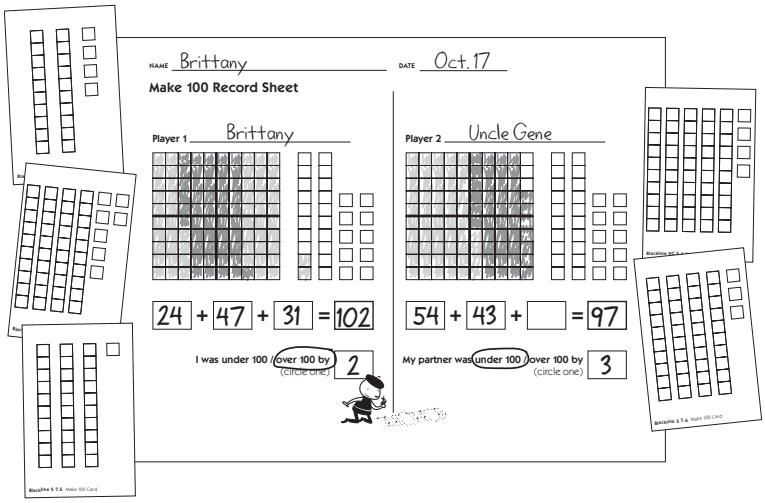
3 The other player takes 2 cards. Both players record the numbers in the boxes and color in the amounts on their Number Charts.

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

Support Activity 7 (cont.)

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 pictured to the right. Those are there in case you go over 100.

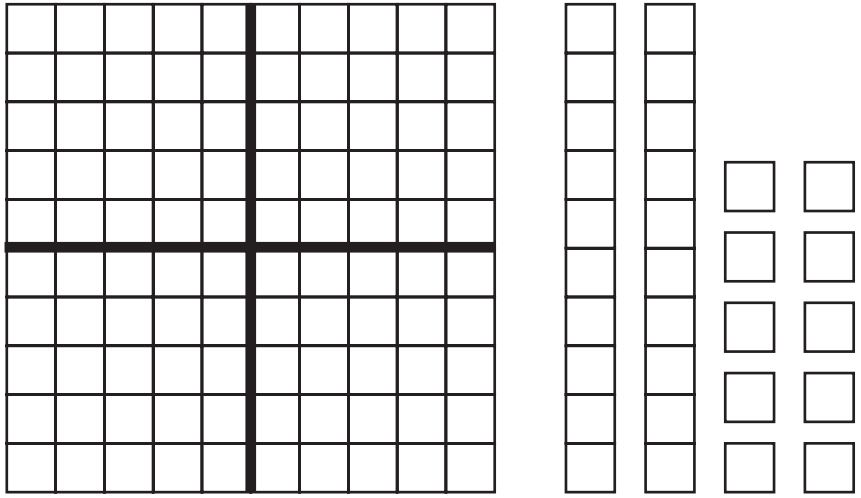
6 Add up the totals and compare to see who came closest to 100. Circle the winner, turn the record sheet over, and play again.



NAME _____ DATE _____

Make 100 Record Sheet

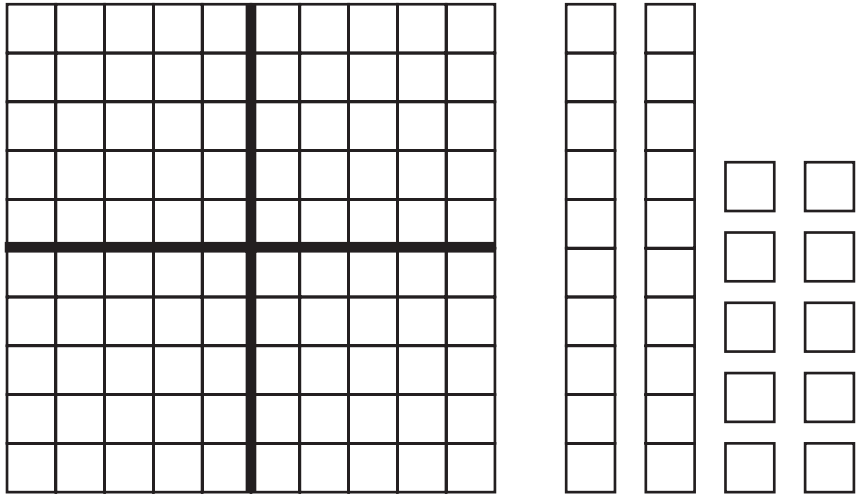
Player 1 _____



_____ + _____ + _____ = _____

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

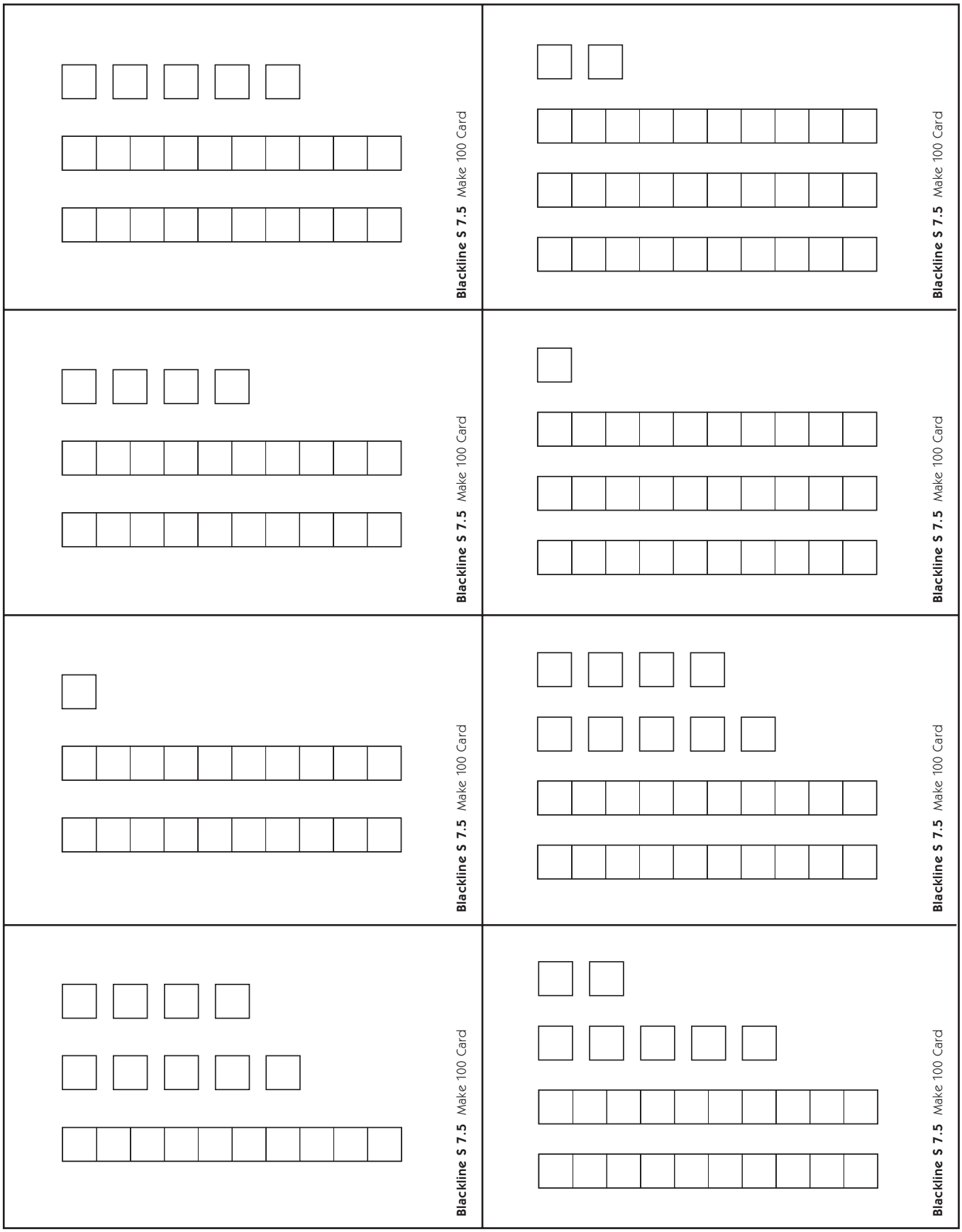
Player 2 _____



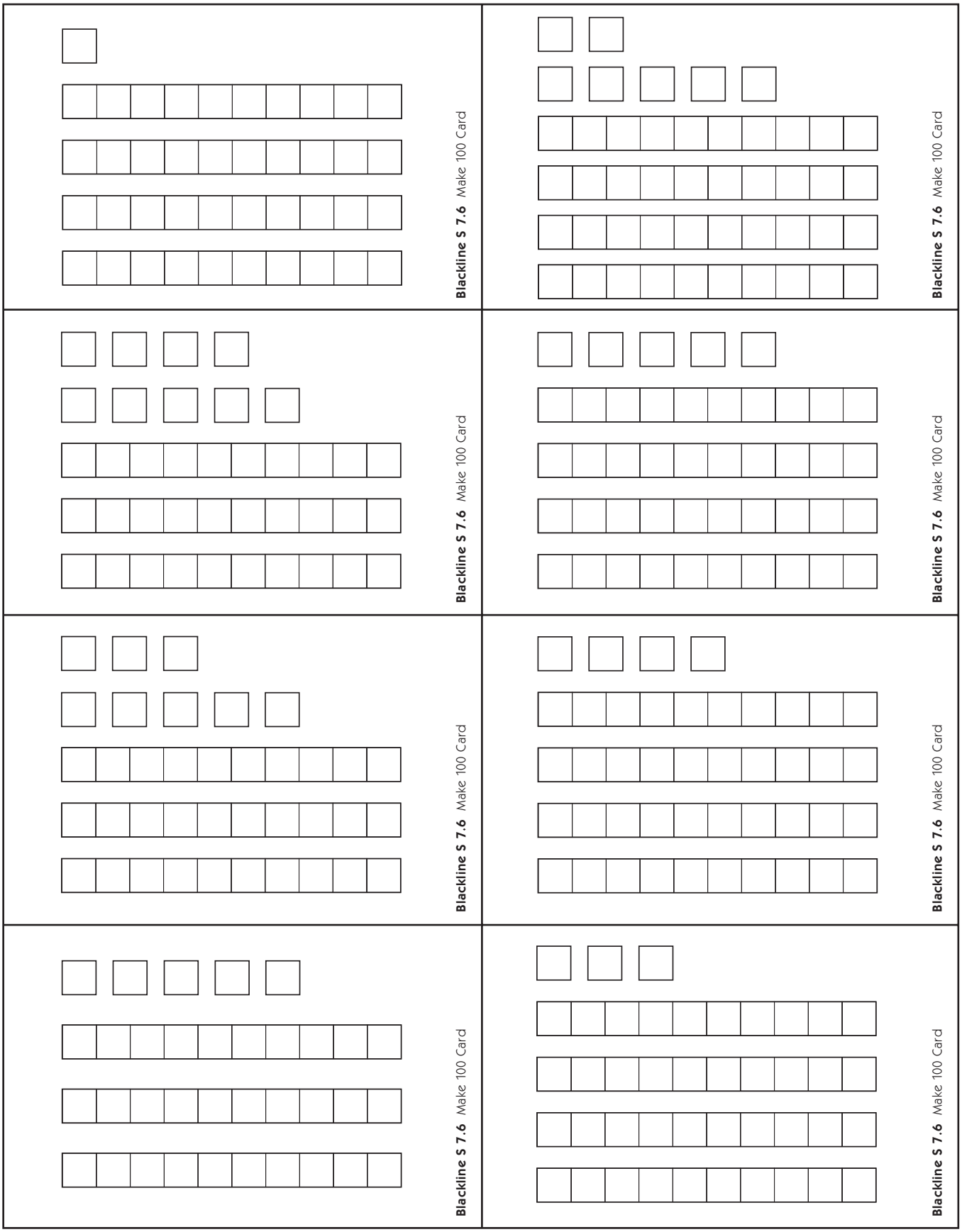
_____ + _____ + _____ = _____

My partner was under 100 / over 100 by _____
(circle one)

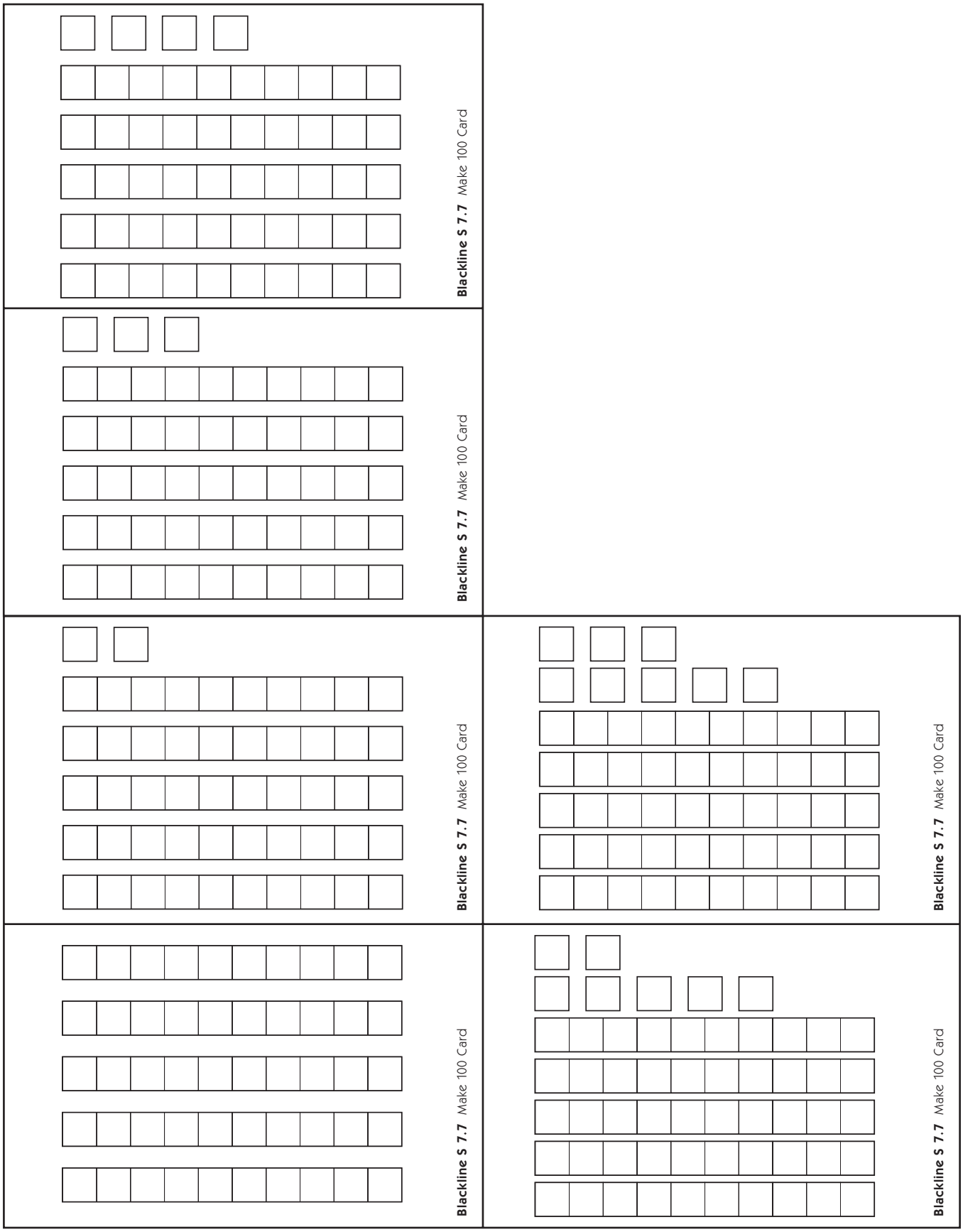
Make 100 Cards page 1 of 3



Make 100 Cards page 2 of 3



Make 100 Cards page 3 of 3



Support Activity 8 ★ Instructional Considerations

SUPPORT ACTIVITY

Race to 100 & Back

Overview

Players take turns spinning two single-digit numbers, adding them together, and adding that total to their collections of base ten pieces. Players add to their collections until they reach 100 when they begin subtracting each total from their collections. The first player to make it back to 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

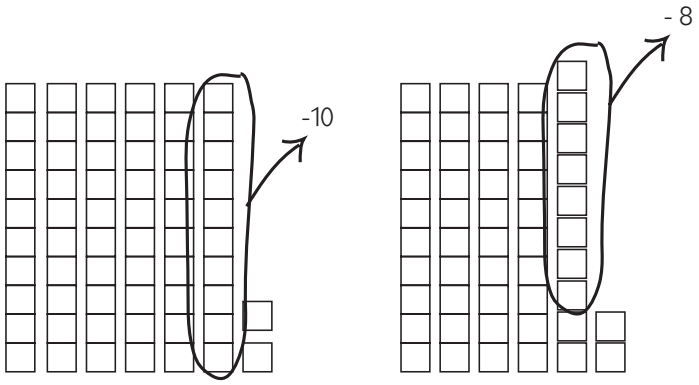
You'll need

★ Race to 100 & Back Spinner (Blackline S 8.5, 1 copy for every 2 pairs of players)

★ 1 set of base ten pieces for each pair of players (Use Blacklines S 8.6 and 8.7 to make your own base ten pieces if needed.)

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

Most third graders, especially with use of the base ten pieces, will find addition with regrouping easier than subtraction with regrouping. For example, when students are asked to remove 18 from a collection of 62, 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.



62 – 10 = 52 52 – 8 = 44

Encourage students 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.

Support Activity 8 (cont.)

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

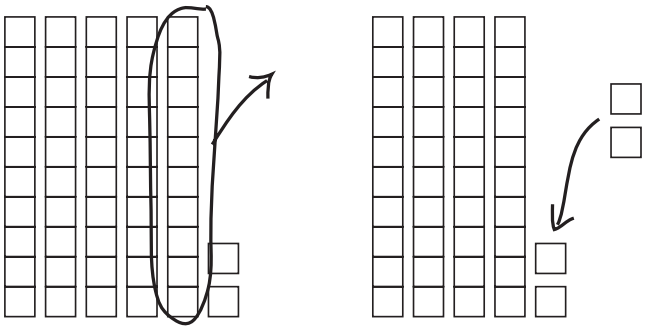
Andre *Well, I know 18 is like 10 plus 8. So first I took 1 ten away from 62.*

Teacher *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 number sentences to show what I hear you saying.

Andre *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 8

SUPPORT ACTIVITY

Race to 100 & Back

You'll need

★ Race to 100 & Back Spinner (Blackline S 8.5, 1 copy for every 2 pairs of players)

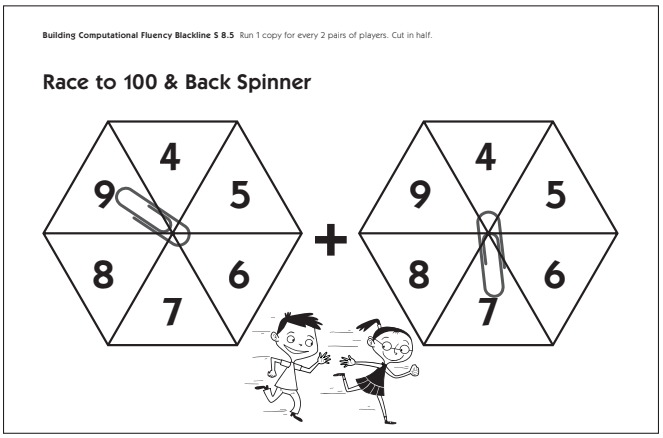
★ 1 set of base ten pieces for each pair of players (Use Blacklines S 8.6 and 8.7 to make your own base ten pieces if needed.)

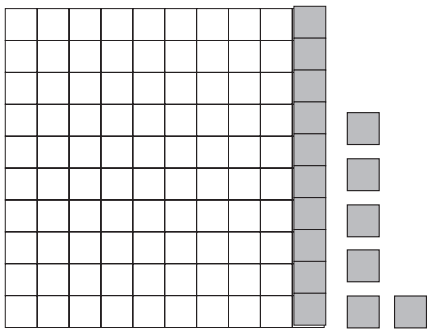
★ paperclip and pencil for use as a spinner (1 set for each pair of players)

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 many tens and ones from your collection of base ten pieces. 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.



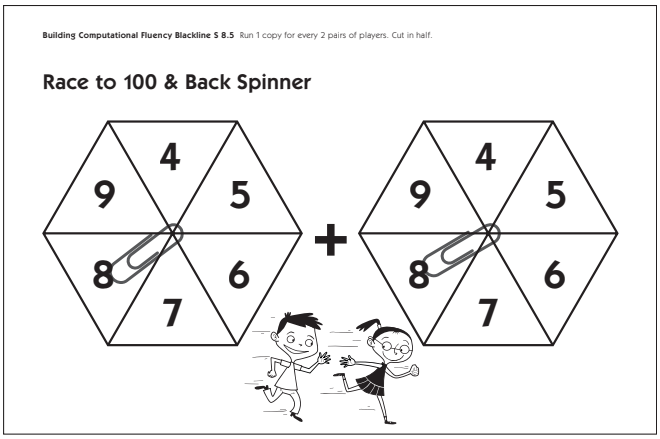


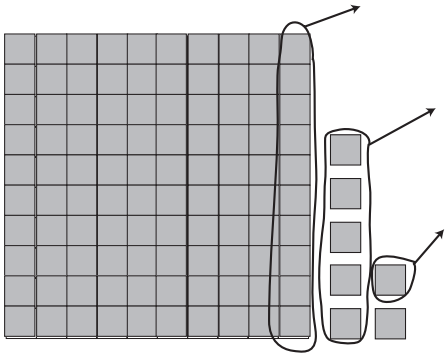
"I got 9 plus 7. That's a fast nine. I know it's 16. So that's 1 ten and 6 ones. I'll put this ten on the hundred, and then I'll put these 6 over to the side, because when I get more ones, I can trade them in for another ten."

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

Support Activity 8 (cont.)

have a turn, you'll 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.

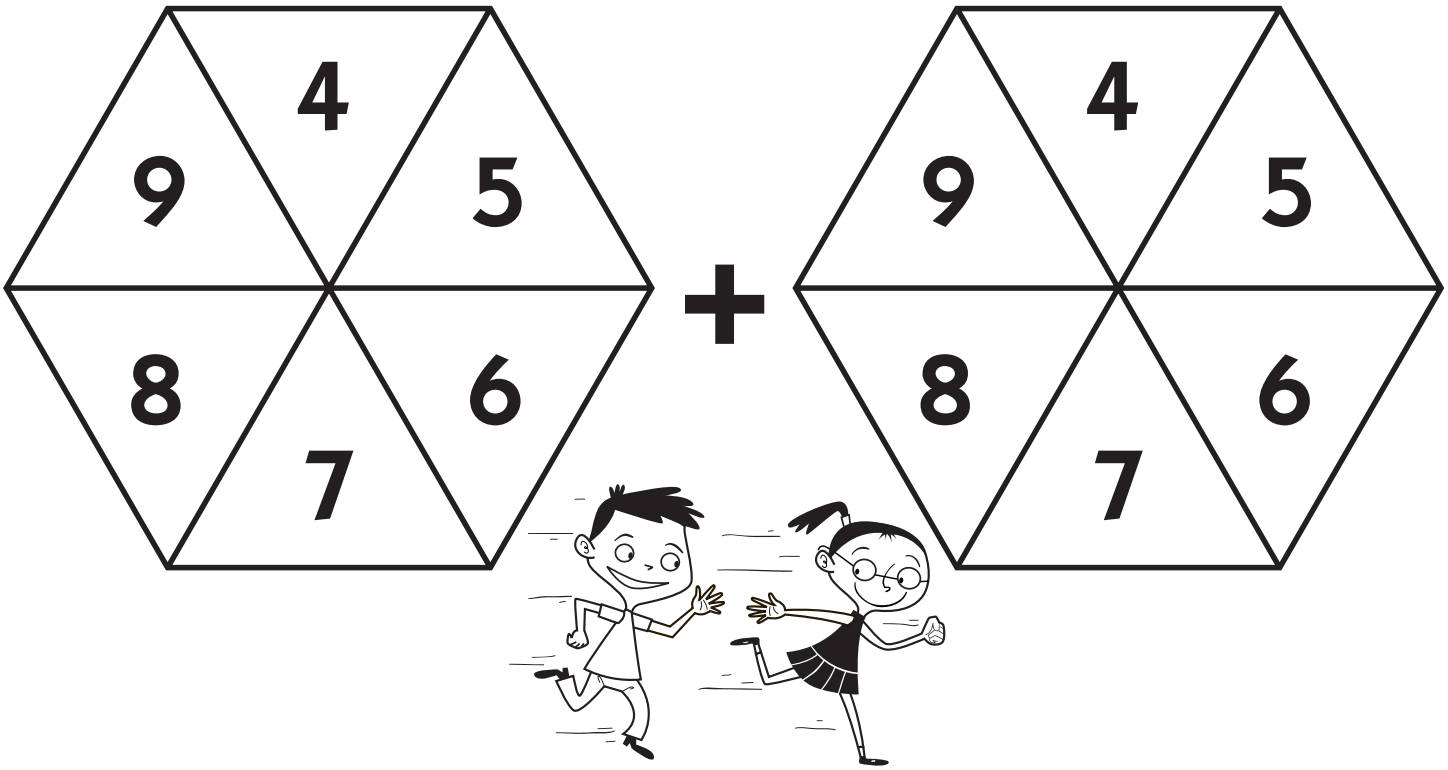




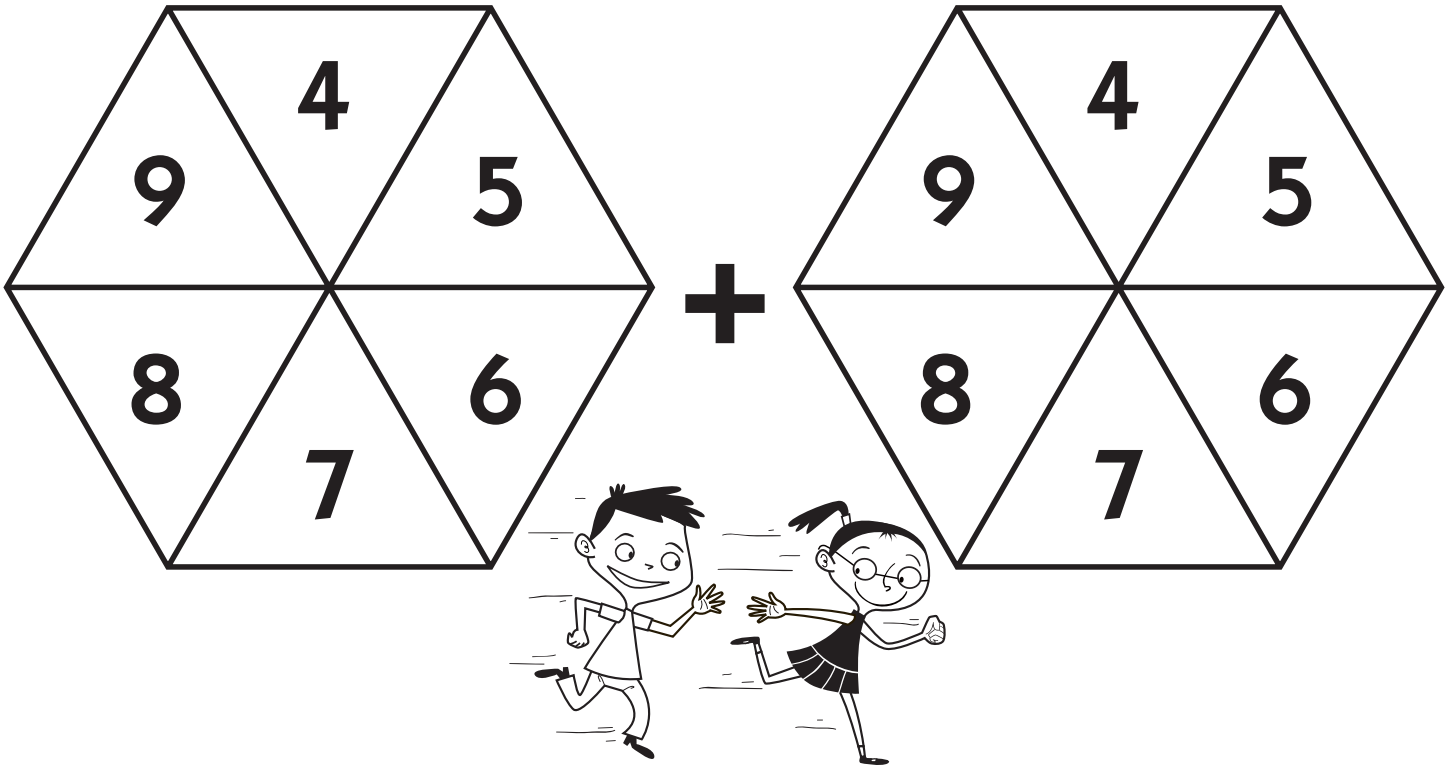
"I got 8 plus 8. That's 16. So I'll take away a ten and then 6 of these ones. So I have 91 left."

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

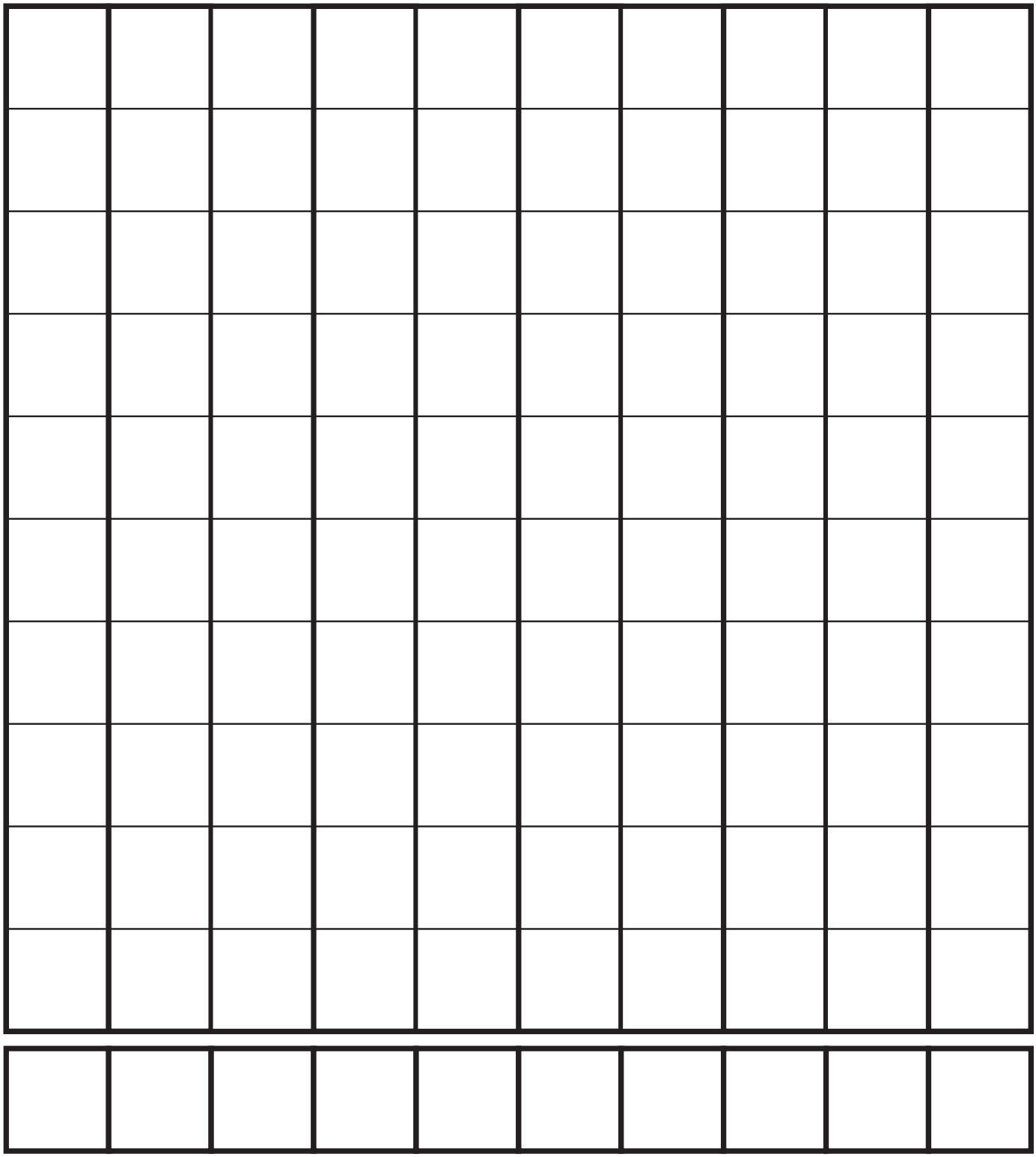


Race to 100 & Back Spinner



Base Ten Pieces page 1 of 2

Base Ten Pieces page 2 of 2



Support Activity 9 ★ Instructional Considerations

SUPPORT ACTIVITY

Three Turns to Win

Overview

Each player gets 3 spins to generate a collection of mixed coins. The players determine how much money they have each collected. The player with the most money wins.

Skills & Concepts

★ counting, adding, subtracting, and estimating money amounts up to $5

★ counting by 1's, 5's, 10's, and 25's

★ adding and subtracting 2- and 3-digit numbers

You'll need

★ Three Turns to Win Game Board (Blackline S 9.3, 1 copy for each pair of players)

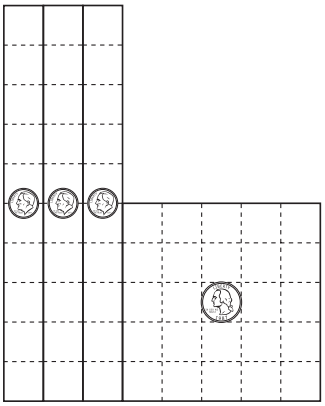
★ 1 set of money value pieces for each pair of players (Use Blacklines S 9.4–9.6 to make your own money value pieces if needed.)

★ 1 money kit for each player (containing real or plastic and paper money)

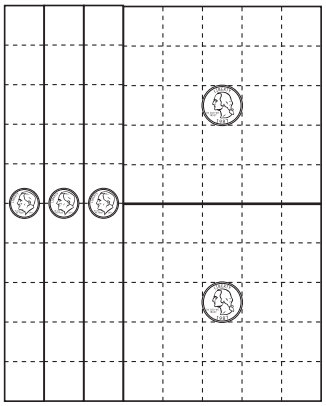
★ pencil and paperclip to use as a spinner (one set for each pair of players)

As you play this game with the student, invite her to tell you how much money she has so far. You can also ask her to compare her collection to yours. First, ask her to estimate who has more money and about how much more that player has. Then, ask her to find the exact difference between the two collections.

Some students may not be ready to compare the collections as they play this game. If a student is having trouble, give him a set of money value pieces to keep track of how much money you and he collect. Each money value piece shows the coin and its value together. Students who are struggling often find it easier to understand the value of money when it is represented on this visual model.



Player 1 3 dimes plus 1 quarter



Player 2 2 quarters plus 3 dimes

Support Activity 9

SUPPORT ACTIVITY

Three Turns to Win

You'll need

★ Three Turns to Win Game Board (Blackline S 9.3, 1 copy for each pair of players)

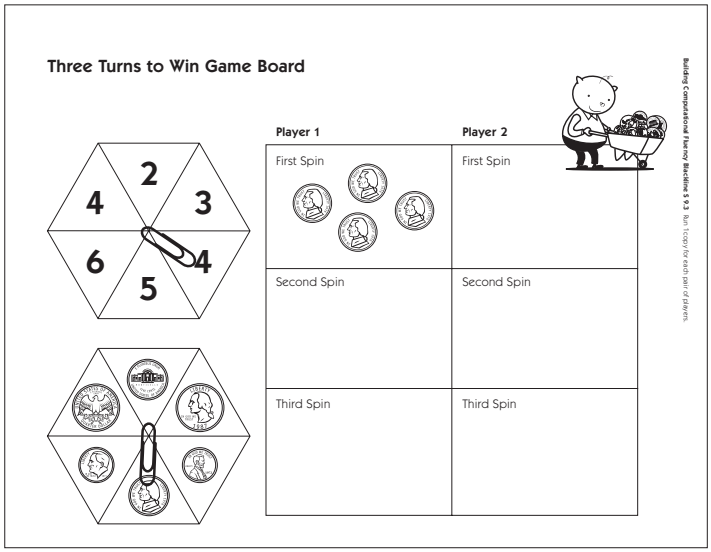
★ 1 set of money value pieces for each pair of players (Use Blacklines S 9.4–9.6 to make your own money value pieces if needed.)

★ 1 money kit for each player (containing real or plastic and paper money)

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

Instructions for Three Turns to Win

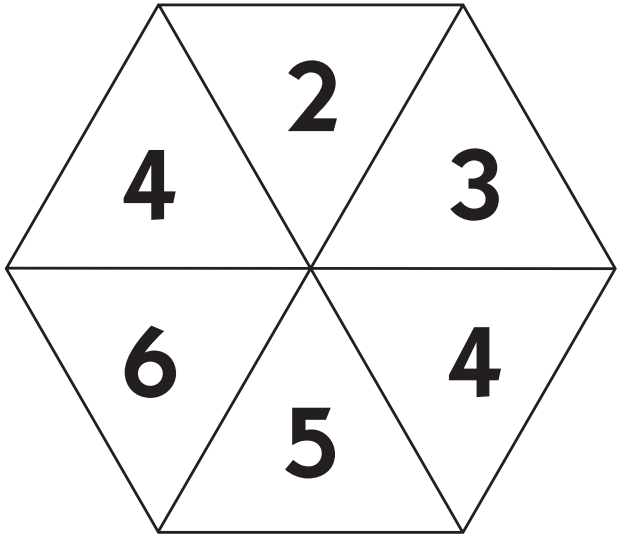
1 Get your own money kit and a game board to share.

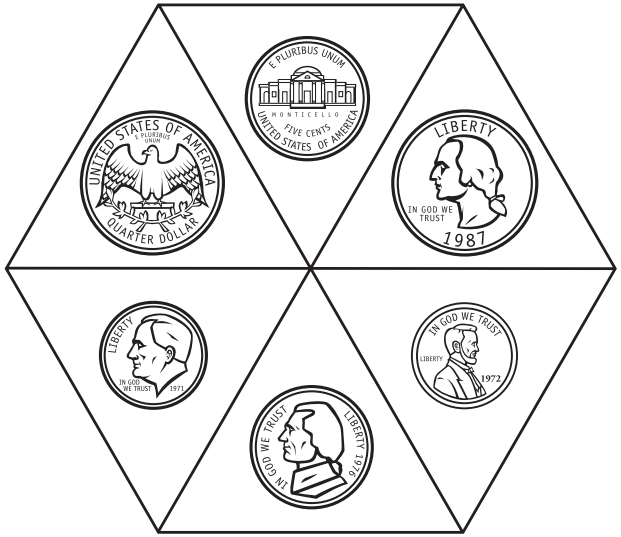


2 Take turns spinning both spinners. They will tell you how many and what kind of coin to collect. Place those coins in the appropriate box. You have a separate box for each spin.

3 When both players have taken 3 turns, find the total value of each player's coin collection. Then compare the collections. Who has more money? How much more money does he or she have than the other player?

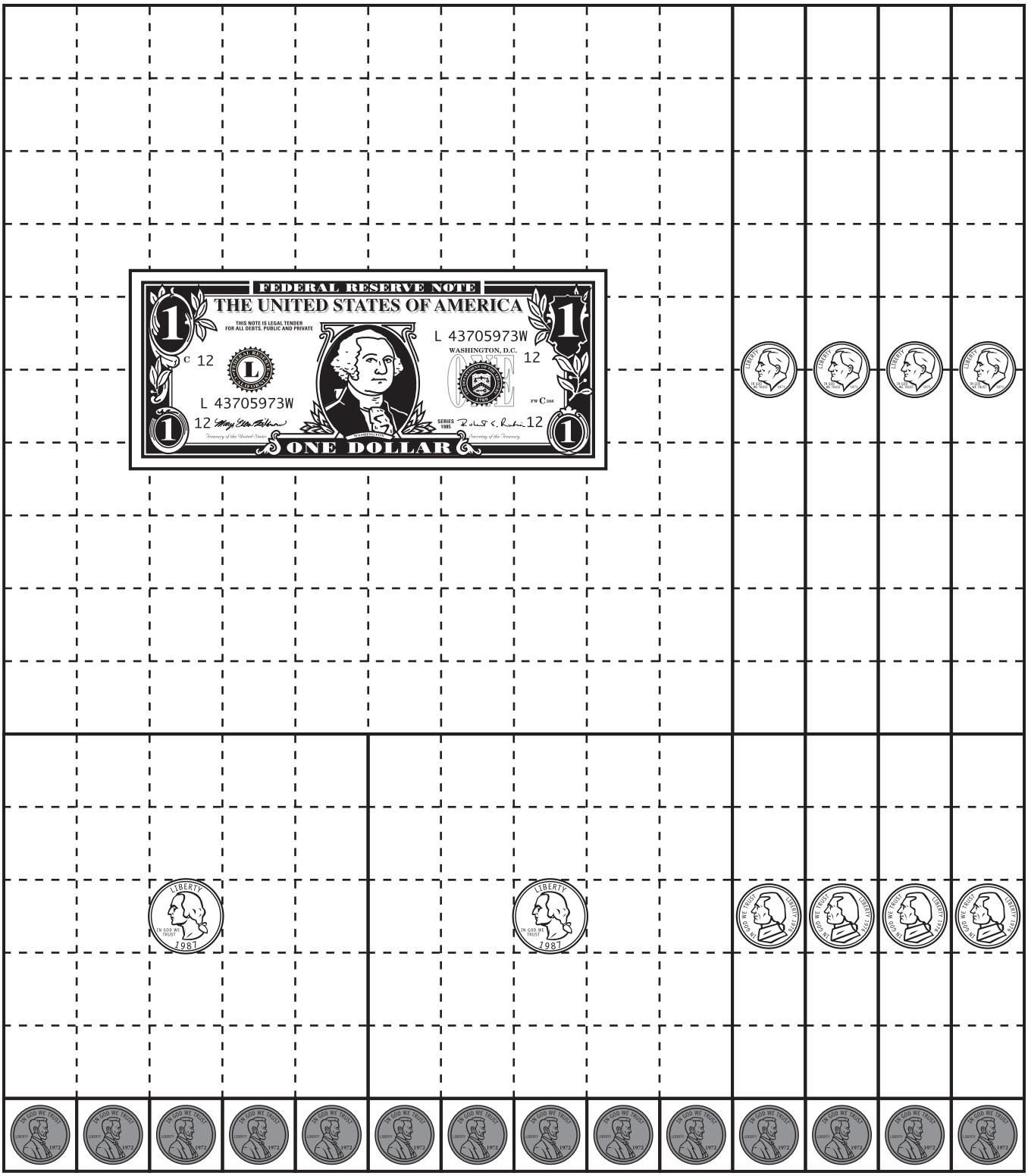
Three Turns to Win Game Board



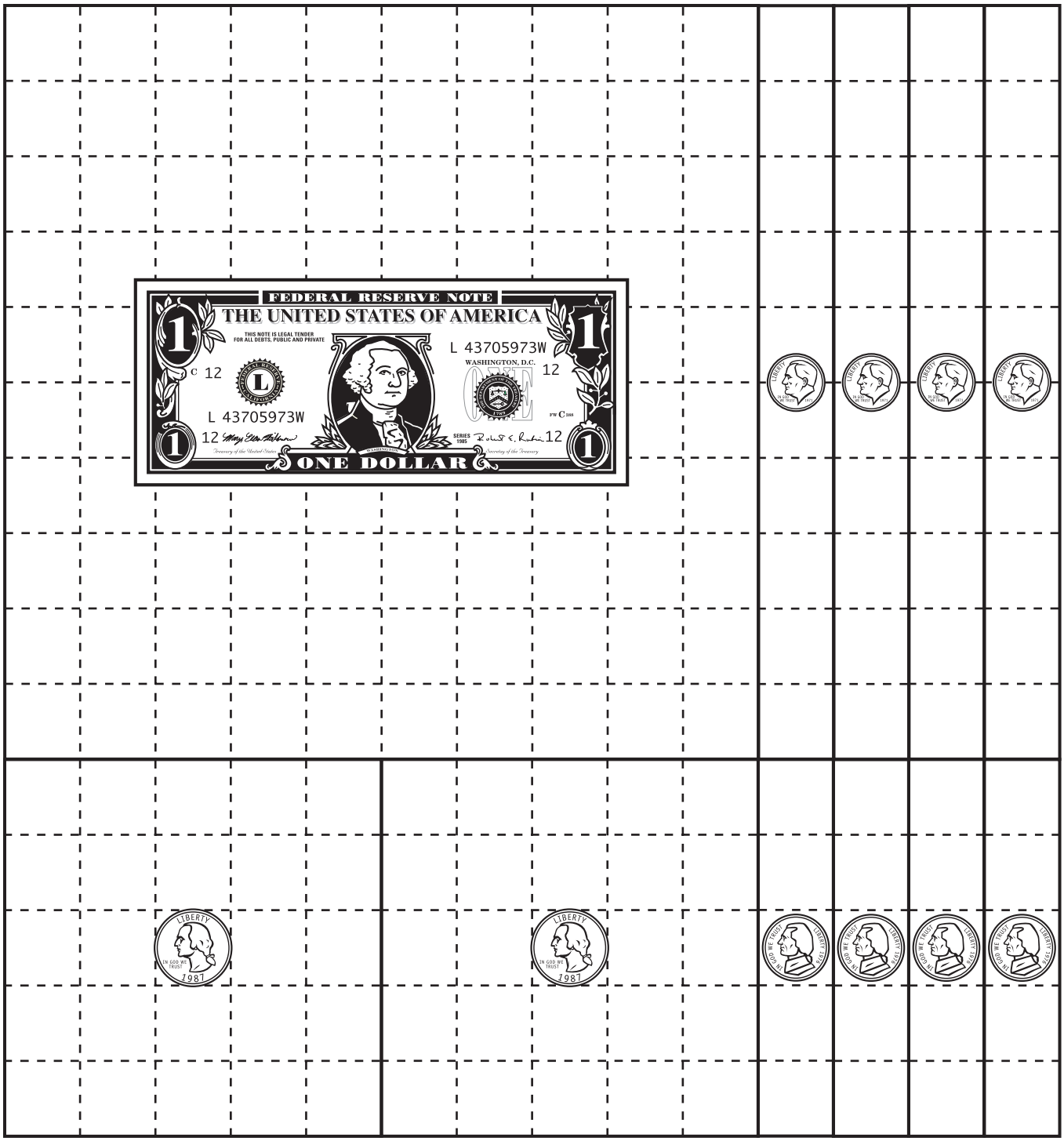


Player 1	Player 2
First Spin	First Spin
Second Spin	Second Spin
Third Spin	Third Spin

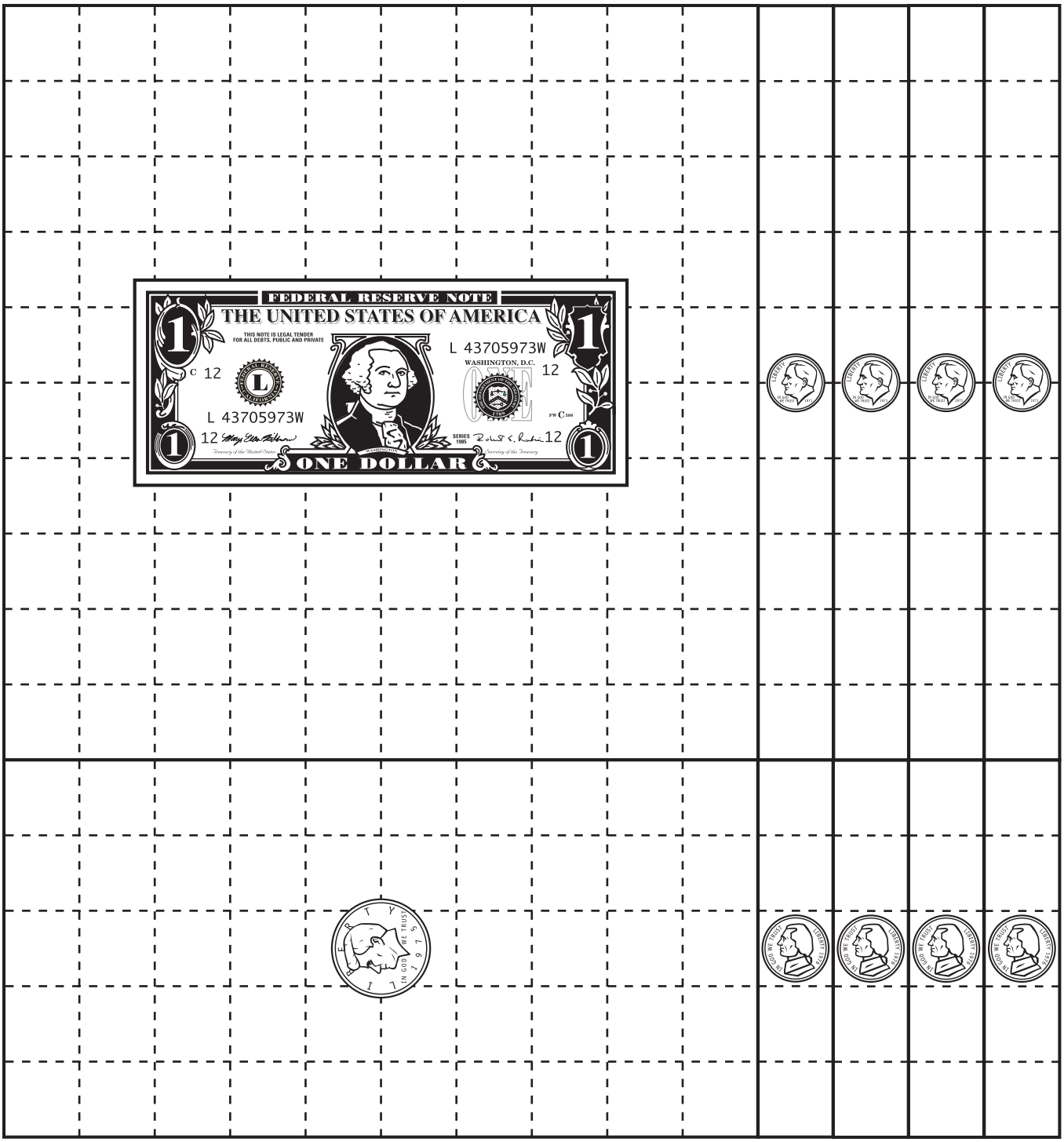
Money Value Pieces page 1 of 3



Money Value Pieces page 2 of 3



Money Value Pieces page 3 of 3



Support Activity 10 ★ Instructional Considerations

SUPPORT ACTIVITY

Finish with $4

Overview

In this narrative game, players each begin with $2 and travel around a game board where each space has them add or subtract money to or from their collections. The first player to make it around the board with at least $4 wins.

Skills & Concepts

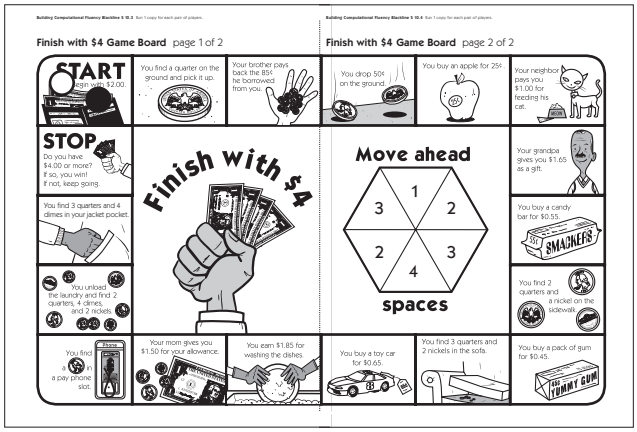
- ★ counting, adding, subtracting, and estimating money amounts up to $5
- ★ identifying and applying the operation needed to solve a problem
- ★ using models, pictures, and/or numbers to demonstrate the meaning of addition and subtraction
- ★ translating problem-solving situations into expressions and equations

You'll need

- ★ Finish with $4 Game Board (Blacklines S 10.3 and 10.4, 1 copy of each page taped together for each pair of players)
- ★ 1 set of money value pieces for each pair of players (Use Blacklines S 9.4–9.6 to make your own money value pieces if needed.)
- ★ 1 game marker for each player
- ★ pencil and paperclip to use as a spinner (1 set for each pair of players)
- ★ money kits (1 for each player or pair of players)
- ★ pencil and scratch paper for writing number sentences and computing

Encourage students to keep track of their money during this game using real or plastic and paper coins and bills. Some students might prefer to use the money value pieces to keep track of their money.

This game is not meant to be a test of students' reading skills. Encourage them to read the words on their own, but don't hesitate to read out loud for them if needed. Each time you or the student lands on a new space, invite the student to explain what's happening. Will she add money to her collection or subtract money from her collection? How could the problem be written as a number sentence? We want students to develop the ability to translate situations into appropriate and meaningful mathematical problems.



Support Activity 10

SUPPORT ACTIVITY

Finish with $4

You'll need

★ Finish with $4 Game Board (Blacklines S 10.3 and 10.4, 1 copy of each page taped together for each pair of players)

★ 1 set of money value pieces for each pair of players (Use Blacklines S 9.4–9.6 to make your own money value pieces if needed.)

★ 1 game marker for each player

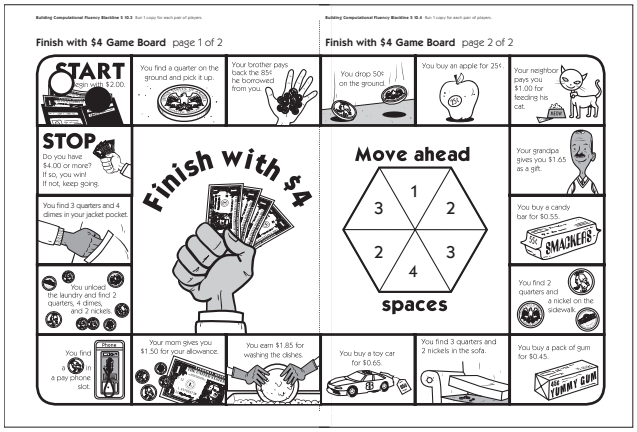
★ pencil and paperclip to use as a spinner (1 set for each pair of players)

★ money kits (1 for each player or pair of players)

★ pencil and scratch paper for writing number sentences and computing

Instructions for Finish with $4

1 Begin by placing your game markers on the start space. Each player begins with $2.00.



2 Take turns spinning the spinner. 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 decides whether he should add money to his collection or take money away from his collection. He decides what the problem is and shows it with a number sentence.

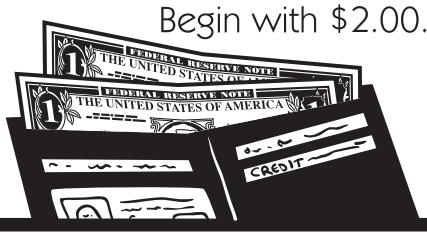
4 Players keep track of their money using coins and bills, numbers, or money value pieces if they have them.

5 The first player to get to the last space with at least $4.00 wins.

Finish with $4 Game Board page 1 of 2

START

Begin with $2.00.



You find a quarter on the ground and pick it up.

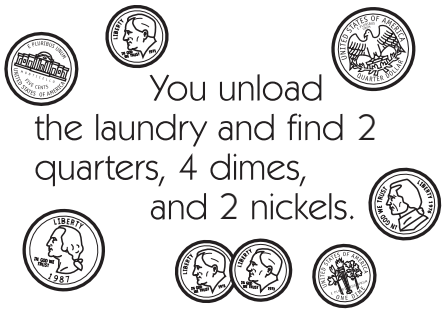
Your brother pays back the 85¢ he borrowed from you.

STOP

Do you have $4.00 or more?
If so, you win!
If not, keep going.

You find 3 quarters and 4 dimes in your jacket pocket.

You unload the laundry and find 2 quarters, 4 dimes, and 2 nickels.



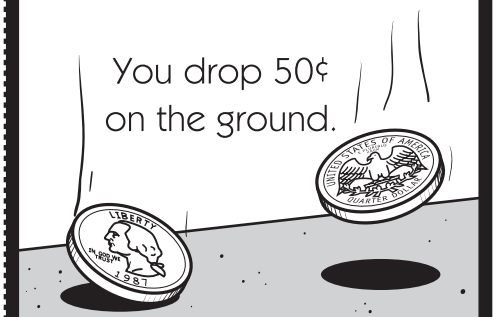
You find a  in a pay phone slot.

Your mom gives you $1.50 for your allowance.

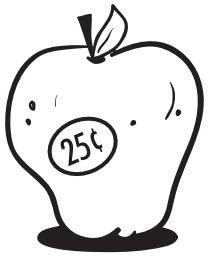
You earn $1.85 for washing the dishes.

Finish with $4 Game Board page 2 of 2

You drop 50¢ on the ground.

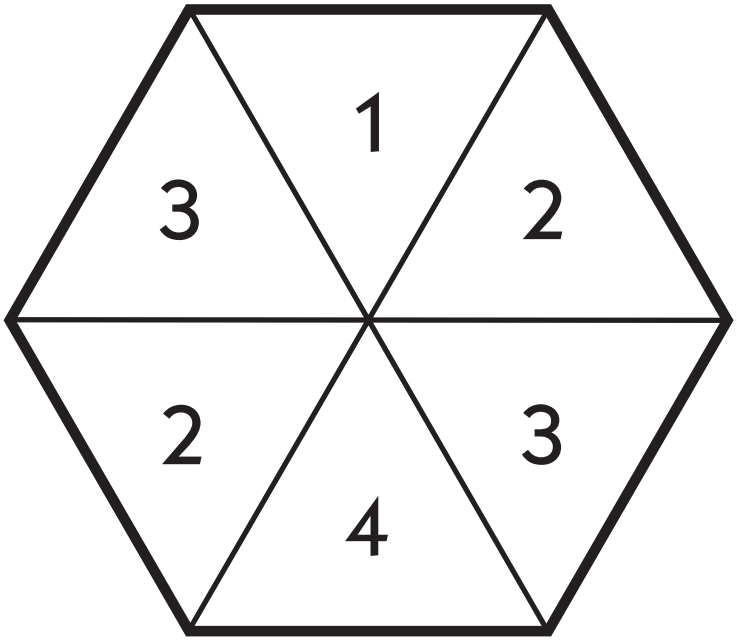


You buy an apple for 25¢.



Your neighbor pays you $1.00 for feeding his cat.

Move ahead

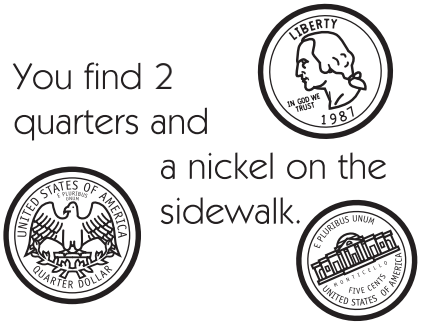


spaces

Your grandpa gives you $1.65 as a gift.

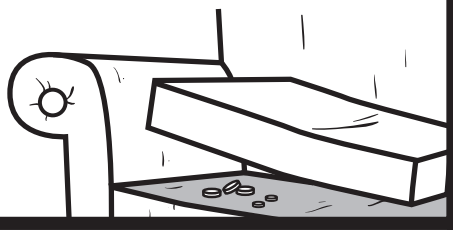
You buy a candy bar for $0.55.

You find 2 quarters and a nickel on the sidewalk.



You buy a toy car for $0.65.

You find 3 quarters and 2 nickels in the sofa.



You buy a pack of gum for $0.45.

Support Activity 11 ★ Instructional Considerations

SUPPORT ACTIVITY

Count Down 400

Overview

Players subtract 4 two-digit numbers from 400 using Number Charts as a visual model. The player who gets closest to 0 after 4 turns wins.

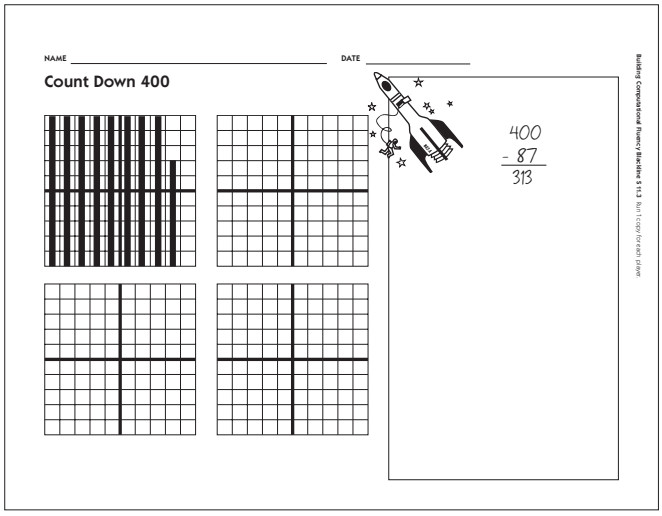
Skills & Concepts

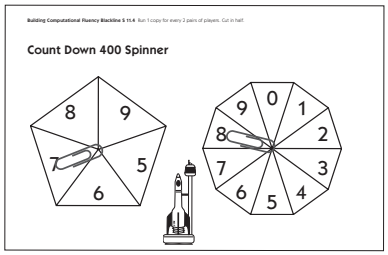
- ★ subtracting with and without regrouping using models and a variety of efficient paper/pencil and mental strategies
- ★ using estimation strategies to solve problems

You'll need

- ★ Count Down 400 (Blackline S 11.3, 1 copy per player)
- ★ Count Down 400 Spinner (Blackline S 11.4, 1 copy for every two pairs of players)
- ★ base ten pieces (optional) (Use Blacklines S 8.6 and 8.7 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 11

SUPPORT ACTIVITY

Count Down 400

You'll need

★ Count Down 400 (Blackline S 11.3, 1 copy per player)

★ Count Down 400 Spinner (Blackline S 11.4, 1 copy for every two pairs of players)

★ base ten pieces (optional) (Use Blacklines S 8.6 and 8.7 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

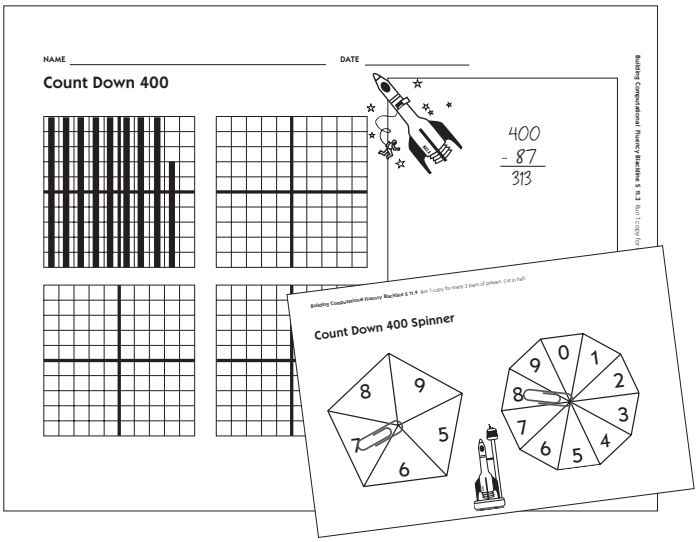
Instructions for Count Down 400

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 a number sentence to show what's left. (See illustration.)

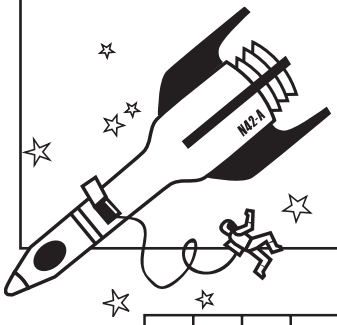
4 Now it's your partner's turn. Share your computation strategies and double-check each other's work. Use the base ten pieces if you'd like. Record each turn in a different color crayon or pencil on the grids.



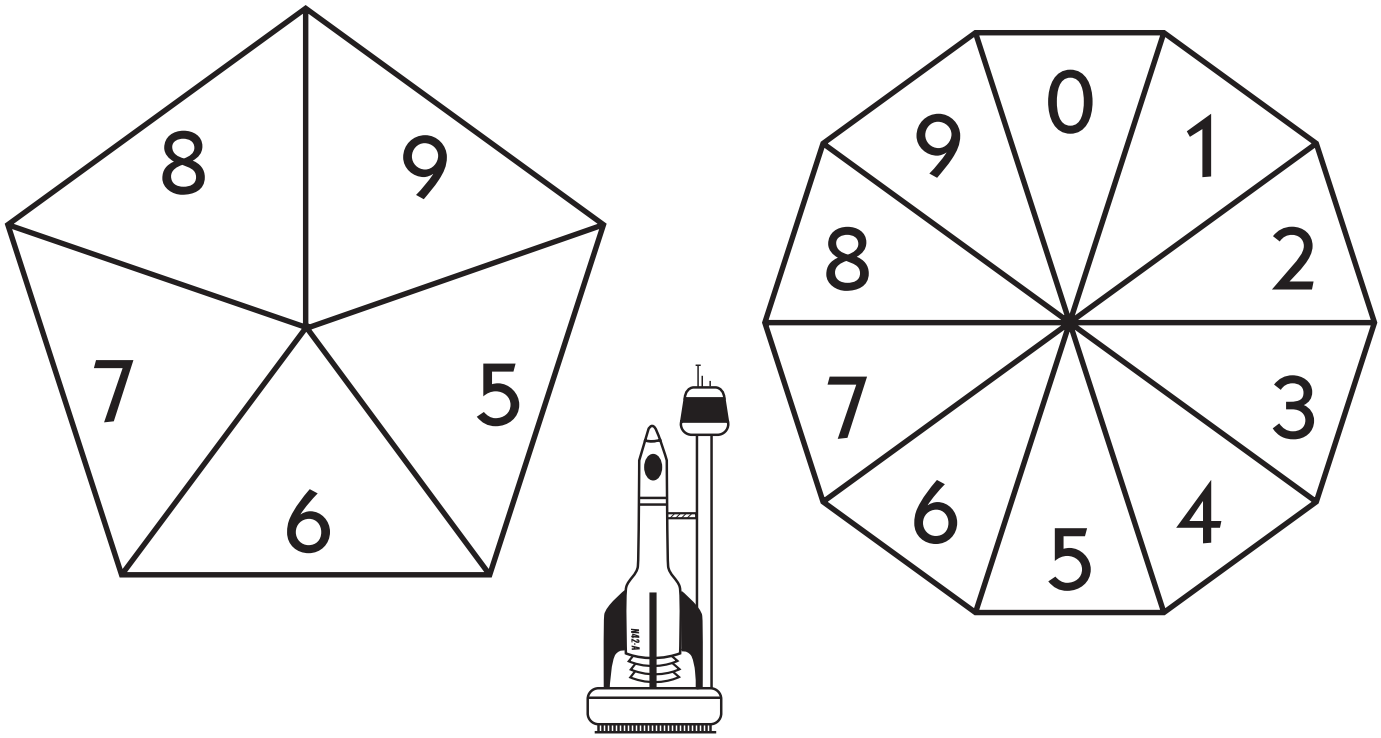
5 After 4 turns, compare how much you both have left on your grids. Estimate and then compute the difference. Share your thinking. The player who is closest to 0 after 4 turns wins the game.

NAME _____ DATE _____

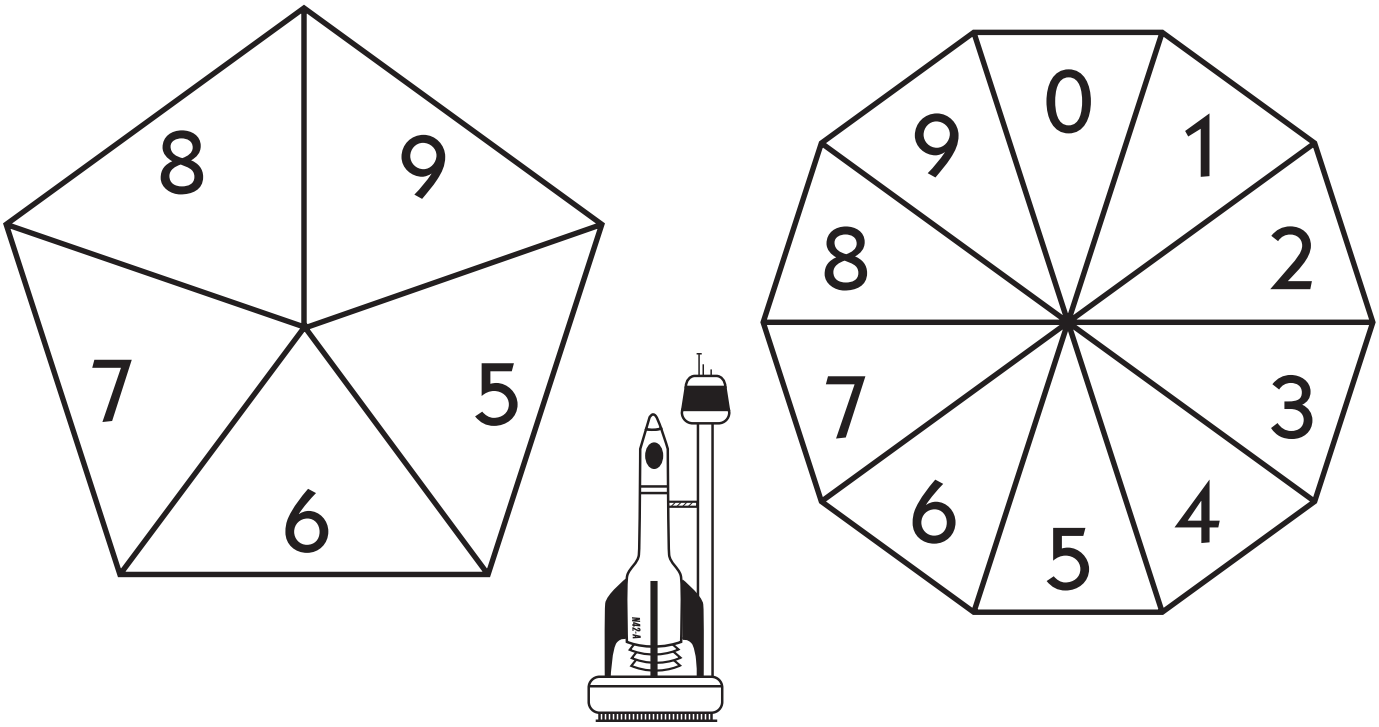
Count Down 400



Count Down 400 Spinner



Count Down 400 Spinner



Support Activity 12 ★ Instructional Considerations

SUPPORT ACTIVITY

Faces of a Solid

Overview

Students match 2-dimensional shapes to 3-dimensional solids that have 1 or more faces of that shape.

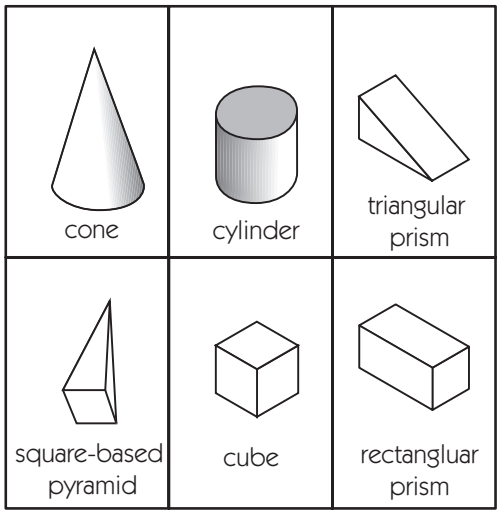
Skills & Concepts

- ★ recognizing, describing, and comparing a variety of 2- and 3-dimensional shapes
- ★ classifing a variety of 3-dimensional figures by their faces

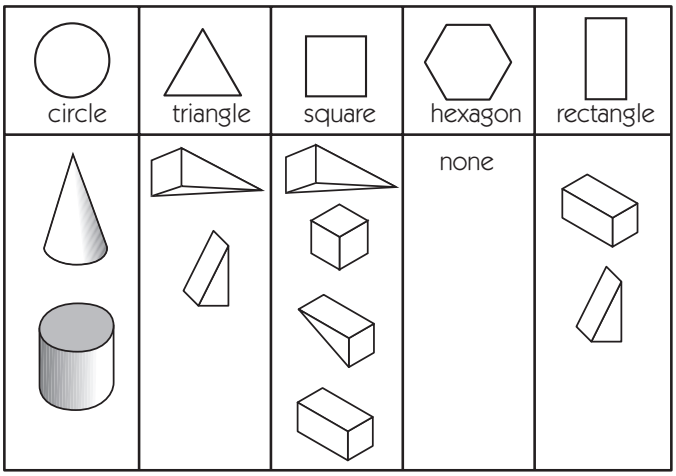
You'll need

- ★ Faces Spinner (Blackline S 12.3, 1 copy for every 2 pairs of players)
- ★ Solids Cards (Blackline S 12.4, 1 copy per player, cut apart)
- ★ pencil and paperclip to use as spinner (1 set for each pair of players)
- ★ set of geoblocks

Make geoblocks available for students to use during this activity. When considering the properties of solid figures, students need to see and hold those figures. We've provided the following key of shape names and matches for your convenience. Let students know that the size and shape of the faces may not match the solids exactly. For example, when they spin the triangle face, they can turn over the card for a solid with any triangular face.



Key of Solid Names



Key of Faces and Solids Matches

Support Activity 12

SUPPORT ACTIVITY

Faces of a Solid

You'll need

★ Faces Spinner (Blackline S 12.3, 1 copy for every 2 pairs of players)

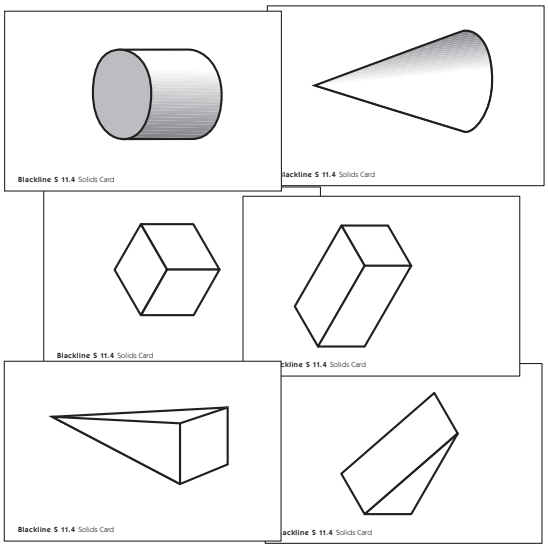
★ Solids Cards (Blackline S 12.4, 1 copy per player, cut apart)

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

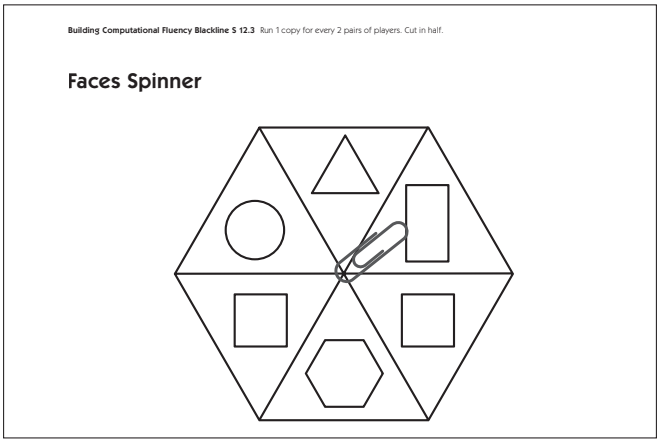
★ set of geoblocks

Instructions for Faces of a Solid

1 You and your partner should each cut out your solid cards and set them out face up in front of you.



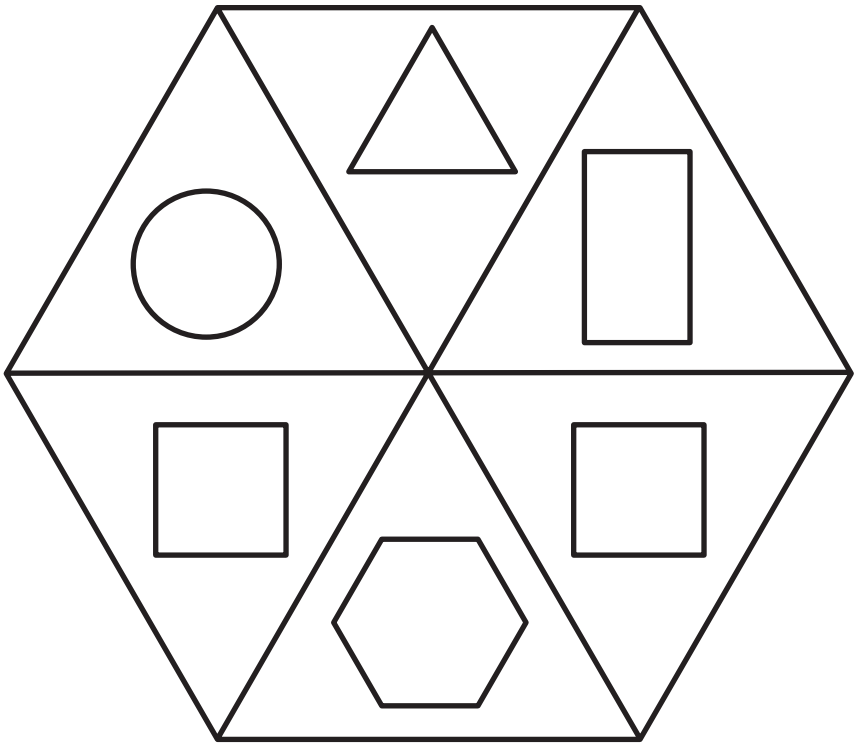
2 Spin the spinner. Name the shape on the spinner. Identify a solid that has the same face as your spin, name the solid, and then turn over that card. You may only turn over one card per spin.



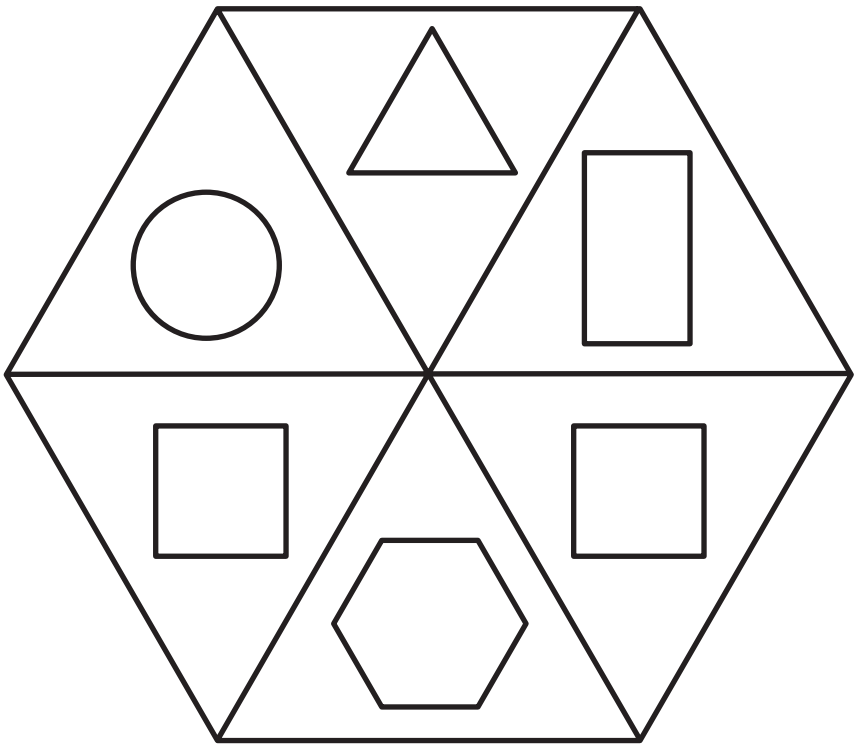
3 Now it's your partner's turn. Continue to spin, name the shape, and turn over a card. If you spin a face you no longer have a card for, you miss that turn.

4 The first person to turn over all 6 solid cards wins the game.

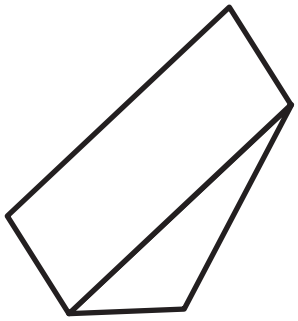
Faces Spinner



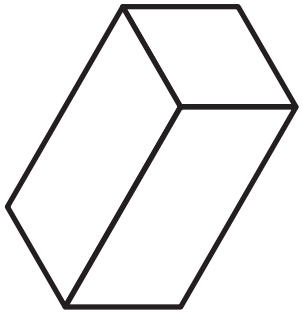
Faces Spinner



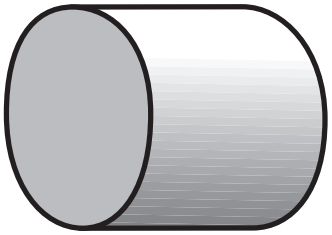
Solids Cards



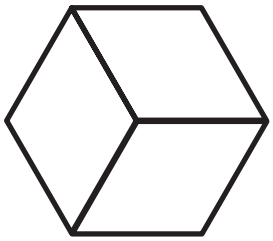
Blackline S 12.4 Solids Card



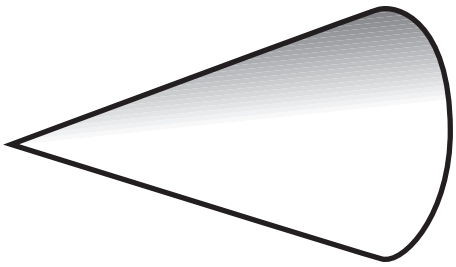
Blackline S 12.4 Solids Card



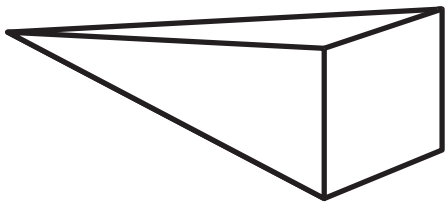
Blackline S 12.4 Solids Card



Blackline S 12.4 Solids Card



Blackline S 12.4 Solids Card



Blackline S 12.4 Solids Card

Support Activity 13 ★ 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 a number sentence in the column labeled with that strategy name. The first player to record at least one fact in each column wins.

Skills & Concepts

★ demonstrating computational fluency with multiplication facts up to 6 x 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

★ Spinning Around Multiplication Spinner (Blackline S 13.4, 1 copy for every 2 pairs of players)

★ Spinning Around Multiplication Record Sheets (Blackline S 13.5, 1 copy per player)

★ Grid Paper (Blackline S 13.6, a few copies per player, optional)

Consult the table of multiplication strategies if you need to review how these strategies work.

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	When you multiply any number by 2, simply double that number.
× 3	doubles plus 1 set facts	3 × 6 = 18 9 × 3 = 27	When you 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	When you multiply any number by 4, double that number, and then double the result. For example, 4 × 6 = 2(2 × 6) = 2 × 12 = 24.
× 5	clock facts	5 × 7 = 35 8 × 5 = 40	Because students are familiar with the analog clock face, they can use positions on the clock to multiply by 5. For example, "I know 5 times 7 is 35 because it is 35 minutes past the hour when the minute hand is on the 7."
× 6	clock facts plus 1 set	6 × 7 = 42 8 × 6 = 48	When multiplying a number by 6, think of the related clock fact and then add the number being multiplied. For example, 6 × 7 = (5 × 7) + 7 = 35 + 7 = 42.

When students focus on the strategies they are using to solve these multiplication facts, they become increasingly aware of important patterns and relationships. This focused practice using equal groups of objects, the array model, and skip counting builds computational fluency.

Support Activity 13 (cont.)

When categorizing their facts to arrange them in columns on the record sheet, students will employ the commutative property of multiplication ($4 \times 3 = 3 \times 4$).

NAME Rosa DATE March 23

Rolling Around Multiplication Record Sheet

	Ones Facts x1	Doubles x2	Doubles Plus 1 Set x3	Double-Doubles x4	Clock Facts x5	Clock Facts Plus 1 Set x6
Round 3						
Round 2						
Round 1			$5 \times 3 = 15$	$3 \times 4 = 12$		

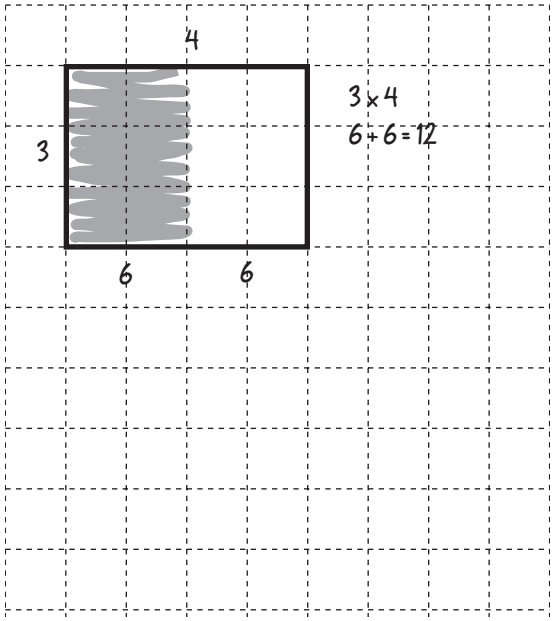
Building Computational Fluency Blackline S 13.5 Run 1 copy for each player.

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

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

Building Computational Fluency Blackline S 13.6 Run 1 to 2 copies for each player.

Grid Paper



Support Activity 13

SUPPORT ACTIVITY

Spinning Around Multiplication

You'll need

★ Spinning Around Multiplication Spinner (Blackline S 13.4, 1 copy for every 2 pairs of players)

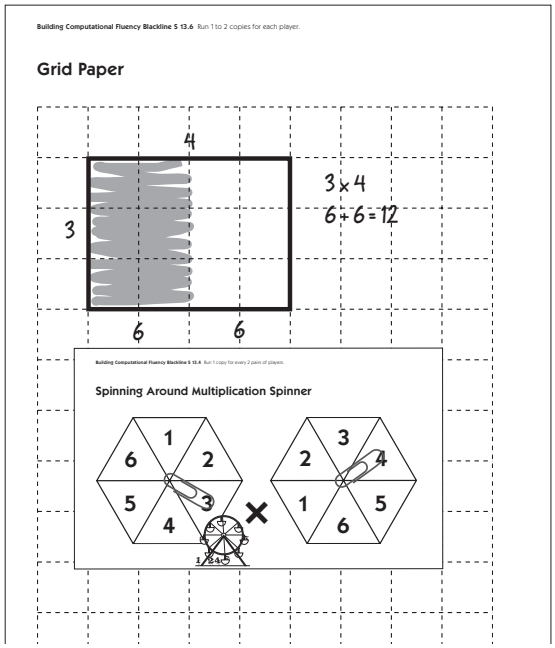
★ Spinning Around Multiplication Record Sheets (Blackline S 13.5, 1 copy per player)

★ Grid Paper (Blackline S 13.6, a few copies per player, optional)

Instructions for Spinning Around Multiplication

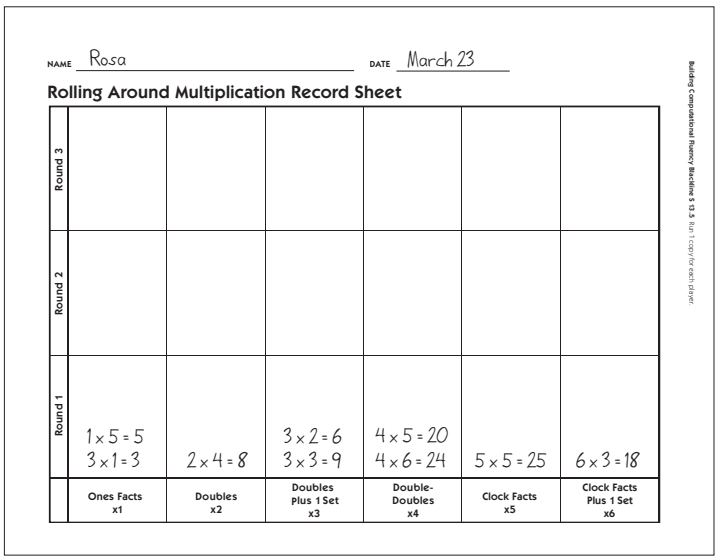
1 Each player needs a record sheet and grid paper. You'll share a spinner.

2 Spin both spinners and multiply the numbers. You can draw arrays on the grid paper to help. Explain to your partner how you think about this multiplication fact. Do you use arrays, repeated addition, skip counting, or other multiplication facts to find the product?



3 Write the number sentence in the appropriate column on your record sheet. For example, 2 × 5 is a doubles fact and a clock fact. You can choose the column you want to write the fact in.

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



NAME Rosa DATE March 23

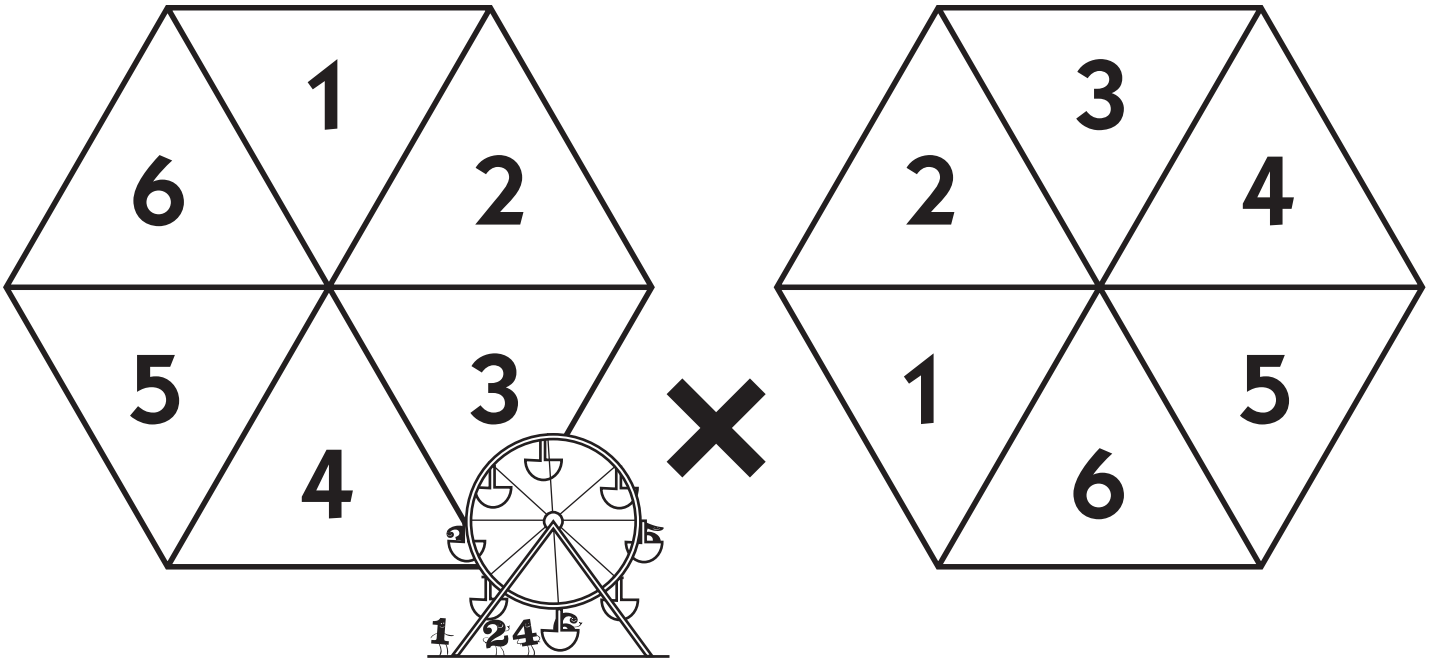
Rolling Around Multiplication Record Sheet

	Ones Facts x1	Doubles x2	Doubles Plus 1 Set x3	Double-Doubles x4	Clock Facts x5	Clock Facts Plus 1 Set x6
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

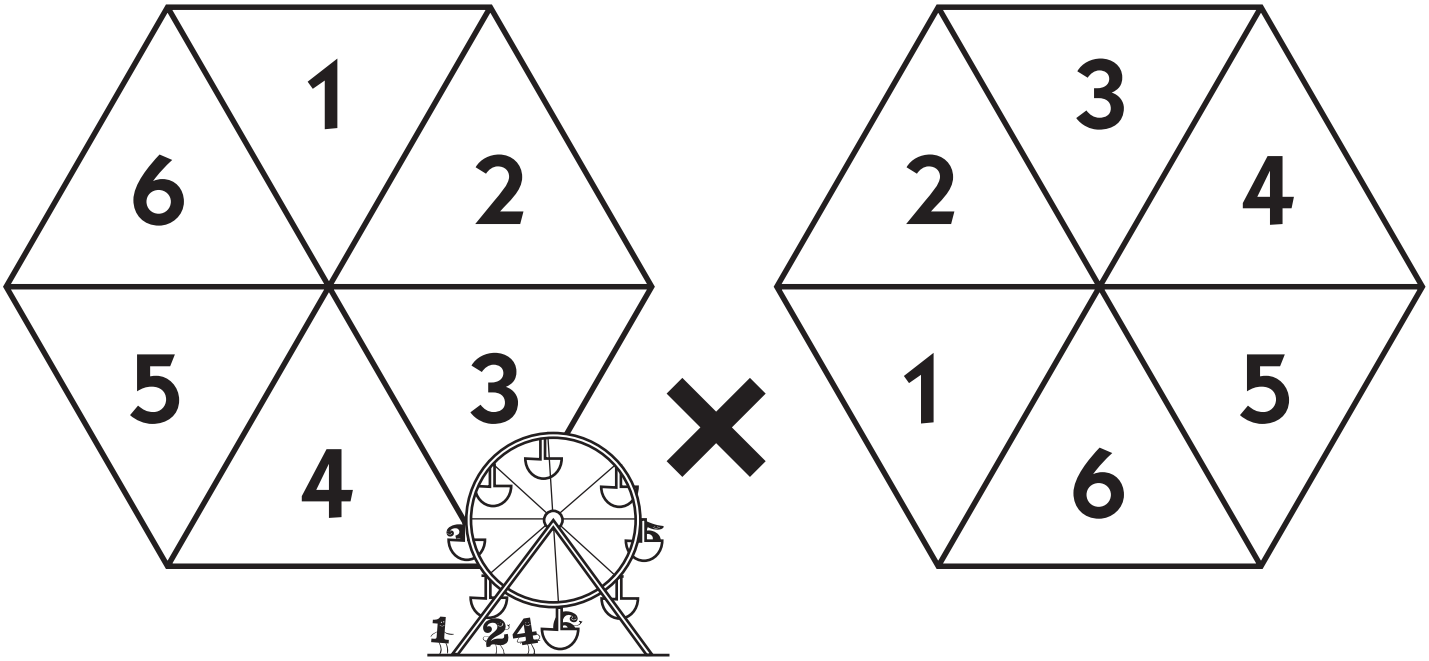
Building Computational Fluency Blackline S 13.5 Run 1 copy for each player.

5 Play 3 rounds.

Spinning Around Multiplication Spinner



Spinning Around Multiplication Spinner



NAME _____ DATE _____

Spinning Around Multiplication Record Sheet

	Ones Facts x1	Doubles x2	Doubles Plus 1 Set x3	Double-Doubles x4	Clock Facts x5	Clock Facts Plus 1 Set x6
Round 1						
Round 2						
Round 3						

Grid Paper

Support Activity 14 ★ Instructional Considerations

SUPPORT ACTIVITY

Show the Sum

Overview

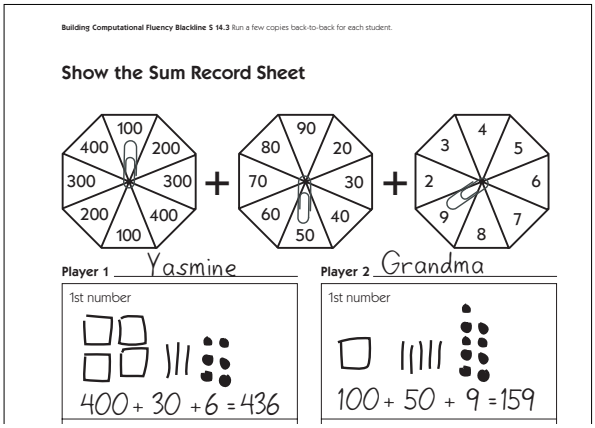
Players take turns spinning to get two 3-digit numbers each. Each player finds the sum of his or her numbers. The player with the larger sum wins.

Skills & Concepts

- ★ reading, writing, and ordering whole numbers up to 1,000
- ★ modeling and comparing place value positions in numbers up to 1,000
- ★ using <, >, and = symbols with whole numbers
- ★ composing and decomposing numbers by place value and using expanded notation to represent numbers
- ★ adding 3-digit numbers with and without regrouping
- ★ using models, numbers, and words to solve addition problems

You'll need

- ★ Show the Sum Record Sheets (Blackline S 14.3, a few copies per player run back-to-back)
- ★ pencil and paperclip for use as a spinner (1 set for each pair of players)
- ★ scratch paper



Some students may use sketches to solve the 3-digit addition problems in Show the Sum. While students' sketches often demonstrate their understanding of place value and computation strategies, we want third graders to have developed efficient strategies for completing these kinds of calculations. Toward that end, encourage students who are working with sketches first to use numbers to label their sketches and then to complete the calculations without the sketches, imagining the visual models in their minds' eye if needed.

Some students may calculate the total of the 100's, 10's, and 1's, from left to right, and then add the total for each place value. This method is based on a solid sense of place value and should not be discouraged. Other students may elect to use the traditional algorithm for adding 3-digit numbers because they find it an efficient and reliable method. If so, ask them to explain the regrouping process so you can be sure they understand what they are doing and why. If they are thinking about the numbers as single digits only—and not as a certain number of 100's, 10's, or 1's—ask them to model the procedure with a base ten sketch and explain the regrouping process. You might also ask them to think of another way to find the sum.

Encourage students to make estimates throughout the game of Show the Sum. Because they compose each three-digit number by place value to start, students tend to maintain their sense of number size throughout this game. If they have difficulty making reasonable estimates, encourage them to identify the number of 100's and 10's in each number and then estimate the result of combining them.

Support Activity 14

SUPPORT ACTIVITY

Show the Sum

You'll need

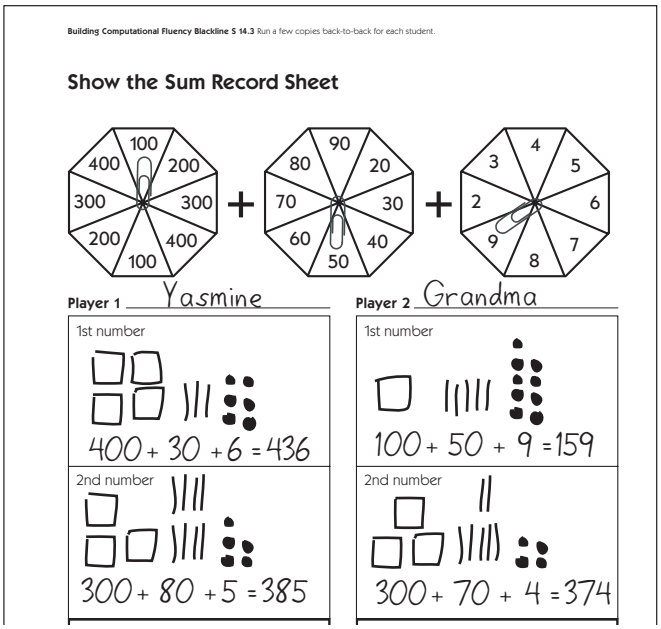
★ Show the Sum Record Sheets (Blackline S 14.3, a few copies per player run back-to-back)

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

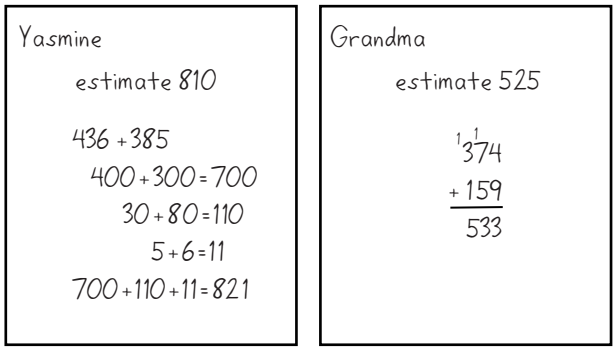
★ scratch paper

Instructions for Show the Sum

1 Players take turns spinning the three spinners and adding the numbers to get a 3-digit number. Each player spins two times to get two 3-digit numbers. Players may record their 3-digit numbers using numbers and/or sketches of base ten pieces, whichever they prefer. The example below shows players using both numbers and sketches.



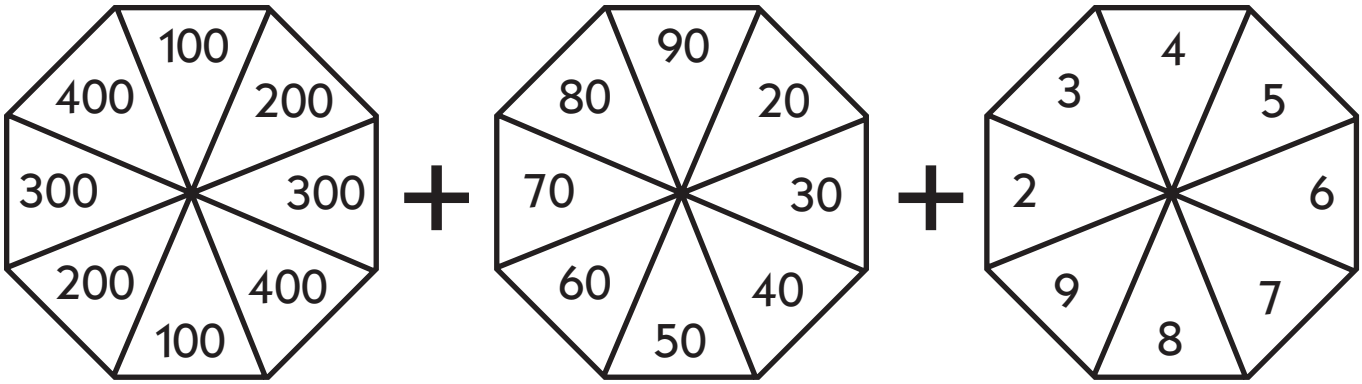
2 When both players have two 3-digit numbers, they add them together. Before adding, players estimate whose sum will be more and whose sum will be less. Players may also estimate what their specific sum will be.



3 Players talk about how they added their numbers and check each other's work.

4 Players compare their sums and write a number sentence at the bottom of the record sheet to show whose sum is greater. The player with the greater sum wins.

Show the Sum Record Sheet



Player 1 _____

1st number
2nd number
Sum

Player 2 _____

1st number
2nd number
Sum

_____ _____ _____

greater than	equals	less than
>	=	<

Support Activity 15 ★ Instructional Considerations

SUPPORT ACTIVITY

Show the Difference

Overview

Players take turns spinning to get two 3-digit numbers each. Each player finds the difference between his or her numbers. The player with the larger difference wins.

Skills & Concepts

★ reading, writing, and ordering whole numbers up to 1,000

★ modeling and comparing place value positions in numbers up to 1,000

★ using <, >, and = symbols with whole numbers

★ composing and decomposing numbers by place value and using expanded notation to represent numbers

★ subtracting 3-digit numbers with and without regrouping

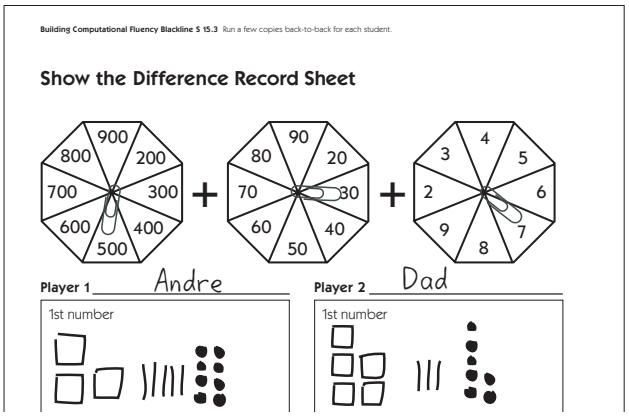
★ using models, numbers, and words to solve subtraction problems

You'll need

★ Show the Difference Record Sheet (Blackline S 15.3, a few copies per player run back-to-back)

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

★ scratch paper


Building Computational Fluency Blackline S 15.3 Run a few copies back-to-back for each student.

Show the Difference Record Sheet

Player 1 Andre

1st number

Player 2 Dad

1st number

Some students may use sketches to solve the 3-digit subtraction problems in Show the Difference. While students' sketches often demonstrate their understanding of place value and computation strategies, we want third graders to have developed efficient strategies for completing these kinds of calculations. Toward that end, encourage students who are working with sketches first to use numbers to label their sketches and then to complete the calculations without the sketches, imagining the visual models in their minds' eye if needed.

Students may elect to use the traditional algorithm for subtracting 3-digit numbers because they find it an efficient and reliable method. If so, ask them to explain the process of decomposing so you can be sure they understand what they are doing and why. If they are thinking about the numbers as digits only—and not as a certain number of 100's, 10's, or 1's—ask them to model the procedure with a base ten sketch and explain the process of decomposing 100's into 10's and 10's into 1's. You might also ask them to think of another way to find the difference.

Encourage students to make estimates throughout the game of Show the Difference. Because they compose each 3-digit number by place value to start, students tend to maintain their sense of number size throughout this game. If they have difficulty making reasonable estimates, encourage them to identify the number of 100's and 10's in each number and then estimate the result of subtracting one number from the other or estimate the difference between the numbers.

Support Activity 15

SUPPORT

Show the Difference

You'll need

★ Show the Difference Record Sheet (Blackline S 15.3, a few copies per player run back-to-back)

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

★ scratch paper

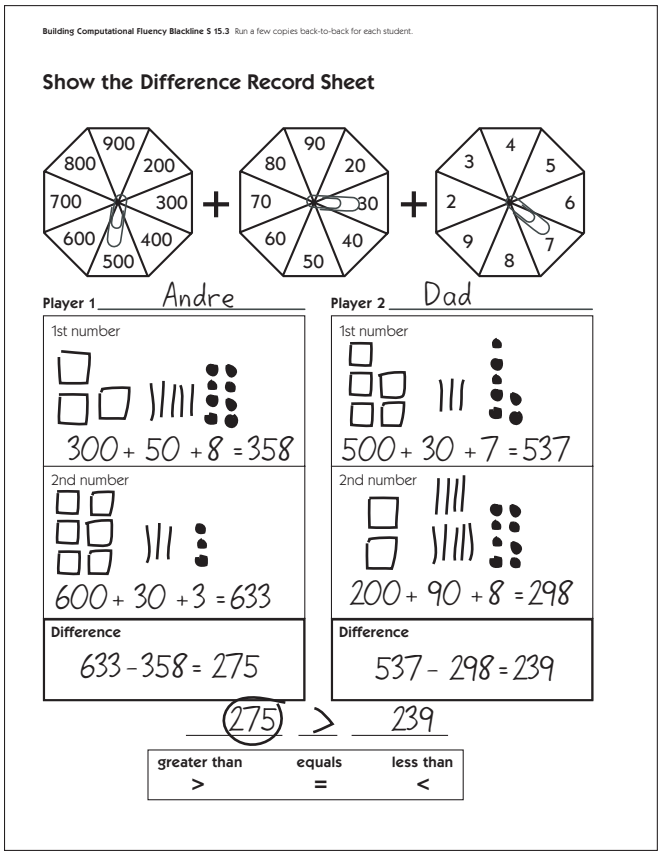
Instructions for Show the Difference

1 Players take turns spinning the 3 spinners and adding the numbers to get a 3-digit number. Each player spins 2 times to get two 3-digit numbers. Players may record their 3-digit numbers using numbers and/or sketches of base ten pieces, whichever they prefer. (The example to the right shows players using both numbers and sketches.)

2 When both players have two 3-digit numbers, they find the difference between the 2 numbers. Before subtracting, players estimate whose difference will be more and whose will be less. Players may also estimate what their specific difference will be.

3 Players talk about how they found the difference between their numbers and check each other's work.

4 Players compare their differences and write a number sentence at the bottom of the record sheet to show whose difference is greater. The player with the greater difference wins.


Building Computational Fluency Blackline S 15.3 Run a few copies back-to-back for each student.

Show the Difference Record Sheet

900, 200, 300, 400, 500, 600, 700, 800 + 90, 20, 30, 40, 50, 60, 70, 80 + 4, 5, 6, 7, 8, 9, 2, 3

Player 1 Andre

1st number: 300 + 50 + 8 = 358

2nd number: 600 + 30 + 3 = 633

Difference: 633 - 358 = 275

Player 2 Dad

1st number: 500 + 30 + 7 = 537

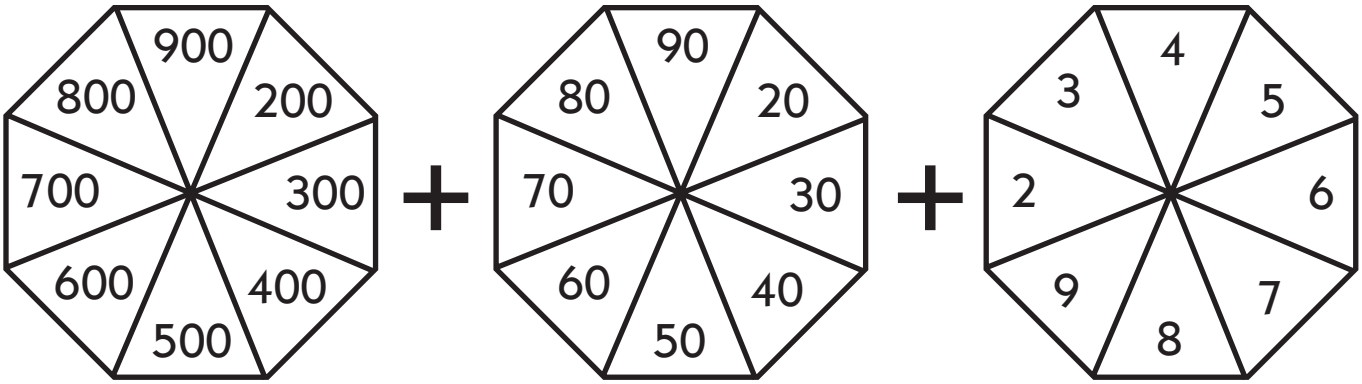
2nd number: 200 + 90 + 8 = 298

Difference: 537 - 298 = 239

275 > 239

greater than	equals	less than
>	=	<

Show the Difference Record Sheet



Player 1 _____

1st number
2nd number
Difference

Player 2 _____

1st number
2nd number
Difference

_____ _____ _____

greater than	equals	less than
>	=	<

Support Activity 16 ★ Instructional Considerations

SUPPORT ACTIVITY

What's Missing? Bingo

Overview

Players take turns drawing cards featuring incomplete multiplication or division equations. The player solves for the unknown quantity in the equation and then both players cover that number on their bingo boards. The first player to cover 3 numbers in a row (horizontal, vertical, or diagonal) 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 x 10

★ developing and using strategies for multiplication facts up to 10 x 10

★ solving for an unknown number in an equation

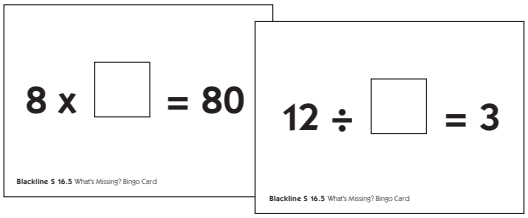
You'll need

★ What's Missing? Bingo Cards (Blacklines S 16.4 and 16.5, 1 copy on cardstock for each pair of players, cut apart and stored in an envelope)

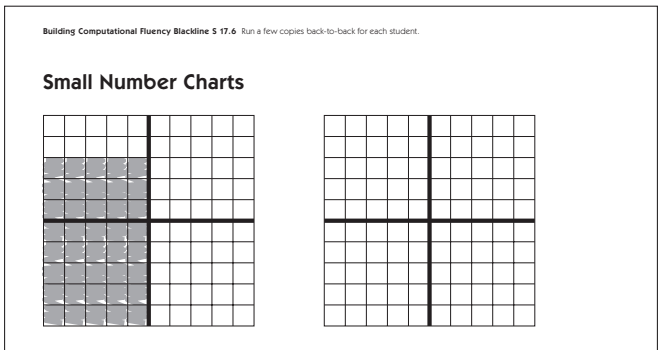
★ What's Missing? Bingo Boards (Blackline S 16.6, 1 copy for each pair of players)

★ Small Number Charts (Blackline S 17.6, a few copies for each player)

★ 9 red and 9 blue game markers or 9 each of 2 different kinds of beans, cereal pieces, or coins to use as game markers



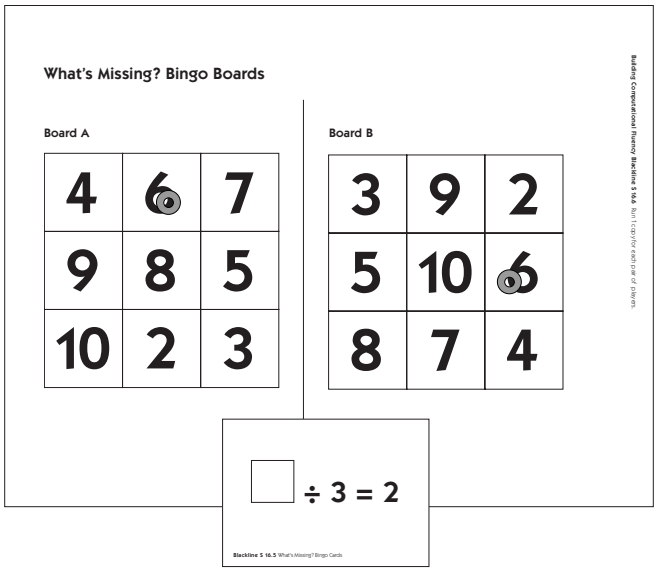
What's Missing? Bingo challenges students to work with their multiplication and division facts and prompts them to consider the relationship between the two operations. For example, to solve for the unknown in the equation 40 ÷ □ = 8, a student might ask herself, "What times 8 equals 40?" Another student might fill in columns of 8 until he has created an array of 40 squares and then check his horizontal dimension to find the unknown.



"First I colored a column of 8. Then I just kept going with more columns until I had colored 40 altogether. I had to make 5 columns of 8, so that means 40 divided by 8 is 5 and 40 divided by 5 is 8."

Support Activity 16 (cont.)

As they play What's Missing? Bingo, press students to make use of these relationships to solve for each unknown. Be sure to make the small Number Charts available to them, and feel free to use only the multiplication cards if the division cards are too challenging at this time.



What's Missing? Bingo Boards

Board A

4	6	7
9	8	5
10	2	3

Board B

3	9	2
5	10	6
8	7	4

Building Computational Fluency Blackline S 16.6 Print 1 copy for each pair of players.

☐ ÷ 3 = 2

Blackline S 16.5 What's Missing? Bingo Cards

Support Activity 16

SUPPORT ACTIVITY

What's Missing? Bingo

You'll need

★ What's Missing? Bingo Cards (Blacklines S 16.4 and 16.5, 1 copy on cardstock for each pair of players, cut apart and stored in an envelope)

★ What's Missing? Bingo Boards (Blackline S 16.6, 1 copy for each pair of players)

★ Small Number Charts (Blackline S 17.6, a few copies for each player)

★ 9 red and 9 blue game markers or 9 each of 2 different kinds of beans, cereal pieces, or coins to use as game markers

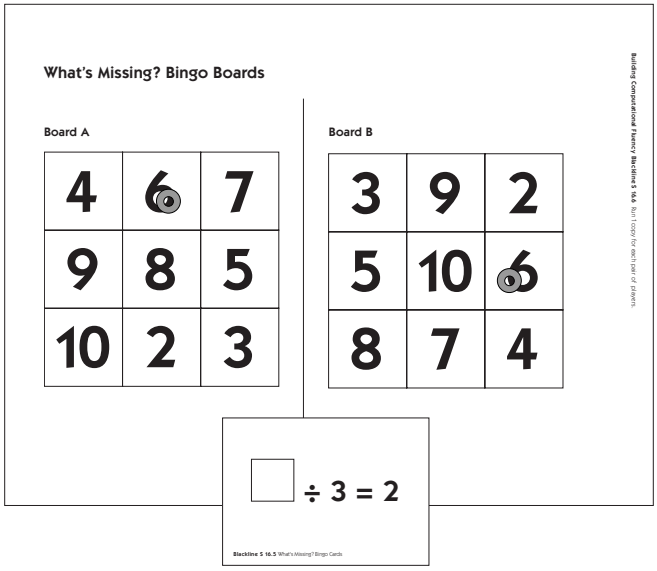
Instructions for What's Missing? Bingo

1 Decide whether you will play with the multiplication cards, the division cards, or both. Place the cards you want to use in a stack face down. Assign each player a set of game markers and one of the two game boards on the sheet. (Players share a sheet.)

2 Take turns drawing the top card from the stack. Identify the missing number that would make the number sentence on the card true. Explain how you know that number would make the number sentence true. Use the small Number Charts if they help you.

3 Both players place a game marker on that number on their game boards.

4 Continue taking turns until one player has covered three numbers in a row horizontally, vertically, or diagonally.



"The card says, 'Something divided by 3 equals 2.' What divided by 3 equals 2? That was hard for me to think about, so instead I thought 2 times 3 is 6, so 6 divided by 3 equals 2. The answer is 6 because it makes the number sentence true."

What's Missing? Bingo Cards page 1 of 2

9 x ☐ = 18 **Blackline S 16.4** What's Missing? Bingo Card	☐ x 7 = 21 **Blackline S 16.4** What's Missing? Bingo Card
5 x ☐ = 30 **Blackline S 16.4** What's Missing? Bingo Card	☐ x 7 = 49 **Blackline S 16.4** What's Missing? Bingo Card
☐ x 8 = 32 **Blackline S 16.4** What's Missing? Bingo Card	☐ x 5 = 25 **Blackline S 16.4** What's Missing? Bingo Card
☐ x 3 = 24 **Blackline S 16.4** What's Missing? Bingo Card	6 x ☐ = 54 **Blackline S 16.4** What's Missing? Bingo Card

What's Missing? Bingo Cards page 2 of 2

8 x ☐ = 80 **Blackline S 16.5** What's Missing? Bingo Card	12 ÷ ☐ = 3 **Blackline S 16.5** What's Missing? Bingo Card
14 ÷ ☐ = 2 **Blackline NC S 16.5** What's Missing? Bingo Card	32 ÷ ☐ = 4 **Blackline S 16.5** What's Missing? Bingo Card
40 ÷ ☐ = 8 **Blackline S 16.5** What's Missing? Bingo Card	☐ ÷ 3 = 2 **Blackline S 16.5** What's Missing? Bingo Card
☐ ÷ 3 = 3 **Blackline S 16.5** What's Missing? Bingo Card	☐ ÷ 5 = 2 **Blackline S 16.5** What's Missing? Bingo Card

What's Missing? Bingo Boards

Board A

4	6	7
9	8	5
10	2	3

Board B

3	9	2
5	10	6
8	7	4

Support Activity 17 ★ Instructional Considerations

SUPPORT ACTIVITY

Ten to Win

Overview

Players take turns spinning to get 2 single-digit numbers. They multiply those numbers and cover the products on their game boards. If a product has already been covered, the player loses that turn. The first player to cover 10 products on the board wins.

Skills & Concepts

★ using models, words, and numbers to demonstrate an understanding of multiplication

★ demonstrating computational fluency with multiplication facts

You'll need

★ Ten to Win Spinner (Blackline S 17.4, 1 copy cut in half for every 2 pairs of players)

★ Ten to Win Game Boards (Blackline S 17.5, a few copies for each pair of players run back-to-back)

★ Small Number Charts (Blackline S 17.6, a few copies run back-to-back per player)

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

★ 10 red or 10 blue game markers or 10 each of two different kinds of beans, cereal pieces, or coins to use as game markers (optional)

Playing Ten to Win is a fun way for students to practice some of the more difficult multiplication facts. Students may be able to recall many of the products, but they'll likely have to think through a few of the facts. Make small Number Charts available for them so they can draw arrays when needed. Also encourage them to employ mental strategies, using the facts they do know to figure out those they don't know immediately. For example, a student who remembers that 7 times 7 is 49 can figure out what 7 times 8 is by adding another 7 to 49. While the arrays are useful visual models that build students' conceptual grasp of multiplication, the mental strategies are ultimately more efficient.

Building Computational Fluency Blackline S 17.5 Run a few copies back-to-back for each pair of players.

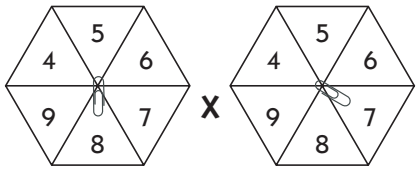
Ten to Win Game Boards

Round 1

16	20	20	24	24	25	25	28	28
30	30	32	32	35	36	36	36	40
40	42	42	45	45	48	48	49	54
54	56	56	63	63	64	72	72	81

Building Computational Fluency Blackline S 17.4 Run 1 copy for every 2 pairs of players. Cut in half.

Ten to Win Spinner



Support Activity 17

SUPPORT ACTIVITY

Ten to Win

You'll need

★ Ten to Win Spinner (Blackline S 17.4, 1 copy cut in half for every 2 pairs of players)

★ Ten to Win Game Boards (Blackline S 17.5, a few copies for each pair of players run back-to-back)

★ Small Number Charts (Blackline S 17.6, a few copies run back-to-back per player)

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

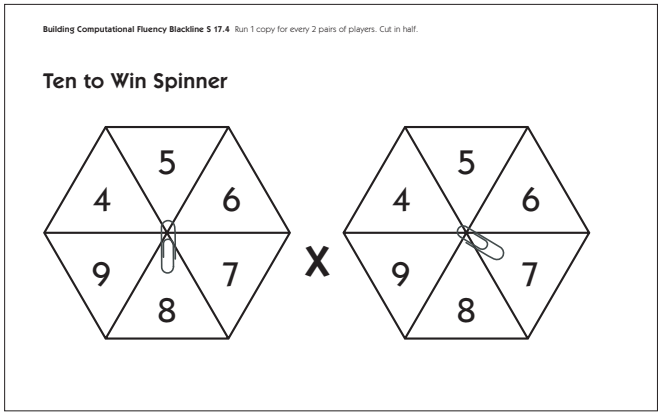
★ 10 red or 10 blue game markers or 10 each of two different kinds of beans, cereal pieces, or coins to use as game markers (optional)

Instructions for Ten to Win

1 If you want to re-use the game board, get 10 each of two different color game markers and assign one color to each player. (If you're playing at home, you can use 2 different kinds of cereal or beans as markers.) You can fill in the spaces on the game board with pencils or crayons instead of using game markers. If you do, you will not be able to reuse the game board.

2 Players take turns spinning both spinners and multiplying the two numbers. The player looks for that product on the game board and covers it with a game marker or fills it in with a color.

3 When the next player spins the spinners, he or she multiplies the two numbers, finds the product on the same game board, and covers it with a game marker or marks it with his or her color. If that product is already covered, the player loses his or her turn.



Support Activity 17 (cont.)

Building Computational Fluency Blackline S 17.5 Run a few copies back-to-back for each pair of players.

Ten to Win Game Boards

Round 1

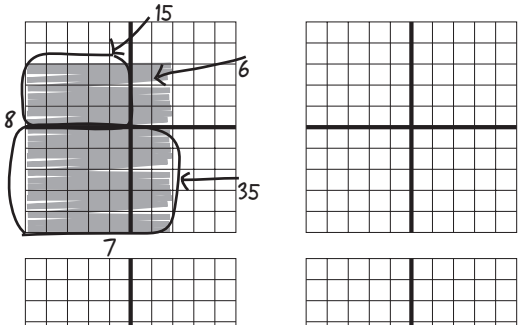
16	20	20	24	24	25	25	28	28
30	30	32	32	35	36	36	36	40
40	42	42	45	45	48	48	49	54
54	56	56	63	63	64	72	72	81

"Eight times seven is 56, so I'll put my marker on 56."

4 If a player gets stumped, he or she can draw the array on a small Number Chart to find the product.

Building Computational Fluency S 17.6 Run a few copies back-to-back for each student.

Small Number Charts

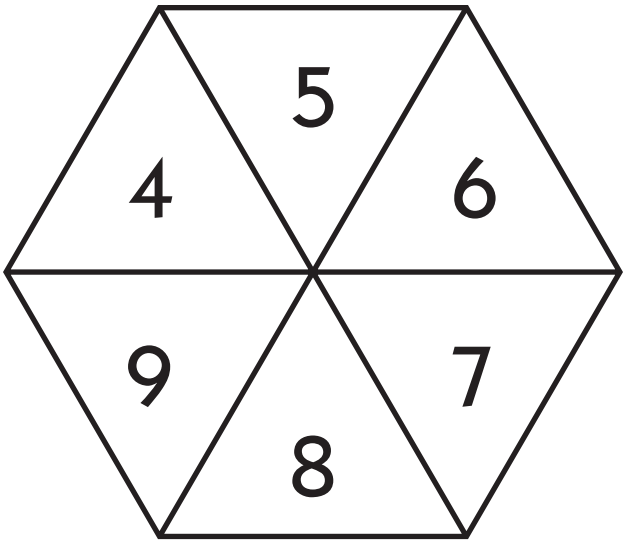


Mom *I couldn't remember 8 times 7, so I made an array on the Number Chart. I see 35 here, 15 here, and 6 here. 35 plus 15 is 50, and then 6 more is 56. So 8 times 7 is 56.*

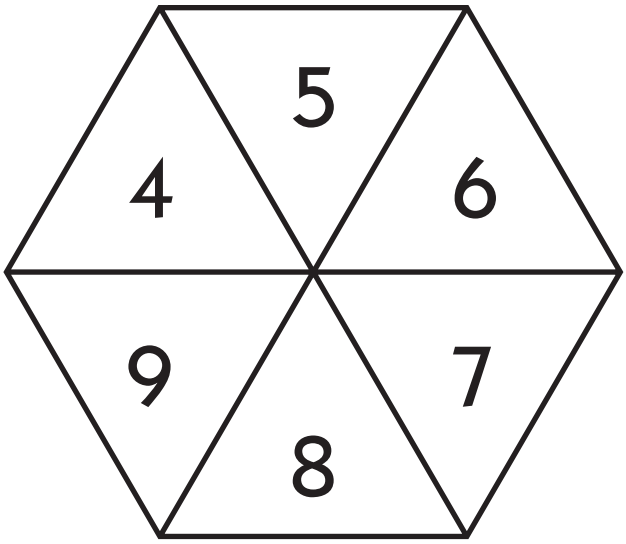
Maria *That's a tricky one. I can always remember 8 times 8 is 64, so then I just think for 8 times 7, it's 64 minus 8. That's 56.*

5 Players take turns until one player has covered 10 products to win the game.

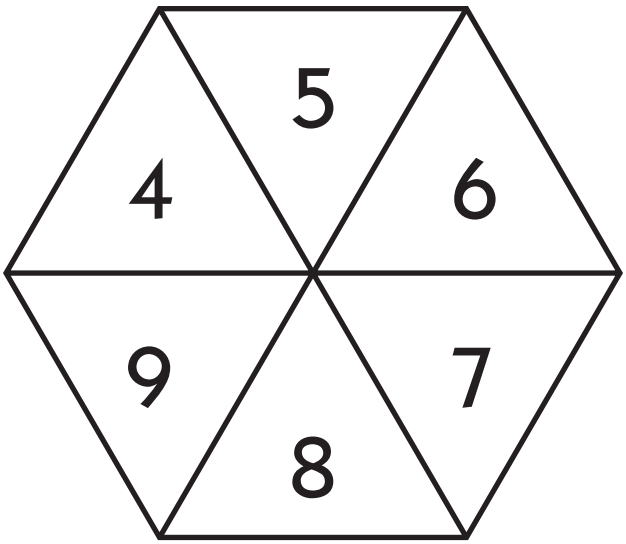
Ten to Win Spinner



X



Ten to Win Spinner



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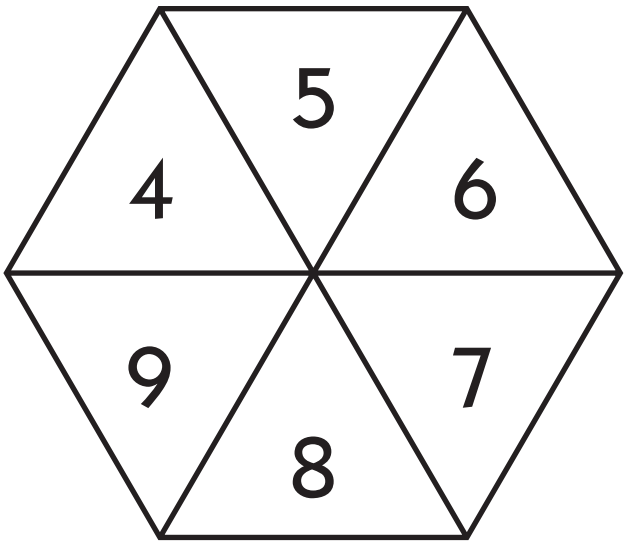


Ten to Win Game Boards

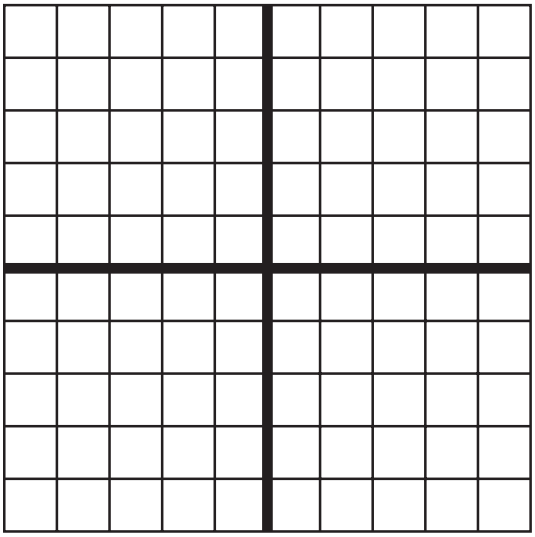
Round 1

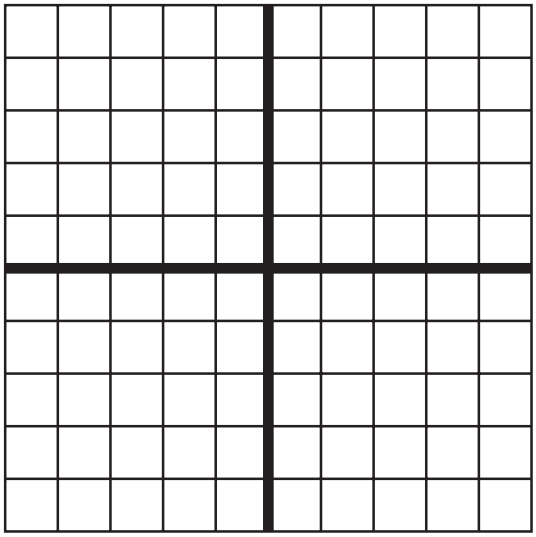
16	20	20	24	24	25	28	28	30
30	32	32	35	35	36	36	36	40
40	42	42	45	45	48	48	49	54
54	56	56	63	63	64	72	72	81

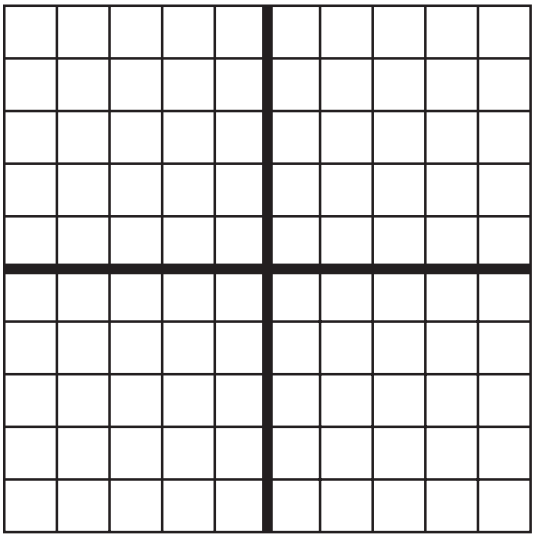
Round 2

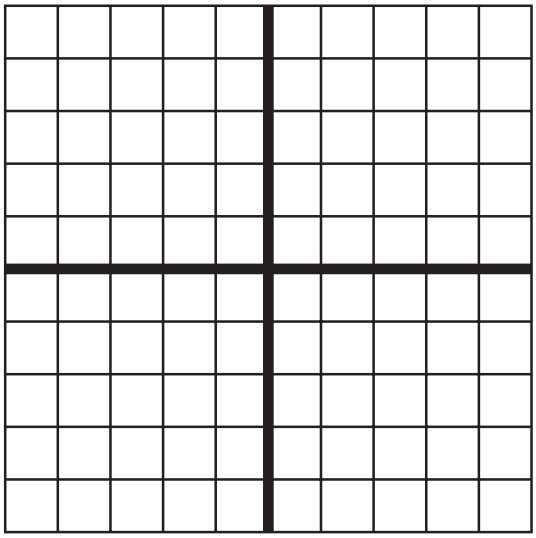
16	20	20	24	24	25	28	28	30
30	32	32	35	35	36	36	36	40
40	42	42	45	45	48	48	49	54
54	56	56	63	63	64	72	72	81

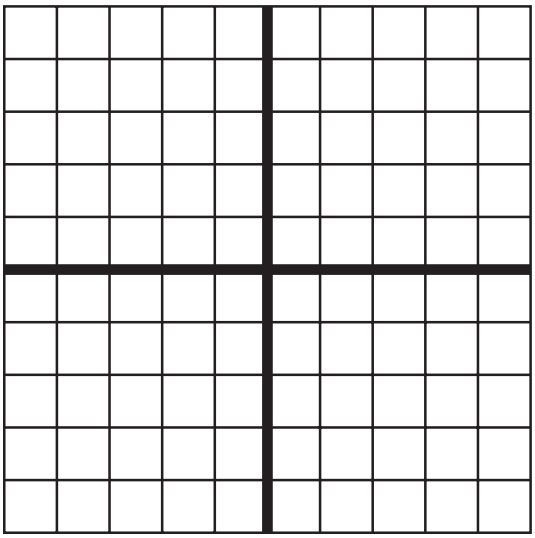
Small Number Charts

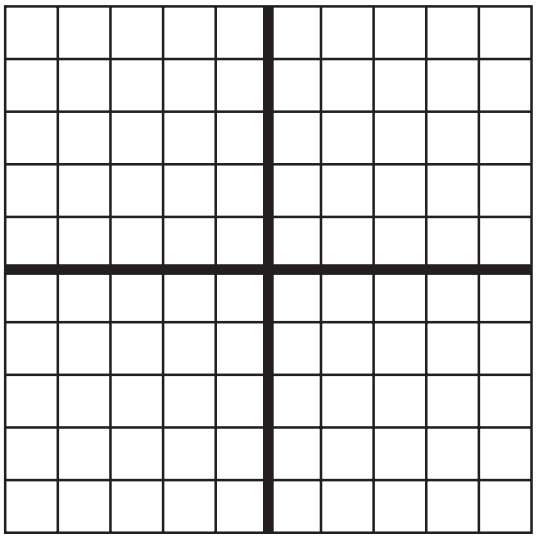












Support Activity 18 ★ Instructional Considerations

SUPPORT ACTIVITY

Make Zero

Overview

Players take turns spinning 4 single-digit numbers. Both players add, subtract, multiply, or divide those numbers in any order to try to get to 0. They can use each number only once. If it is not possible to get to 0 with those 4 numbers, players can spin for a fifth number, which they can use in addition to the other 4 numbers or use to replace one of the other numbers. Players see how many different ways they can get to 0 with the same group of numbers.

Skills & Concepts

★ demonstrating computational fluency with addition, subtraction, and multiplication

★ exploring the commutative, associative, and distributive properties of multiplication, as well as the special properties of 0 and 1 in multiplication

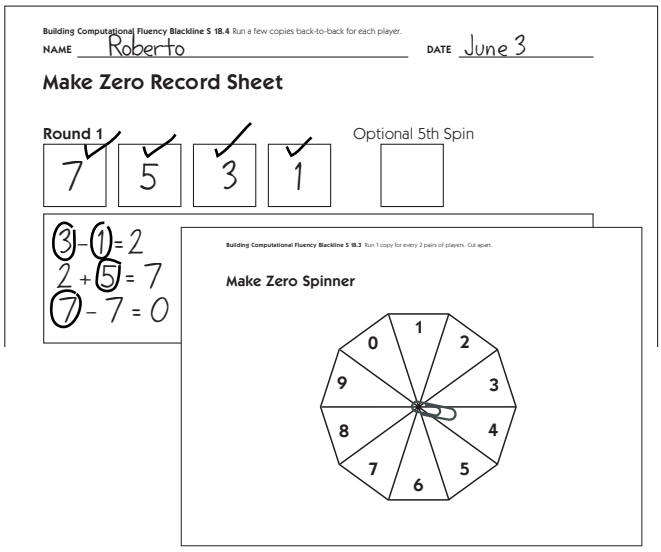
★ identifying and applying the operation needed (addition, subtraction, multiplication, or division) for solving a problem

You'll need

★ Make Zero Spinner (Blackline S 18.3, 1 copy for every 2 pairs of players)

★ Make Zero Record Sheet (Blackline S 18.4, a few copies run back-to-back for each player)

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



Make Zero gives students practice with their basic facts in a problem-solving context. It also gives them plenty of opportunities to apply the zero properties of addition (0 + a = a) and multiplication (0 x a = 0). As they use these properties, encourage them to make generalizations about them. If they multiply 6 times 0 to get to 0, for example, ask them whether they'd get the same result if they multiplied 8 times 0. Press them to explain why.

In Make Zero, students will use addition and subtraction more often than multiplication and division. If you see an opportunity that they have missed to use multiplication or division, ask if they can see a way to get to zero using these operations.

Do bear in mind that Make Zero does not provide visual models to support students who are struggling with their basic facts. If a student needs to use arrays for multiplication and division, or is still struggling with basic addition and subtraction, use a support activity that includes a model for the operation(s) with which the student is struggling.

Support Activity 18

SUPPORT ACTIVITY

Make Zero

You'll need

★ Make Zero Spinner (Blackline S 18.3, 1 copy for every 2 pairs of players)

★ Make Zero Record Sheet (Blackline S 18.4, a few copies run back-to-back for each player)

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

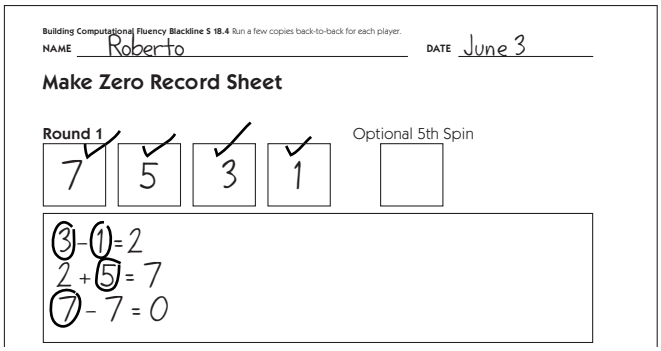
Instructions for Make Zero

1 Players share a spinner but use their own record sheets. Assign one player to spin the spinner to get 4 different numbers. The player may need more than 4 spins to get 4 different numbers. Both players write each number in the boxes on their record sheets.

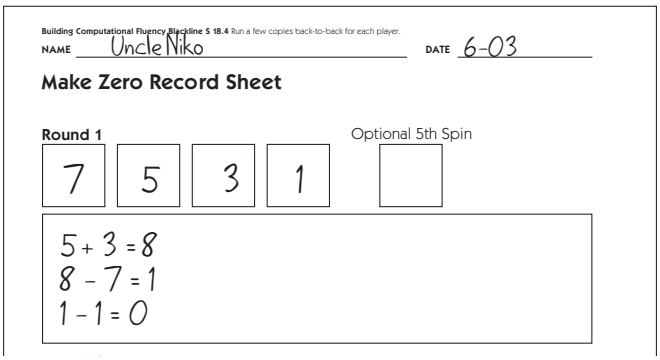
2 Now both players try to get to 0 using each number only once. Players can add, subtract, multiply, or divide, and can use the numbers in any order, but may use each number only once.

3 If both players find they are unable to get to 0, one player spins one more time for a fifth number. Players may use all 5 numbers now, or use the fifth number instead of one of the 4 original numbers.

4 When both players have found a way to get to 0, they compare their ways. If they did it the same way, they work together to think of another way to do it with the same numbers.

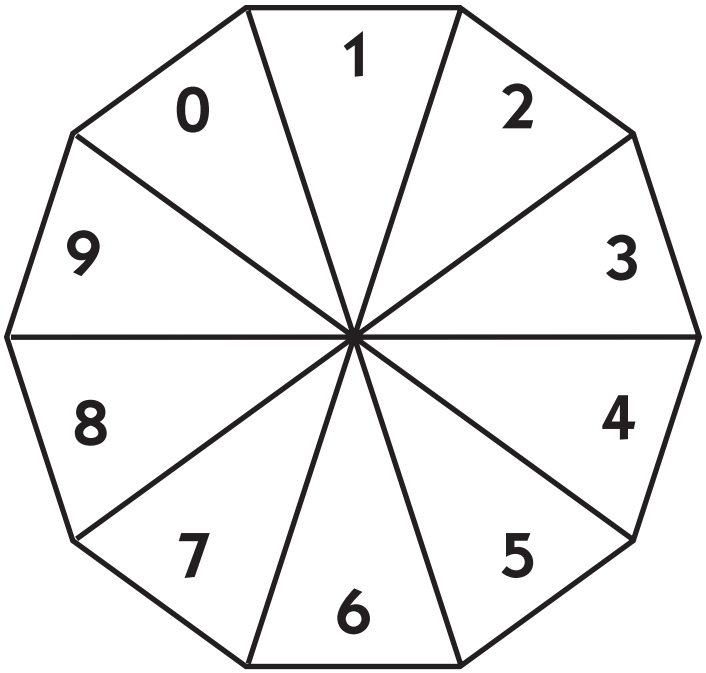

Building Computational Fluency Blackline S 18.4 Run a few copies back-to-back for each player.
NAME Roberto DATE June 3
Make Zero Record Sheet
Round 1
7 5 3 1
Optional 5th Spin
3 - 1 = 2
2 + 5 = 7
7 - 7 = 0

Roberto *First I said 3 minus 1 is 2. And then I said 2 plus 5 is 7. And then 7 minus 7 is 0!*

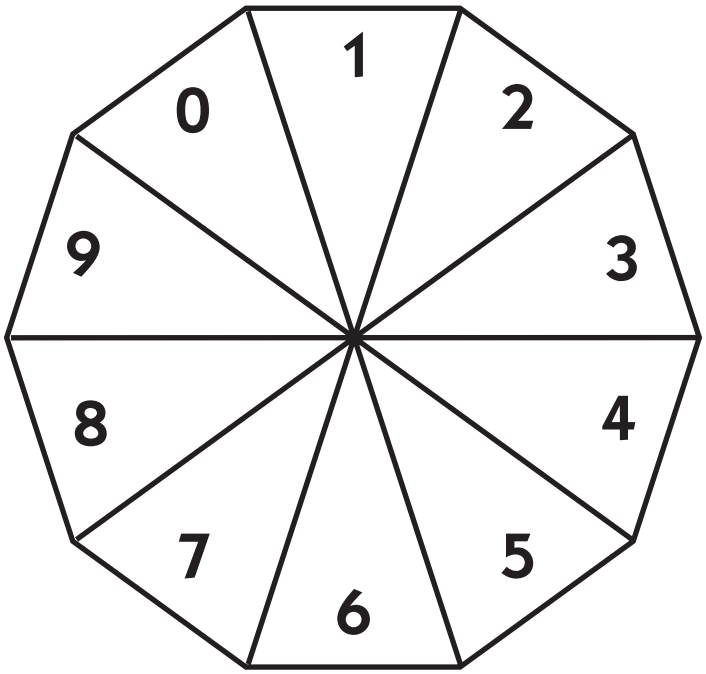

Building Computational Fluency Blackline S 18.4 Run a few copies back-to-back for each player.
NAME Uncle Niko DATE 6-03
Make Zero Record Sheet
Round 1
7 5 3 1
Optional 5th Spin
5 + 3 = 8
8 - 7 = 1
1 - 1 = 0

Uncle Niko *I said 5 plus 3 is 8. And then 8 minus 7 is 1. And 1 minus 1 is 0. Want to see if we can find some more ways?*

Make Zero Spinner



Make Zero Spinner



NAME _____ **DATE** _____

Make Zero Record Sheet

Round 1

Optional 5th Spin

Round 2

Optional 5th Spin

Round 3

Optional 5th Spin