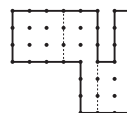
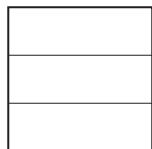


Equal Shares and Whole Number Operations

In Unit 9 children partition shapes into same-size parts, or equal shares. They practice using fraction vocabulary to name these equal shares and learn that equal shares do not necessarily have to be the same shape.



These equal shares are the same shape. These equal shares are not the same shape.

Children also work with fractional units of length. They identify half-inches and quarter-inches on their rulers and measure objects to the nearest half-inch.

Later in the unit, children extend their work with place value to the thousands place and apply their understanding of place value to learn a new subtraction method called *expand-and-trade subtraction*. Children learn the expand-and-trade method by using expanded form to think about making trades.

Example: $45 - 27$.

$$\begin{array}{r}
 45 \rightarrow \overset{30}{\cancel{40}} + \overset{15}{\cancel{5}} \\
 - 27 \rightarrow \underline{20} + 7 \\
 \hline
 10 + 8 = 18
 \end{array}$$

Expand-and-trade subtraction will be reviewed in Grade 3. By the end of Grade 2, children are expected to subtract within 1,000 using any strategy or method.

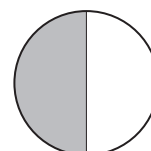
In the final part of the unit, children review the values of coins and find coin combinations to pay for a variety of items using exact change. They use dimes and nickels as a context for finding multiples of 10 and 5 and also use doubling and doubles facts as a context for finding multiples of 2. These activities lay the foundation for multiplying by 2, 5, and 10 early in Grade 3.

Please keep this Family Letter for reference as your child works through Unit 9.

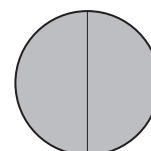
Vocabulary Important terms in Unit 9:

one-half (1-half) A name for 1 out of 2 equal shares. The standard notation for one-half is $\frac{1}{2}$, but children do not use standard notations in Grade 2.

two-halves (2-halves) A name for the whole when it is divided into 2 equal shares. The standard notation for two-halves is $\frac{2}{2}$.



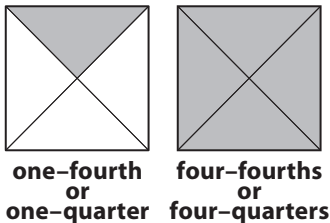
one-half



two-halves

one-fourth (1-fourth) A name for 1 out of 4 equal shares. The standard notation for one-fourth is $\frac{1}{4}$. Also called *one-quarter* or *1-quarter*.

four-fourths (4-fourths) A name for the whole when it is divided into 4 equal shares. The standard notation for four-fourths is $\frac{4}{4}$. Also called *four-quarters* or *4-quarters*.



equal share Another name for equal parts. The result of dividing something into parts that are all the same size.



Home Links 9-1 and 9-2 provide more information about equal shares and the fraction language that appears in the definitions on this page.

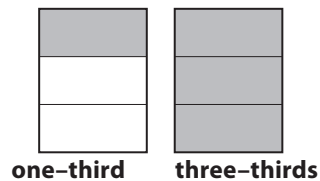
one-third (1-third) A name for 1 out of 3 equal shares. The standard notation for one-third is $\frac{1}{3}$.

three-thirds (3-thirds) A name for the whole when it is divided into 3 equal shares. The standard notation for three-thirds is $\frac{3}{3}$.

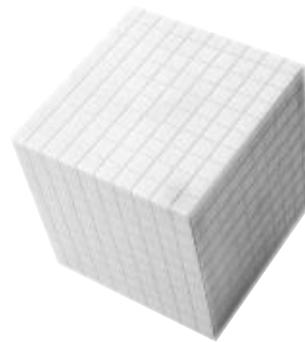
Do-Anytime Activities

To work with your child on Grade 2 concepts, try these interesting and rewarding activities:

1. Ask your child to divide food items or other objects into 2, 3, or 4 equal parts. For example, ask your child to fairly share a sandwich with a sibling or cut a piece of paper into four pieces that are the same size. Ask your child to name the parts of the object using language such as *one-half*, *1-third*, or *1 out of 4 equal parts*. Then ask your child to name the whole object using language such as *whole*, *three-thirds*, or *4-fourths*.
2. Have your child measure the lengths of objects to the nearest inch and use the measurements to compare the objects. When your child is comfortable measuring to the nearest inch, have him or her measure the same objects to the nearest half-inch.



thousand cube In *Everyday Mathematics*, a base-10 block that measures 10 cm by 10 cm by 10 cm. A thousand cube consists of one thousand 1-centimeter cubes.



A thousand cube

expand-and-trade subtraction A subtraction algorithm in which expanded notation is used to facilitate place-value exchanges. Home Links 9-6 and 9-7 provide more information about expand-and-trade subtraction.

multiple The product of a certain number and any counting number. For example, the multiples of 2 are 2, 4, 6, 8, and so on (because those numbers are obtained by multiplying 2 by 1, 2, 3, 4, and so on, respectively). The multiples of 5 are 5, 10, 15, 20, and so on. And the multiples of 10 are 10, 20, 30, 40, and so on.

3. Pose subtraction problems involving 2-digit numbers and ask your child to explain his or her strategy for solving them.
4. Point to an item in a store or an ad and have your child tell you what coins and bills he or she could use to pay for the item with exact change.

Building Skills through Games

In Unit 9 your child will play the following games to practice his or her mathematical skills.

Array Concentration

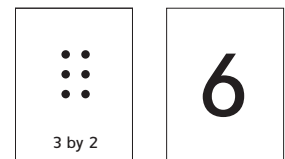
Players arrange a set of *Array Concentration* Number Cards and Array Cards facedown in front of them. A player flips over one of each type of card. If the cards “match”—that is, if the number on the number card equals the total number of dots in the array—the player takes the cards and takes another turn.

Shape Capture

Players have a set of Shape Cards spread out in front of them. One at a time players draw an Attribute Card and “capture” all the shapes that have that attribute. The player who captures the most shapes wins.

Beat the Calculator

One player is the Caller, who names two 1-digit numbers. Another player is the Brain, who adds the two numbers mentally. A third player is the Calculator, who adds the numbers with a calculator. The Brain tries to find the sum faster than the Calculator.



These cards match because there are 6 dots in the array.

Hit the Target

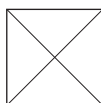
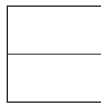
Players choose a 2-digit multiple of 10 (such as 10, 20, or 30) as a target number. One player chooses a starting number less than or greater than the target number, which the second player enters into a calculator. The second player tries to change it to the target number by adding or subtracting on the calculator.

As You Help Your Child with Homework

When your child brings home assignments, you may want to go over the instructions together, clarifying them. The answers listed below will guide you through the Unit 9 Home Links.

Home Link 9-1


1. one-half; 1-half; 1 out of 2 equal parts; 2-halves; two-halves; 2 out of 2 equal parts
2. 1 out of 4 equal parts; 1-fourth; one-quarter; whole; four-fourths; 4 out of 4 equal parts



Home Link 9-2

1. Sample answer: 1 out of 2 equal parts; 2 out of 2 equal parts
2. Sample answer: 1-third; three-thirds

Home Link 9-3

1. Sample answer: 

2. Sample answer: Cut the rectangle out and fold it along the lines to see if the parts are the same size.

3. Sample answers: 1-fourth; one-quarter

4. Sample answers: four out of four equal shares; 4-fourths

5. 107 6. 47 7. 82

Home Link 9-4

1. About 2 inches

2. Possible answers: 3 and one-half; 3 and 1-half

3. About 2 inches 4.-7. Answers vary.

Home Link 9-5

1. 329 2. 183

3. Three hundred twenty-nine; one hundred eighty-three

4. $400 + 90 + 1$ $400 + 70 + 1$ $491 > 471$

5. $<$ 6. $>$ 7. 158 8. 26 9. 102

Home Link 9-6

1. Sample estimates: $50 - 30 = 20$; $60 - 35 = 25$

Sample sketch:

 Answer: 19

2. Sample estimate: $60 - 30 = 30$

Sample sketch:

 Answer: 36

Home Link 9-7

1. Sample estimate: $60 - 40 = 20$

$$\begin{array}{r|l} 40 & 15 \\ \cancel{50} & \cancel{5} \\ - 30 & 7 \\ \hline 10 & 8 \end{array} \quad 10 + 8 = 18$$

2. Sample estimate: $80 - 30 = 50$

$$\begin{array}{r|l} 70 & 11 \\ \cancel{80} & \cancel{1} \\ - 20 & 8 \\ \hline 50 & 3 \end{array} \quad 50 + 3 = 53$$

Home Link 9-8

1. Possible answers: 10¢ or \$0.10; 50¢ or \$0.50; 100¢ or \$1.00; 250¢ or \$2.50

2. Answers vary.

Home Link 9-9

1-2. Sample explanations given.

1. No. 59¢ is almost 60¢, and 49¢ is almost 50¢. $60¢ + 50¢$ is more than \$1.

2. No. $30 + 10 = 40$ and 2 and 8 make another 10, so the total for the radio and headphones is \$50. I couldn't buy the calculator, too.

3. 38 4. 91 5. 25

Home Link 9-10

1. 14 fingers; $7 + 7 = 14$

2. 4 shells; $4 + 4 = 8$

3. 58 4. 130 5. 25

Home Link 9-11

1. 10 cents, 10, 10; 30 cents, 30, 30

2. 40 cents, 40, 40; 70 cents, 70, 70

3. 80 cents, 80, 80; 40 cents, 40, 40

4. 140 5. 43 6. 175