STUDY LINK 1·9

Unit 2: Family Letter

Using Numbers and Organizing Data

Your child is about to begin this year's work with numbers. The class will examine what numbers mean and how they are used in everyday life.

In today's world, numbers are all around us—in newspapers and magazines and on TV. We use them

◆ to count things *(How many people are in the room?)*

◆ to measure things *(How tall are you?)*

◆ to create codes *(What is your Social Security number?)*

◆ to locate things in reference frames *(What time is it?)*

◆ to express rates, scales, and percents *(How many miles per gallon does your car get? What percent voted for Jamie?)*

Sometimes students will need to interpret a collection of numbers. The class will learn to organize such collections of numbers in tables and graphs and to draw conclusions about them.

Computation is an important part of problem solving. Fortunately, we are no longer restricted to paper-and-pencil methods of computation. We can use calculators or computer programs to solve lengthy or complex problems. Your child will practice mental and paper-and-pencil methods of computation, use a calculator, and have opportunities to decide which is most appropriate for solving a particular problem.

Many of us were taught that there is just one way to do computations. For example, we may have learned to subtract by "borrowing." We may not have realized that there are other ways of subtracting numbers. While students will not be expected to learn more than one method, they will examine several different methods and realize that there are often several ways to arrive at the same result. They will have the option of using the methods with which they are comfortable or even inventing one of their own.

Mathematics games will be used throughout the school year to practice various arithmetic skills. Through games, practice becomes a thinking activity to be enjoyed. The games your child will play in this unit will provide practice with renaming numbers, with addition, and with subtraction. They require very little in the way of materials, so you may play them at home as well.

Please keep this Family Letter for reference as your child works through Unit 2.

STUDY LINK 1·9 | **Unit 2: Family Letter** *cont.*

Vocabulary

Important terms in Unit 2:

algorithm A set of step-by-step instructions for doing something, such as carrying out a computation or solving a problem.
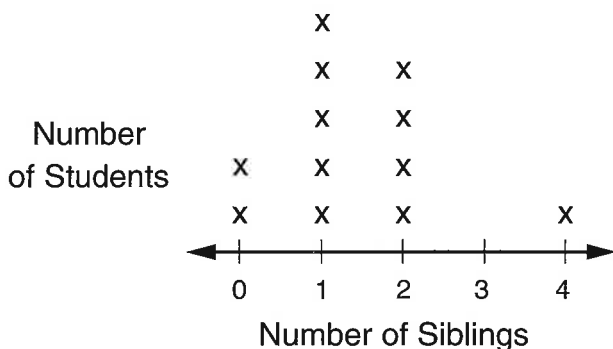
base 10 Our number system in which each place in a number has a value 10 times the place to its right and $\frac{1}{10}$ the place to its left.

column-addition A method for adding numbers in which the addends' digits are first added in each place-value column separately, and then 10-for-1 trades are made until each column has only one digit. Lines are drawn to separate the place-value columns.

	100s	10s	1s
	2	4	8
+	1	8	7
Add the columns:	3	12	15
Adjust the 1s and 10s:	3	13	5
Adjust the 10s and 100s:	4	3	5

equivalent names Different names for the same number. For example, $2 + 6$, $4 + 4$, $12 - 4$, $18 - 10$, $100 - 92$, $5 + 1 + 2$, eight, VIII, and $\cancel{||||}\ |||$ are equivalent names for 8.

line plot A sketch of data in which check marks, Xs, or other marks above a labeled line show the frequency of each value.

Number of Students

```
              X
              X     X
              X     X
    X    X    X
    X    X    X              X
  <-+----+----+----+----+->
    0    1    2    3    4
        Number of Siblings
```

mean The sum of a set of numbers divided by the number of numbers in the set. The mean is often referred to simply as the "average."

median The middle value in a set of data when the data are listed in order from least to greatest. If there is an even number of data points, the median is the *mean* of the two middle values.

mode The value or values that occur most often in a set of data.

name-collection box A diagram that is used for writing *equivalent names* for a number. The box to the right shows names for 8.

8
2 + 6
4 + 4
VIII
eight

partial-differences subtraction A way to subtract in which differences are computed separately for each place (ones, tens, hundreds, and so on). The partial differences are then added to give the final answer.

$$\begin{array}{r} 932 \\ -\ 356 \\ \hline \end{array}$$

Subtract the hundreds:	$900 - 300 \rightarrow$	600
Subtract the tens:	$30 - 50 \rightarrow -$	20
Subtract the ones:	$2 - 6 \rightarrow -$	4
Find the total:	$600 - 20 - 4 \rightarrow$	576

partial-sums addition A way to add in which sums are computed for each place (ones, tens, hundreds, and so on) separately. The partial sums are then added to give the final answer.

$$\begin{array}{r} 496 \\ 229 \\ +\ 347 \\ \hline \end{array}$$

Add the hundreds:	$400 + 200 + 300 \rightarrow$	900
Add the tens:	$90 + 20 + 40 \rightarrow$	150
Add the ones:	$6 + 9 + 7 \rightarrow +$	22
Find the total:	$900 + 150 + 22 \rightarrow$	1,072

range The difference between the maximum and the minimum in a set of data.

trade-first subtraction A subtraction method in which all trades are done before any subtractions are carried out.

whole numbers The numbers 0, 1, 2, 3, 4, and so on.

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 this unit's Study Links.

Study Link 2·2

1. Sample answers: 8 × 8; 32 × 2; 10 + 54
2. Sample answers: 2 × 66; 11 × 12; 66 + 66;
   30 + 30 + 30 + 30 + 12;
   (50 × 2) + 32
3. Sample answers: 20 + 20; 80 ÷ 2; $\frac{1}{2}$ × 80
4. Sample answers: 9 × 4; 72 ÷ 2; (12 × 4) − 12

Study Link 2·3

1. 876,504,000   2. 23,170,080
3. 876,504,000
4. a. thousand; 400,000
   b. million; 80,000,000
   c. million; 500,000,000
   d. thousand; 30,000
5. b. 596,708   d. 1,045,620
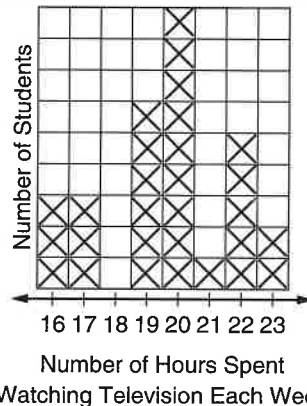6. b. 13,877,000   d. 150,691,688

Study Link 2·4

2. 581,970,000   3. 97,654,320
5. a. 487,000,063   b. 15,000,297
6. 97,308,080

Study Link 2·5

2. 27   3. 8   4. 2   5. 6   6. 5

Study Link 2·6

1.

Student Data on Television Time

Number of Students (vertical axis)

16 17 18 19 20 21 22 23

Number of Hours Spent
Watching Television Each Week

2. a. 23   b. 16   c. 7   d. 20   e. 20
4. 19.7

Study Link 2·7

1. 152   2. 510   3. 613
4. 1,432   5. 2,520   6. 5,747
11. 136   12. 720   13. 225
14. 720   15. 1,573   16. 2,356

Study Link 2·8

1. a. 645   b. 19   c. 626   d. 151
2. Giraffe, Asian elephant, and rhinoceros
3. 90   4. dog   5. mouse

Study Link 2·9

1. 68   11. 29
2. 382   12. 57
3. 367   13. 406
4. 3,746   14. 224
5. 2,889   15. 4,479
6. 2,322   16. 2,538

STUDY LINK 2·1 | 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

Many Names for Numbers   SRB 149

1. Write five names for 64.

2. Write five names for 132.

64

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. $110 - 40 =$ _____

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: _____

45

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

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. 80,007,941 _____   **b.** 835,099,714 _____

c. 8,714,366 _____   **d.** 860,490 _____

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? __ __ , __ __ __ , __ __ __

STUDY LINK
2·5

Collecting Data

SRB
72 73

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 = _____

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
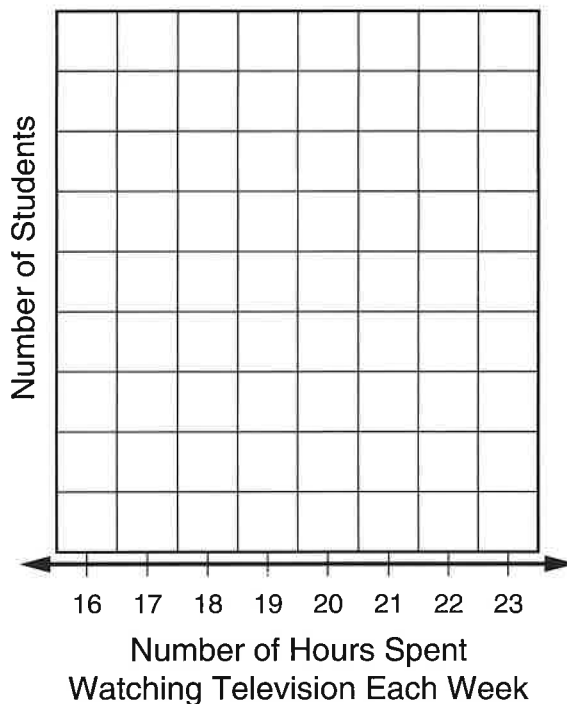
2. Find the following landmarks for the data:

   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 = _____

54

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.	2.	3.
67 + 85	439 + 71	227 + 386
Ballpark estimate:	Ballpark estimate:	Ballpark estimate:
_____	_____	_____
4.	**5.**	**6.**
493 + 939	732 + 1,788	4,239 + 1,508
Ballpark estimate:	Ballpark estimate:	Ballpark estimate:
_____	_____	_____

Practice

7. $8 \times 7 =$ _____   **8.** $9 \times 9 =$ _____   **9.** _____ $\div 6 = 9$ **10.** _____ $\div 4 = 8$

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.

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

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.	**12.**	**13.**
84 − 55	136 − 79	573 − 167
Ballpark estimate: _____	Ballpark estimate: _____	Ballpark estimate: _____
14.	**15.**	**16.**
506 − 282	5,673 − 1,194	3,601 − 1,063
Ballpark estimate: _____	Ballpark estimate: _____	Ballpark estimate: _____

Practice

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

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