



### Core Focus

- Estimating answers for addition and subtraction within 100
- Using the associative property of addition to add three or four numbers
- Identifying one-half, one-fourth, and one-third of a collection or region
- Exploring and analyzing fractions and parts of a whole

### Addition and Subtraction

- Many times in real life, an exact answer is not needed and an estimate will do. Students visualize where numbers appear on a number line to decide on the closest ten.
- To estimate  $48 + 23$ , students might think  $50 + 20 = 70$  (changing both addends to the closest ten). For a closer estimate, students might think  $50 + 23 = 73$  (changing just 48 to the closest ten).

**9.2 Estimating Answers (Adding within 100)**

Imagine you had \$80. Could you buy both items? How do you know?  
How could you estimate the total cost?

\$48 is close to \$50 so I just think \$50 + \$25.

In this lesson, students explore efficient strategies to estimate the total of two two-digit numbers that total less than 100.

- Students also use estimation strategies with mental subtraction. To estimate  $84 - 39$ , students might think  $84 - 40 = 44$ . This subtraction is easy to do mentally because the second number (40) is a multiple of 10. Changing the first number to a multiple of ten ( $80 - 39$ ) does not make the subtraction easier.

**9.3 Estimating Answers (Subtracting within 100)**

Imagine you cut off 39 cm from this piece of wood.  
What is an easy way to estimate the length of the piece left over?

39 is close to 40 so I just think  $75 - 40$ .

In this lesson, students explore efficient strategies to estimate the difference between two two-digit numbers.

### Ideas for Home

- Children often want to find the exact answer to an addition or subtraction problem. After they solve a problem, encourage them to compare different estimates to the exact answer and discuss which estimates were closest and why. Ask, "When is it better to change both numbers to the closest ten and when is it better to change only one?"
- Draw a simple 0 to 100 number line with the tens marked (10, 20, 30, etc.). Name two-digit numbers and ask your child to point to where the numbers are on the number line and tell you which multiple of 10 is closest.
- Tell your child about times when you estimate with addition and subtraction. Explain when it is important for you to have an exact answer (balancing a checking account) and when it is OK to have an estimate (thinking how much money will be left over after buying an item).

### Glossary

- The **associative property** of addition means numbers can be added in any order.

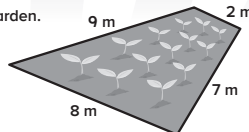
- When students add three or more numbers mentally, it is helpful for them to think about pairs of numbers that make ten, or multiples of ten. These pairs are called "friendly numbers." To find the total of  $3 + 5 + 7$ , students might add the 3 and 7 first to make 10, then add the 5 to make 15.

**9.5 Using the Associative Property of Addition with Four One- and Two-Digit Numbers**

Imagine you had to build a fence around this garden.  
How many meters of fencing would you need?  
How could you figure out the total?



I added  $8 + 2$  first because that's 10.  
Then  $9 + 7$  is 16 and  $10 + 16$  is 26.



In Lesson 5, students look for “friendly” pairs of numbers to add four addends involving one- and two-digit numbers.

**Fractions**

- Students visualize three simple fractions (one-half, one-third, and one-fourth) through folding paper, working with sets of objects, and dividing geometric shapes.
- Students focus on developing the concept of fractions. They do not read or write the fractions as numerals ( $\frac{1}{2}$ ,  $\frac{1}{3}$ ,  $\frac{1}{4}$ ). It is important that students realize that a fraction is one or more of a number of equal parts of a whole.

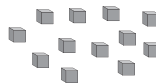
**9.7 Identifying One-Half, One-Fourth, and One-Third of a Collection**

These sheets of paper have been folded into parts that are the same size, then opened out again.



How many parts do you see on each sheet of paper?  
What is one part on each sheet called?

Imagine these 12 blocks are shared equally between the parts on the first sheet of paper.



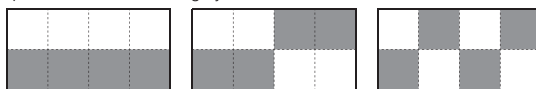
How many blocks will be in each part? How do you know?  
How could you describe the number of blocks in each part?

In this lesson, students relate sharing by 2, 3, and 4 to finding one-half, one-third, and one-fourth of a collection.

- Students see that fractions are proportional to the size of the whole (e.g. one-half of a pizza is much larger than one-half of a cookie).
- Students also understand that the same fraction of identical wholes does not need to look the same. One-half of a rectangle could be shown with a diagonal line from corner to corner or with a straight line down the center.

**9.8 Identifying One-Half, One-Fourth, and One-Third of a Region**

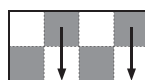
These sheets of paper have been folded into parts that are the same size, then opened out again.  
Some parts have been shaded gray.



How many parts of each sheet are gray?  
On each sheet, how would you describe the total amount that is gray?

How could you prove that each sheet shows one-half?

You could rearrange the orange parts to look the same as those in the first sheet.



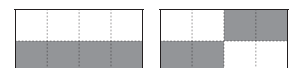
In Lesson 8, students use region models to explore different representations of one-half, one-fourth, and one-third.

**Ideas for Home**

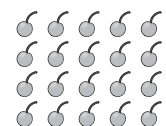
- Ask your child to find one-fourth, one-half, or one-third of a set of small items. It may be helpful to fold a piece of paper into 2, 3, or 4 parts and have your child share the objects to determine the answer. Try 20 shared by 4, 18 shared by 3, and 14 shared by 2. Encourage your child to use fraction language to describe the shares (e.g. “one-fourth of 20 is 5”).
- Fold a rectangular piece of paper into eight equal parts (as shown in the Glossary). Challenge your child to color in one-half or one-fourth of the rectangle in as many ways as possible. You can also divide a rectangle into six equal parts to show one-half or one-third.
- When walking in your neighborhood, pick a landmark that is about 10 to 15 feet away (e.g. a tree or a light pole). Ask your child to walk one-half (or one-fourth or one-third) of the way to the landmark and stop. Ask how they estimated where to stop.

**Glossary**

- Both pictures show **one-half** of the rectangle as shaded.



- Students see that fractions can represent equal shares of a collection.



One-half of 20 is \_\_\_\_\_.