5 BRIDGES IN MATHEMATICS

GRADE 5 SUPPLEMENT

Set A1 Number & Operations: Estimating to Add & Subtract

Includes

Skills & Concepts

★ develop and use strategies to estimate the results of multi-digit addition and subtraction and judge the reasonableness of such results

Bridges in Mathematics Grade 5 Supplement
Set A1 Numbers & Operations: Estimating to Add & Subtract

Bridges in Mathematics is a standards-based K–5 curriculum that provides a unique blend of concept development and skills practice in the context of problem solving. It incorporates the Number Corner, a collection of daily skill-building activities for students.

The Math Learning Center is a nonprofit organization serving the education community. Our mission is to inspire and enable individuals to discover and develop their mathematical confidence and ability. We offer innovative and standards-based professional development, curriculum, materials, and resources to support learning and teaching. To find out more, visit us at www.mathlearningcenter.org.

NAME _____   DATE _____

Set A1 ★ Independent Worksheet 1

INDEPENDENT WORKSHEET

Using Compatible Numbers to Estimate Answers

Mathematicians sometimes estimate answers to addition and subtraction problems by using *compatible numbers*. Compatible numbers are numbers that work well together. If a pair of numbers is easy to add or subtract, those numbers are friendly or *compatible.* For example:

Tonio collects sports cards. He has 17 football cards and 26 baseball cards. *About* how many cards does he have in all? *About* how many more baseball than football cards does he have?

17 is close to 15
26 is close to 25
15 + 25 = 40, so he has about 40 cards in all.
25 – 15 = 10, so he has about 10 more baseball than football cards.

1 Use compatible numbers to estimate the answer to each problem below. To use this estimation strategy, change the actual numbers to *compatible* numbers. The first two are done for you.

addition example 397 + 198	**subtraction example** 252 – 126
397 is close to __400__.	252 is close to __250__.
198 is close to __200__.	126 is close to __125__.
__400__ + __200__ = __600__,	__250__ – __125__ = __125__,
so the answer is about __600__.	so the answer is about __125__.
a 149 + 148	**b** 481 – 138
149 is close to _____.	481 is close to _____.
148 is close to _____.	138 is close to _____.
_____ + _____ = _____,	_____ – _____ = _____,
so the answer is about _____.	so the answer is about _____.

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Independent Worksheet 1 Using Compatible Numbers to Estimate Answers (cont.)

c 529 + 398	**d** 652 – 249
529 is close to _____.	652 is close to _____.
398 is close to _____.	249 is close to _____.
_____ + _____ = _____,	_____ – _____ = _____,
so the answer is about _____.	so the answer is about _____.

2 Use compatible numbers to estimate the answer to each problem below. Show your work.

a Sam and Sara are on vacation with their mom. They live in Seattle, Washington, and they're driving to Disneyland in California. The first day, they drove 172 miles to Portland, Oregon, and stopped for lunch. After they'd gone another 128 miles, they stopped for gas. *About* how many miles had they driven so far?

b They stopped in Ashland, Oregon to spend the night. It cost them $74.99, including tax, to stay in a motel. Dinner cost $24.97 for the three of them. Breakfast the next morning cost $14.99. *About* how much money did they spend while they were in Ashland?

c After breakfast, their mom said, "We're going to stop near Sacramento for lunch. That's 295 miles from here." When they stopped for gas that morning they still had 147 miles left to go. *About* how many miles had they driven so far?

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NAME _____   DATE _____

Independent Worksheet 1 Using Compatible Numbers to Estimate Answers (cont.)

d Sam and Sara took $7.00 into the store at the gas station to buy snacks. They got some juice for $2.99 and a bag of pretzels for $1.49. Then Sara said, "Hey look! Let's get 3 oranges too. They only cost 49¢ each." *About* how much change did they get back after they paid for the juice, pretzels, and oranges?

e When they got back into the car their mom said, "The odometer on our car said 28,103 miles when we started. Now it says 28,601 miles. *About* how far have we driven so far?"

f Sara looked at the map and said, "We have 424 miles left to go until we get to Disneyland." Her mom said, "We're going to stop for lunch near Merced, which is 127 miles from here. *About* how much farther will we have to go after that?"

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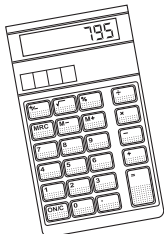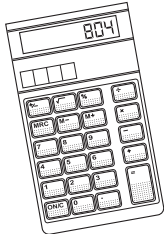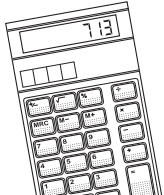
Set A1 ★ Independent Worksheet 2

INDEPENDENT WORKSHEET
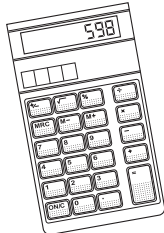
Are These Answers Reasonable?

Compatible numbers are numbers that work well together. If a pair of numbers is easy to add or subtract, those numbers are *compatible*. You can check to see if answers to problems are reasonable by changing the actual numbers to compatible numbers.

Use compatible numbers to decide whether or not the answer to each problem below is reasonable or not. Explain your answer each time

Question	Is this answer reasonable? Why or why not?
example Ty used a calculator to add 598 and 349. Here's the answer he got: `795`	*It's not reasonable because 598 is close to 600 and 349 is close to 350. 600 + 350 = 950, so 795 is way off.*
1 Abby used a calculator to add 203, 449, and 152. Here's the answer she got: `804`	
2 Miguel used a calculator to find the difference between 1,203 and 598. Here's the answer he got: `713`	

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Independent Worksheet 2 Are These Answers Reasonable? (cont.)

Question	Is this answer reasonable? Why or why not?
3 Keiko used a calculator to add 749 and 498. Then she subtracted 649. Here's the final answer she got: *[calculator showing 598]*	
4 Mr. Gordon went to the store to buy some fruit. Here's his sales slip. Thriftee Mart Peaches $1.99 Grapes $2.03 Apples $1.49 Bananas $1.52 Total $9.28	
5 Mrs. Chan went to an office supply store in Oregon where there is no sales tax. She bought 6 boxes of markers for $3.99 a box, 1 box of pencil grips for $4.99, 10 boxes of pencils for $.99 each, and an electric pencil sharpener for $13.99. She gave the lady at the check stand three 20-dollar bills and got back $7.18 in change.	

NAME _____   DATE _____

Independent Worksheet 2 Are These Answers Reasonable? (cont.)

6 We have 4 elementary schools in our town, 2 middle schools, and 1 high school. The chart below shows how many students there are at each school.

Name of School	Number of Students
King Elementary	514
Lincoln Elementary	413
Garfield Elementary	226
Adams Elementary	399
Madison Middle School	598
Jefferson Middle School	603
Grant High School	1,012

a The town newsletter said that there are 320 more students at King and Lincoln than there are at Garfield and Adams. Is this a reasonable statement? Why or why not?

b My brother said that if you add the number of students at both the middle schools, there are about 200 more kids at the middle schools than there are at the high school. Is this a reasonable estimate? Why or why not?

c *About* how many students are there in all 7 schools put together? Use compatible numbers to help make your estimate. Show your work below.

NAME _____ DATE _____

Set A1 ★ Independent Worksheet 3

INDEPENDENT WORKSHEET

Travel Miles

Compatible numbers are numbers that work well together. If a pair of numbers is easy to add or subtract, those numbers are *compatible*. When you're solving problems, you can check to see if your answers are reasonable by changing the actual numbers to compatible numbers.

The chart below shows the travel miles between several cities in the U.S.

U.S. Cities	Denver	Houston	Orlando	Nashville	Philadelphia	San Francisco
Denver		875 miles	1,858 miles	1,023 miles	1,575 miles	956 miles
Houston	875 miles		960 miles	663 miles	1,336 miles	1,647 miles
Orlando	1,858 miles	960 miles		686 miles	992 miles	2,887 miles
Nashville	1,023 miles	663 miles	686 miles		681 miles	1,969 miles
Philadelphia	1,575 miles	1,336 miles	992 miles	681 miles		2,526 miles
San Francisco	956 miles	1,647 miles	2,887 miles	1,969 miles	2,526 miles	

Use the information on the chart to sove the problems on the following pages.

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Independent Worksheet 3 Travel Miles (cont)

1 Use the chart of travel miles on the previous page to solve the problems below. For each one, show your work. Then use compatible numbers to explain why your answer is reasonable The first one is done for you.

Question	My Work	My answer is reasonable because
example Mr. Buck and Ms. Penny both live in Houston and work for a video game company. On Monday, Mr. Buck flew to Orlando and Ms. Penny flew to San Francisco for business meetings. How much farther did Ms. Penny travel than Mr. Buck?	$\begin{array}{r} 1,\overset{5}{\cancel{6}}47 \\ -\ 960 \\ \hline 687 \end{array}$ Ms. Penny traveled 687 miles farther than Mr. Buck.	My answer is reasonable because 1,647 is close to 1,650 and 960 is close to 950. 1,650 – 950 = 700. My answer is 687, and that's really close to 700.
a Anna's family lives in Houston. They're trying to decide whether to go to Nashville or Orlando for a vacation next summer. Which city is farther from Houston? How much farther is it?		
b Mrs. Polanco has to fly from San Francisco to Denver and back home again in October. She has to fly from San Francisco to Orlando and back home again in November. How much farther does she have to fly in November than in October?		

(Continued on next page.)

NAME _____ **DATE** _____

Independent Worksheet 3 Travel Miles (cont)

Question	My Work	My answer is reasonable because
c How much farther is it to fly from San Francisco to Philadephia and back, than to fly from Denver to Houston to Orlando and then back to Denver?		
d The Houston Astros are flying from Houston to San Francisco to play a baseball game with the Giants on Friday. Next, they're flying from San Francisco to Denver to play a game with the Colorado Rockies. After that, they have to fly from Denver to Philadelphia to play the Phillies. Then they're flying from Philadelphia back home to Houston. How many miles do they have to travel in all?		

2 Plan an imaginary trip. You can start in any city you want and fly to as many places as you want, but your travel miles have to total between 9,000 and 10,000 miles, including the return trip to your starting city. Show your travel plan on the back of this page and prove that your mileage isn't less than 9,000 or more than 10,000 miles in all.