LESSON 2·1

Uses of Numbers

Answer the following questions:

1. How many students are in your class? _____ students

2. What is your mailing address? _____

3. In what year were you born? _____

4. About how long do you have to eat lunch at school? _____ minutes

5. What time does school start? _____

6. About how many times older than you is your principal? _____

7. Write and answer a question that has a number for an answer.

   _____

   _____

Numbers Everywhere

Find examples of numbers—all kinds of numbers. Look in newspapers and magazines. Look in books. Look on food packages. Ask people in your family for examples.

Write your numbers below. If an adult says you may, cut out the numbers and tape them onto the back of this page.

Be sure you write what the numbers mean.

Example: Mount Everest is 29,028 feet high. It is the world's tallest mountain.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Practice

1. $5 \times 3 =$ _____   **2.** _____ $= 4 \times 3$ **3.** _____ $= 10 \div 2$ **4.** $8 \div 4 =$ _____

39

LESSON 2·1 | **Solving Frames-and-Arrows Problems**

1. On the number line below, count by 3s starting with 0. Circle every number that is part of the count.

SRB
160 161

```
0  1  2  3  4  5  6  7  8  9  10  11  12  13  14  15  16  17  18  19  20  21  22
```
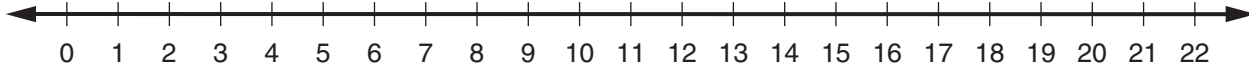
2. Use the rule to fill in the missing numbers.

Rule

+3

| 9 | | | 18 | |

3. Find the rule and fill in the missing numbers.

a.

Rule

| 100 | 150 | | | 300 |

b.

Rule

| 1,800 | | 1,850 | | 1,900 |
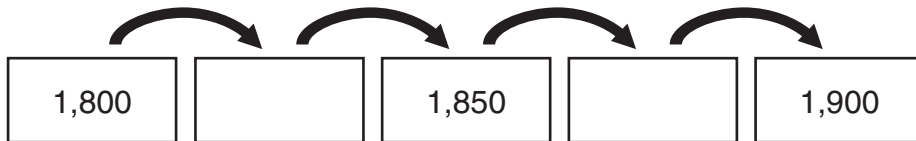
4. Explain how you figured out the rule for Problem 3b.

_____

_____

Try This

5. Find the missing numbers.

```
350        _____     _____     _____        550
```

LESSON 2·1 | **Missing Numbers on a Number Line**

Mrs. Gonzalez told her students that there is a strategy they can always use to find missing numbers on a number line when the missing numbers are the same distance apart.

Solve the problems.

1. ⟵————┬————┬————┬————┬————┬————┬————┬————⟶

      21   ____   ____   63   ____   ____

2. ⟵————┬————┬————┬————┬————┬————┬————┬————⟶

      202   ____   ____   ____   562   ____   ____

3. ⟵————┬————┬————┬————┬————┬————┬————┬————⟶

      2,493   _____   _____   _____   _____   8,008

4. ⟵————┬————┬————┬————┬————┬————┬————┬————⟶

      1,562   _____ _____ _____ _____ _____   1,874

5. Describe a strategy that the students in Mrs. Gonzalez's class might have used to solve all of the problems on this page.

_____

_____

_____

_____

_____

6. Create a number-line problem like the ones above. Ask a partner to solve it.

⟵————┬————┬————┬————┬————┬————┬————┬————⟶

STUDY LINK 2·2 | **Many Names for Numbers** | SRB 149

1. Write five names for 64.

64

2. Write five names for 132.

132

3. Pretend that the 4-key on your calculator is broken. Write six ways to display the number 40 on the calculator without using the 4-key. Try to use different numbers and operations.

Example: $2 \times 2 \times 10$

_____   _____   _____

_____   _____   _____

Try This

4. Now pretend that all the keys on your calculator work except for the 3-key and the 6-key. Write six ways to display the number 36 without using these keys.

_____   _____   _____

_____   _____   _____

Practice

5. $20 + 60 =$ _____

6. _____ $= 60 + 90$

7. _____ $= 80 - 30$

8. $110 - 40 =$ _____

LESSON 2·2 | Domino Sums

Materials   ☐   1 or 2 sets of double-9 dominoes or *Math Masters,*
                        pages 394–396

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                ☐   number cards 0–18 (1 each; from the Everything Math Deck, if available)

Directions

1.   Lay out the number cards in order from 0 through 18.

2.   Place each domino above the number card that shows the sum of the
     domino's dots. In the example below, the sum of 4 and 1 is 5, and the sum of
     2 and 3 is 5.

     2 + 3 and 4 + 1 are **equivalent names** for the number 5.

     Example:

3.   In the space below, list the addition facts shown by the dominoes.
     Before you begin, decide how you will organize the facts.

LESSON 2·2 | Pan-Balance Problems

A **pan balance** is used to weigh objects. When the weight of the objects in one pan is the same as the weight of the objects in the other pan, the pans are in perfect balance.
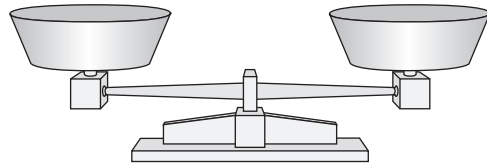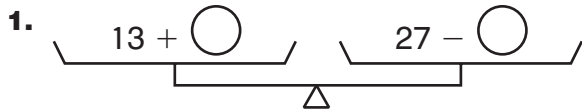
In each figure below, the pans hold **equivalent names** for a number. The pans are in perfect balance. Fill in the missing numbers. Write the name for the pan balance.
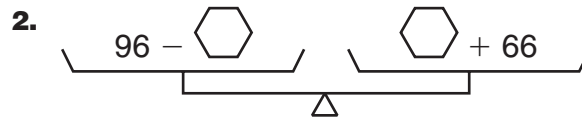
Example:

$5 + 5 + \boxed{5}$ $3 \times \boxed{5}$
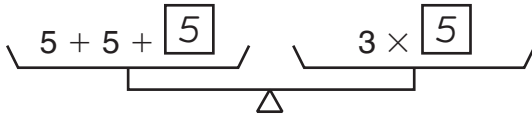
a. $\square = \underline{\quad 5 \quad}$

b. Pan-balance name $\underline{\quad 15 \quad}$

1.

$13 + \bigcirc$ $27 - \bigcirc$

a. $\bigcirc = \underline{\quad\quad}$

b. Pan-balance name $\underline{\quad\quad}$

2.

$96 - \hexagon$ $\hexagon + 66$

a. $\hexagon = \underline{\quad\quad}$

b. Pan-balance name $\underline{\quad\quad}$

3.

$\pentagon \times 7$ $63 \div \pentagon$

a. $\pentagon = \underline{\quad\quad}$

b. Pan-balance name $\underline{\quad\quad}$

4.

$36 - \trapezoid$ $(60 \div 4) \times (\trapezoid \div 3)$

a. $\trapezoid = \underline{\quad\quad}$
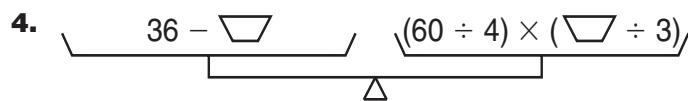
b. Pan-balance name $\underline{\quad\quad}$

STUDY LINK 2·3 Place Value in Whole Numbers

1. Write the number that has

6 in the millions place,
4 in the thousands place,
7 in the ten-millions place,
5 in the hundred-thousands place,
8 in the hundred-millions place, and
0 in the remaining places.

__ __ 6 , __ __ __ , __ __ __

2. Write the number that has

7 in the ten-thousands place,
3 in the millions place,
1 in the hundred-thousands place,
8 in the tens place,
2 in the ten-millions place, and
0 in the remaining places.

__ __ , __ __ __ , __ __ __

3. Compare the two numbers you wrote in Problems 1 and 2.

Which is greater? _____

4. The 6 in 46,711,304 stands for 6 _million_ , or _6,000,000_ .

 a. The 4 in 508,433,529 stands for 400 _____, or _____.

 b. The 8 in 182,945,777 stands for 80 _____, or _____.

 c. The 5 in 509,822,119 stands for 500 _____, or _____.

 d. The 3 in 450,037,111 stands for 30 _____, or _____.

Try This

5. Write the number that is 1 hundred thousand more.

 a. 210,366 _310,366_   **b.** 496,708 _____

 c. 321,589 _____   **d.** 945,620 _____

6. Write the number that is 1 million more.

 a. 3,499,702 _4,499,702_   **b.** 12,877,000 _____

 c. 29,457,300 _____   **d.** 149,691,688 _____

Practice

7. 32, 45, 58, _____, _____, _____

 Rule: _____

8. _____, _____, _____, 89, 115, 141

 Rule: _____

LESSON 2·3

Number-Grid Puzzles

1. Find the missing numbers.

| | 9,962 | |
| | | |

| | | |
| | | 9,984 |

| | |
| | |

| | | | |
| | | | |

| | |
| | △ |

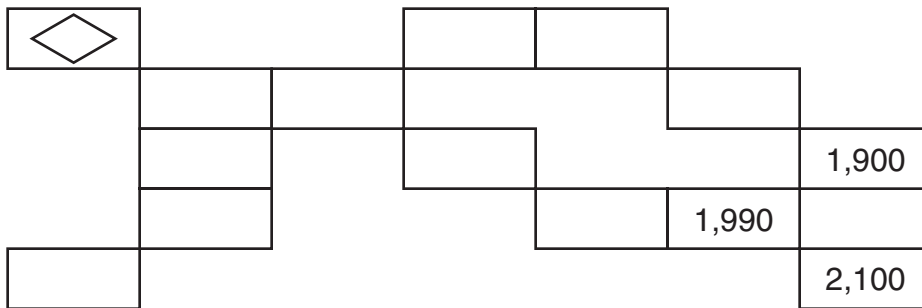**a.** △ = _____
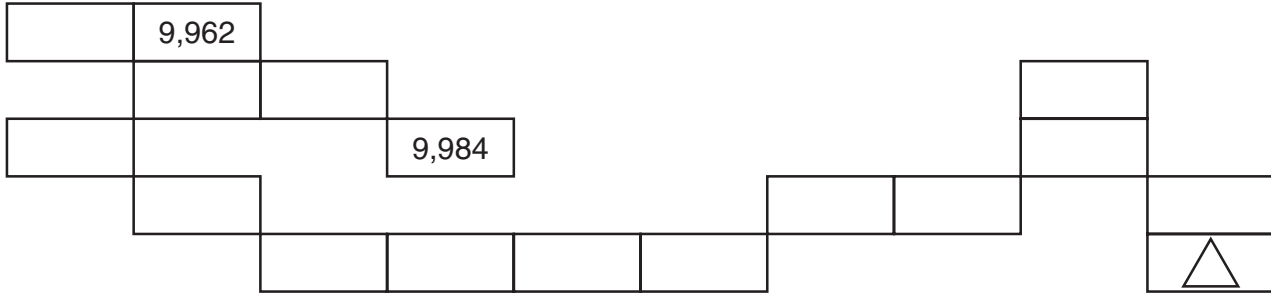
b. Explain how you found △.

_____

_____

_____

2. Below is a number-grid puzzle cut from a different number grid.
Figure out the pattern, and use it to fill in the missing numbers.

| ◇ | | |
| | | |

| | | | |
| | | 1,900 |

| | | |
| | 1,990 | |

| | | |
| | | 2,100 |

a. ◇ = _____

b. Explain how you found ◇.

_____

_____

_____

c. Describe how this number grid is different from number grids you have used before.

_____

_____

LESSON 2·4

Calculator "Change" Problems

Use this page with *Math Journal 1,* page 36, Problem 1.

	Start with	Place of Digit	Change to	Operation	New Number
a.	570	Tens			
b.	409	Hundreds			
c.	54,463	Thousands			
d.	760,837	Tens			
e.	52,036,458	Ones			
f.		Ten Thousands			
g.		Millions			

Make up your own calculator "change" problems.

	Start with	Place of Digit	Change to	Operation	New Number
a.					
b.					
c.					
d.					
e.					
f.					
g.					
h.					
i.					

STUDY LINK
2·4 | **Place Values in Whole Numbers**

1. Write the numbers in order from smallest to largest.

15,964   1,509,460   150,094,400
1,400,960   15,094,600

_____

_____

_____

_____

_____

2. Write the number that has

SRB
4

5 in the hundred-millions place,
7 in the ten-thousands place,
1 in the millions place,
9 in the hundred-thousands place,
8 in the ten-millions place, and
0 in all other places.

___ ___ ___, ___ ___ ___, ___ ___ ___

3. Write the largest number you can. Use each digit just once.

3   5   0   7   9   2   6   4   _____

4. Write the value of the digit 8 in each numeral below.

a. **8**0,007,941 _____   **b.** **8**35,099,714 _____

c. **8**,714,366 _____   **d.** **8**60,490 _____

5. Write each number using digits.

a. four hundred eighty-seven million, sixty-three _____

b. fifteen million, two hundred ninety-seven _____

Try This

6. I am an 8-digit number.
   • The digit in the thousands place is the result of dividing 64 by 8.
   • The digit in the millions place is the result of dividing 63 by 9.
   • The digit in the ten-millions place is the result of dividing 54 by 6.
   • The digit in the tens place is the result of dividing 40 by 5.
   • The digit in the hundred-thousands place is the result of dividing 33 by 11.
   • All the other digits are the result of subtracting any number from itself.

   What number am I? ___ ___, ___ ___ ___, ___ ___ ___

LESSON 2·4 | **Use a Place-Value Tool**

1. Display each number below in your place-value flip book. Then display, read, and record the numbers that are 10 more, 100 more, and 1,000 more. Circle the digit that changed.

Number	10 more	100 more	1,000 more
146	1⑤6	②46	①,146
508			
2,368			
4,571			
15,682			

2. Display each number below in your place-value flip book. Then display, read, and record the numbers that are 10 less, 100 less, and 1,000 less. Circle the digit that changed.

Number	10 less	100 less	1,000 less
2,345	2,3③5	2,②45	①,345
3,491			
6,839			
12,367			
45,130			

3. Use your place-value flip book to help you answer the following questions.

    a. What number is 50 more than 329? _____

    b. What number is 300 more than 517? _____

    c. What number is 60 less than 685? _____

    d. What number is 400 less than 932? _____

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LESSON 2·4

Crack the Muffin Code

Daniel takes orders at the Marvelous Muffin Bakery. The muffins are packed into boxes that hold 1, 3, 9, or 27 muffins. When a customer asks for muffins, Daniel fills out an order slip.

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4 175

- If a customer orders 5 muffins, Daniel writes CODE 12 on the order slip.
- If a customer orders 19 muffins, Daniel writes CODE 201 on the order slip.
- If a customer orders 34 muffins, Daniel writes CODE 1021 on the order slip.

1. What would Daniel write on the order slip if a customer asked for 47 muffins? Explain.

CODE _____

_____

_____

_____

_____

2. If the Marvelous Muffin Bakery always packs its muffins into the fewest number of boxes possible, what is a code Daniel would never write on an order slip? Explain.

CODE _____

_____

_____

_____

_____

3. The largest box used by the bakery holds 27 muffins. Daniel thinks the bakery should have a box one size larger. How many muffins would the new box hold? Explain.

_____ muffins

_____

_____

_____

_____

STUDY LINK 2·5 | Collecting Data

1. Make a list of all the people in your family. Include all the people living at home now. Also include any brothers or sisters who live somewhere else. The people who live at home do not have to be related to you. Do not forget to write your name in the list.

   You will need this information to learn about the sizes of families in your class.

   _____   _____   _____

   _____   _____   _____

   _____   _____   _____

   How many people are in your family? _____ people

The tally chart at the right shows the number of books that some students read over the summer. Use the information to answer the questions below.

Number of Books Reported	Number of Students
2	///
3	##//
4	
5	##// //
6	##// /
7	//
8	////

2. How many students reported the number of books they read? _____

3. What is the **maximum** (the largest number of books reported)? _____

4. What is the **minimum** (the smallest number of books reported)? _____

5. What is the **range?** _____

6. What is the **mode** (the most frequent number of books reported)? _____

Practice

7. 30 + 50 = _____

8. _____ = 70 + 70 + 70

9. _____ = 90 + 80 + 60

10. 100 + 40 + 70 = _____

LESSON 2·5

Dice-Roll Tally Chart

Tally marks are vertical marks used to keep track of a count.
The fifth tally mark crosses the first four.

SRB 71

Examples:

/	//	///	////	⊬⊦
one	two	three	four	five
⊬⊦ /	⊬⊦ //	⊬⊦ ///	⊬⊦ ////	⊬⊦ ⊬⊦
six	seven	eight	nine	ten

1. Roll a pair of dice and find the sum.

2. Make a tally mark next to the sum in the chart below.

3. Set a timer for 3 minutes. Roll the dice and make a tally mark for each sum until the timer goes off.

Sum	Tallies
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	

4. Answer the questions below.

   a. How many times did you roll a sum of

   4? _____ times

   7? _____ times

   11? _____ times

   b. Which sum was rolled the most number of

   times? _____

   c. Which sum was rolled the least number of

   times? _____

   d. How many times did you roll the dice in all?

   _____ times

   e. On the back of this page, write two more things that you notice about the data you collected.

LESSON 2·5 | Making a Prediction Based on a Sample

Sometimes large numbers of people or things are impossible to count or take too much time to count. A smaller **sample** of data is often used to make predictions about a larger group or **population.**

You and your class collected, recorded, and analyzed data about the number of raisins found in $\frac{1}{2}$-ounce boxes of raisins.

Use the raisin data you collected on journal page 38 to answer the following questions.
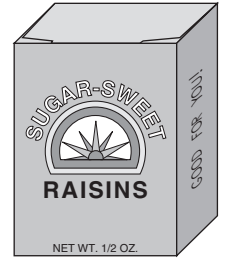
1. Without opening it, how many raisins do you think are in a large box (12 or 15 ounces) of raisins?

   About _____ raisins are in a _____-ounce box.

2. Explain the strategy you used to make your prediction.

   _____

   _____

   _____

3. Suppose you only knew the number of raisins in a single $\frac{1}{2}$-ounce box of raisins. Would that affect your prediction about the number of raisins in the large box? Why or why not?

   _____

   _____

   _____

   _____

**STUDY LINK
2·6** **Line Plots**

The students in Sylvia's class estimated how much time they spend watching television each week. The tally chart below shows the data they collected.

Number of Hours per Week Spent Watching TV	Number of Students
16	///
17	///
18	
19	//// /
20	//// ////
21	/
22	////
23	//

1. Construct a line plot for the data.

Student Data on Television Time

Number of Students

16 17 18 19 20 21 22 23

Number of Hours Spent
Watching Television Each Week
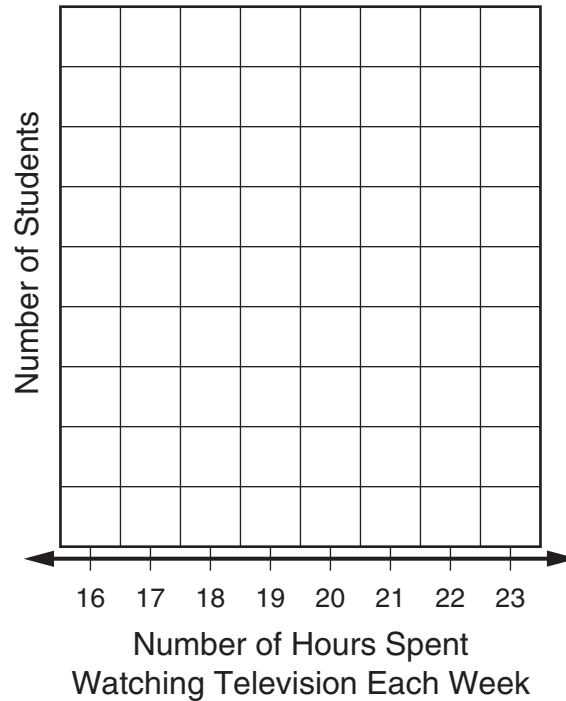
2. Find the following landmarks for the data:

   a. The maximum number of hours spent watching television each week. _____ hours

   b. minimum _____ hours   c. range _____ hours

   d. mode _____ hours   e. median _____ hours

3. Estimate the amount of time that you watch television each week. _____ hours

___

Try This

4. Calculate the mean number of hours Sylvia and her classmates spent

   watching TV each week. _____ hours

___

Practice

5. 80 + 30 = _____

6. _____ = 90 + 90

7. _____ = 70 + 60

8. 120 + 30 = _____
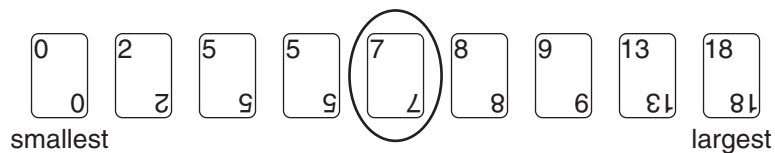
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LESSON 2·6 — Find the Median Number

The number in the middle of an ordered set of data is called the **middle value,** or **median.**

For Problems 1–3,

◆ Draw nine cards from a deck of number cards.

◆ Arrange the cards in order from smallest to largest.

◆ Record the numbers in the boxes below.

◆ Circle the number in the middle.

Example:

| 0 | 2 | 5 | 5 | 7 | 8 | 9 | 13 | 18 |

smallest   largest

1.

The median of my nine cards is _____.

smallest   largest

2.

The median of my nine cards is _____.

smallest   largest

3.

The median of my nine cards is _____.

smallest   largest

4. Describe how you found the middle number in the problems above.

_____

_____

_____

5. If you arranged the cards in Problem 1 in order from *largest* to *smallest,* would the middle number stay the same? _____ Explain.

_____

_____

LESSON 2·6 | **Comparing Family-Size Data**

1. Create a display that compares the family-size data from your class with those of other fourth-grade classes.

   SRB
   70–75

2. Compare the maximum, minimum, range, mode, and median for family size for each class. Write about the similarities and differences. Use the back of this page if you need more space.

   _____

   _____

   _____

   _____

   _____

   _____

Combine and organize the data from all of the classes. Then answer the following questions.

3. What is the *median* family size for all of the classes? _____ people

4. How does your class median compare with the larger sample?

   _____

   _____

5. What is the *mean* family size for all of the classes? _____ people

6. If you had to predict the family size of a student from your school that you did not know, what would you predict? Explain your answer.

   _____

   _____

STUDY LINK 2·7 | Multidigit Addition

Make a ballpark estimate. Use the **partial-sums method** to add. Compare your answer with your estimate to see if your answer makes sense.

SRB 10

1.

$$67$$
$$+\ 85$$

Ballpark estimate:

_____

2.

$$439$$
$$+\ \ 71$$

Ballpark estimate:

_____

3.

$$227$$
$$+\ 386$$

Ballpark estimate:

_____

4.

$$493$$
$$+\ 939$$

Ballpark estimate:

_____

5.

$$732$$
$$+\ 1{,}788$$

Ballpark estimate:

_____

6.

$$4{,}239$$
$$+\ 1{,}508$$

Ballpark estimate:

_____

Practice

7. $8 \times 7 =$ _____

8. $9 \times 9 =$ _____

9. _____ $\div\ 6 = 9$

10. _____ $\div\ 4 = 8$

STUDY LINK 2·7 — Multidigit Addition *continued*

Make a ballpark estimate. Use the **column-addition method** to add.
Compare your answer with your estimate to see if your answer makes sense.

11. $\begin{array}{r} 89 \\ +\ 47 \\ \hline \end{array}$	**12.** $\begin{array}{r} 634 \\ +\ 86 \\ \hline \end{array}$	**13.** $\begin{array}{r} 148 \\ +\ 77 \\ \hline \end{array}$
Ballpark estimate: _____	Ballpark estimate: _____	Ballpark estimate: _____
14. $\begin{array}{r} 481 \\ +\ 239 \\ \hline \end{array}$	**15.** $\begin{array}{r} 746 \\ +\ 827 \\ \hline \end{array}$	**16.** $\begin{array}{r} 508 \\ +\ 1{,}848 \\ \hline \end{array}$
Ballpark estimate: _____	Ballpark estimate: _____	Ballpark estimate: _____

Practice

17. 16, 21, 26, _____, _____, _____   Rule: _____

18. _____, 52, _____, 104, 130, _____   Rule: _____

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LESSON 2·7

Addition Number Stories

Use *Math Masters,* page 405 and base-10 blocks to solve the number stories.
Record what you did in the parts-and-total diagrams.

Example:

The class had 43 blue crayons and 15 red crayons.

How many crayons did they have in all?

_58_ crayons

Total
58

Part	Part
43	*15*

1. Auntie May had 24 fish and 11 hamsters. How many pets did she have altogether?

_____ pets

Total

Part	Part

2. Jordan made a flower basket for his mother that had 23 daisies and 8 roses. How many flowers were in the basket?

_____ flowers

Total

Part	Part

3. Lucia had 38 cents and Madison had 29 cents. If they put their money together, how much money would they have?

_____ cents

Total

Part	Part

4. Miguel has 54 baseball cards. Janet gave him 47 more baseball cards. How many baseball cards does he have now?

_____ baseball cards

Total

Part	Part

LESSON 2·8   **Measuring and Drawing Line Segments**

Measure the following line segments to the nearest $\frac{1}{2}$ centimeter.

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1. ─────────────────────

About _____ cm

2. ──────────────────────────

About _____ cm

3. ───────────────────

About _____ cm

4. ──────────────────────────────

About _____ cm

Draw line segments having the following lengths:

5. 8 centimeters

6. 10 centimeters

7. 3.5 centimeters

Try This

8. Draw a line segment having the following length: 46 millimeters

STUDY LINK
2·8

Gestation Period

The period between the time an animal becomes pregnant and the time its baby is born is called the **gestation period.** The table below shows the number of days in the average gestation period for some animals.

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1. For the gestation periods listed in the table ...

   a. what is the maximum number of days?

   _____ days

   b. what is the minimum number of days?

   _____ days

   c. what is the range (the difference between the maximum and the minimum)?

   _____ days

   d. what is the median (middle) number of days?

   _____ days

Average Gestation Period (in days)	
Animal	**Number of Days**
dog	61
giraffe	457
goat	151
human	266
Asian elephant	645
mouse	19
squirrel	44
rhinoceros	480
rabbit	31

Source: World Almanac

2. Which animals have an average gestation period that is longer than 1 year?

   _____

3. How much longer is the average gestation period for a goat than for a dog? _____ days

4. Which animal has an average gestation period that is about twice as long

   as a rabbit's? _____

5. Which animal has an average gestation period that is about half as long

   as a squirrel's? _____

Practice

6. 56 + 33 = _____

7. _____ = 167 + 96

8. _____ = 78 − 32

9. 271 − 89 = _____

61

**LESSON 2·8** | **Construct a "Real" Graph**

Do this activity with a partner.

Materials ☐ set of pattern blocks from your teacher

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☐ graph mat (4 copies of *Math Masters,* page 406 taped together)

1. Display the pattern blocks on the graph mat so that you can easily count and compare the number of hexagons, trapezoids, triangles, squares, blue rhombi, and tan rhombi.

hexagon   trapezoid   triangle   square   blue rhombus   tan rhombus
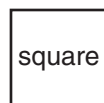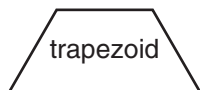
2. Use your display to answer the following questions.

a. Which pattern block appears the most? _____ The least? _____

b. How many hexagons and triangles are there altogether? _____

c. How many more trapezoids are there than squares? _____

3. Use your display to complete the following statements.

a. There are fewer _____ than _____ .

b. There are more _____ than _____ .

c. There is the same number of _____ as _____ .

4. Write a question that can be answered by looking at your display. Answer your question.

a. Question _____

_____

b. Answer _____

Try This

5. How many more quadrangles are there than nonquadrangles? _____

LESSON 2·8 **"One Size Fits All" Claim**

Makers of adjustable baseball caps claim that "one size fits all." Do you think this is a true statement? Use the head-size data you collected on journal pages 46 and 47 to help you decide.

1. Select a baseball cap and adjust the headband to the smallest size. Measure and record the distance around the inside of the baseball cap to the nearest half centimeter.

   Smallest size: _____ cm

2. Now adjust the headband to the largest size. Measure and record.

   Largest size: _____ cm

3. Compare the measurements above with the head-size data you and your class collected. Could this baseball cap be worn by everyone in the class? Explain your answer.

   _____

   _____

   _____

   _____

   _____

4. Do you think you have enough information to decide whether or not the claim "one size fits all" is true? _____ Explain.

   _____

   _____

   _____

   _____

STUDY LINK 2·9 | Multidigit Subtraction

Make a ballpark estimate. Use the **trade-first subtraction method** to subtract.
Compare your answer with your estimate to see if your answer makes sense.

SRB 12

1.

$$\begin{array}{r} 96 \\ -\ 28 \\ \hline \end{array}$$

Ballpark estimate:

_____

2.

$$\begin{array}{r} 469 \\ -\ 87 \\ \hline \end{array}$$

Ballpark estimate:

_____

3.

$$\begin{array}{r} 732 \\ -\ 365 \\ \hline \end{array}$$

Ballpark estimate:

_____

4.

$$\begin{array}{r} 4{,}321 \\ -\ 575 \\ \hline \end{array}$$

Ballpark estimate:

_____

5.

$$\begin{array}{r} 5{,}613 \\ -\ 2{,}724 \\ \hline \end{array}$$

Ballpark estimate:

_____

6.

$$\begin{array}{r} 6{,}600 \\ -\ 4{,}278 \\ \hline \end{array}$$

Ballpark estimate:

_____

Practice

7. $8 \times$ _____ $= 64$ **8.** $9 \times$ _____ $= 72$ **9.** $56 =$ _____ $\times 8$ **10.** $42 =$ _____ $\times 7$

64

STUDY LINK
2·9

Multidigit Subtraction *continued*

Make a ballpark estimate. Use the **partial-differences method** to subtract.
Compare your answer with your estimate to see if your answer makes sense.

SRB
12

11.
$$\begin{array}{r} 84 \\ -\ 55 \\ \hline \end{array}$$

Ballpark estimate:

_____

12.
$$\begin{array}{r} 136 \\ -\ 79 \\ \hline \end{array}$$

Ballpark estimate:

_____

13.
$$\begin{array}{r} 573 \\ -\ 167 \\ \hline \end{array}$$

Ballpark estimate:

_____

14.
$$\begin{array}{r} 506 \\ -\ 282 \\ \hline \end{array}$$

Ballpark estimate:

_____

15.
$$\begin{array}{r} 5,673 \\ -\ 1,194 \\ \hline \end{array}$$

Ballpark estimate:

_____

16.
$$\begin{array}{r} 3,601 \\ -\ 1,063 \\ \hline \end{array}$$

Ballpark estimate:

_____

Practice

17. _____, _____, 55, 44, _____, 22   Rule: _____

18. _____, _____, _____, _____, 72, 81   Rule: _____

65

LESSON 2·9 | # Subtraction by Counting Up

Use the **counting-up method** to solve these problems. Use the number lines if they are helpful.
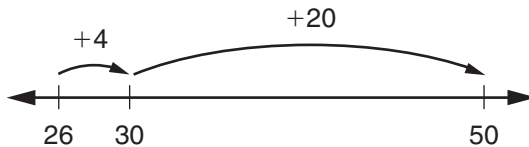
SRB
14

Example:

$50 - 26 = $?

Think: $26 + \textbf{4} = 30$

$30 + \textbf{20} = 50$

$\textbf{4} + \textbf{20} = 24$

So, $50 - 26 = 24$

```
        +4          +20
      ⌒         ⌒⌒⌒⌒⌒⌒
 ◄──┼──┼─────────────┼──►
    26  30           50
```

---

1. $80 - 37 = $ _____

```
◄──┼──────────────┼──►
   37             80
```

2. $70 - 29 = $ _____

```
◄──┼──────────────┼──►
   29             70
```

3. _____ $= 130 - 84$

```
◄──┼──────────────┼──►
   84            130
```

4. $120 - 45 = $ _____

```
◄──┼──────────────┼──►
   45            120
```

5. $224 - 150 = $ _____

```
◄──┼──────────────┼──►
   150           224
```

6. _____ $= 146 - 92$

```
◄──┼──────────────┼──►
   92            146
```
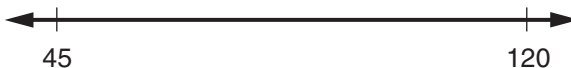
LESSON 2·9

Number-Tile Problems

SRB 12–15

Cut out the 20 number tiles at the bottom of the page. Use them to help you solve the problems.

1. Use five odd-numbered tiles to make the smallest possible difference.

2. Use five even-numbered tiles (that includes 0) to make the largest possible difference. Do not use 0 as the first digit.

3. Use one set of the number tiles 0–9. Find the missing digits in these addition and subtraction problems.

a.

$$
\begin{array}{r}
7\ \square \\
-\ \square\ 3 \\
\hline
3\ 6
\end{array}
$$

b.

$$
\begin{array}{r}
9\ \square\ 2 \\
-\ \square\ 5\ 6 \\
\hline
8\ 2\ \square
\end{array}
$$

c.

$$
\begin{array}{r}
7\ \square\ 4 \\
+\ \square\ 1\ 5 \\
\hline
1{,}2\ 8\ 9
\end{array}
$$

d.

$$
\begin{array}{r}
1\ \square\ 4 \\
+\ \ \ 8\ \square \\
\hline
\square\ 1\ 4
\end{array}
$$

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

STUDY LINK 2·10 | **Unit 3: Family Letter**

Multiplication and Division; Number Sentences and Algebra

One of our goals in the coming weeks is to finish memorizing the multiplication facts for single-digit numbers. To help students master the facts, they will play several math games. Ask your child to teach you one of the games described in the *Student Reference Book,* and play a few rounds together.

The class will also take a series of 50-facts tests for multiplication. Because correct answers are counted only up to the first mistake (and not counted thereafter), your child may at first receive a low score. If this happens, don't be alarmed. Before long, scores will improve dramatically. Help your child set a realistic goal for the next test, and discuss what can be done to meet that goal.

Your child will use Multiplication/Division Fact Triangles to review the relationship between multiplication and division. (For example, $4 \times 5 = 20$, so $20 \div 5 = 4$ and $20 \div 4 = 5$.) You can use the triangles to quiz your child on the basic facts and test your child's progress.

In this unit, alternative symbols for multiplication and division are introduced. An asterisk (∗) may be substituted for the traditional $\times$ symbol, as in $4 * 5 = 20$. A slash (/) may be used in place of the traditional $\div$ symbol, as in $20/4 = 5$.

In Unit 3, the class will continue the World Tour, a yearlong project in which the students travel to a number of different countries. Their first flight will take them to Cairo, Egypt. These travels serve as background for many interesting activities in which students look up numerical information, analyze this information, and solve problems.

Finally, the class will have its first formal introduction to solving equations in algebra. (Informal activities with missing numbers in number stories have been built into the program since first grade.) Formal introduction to algebra in fourth grade may surprise you, because algebra is usually regarded as a high school subject. However, an early start in algebra is integral to the *Everyday Mathematics* philosophy.
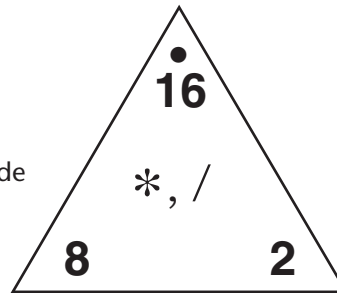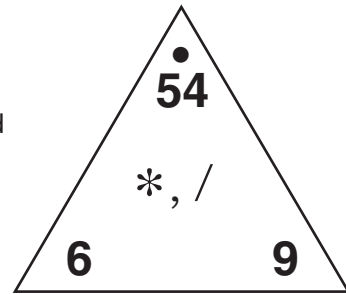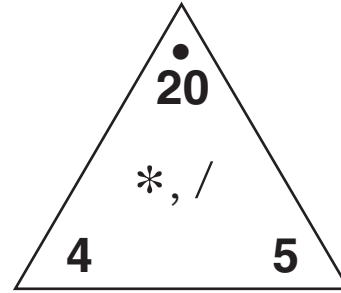
Please keep this Family Letter for reference as your child works through Unit 3.

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Vocabulary

Important terms in Unit 3:

dividend In division, the number that is being divided. For example, in $35 \div 5 = 7$, the dividend is 35.

divisor In division, the number that divides another number. For example, in $35 \div 5 = 7$, the divisor is 5.

Fact family A set of related arithmetic facts linking two inverse operations. For example, $4 + 8 = 12$, $8 + 4 = 12$, $12 - 4 = 8$, and $12 - 8 = 4$ is an addition/subtraction fact family, and $4 * 8 = 32$, $8 * 4 = 32$, $32/4 = 8$, and $32/8 = 4$ is a multiplication/division fact family.

Fact Triangle A triangular flash card labeled with the numbers of a *fact family* that students can use to practice addition/subtraction or multiplication/division facts.
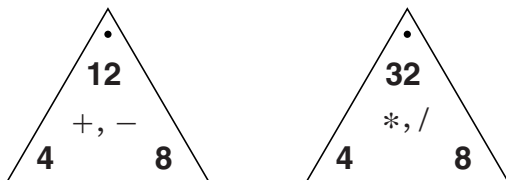
factor One of two or more numbers that are multiplied to give a product. For example, $4 * 1.5 = 6$; so 6 is the product, and 4 and 1.5 are the factors. See also *factor of a counting number* n.

factor of a counting number *n* A counting number whose product with some other counting number equals *n*. For example, 2 and 3 are factors of 6 because $2 * 3 = 6$. But 4 is not a factor of 6 because $4 * 1.5 = 6$ and 1.5 is not a counting number.

multiple of a number *n* A product of *n* and a counting number. The multiples of 7, for example, are 7, 14, 21, 28, and so on.

number sentence Two numbers or expressions separated by a relation symbol ($=, >, <, \geq, \leq,$ or $\neq$). Most number sentences also contain at least one operation symbol ($+, -, \times, *, \cdot, \div, /$). Number sentences may also have grouping symbols, such as parentheses.

open sentence A *number sentence* in which one or more *variables* hold the places of missing numbers. For example, $5 + x = 13$ is an open sentence.

percent (%) Per hundred, or out of a hundred. For example, "48% of the students in the school are boys" means that, on average, 48 out of every 100 students in the school are boys; $48\% = \frac{48}{100} = 0.48$

product The result of multiplying two numbers called *factors*. For example, in $4 * 3 = 12$, the product is 12.

quotient The result of dividing one number by another number. For example, in $35 \div 5 = 7$, the quotient is 7.

square number A number that is the product of a counting number and itself. For example, 25 is a square number because $25 = 5 * 5$. The square numbers are 1, 4, 9, 16, 25, and so on.

variable A letter or other symbol that represents a number. A variable can represent one specific number. For example, in the number sentence $5 + n = 9$, only *n* makes the sentence true. A variable may also stand for many different numbers. For example, $x + 2 < 10$ is true if *x* is any number less than 8. And in the equation $a + 3 = 3 + a$, *a* stands for all numbers.

"What's My Rule?" problem A type of problem that asks for a rule for relating two sets of numbers. Also, a type of problem that asks for one of the sets of numbers, given a rule and the other set of numbers.

Rule	in	out
×8	6	48
	10	80
	3	
		56
		64

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Do-Anytime Activities

To work with your child on the concepts taught in this unit, try these interesting and rewarding activities:

1. Continue to work on multiplication and division facts by using Fact Triangles and fact families and by playing games described in the *Student Reference Book.*

2. As the class proceeds through the unit, give your child multidigit addition and subtraction problems related to the lessons covered, such as 348 + 29, 427 + 234, 72 − 35, and 815 − 377.

3. Help your child recognize and identify real-world examples of right angles, such as the corner of a book, and examples of parallel lines, such as railroad tracks.

Building Skills through Games

In Unit 3, your child will play the following games.

Baseball Multiplication See *Student Reference Book,* pages 231 and 232.

Two players will need 4 regular dice, 4 pennies, and a calculator to play this game. Practicing the multiplication facts for 1–12 and strengthening mental arithmetic skills are the goals of *Baseball Multiplication.*

Beat the Calculator See *Student Reference Book,* page 233.

This game involves 3 players and requires a calculator and a deck of number cards, four each of the numbers 1 through 10. Playing *Beat the Calculator* helps your child review basic multiplication facts.

Division Arrays See *Student Reference Book,* page 240.

Materials for this game include number cards, 1 each of the numbers 6 through 18; a regular (6-sided) die; 18 counters; and paper and pencil. This game, involving 2 to 4 players, reinforces the idea of dividing objects into equal groups.

Multiplication Top-It See *Student Reference Book,* page 264.

The game can be played with 2 to 4 players and requires a deck of cards, four each of the numbers 1 through 10. This game helps your child review basic multiplication facts.

Name That Number See *Student Reference Book,* page 254.

Played with 2 or 3 players, this game requires a complete deck of number cards and paper and pencil. Your child tries to name a target number by adding, subtracting, multiplying, and dividing the numbers on as many of the cards as possible.

As You Help Your Child with Homework

As your child brings assignments home, you may want to go over the instructions together, clarifying them as necessary. The answers listed below will guide you through some of the Study Links in this unit.

Study Link 3·1

1. 60, 230, 110, 280, 370

2. 110, 80, 310, 240, 390

3. 34, 675, 54; +46   **4.** 9, 50, 420; ×7

5. 2, 400, 2,000   **6.** Answers vary.

7. 115   **8.** 612   **9.** 1,440

Study Link 3·2

2. 1, 2, 3, 4, 6, 9, 12, 18, 36   **3.** 1, 16; 2, 8; 4, 4

4. 56   **5.** Sample answer: 4, 8, 12, 16   **6.** 53

7. 388   **8.** 765

Study Link 3·3

1. 24   **2.** 54   **3.** 28   **4.** 16

5. 45   **6.** 18   **7.** 40   **8.** 25

9. 48   **11.** 1, 2, 3, 6, 9, 18

Study Link 3·4

1. 6   **2.** 8   **3.** 6   **4.** 3

6. 20; 5   **7.** 18; 6   **8.** 49; 7   **9.** 9; 2

10. 7; 5   **11.** 7; 4

12. Sample answer: 10, 15, 20, 25

13. 1, 2, 3, 4, 6, 8, 12, 24

Study Link 3·5

1. 5   **2.** 7   **3.** 72   **4.** 10

5. 32   **15.** 1,646   **16.** 5,033

17. 289   **18.** 1,288

Study Link 3·6

3. a. T

4. about 128,921 miles;
132,000 − 3,079 = 128,921

5. a. 4

6. 1, 2, 3, 4, 6, 12

7. Sample answers: 16, 24, 32, 40

Study Link 3·7

	Cities	Measurement on Map (inches)	Real Distance (miles)
1.	Cape Town and Durban	4	800
2.	Durban and Pretoria	$1\frac{3}{4}$	350
3.	Cape Town and Johannesburg	4	800
4.	Johannesburg and Queenstown	2	400
5.	East London and Upington	$2\frac{1}{2}$	500
6.	____ and ____	Answers vary.	

Study Link 3·8

1. 659 − 457 = 202; 202

2. 1,545 + 2,489 = 4,034; 4034

3. 700 − 227 = 473; 473

4. 1,552 − 1,018 = 534; 534

5. 624 + 470 + 336 = 1,430; 1,430   **6.** 9

7. 6, 12, 18, 24, 30, 36, 42, 48, 54, 60

Study Link 3·9

1. F   **2.** F   **3.** T   **4.** T

5. F   **6.** T   **7.** T   **8.** ?

11. b. 7 * 8 = 56   **12.** 36, 60, 84; +12

13. 54, 216, 324; +54

Study Link 3·10

1. 27   **2.** 33   **3.** 1   **4.** 24

5. 37   **6.** 8   **7.** 3 * (6 + 4) = 30

8. 15 = (20/4) + 10   **9.** 7 + (7 * 3) = 4 * 7

10. 9 * 6 = (20 + 7) * 2

11. 72 ÷ 9 = (2 * 3) + (18 ÷ 9)

12. 35 ÷ (42 ÷ 6) = (10 − 6) + 1   **13.** ?

14. ?   **15.** F   **16.** T   **17.** F   **18.** T