

• Naming Numbers Through Hundred Billions

Power Up

facts

Power Up F

count aloud

Count by 6s from 6 to 60. Count by 60s from 60 to 300.

mental math

- Time:** 2 minutes 10 seconds is how many seconds?
- Measurement:** The window was 4 feet 2 inches from top to bottom. What is this length in inches?
- Measurement:** There are 16 ounces in a pound. How many ounces are in 3 pounds?
- Number Sense:** $1\frac{1}{8} + \frac{7}{8}$
- Time:** 50% of a minute
- Time:** 25% of a minute
- Time:** 10% of a minute
- Calculation:** $6 \times 6, - 6, \div 6, + 5, \div 5, \times 7, + 1, \div 3$

problem solving

Alicia and Barbara attended the carnival together. Alicia paid the admission prices, which were \$8 per person. Barbara paid for the rides and the snacks, which were \$20 altogether.

After the carnival, Alicia and Barbara decided to share the costs equally. Which girl paid more than her share at the carnival? Which girl paid less than her share at the carnival? How could they settle the difference so that they each pay an equal amount?

Focus Strategies: Make a Model; Act It Out

Understand We are told that Alicia and Barbara each paid for items at a carnival. We are asked to find which girl paid more than her share and which paid less than her share. We are also asked to find how the girls could settle the difference so that they each would pay an equal amount.

Texas Essential Knowledge and Skills

- (5.1)(A) use place value to read and write whole numbers through the 999,999,999,999.
- (5.3)(A) use addition to solve problems involving decimals.
- (5.3)(B) use multiplication to solve problems with whole numbers.
- (5.14)(A) identify the mathematics in everyday situations.
- (5.14)(C) develop the problem-solving strategy acting it out to solve a problem.
- (5.15)(A) explain observations using technology.
- (5.16)(B) justify why an answer is reasonable.

Plan We can *act out* the situation by using our money manipulatives to *model* the problem. Let's suppose Alicia and Barbara each start with \$20. If the girls start with the same amount and then share costs equally, they should have equal amounts of money left over after paying for items at the carnival.

Solve Alicia paid the admission prices, which were \$8 per person, or \$16 altogether. We take away \$16 from Alicia's money. This leaves Alicia with \$4. Barbara paid for snacks and rides, which cost \$20 altogether. We take away \$20 from Barbara's money, which leaves her with no money. We see that if **Alicia gives Barbara \$2** from the \$4 she has remaining, each girl would have \$2, and they would be "even."

If we add up the prices, we see that the girls spent \$36 altogether. Half of that amount is \$18. This means that before settling the difference, **Alicia paid \$2 less than her share, and Barbara paid \$2 more than her share.**

Check We know that our answers are reasonable because the girls spent \$36 altogether, which means each girl should have spent \$18. However, Alicia paid \$16 and Barbara paid \$20. So Alicia spent \$2 less than she should have, and Barbara spent \$2 more than she should have.

In our solution, we assumed that each girl started with the same amount of money. If the girls started with different amounts, would they still equally share the cost after paying for the items at the carnival? Explain your answer.

New Concept

The diagram below shows the values of the first twelve whole-number places:



Visit www.SaxonMath.com/Int5Activities for an online activity.

hundred billions	hundred millions	hundred thousands	hundreds
ten billions	ten millions	ten thousands	tens
billions	millions	thousands	ones
— — —	— — —	— — —	— — —
	,		,

Discuss Describe how the millions place and the thousands place compare.

Drawing the place-value diagram a different way emphasizes the repeating pattern of place values.

Billions			billions comma	Millions			millions comma	Thousands			thousands comma	Units (Ones)		
hundreds	tens	ones		hundreds	tens	ones		hundreds	tens	ones		hundreds	tens	ones
—	—	—		—	—	—		—	—	—		—	—	—

Analyze How many millions are equal to one billion?

We see that the pattern of **ones, tens, hundreds** repeats through the thousands, millions, and billions.

Example 1

Which digit shows the number of hundred billions in 987,654,321,000?

Moving from right to left, the pattern of ones, tens, hundreds continues through the thousands, millions, and billions. The digit in the hundred-billions place is **9**.

Example 2

What is the value of the 2 in the number 12,345,678?

- A 2,000,000 B 2000 C 2 D 20,000**

The value of a digit depends upon its place in the number. Here the 2 means “two million.” The correct choice is **2,000,000**.

To name whole numbers with many digits, it is helpful to use commas. To insert commas, we count digits from the right-hand side of the whole number and put a comma after every three digits.

87,654,321

We write a comma after the millions place and after the thousands place. When reading a number with two commas, we say “million” when we come to the first comma and “thousand” when we come to the second comma.

8 7 , 6 5 4 , 3 2 1
 “million” “thousand”

Reading Math

Newspapers and magazines usually use the short word form of very large numbers, such as:

- 105 million
- 260 billion
- 3 trillion

Using words, we name this number as follows:
eighty-seven million, six hundred fifty-four thousand,
three hundred twenty-one

Example 3

Use words to name 1345200.

We first put the commas in the number: 1,345,200. Then we name the number as **one million, three hundred forty-five thousand, two hundred.**

Example 4

Use digits to write one hundred thirty-four billion, six hundred fifty-two million, seven hundred thousand.

We write the number as **134,652,700,000.**

Example 5

Write 2,500,000 in expanded notation.

We write 2 times its place value plus 5 times its place value.

$$(2 \times 1,000,000) + (5 \times 100,000)$$

Verify Two million, five hundred thousand can be written as 2.5 million. Explain why.

Lesson Practice

In problems **a–d**, name the value of the place held by the zero in each number.

a. 345,052

b. 20,315,682

c. 1,057,628

d. 405,176,284

e. In 675,283,419,000, which digit is in the ten-billions place?

f. Multiple Choice In which of the following numbers does the 7 have a value of seventy thousand?

A 370,123,429

B 1,372,486

C 4,703,241

D 7,000,469

g. Use words to write the value of the 1 in 321,987,654.

Represent Use words to name each number:

h. 21462300

i. 19650000000

Represent Use digits to write each number:

j. nineteen million, two hundred twenty-five thousand,
five hundred

k. seven hundred fifty billion, three hundred million

l. two hundred six million, seven hundred twelve thousand,
nine hundred thirty-four

m. **Represent** Write 7,500,000 in expanded notation.

Written Practice

Distributed and Integrated

- ⁽⁴⁹⁾ 1. Thao made 5 dozen baked apples and gave 24 to a friend. How many baked apples did she have left?
- ⁽⁴⁶⁾ 2. Marco weighs 120 pounds. His younger brother weighs one half as much. How much does his brother weigh?
- ⁽⁴⁹⁾ 3. Hope bought a chain for \$3.60 and a lock for \$4. How much should she get back in change from a \$10 bill?
- ^(28, 35) 4. In 1607, Captain John Smith led a group of British explorers who settled in Jamestown, Virginia. How many centuries are there from the year 1607 to the year 2007?
- ⁽⁴⁸⁾ 5. **Represent** Write $(1 \times 100) + (4 \times 10) + (8 \times 1)$ in standard form.
- ^(37, 44) *6. **Represent** Draw a rectangle that is 2 inches long and 1 inch wide. Shade all but three eighths of it. What percent of the rectangle is not shaded?
- ⁽⁷⁾ 7. **Represent** Use words to name the number 250,000.
- ⁽⁵⁰⁾ *8. **Analyze** This picture shows three stacks of books. If the stacks were made equal, how many books would be in each stack? Explain your answer.
- ⁽⁵²⁾ *9. Which digit in 789,456,321 shows the number of hundred millions?



10. Round 1236 to the nearest hundred.
(33)

11. Name the value of the place held by the zero in 102,345,678.
(52)

$$\begin{array}{r} 12. \quad 57 \\ (51) \quad \times 22 \\ \hline \end{array}$$

$$\begin{array}{r} 13. \quad \$0.83 \\ (51) \quad \times 47 \\ \hline \end{array}$$

$$\begin{array}{r} 14. \quad 167 \\ (51) \quad \times 89 \\ \hline \end{array}$$

$$\begin{array}{r} 15. \quad \$1.96 \\ (51) \quad \times 46 \\ \hline \end{array}$$

$$\begin{array}{r} 16. \quad 8437 \\ (6) \quad 3429 \\ \quad 5765 \\ + 9841 \\ \hline \end{array}$$

$$\begin{array}{r} 17. \quad \$26.38 \\ (13) \quad - \$19.57 \\ \hline \end{array}$$

$$\begin{array}{r} *18. \quad 3041 \\ (14) \quad - \quad w \\ \hline 2975 \end{array}$$

$$19. \quad \frac{4328}{4} \\ (34)$$

$$20. \quad \frac{5670}{10} \\ (26)$$

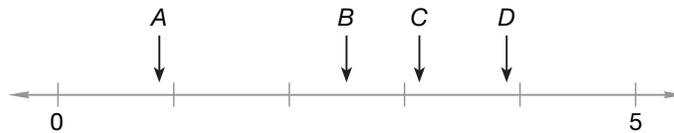
$$21. \quad \frac{\$78.40}{4} \\ (34)$$

$$22. \quad \frac{3}{10} + 2 + 1\frac{4}{10} \\ (43)$$

$$23. \quad 5\frac{3}{4} - \left(2\frac{3}{4} - 2\right) \\ (41, 43)$$

24. $\$10 - (\$1.43 + \$2 + \$2.85 + \$0.79)$
(13, 24)

*25. **Connect** Which arrow could be pointing to $3\frac{9}{10}$ on the number line below?
(38)



26. Tuan needed to multiply 25 by 24. He thought of 24 as $20 + 4$. Using the Distributive Property, show two choices Tuan has for multiplying the numbers.
(51)

*27. Maura counted the number of trees on each property on her block. The results are listed below.
(Inv. 5)

a. Make a line plot to display these data:

2, 9, 2, 5, 4, 5, 1, 5, 4, 5, 5, 4, 12, 4

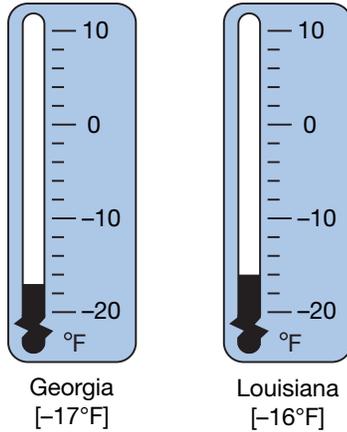
b. Name the median, mode, and range.

c. Name two outliers.

d. Name a data cluster.

- *28. **Represent** Write three million, two hundred thousand in expanded notation.
(52)

29. The thermometers show the lowest temperatures ever recorded in two states.
(27)



The two temperatures differ by what number of degrees?

- *30. Cameron's age in years is 2 fewer years than 10 times his brother's age.
(49) Cameron's brother is 1 year old. How old is Cameron?

**Early
Finishe**
Real-World
Connection

Saturn is about 1352550000 kilometers away from the sun.

- Rewrite the number and insert commas.
- Which digit is in the hundred-millions place?
- Underline the digit in the ten-thousands place.
- Use words to write the number.