

• Review of Subtraction

Power Up

facts

Power Up A

count aloud

Count by threes from 3 to 30.

mental math

Number Sense: Nine is one less than ten. When adding 9 to a number, we may mentally add 10 and then think of the number that is one less than the sum. For $23 + 9$ we may think, “ $23 + 10$ is 33, and one less than 33 is 32.”

$$\begin{array}{r} \text{a.} \quad 33 \\ + 10 \\ \hline \end{array}$$

$$\begin{array}{r} \text{b.} \quad 33 \\ + 9 \\ \hline \end{array}$$

$$\begin{array}{r} \text{c.} \quad 46 \\ + 10 \\ \hline \end{array}$$

$$\begin{array}{r} \text{d.} \quad 46 \\ + 9 \\ \hline \end{array}$$

$$\begin{array}{r} \text{e.} \quad 65 \\ + 10 \\ \hline \end{array}$$

$$\begin{array}{r} \text{f.} \quad 65 \\ + 9 \\ \hline \end{array}$$

problem solving

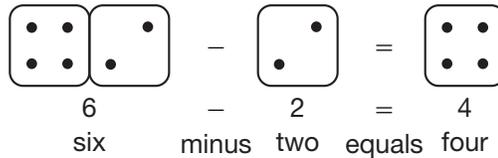
Choose an appropriate problem-solving strategy to solve this problem. At the arcade, Bao won 8 prize tickets and Sergio won 4 prize tickets. They decide to share the tickets equally. How many tickets should Bao give Sergio so that they have an equal number of prize tickets? How many tickets will each boy have? Explain how you arrived at your answer.

New Concept

Remember that when we add, we combine two groups into one group.

$$\begin{array}{ccccccc} \begin{array}{|c|} \hline \bullet \bullet \\ \bullet \bullet \\ \hline \end{array} & + & \begin{array}{|c|} \hline \bullet \\ \bullet \\ \hline \end{array} & = & \begin{array}{|c|c|} \hline \bullet \bullet & \bullet \\ \bullet \bullet & \bullet \\ \hline \end{array} \\ 4 & + & 2 & = & 6 \\ \text{four} & \text{plus} & \text{two} & \text{equals} & \text{six} \end{array}$$

When we **subtract**, we separate one group into two groups. To take away two from six, we subtract.



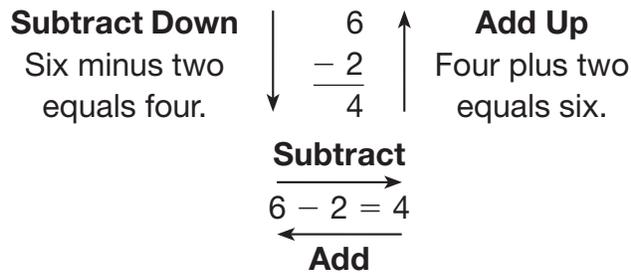
When we subtract one number from another number, the answer is called the **difference**. If we subtract two from six, the difference is four.

$$\begin{array}{r} 6 \\ - 2 \\ \hline 4 \end{array} \text{ difference}$$

Here we write “two subtracted from six” horizontally:

$$6 - 2 = 4$$

We can check a subtraction answer by adding the difference to the number subtracted. This is like doing the problem “in reverse.” The sum of the addition should equal the starting number.



Math Language

An **expression** is a number, a letter, or a combination of numbers and letters. Expressions usually contain one or more operation symbols.

$$3 \quad a \quad 4n \quad 6 + t$$

An **equation** is a number sentence that states that two expressions are equal. An equation always includes an equal sign.

$$3 + 5 = 8$$

< >
expressions

The order of numbers matters in subtraction. The expression $6 - 2$ means “take two from six.” This is not the same as $2 - 6$, which means “take six from two.”

Discuss Since addition and subtraction are opposite operations, we can use addition to check subtraction and use subtraction to check addition. When operations are opposite, one operation undoes the other. How could we use subtraction to check the addition $6 + 8 = 14$?

A **fact family** is a group of three numbers that can be arranged to form four facts. The three numbers 2, 4, and 6 form an addition and subtraction fact family.

$$\begin{array}{r} 2 \\ + 4 \\ \hline 6 \end{array} \quad \begin{array}{r} 4 \\ + 2 \\ \hline 6 \end{array} \quad \begin{array}{r} 6 \\ - 2 \\ \hline 4 \end{array} \quad \begin{array}{r} 6 \\ - 4 \\ \hline 2 \end{array}$$

Recognizing addition and subtraction fact families can help us learn the facts.

Example

The numbers 3, 5, and 8 form an addition and subtraction fact family. Write two addition facts and two subtraction facts using these three numbers.

$$\begin{array}{r} 3 \\ + 5 \\ \hline 8 \end{array} \quad \begin{array}{r} 5 \\ + 3 \\ \hline 8 \end{array} \quad \begin{array}{r} 8 \\ - 3 \\ \hline 5 \end{array} \quad \begin{array}{r} 8 \\ - 5 \\ \hline 3 \end{array}$$

Connect We can write a fact family using three numbers because addition and subtraction are related operations. How would you write a fact family for 9, 9, and 18?

Lesson Practice

Subtract. Then check your answers by adding.

a. $\begin{array}{r} 14 \\ - 8 \\ \hline \end{array}$ b. $\begin{array}{r} 9 \\ - 3 \\ \hline \end{array}$ c. $\begin{array}{r} 15 \\ - 7 \\ \hline \end{array}$ d. $\begin{array}{r} 11 \\ - 4 \\ \hline \end{array}$ e. $\begin{array}{r} 12 \\ - 5 \\ \hline \end{array}$

f. **Connect** The numbers 5, 6, and 11 form a fact family. Write two addition facts and two subtraction facts using these three numbers.

g. **Explain** How can you check a subtraction answer? Give an example.

Written Practice

Distributed and Integrated

*1. $\begin{array}{r} 14 \\ (6) \quad - 5 \\ \hline \end{array}$

*2. $\begin{array}{r} 15 \\ (6) \quad - 8 \\ \hline \end{array}$

3. $\begin{array}{r} 9 \\ (6) \quad - 4 \\ \hline \end{array}$

4. $\begin{array}{r} 11 \\ (6) \quad - 7 \\ \hline \end{array}$

5. $\begin{array}{r} 12 \\ (6) \quad - 8 \\ \hline \end{array}$

6. $\begin{array}{r} 11 \\ (6) \quad - 6 \\ \hline \end{array}$

7. $\begin{array}{r} 15 \\ (6) \quad - 7 \\ \hline \end{array}$

8. $\begin{array}{r} 9 \\ (6) \quad - 6 \\ \hline \end{array}$

9. $\begin{array}{r} 13 \\ (6) \quad - 5 \\ \hline \end{array}$

10. $\begin{array}{r} 12 \\ (6) \quad - 6 \\ \hline \end{array}$

11. $\begin{array}{r} 8 \\ (1) \quad + n \\ \hline 17 \end{array}$

12. $\begin{array}{r} a \\ (1) \quad + 8 \\ \hline 14 \end{array}$

13. $\begin{array}{l} 3 + w = 11 \\ (1) \end{array}$

14. $\begin{array}{l} 1 + 4 + m = 13 \\ (2) \end{array}$

*15. **Connect** The numbers 4, 6, and 10 form a fact family. Write two addition facts and two subtraction facts using these three numbers.

Generalize Write the rule and the next three numbers of each counting sequence:

* 16. 16, 18, 20, _____, _____, _____, ...
(3)

* 17. 21, 28, 35, _____, _____, _____, ...
(3)

* 18. 20, 24, 28, _____, _____, _____, ...
(3)

* 19. How many days are in the tenth month of the year?
(5)

20. **Represent** Draw a diagram to show \$326.
(4)

21. The digit 6 is in what place in 456?
(4)

Find each missing addend:

22. $2 + n + 4 = 13$
(2)

23. $a + 3 + 5 = 16$
(2)

* 24. What is the name for the answer when we subtract?
(6)

* 25. **List** Show six ways to add 3, 4, and 5.
(1)

* 26. **Multiple Choice** The ages of the children in Tyrese's family are 7 and 9. The ages of the children in Mary's family are 3, 5, and 9. Which number sentence shows how many children are in both families?

A $3 + 7 = 10$

B $7 + 9 = 16$

C $2 + 3 = 5$

D $3 + 5 + 9 = 17$

27. How many different three-digit numbers can you write using the digits 6, 3, and 9? Each digit may be used only once in every number you write. List the numbers in counting order.
(3)

* 28. Write a horizontal number sentence that has a sum of 23.
(1)

* 29. Write a horizontal number sentence that has a difference of 9.
(6)

* 30.  **Formulate** Write and solve an addition word problem using the numbers 6, 5, and 11.
(1)

• Writing Numbers Through 999

Power Up

facts

Power Up A

count aloud

Count by tens from 10 to 200.

mental mathAdd one less than ten to a number in **a–c**.

a. **Number Sense:** $28 + 9$

b. **Number Sense:** $44 + 9$

c. **Number Sense:** $87 + 9$

d. **Review:** $63 + 20$

e. **Review:** $46 + 50$

f. **Review:** $38 + 30$

problem solving

Choose an appropriate problem-solving strategy to solve this problem. Steve has 5 pencils. Perry has 3 pencils. Chad has only 1 pencil. How can one boy give one other boy some pencils so that they each have the same number of pencils? Explain your answer.

New Concept

Whole numbers are the counting numbers and the number zero.

0, 1, 2, 3, 4, 5, ...

Reading Math

The names of two-digit numbers greater than twenty that do not end in zero are written with a hyphen.

Examples:
twenty-three
fifty-one
eighty-seven

To write the names of whole numbers through 999 (nine hundred ninety-nine), we need to know the following words and how to put them together:

0....zero	10....ten	20....twenty
1....one	11....eleven	30....thirty
2....two	12....twelve	40....forty
3....three	13....thirteen	50....fifty
4....four	14....fourteen	60....sixty
5....five	15....fifteen	70....seventy
6....six	16....sixteen	80....eighty
7....seven	17....seventeen	90....ninety
8....eight	18....eighteen	100....one hundred
9....nine	19....nineteen	

You may refer to this chart when you are asked to write the names of numbers in the problem sets.

Example 1

Use words to write the number 44.

We use a hyphen and write “**forty-four.**” Notice that “forty” is spelled without a “u.”

To write three-digit numbers, we first write the number of hundreds and then we write the rest of the number. **We do not use the word *and* when writing whole numbers.**

Example 2

Use words to write the number 313.

First we write the number of hundreds. Then we write the rest of the number to get **three hundred thirteen.** (We do not write “three hundred *and* thirteen.”)

Example 3

Use words to write the number 705.

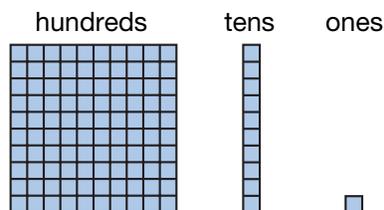
First we write the number of hundreds. Then we write the rest of the number to get **seven hundred five.**

Example 4

Use digits to write the number six hundred eight.

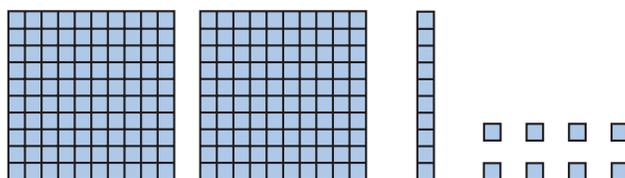
Six hundred eight means “six hundreds plus eight ones.” There are no tens, so we write a zero in the tens place and get **608.**

In Lesson 4 we used \$100 bills, \$10 bills, and \$1 bills to demonstrate place value. Here we show another model for place value. Small squares represent ones. The long, ten-square rectangles represent tens. The large, hundred-square blocks represent hundreds.



Example 5

Use words to write the number shown by this model:

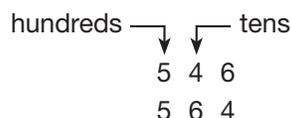


Two hundreds, one ten, and eight ones is 218, which we write as **two hundred eighteen**.

Example 6

Which of these two numbers is greater: 546 or 564?

We compare whole numbers by considering the place value of the digits. Both numbers have the same digits, so the position of the digits determines which number is greater.



Both numbers have 5 hundreds. However, 564 has 6 tens while 546 has only 4 tens. This means **564 is greater**, and 546 is less no matter what digit is in the ones place.

Example 7

Arrange these numbers in order from least to greatest:

36 254 105 90

Arranging whole numbers vertically with last digits aligned also aligns other digits with the same place value.

36

254

105

90

Looking at the hundreds place, we see that 254 is the greatest number listed and 105 is the next greatest. By comparing the tens place of the two-digit numbers, we see that 36 is less than 90. We write the numbers in order:

36, 90, 105, 254

Lesson Practice

Represent Use words to write each number:

a. 0

b. 81

c. 99

d. 515

e. 444

f. 909

Represent Use digits to write each number:

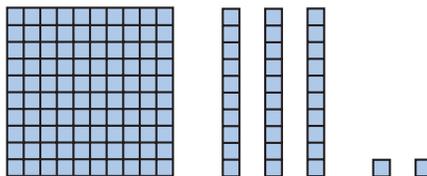
g. nineteen

h. ninety-one

i. five hundred twenty-four

j. eight hundred sixty

k. Use words to write the number shown by this model:



l. **Compare** Which of these two numbers is less: 381 or 359?

m. Write these numbers in order from least to greatest:

154 205 61 180

Written Practice

Distributed and Integrated

Formulate Write and solve equations for problems 1 and 2.

- *1. Anita has 8 dollars. She needs 6 dollars more to buy the radio. How much does the radio cost?

- *2. Peyton poured 8 ounces of water into a pitcher containing 8 ounces of lemon juice. How many ounces of liquid were in the mixture?

Find the missing addend:

3. $5 + n + 2 = 11$
(2)

4. $2 + 6 + n = 15$
(2)

Subtract. Check by adding.

*5. $\begin{array}{r} 13 \\ - 5 \\ \hline \end{array}$
(6)

6. $\begin{array}{r} 16 \\ - 8 \\ \hline \end{array}$
(6)

7. $\begin{array}{r} 13 \\ - 7 \\ \hline \end{array}$
(6)

8. $\begin{array}{r} 12 \\ - 8 \\ \hline \end{array}$
(6)

Represent Use digits to write each number:

- *9. two hundred fourteen
(7)

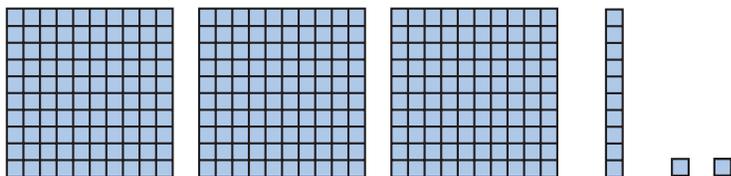
- *10. five hundred thirty-two
(7)

Represent Use words to write each number:

- *11. 301
(7)

- *12. 320
(7)

- *13. **Represent** Use words to write the number shown by this model:
(7)



14. **Represent** Write a number sentence for this picture:
(1)



Generalize Write the rule and the next three numbers of each counting sequence:

15. 12, 18, 24, _____, _____, _____, ...
(3)

- *16. 15, 18, 21, _____, _____, _____, ...
(3)

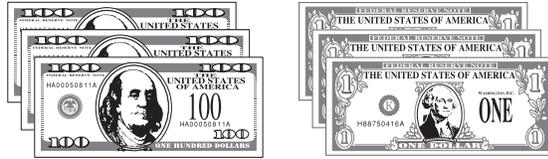
Connect Find the missing number in each counting sequence:

- *17. 35, 42, _____, 56, ...
(3)

- *18. 40, _____, 56, 64, ...
(3)

19. **Connect** How much money is shown by this picture?

(4)



*20. **Connect** The numbers 7, 8, and 15 form a fact family. Write two addition facts and two subtraction facts using these three numbers.

(6)

*21. **Explain** Brad was twelfth in line. His sister was sixth in line. How many people were between Brad and his sister? Explain how you can use the four-step problem-solving process to solve this problem.

(5)

22. Which month is five months after October?

(5)

23. Six nickels equals how many cents? Count by fives.

(3)

24. $4 + 7 + 8 + 5 + 4$

(1)

25. $2 + 3 + 5 + 8 + 5$

(1)

26. $5 + 8 + 6 + 4 + 3 + 7 + 2$

(1)

*27. **Multiple Choice** Which addition equation is related to $12 - 5 = 7$?

(6)

A $7 + 5 = 12$

B $12 + 5 = 17$

C $12 + 7 = 19$

D $12 - 7 = 5$

*28. How many different three-digit numbers can you write using the digits 4, 1, and 6? Each digit may be used only once in every number you write. List the numbers in order from least to greatest.

(3)

*29. Compare 126 and 162. Which number is less?

(7)

*30. The table shows the lengths of three rivers in North America.

(7)

List the rivers in order from longest to shortest.

**The Lengths of Rivers
(in miles)**

River	Length
Alabama	729
Green	730
Kuskokwim	724

• Adding Money

Power Up

facts

Power Up B

count aloud

Count by fives from 5 to 100.

mental math

Add one less than ten to a number in problems **a–c**.

a. **Number Sense:** $56 + 9$

b. **Number Sense:** $63 + 9$

c. **Number Sense:** $48 + 9$

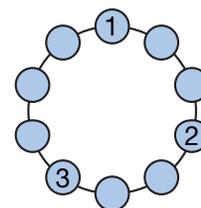
d. **Review:** $74 + 20$

e. **Review:** $60 + 30$

f. **Review:** $49 + 40$

problem solving

Copy this design of ten circles on a piece of paper. In each circle, write a number from 1 to 10 that continues the pattern of “1, skip, skip, 2, skip, skip, 3,”



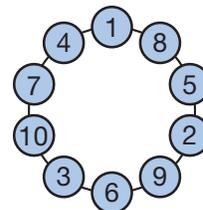
Focus Strategy: Extend a Pattern

Understand We are asked to copy the design of ten circles and to write a number in each circle. Three circles in the design are already filled with numbers. We are asked to continue the pattern of “1, skip, skip, 2, skip, skip, 3,”

Plan We will draw the design on our paper and *extend the pattern*.

Solve Copy the design of ten circles on your paper and write “1” in the top circle, as shown. Moving down and to the right (clockwise), skip two circles (skip, skip) and then write “2” in the next circle.

Then skip two more circles and write “3” in the next circle. Then skip two more circles and write “4.” Continue skipping two circles and then writing the next counting number. Your completed design should look like the picture at right.



Check We completed the task by extending the pattern of “1, skip, skip, 2, skip, skip, 3, ...” in the circle design until we filled all ten circles. We know our answer is reasonable because the pattern is still valid if we start at the end and work forward.

New Concept

Money manipulatives can be used to model or act out the addition of money amounts.

Sakura had \$24. Then she was given \$15 on her birthday. How much money does Sakura now have?

We can use  and  to add \$15 to \$24.

Sakura had \$24.



2



4

She was given \$15.

+



1



5

Now she has ...



3



9

The total is 3 tens and 9 ones, which is \$39.

We can also add \$24 and \$15 with pencil and paper. When we use pencil and paper, we first add the digits in the ones place. Then we add the digits in the tens place. (Remember to include the dollar sign in the answer.)

$$\begin{array}{r}
 \text{Add ones.} \quad \swarrow \searrow \\
 \text{Add tens.} \quad \swarrow \searrow \\
 \begin{array}{r}
 \$24 \\
 + \$15 \\
 \hline
 \$39
 \end{array}
 \end{array}$$

Thinking Skill

Verify

Explain why 3 tens + 9 ones equals 39.

Example

Sh'Tania had \$32. She earned \$7 babysitting. Then how much money did Sh'Tania have?

We add \$32 and \$7. To add with pencil and paper, we write the numbers so that the digits in the ones place are lined up.

$$\begin{array}{r} \$32 \\ + \$ 7 \\ \hline \$39 \end{array}$$

After babysitting Sh'Tania had **\$39**.

Activity

Adding Money Amounts

Materials needed:

- money manipulatives from Lesson 4 (from **Lesson Activities 1, 2, and 3**)

Use money manipulatives to act out these word problems:

1. Nelson paid \$36 to enter the amusement park and spent \$22 on food and souvenirs. Altogether, how much money did Nelson spend at the amusement park?
2. The plumber charged \$63 for parts and \$225 for labor. Altogether, how much did the plumber charge?

Lesson Practice

Add:

- | | | |
|------------------|------------------|------------------|
| a. $\$53 + \6 | b. $\$14 + \75 | c. $\$36 + \42 |
| d. $\$27 + \51 | e. $\$15 + \21 | f. $\$32 + \6 |

Written Practice

Distributed and Integrated

Represent In problems 1 and 2, use digits to write each number.

- *1. three hundred forty-three
(7)
- *2. three hundred seven
(7)
- *3. Use words to write the number 592.
(7)

Find each missing addend:

$$\begin{array}{r} 4. \quad 2 \\ (2) \quad 4 \\ + n \\ \hline 12 \end{array}$$

$$\begin{array}{r} 5. \quad 1 \\ (2) \quad r \\ + 6 \\ \hline 10 \end{array}$$

$$\begin{array}{r} 6. \quad 1 \\ (2) \quad t \\ + 7 \\ \hline 14 \end{array}$$

$$\begin{array}{r} 7. \quad 2 \\ (2) \quad 6 \\ + n \\ \hline 13 \end{array}$$

$$\begin{array}{r} *8. \quad \$25 \\ (8) \quad + \$14 \\ \hline \end{array}$$

$$\begin{array}{r} 9. \quad \$85 \\ (8) \quad + \$14 \\ \hline \end{array}$$

$$\begin{array}{r} 10. \quad \$22 \\ (8) \quad + \$ 6 \\ \hline \end{array}$$

$$\begin{array}{r} *11. \quad \$40 \\ (8) \quad + \$38 \\ \hline \end{array}$$

$$\begin{array}{r} *12. \quad 13 \\ (6) \quad - 9 \\ \hline \end{array}$$

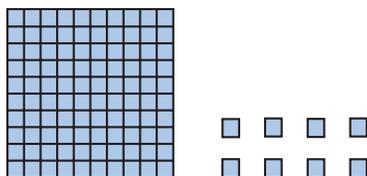
$$\begin{array}{r} 13. \quad 17 \\ (6) \quad - 5 \\ \hline \end{array}$$

$$\begin{array}{r} 14. \quad 17 \\ (6) \quad - 8 \\ \hline \end{array}$$

$$\begin{array}{r} 15. \quad 14 \\ (6) \quad - 6 \\ \hline \end{array}$$

- *16. **Formulate** D'Jeran has \$23. Beckie has \$42. Together, D'Jeran and Beckie have how much money? Write an equation to solve this problem.

- *17. **Represent** Use words to write the number shown by this model:



- *18. Salma was born on the fifth day of August in 1994. Write her birth date in month/day/year form.

Generalize Write the rule and the next three numbers of each counting sequence:

- *19. 12, 15, 18, _____, _____, _____, ...

- *20. 28, 35, 42, _____, _____, _____, ...

$$\begin{array}{r} 21. \quad 5 \\ (1) \quad 8 \\ \quad 7 \\ \quad 6 \\ \quad 4 \\ + 3 \\ \hline \end{array}$$

$$\begin{array}{r} 22. \quad 9 \\ (1) \quad 7 \\ \quad 6 \\ \quad 4 \\ \quad 8 \\ + 7 \\ \hline \end{array}$$

$$\begin{array}{r} 23. \quad 2 \\ (1) \quad 5 \\ \quad 7 \\ \quad 3 \\ \quad 5 \\ + 4 \\ \hline \end{array}$$

*24. **List** Show six ways to add 5, 6, and 7.
(1)

*25. **Connect** Write two addition facts and two subtraction facts using 7, 8, and 15.
(6)

*26. **Multiple Choice** If $7 + \diamond = 15$, then which of the following is *not* true?
(6)

A $\diamond - 7 = 15$

B $15 - 7 = \diamond$

C $15 - \diamond = 7$

D $\diamond + 7 = 15$

*27. How many different three-digit numbers can you write using the digits 7, 6, and 5? Each digit may be used only once in every number you write. List the numbers in order from least to greatest.
(3, 7)

28. Compare 630 and 603. Which is greater?
(7)

*29. The table shows the number of skyscrapers in three cities.
(7)

Write the names of the cities in order from the least number of skyscrapers to the greatest number of skyscrapers.

Skyscrapers

City	Number
Boston	16
Hong Kong	30
Singapore	14

*30. **Formulate** Write and solve an addition word problem that has a sum of 16.
(1)

Early Finishers

Real-World Connection

Mel works at the Cumberland Island National Seashore. He began the day with \$13 in the cash register. A family of four visiting the seashore gives Mel \$4 each for their entrance fees. What is the total amount Mel collects from the family? How much money is in the cash register now?

• Adding with Regrouping

Power Up

facts

Power Up B

count aloud

Count by threes from 3 to 30.

mental math

Number Sense: Nineteen is one less than 20. When adding 19 to a number, we may mentally add 20 and then think of the number that is one less than the sum.

$$\begin{array}{r} \text{a.} \quad 36 \\ + 20 \\ \hline \end{array}$$

$$\begin{array}{r} \text{b.} \quad 36 \\ + 19 \\ \hline \end{array}$$

$$\begin{array}{r} \text{c.} \quad 47 \\ + 20 \\ \hline \end{array}$$

$$\begin{array}{r} \text{d.} \quad 47 \\ + 19 \\ \hline \end{array}$$

$$\begin{array}{r} \text{e.} \quad 24 \\ + 20 \\ \hline \end{array}$$

$$\begin{array}{r} \text{f.} \quad 24 \\ + 19 \\ \hline \end{array}$$

problem solving

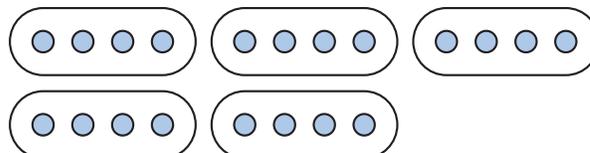
Twenty students are going on a field trip. Each car can hold 4 students. How many cars are needed for all the students?

Focus Strategy: Draw a Picture

Understand We are told that 20 students are going on a field trip. We are also told that each car can hold 4 students. We are asked to find the number of students each car can hold.

Plan We could act out this problem, but we can find the answer more quickly if we *draw a picture*. We could draw dots or other symbols to stand for the 20 students and then circle groups of 4 students.

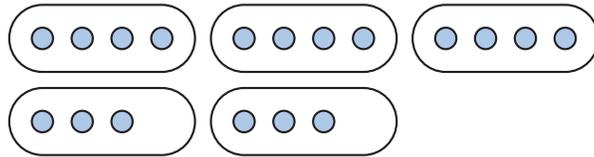
Solve We draw 20 dots on our paper to show 20 students. Then we circle groups of 4 dots. Each circle with 4 dots inside it stands for one car.



We drew 5 circles, which means that **5 cars** are needed for the field trip. Remember, each dot stands for one student, and each circle stands for one car.

Check We know our answer is reasonable because drawing a picture helped us to see how the students divide evenly into 5 equal groups of 4 students each.

We might wonder how many cars would be needed for a different number of students, such as 18. For 18 students, we can erase two dots in the picture, but we see that five cars (represented by the circles) are still needed to carry all 18 students.



New Concept

When we add, we sometimes have to regroup because we cannot have a number larger than 10 as the sum of any place value.

Example 1

Karyn had \$39. She earned \$14 more by raking leaves. How much money does Karyn have altogether?

Model We may use \$10 bills and \$1 bills to add \$14 to \$39.

Karyn had \$39.			
	3	9	
She earned \$14.			+
	1	4	

<i>Altogether she has ...</i>			
	4	13	

Since there are more than ten \$1 bills in the right-hand column, we exchange ten of the \$1 bills for one \$10 bill.

	
5	3

Now we have 5 tens and 3 ones, which equals **\$53**.

Thinking Skill

Verify

Why is 4 tens + 13 ones equal to 5 tens + 3 ones?

Thinking Skill**Discuss**

How do we know when to regroup?

We use a similar method when we add numbers with pencil and paper. To add 14 to 39, we add the digits in the ones place and get 13.

$$\begin{array}{r}
 \text{Add ones.} \downarrow \\
 39 \\
 + 14 \\
 \hline
 \textcircled{13} \leftarrow 1 \text{ ten and 3 ones}
 \end{array}$$

Thirteen ones is the same as 1 ten and 3 ones. We write the 3 in the ones place and add the 1 ten to the other tens. We show this by writing a 1 either above the column of tens or below it. Then we add the tens.

$$\begin{array}{r}
 \text{Add ones.} \quad \text{Add tens.} \\
 \text{Add tens.} \quad \text{Add ones.} \\
 \begin{array}{r}
 1 \text{ above} \rightarrow 1 \\
 39 \\
 + 14 \\
 \hline
 53
 \end{array}
 \quad
 \begin{array}{r}
 39 \\
 + 14 \\
 \hline
 1 \\
 53
 \end{array}
 \end{array}$$

Example 2

**One of the largest carrots ever grown weighed 18 pounds.
One of the largest zucchinis ever grown weighed 64 pounds.
Together, how many pounds did those two vegetables weigh?**

We combine the weights of the two vegetables by adding:

$$\begin{array}{r}
 18 \\
 + 64 \\
 \hline
 82
 \end{array}$$

Together the vegetables weighed **82 pounds**.

Lesson Practice

Model Demonstrate each problem using money manipulatives. Then add using pencil and paper.

a. $\begin{array}{r} \$36 \\ + \$29 \\ \hline \end{array}$

b. $\begin{array}{r} \$47 \\ + \$8 \\ \hline \end{array}$

c. $\begin{array}{r} \$57 \\ + \$13 \\ \hline \end{array}$

Use pencil and paper to add:

d. $68 + 24$

e. $\$59 + \8

f. $46 + 25$

Represent In problems 1 and 2, use digits to write each number:

*1. six hundred thirteen
(7)

*2. nine hundred one
(7)

3. Use words to write 941.
(7)

Find each missing addend for problems 4–7.

$$\begin{array}{r} 4. \quad 2 \\ (2) \quad 4 \\ + f \\ \hline 11 \end{array}$$

$$\begin{array}{r} 5. \quad 5 \\ (2) \quad g \\ + 2 \\ \hline 13 \end{array}$$

$$\begin{array}{r} 6. \quad h \\ (2) \quad 4 \\ + 7 \\ \hline 15 \end{array}$$

$$\begin{array}{r} 7. \quad 2 \\ (2) \quad 7 \\ + n \\ \hline 16 \end{array}$$

$$\begin{array}{r} *8. \quad 33 \\ (9) \quad + 8 \\ \hline \end{array}$$

$$\begin{array}{r} *9. \quad \$47 \\ (9) \quad + \$18 \\ \hline \end{array}$$

$$\begin{array}{r} *10. \quad 27 \\ (9) \quad + 69 \\ \hline \end{array}$$

$$\begin{array}{r} *11. \quad \$49 \\ (9) \quad + \$25 \\ \hline \end{array}$$

$$\begin{array}{r} *12. \quad 17 \\ (6) \quad - 8 \\ \hline \end{array}$$

$$\begin{array}{r} 13. \quad 12 \\ (6) \quad - 6 \\ \hline \end{array}$$

$$\begin{array}{r} 14. \quad 9 \\ (6) \quad - 7 \\ \hline \end{array}$$

$$\begin{array}{r} 15. \quad 13 \\ (6) \quad - 6 \\ \hline \end{array}$$

16. What is the name for the answer when we add?
(1)

17. What is the name for the answer when we subtract?
(6)

*18. Which month is two months after the twelfth month?
(5)

Generalize Write the rule and the next three numbers of each counting sequence:

*19. 30, 36, 42, _____, _____, _____, ...
(3)

*20. 28, 35, 42, _____, _____, _____, ...
(3)

21. Which digit is in the hundreds place in 843?
(4)

$$22. \quad 28 + 6 \\ (9)$$

$$*23. \quad \$47 + \$28 \\ (9)$$

$$24. \quad 35 + 27 \\ (9)$$

• Even and Odd Numbers

Power Up

multiples

Power Up K

A hundred number chart lists the whole numbers from 1 to 100. On your hundred number chart, shade the numbers we say when we count by 2s. What do we call these numbers? What are the last digits of these numbers?

count aloud

Count by fours from 4 to 40.

mental math

- Number Sense:** $28 + 9$
- Number Sense:** $36 + 19$
- Number Sense:** $43 + 9$
- Number Sense:** $25 + 19$
- Number Sense:** $56 + 9$
- Number Sense:** $45 + 19$

problem solving

Choose an appropriate problem-solving strategy to solve this problem. In his backyard garden, Randall planted three rows of carrots. He planted eight carrots in each row. Altogether, how many carrots did Randall plant? Explain how you arrived at your answer.

New Concept

The numbers we say when we start with 2 and then count up by twos are **even numbers**. Notice that every even number ends in either 2, 4, 6, 8, or 0.

2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, ...

The list of even numbers goes on and on. We do not begin with zero when we count by twos. However, the number 0 is an even number.

Example 1

Thinking Skill

Generalize

Think about any two even numbers. Will the sum of two even numbers always be an even number, or will the sum of two even numbers always be an odd number? Use examples to support your answer.

Which one of these numbers is an even number?

463 285 456

We can tell whether a number is even by looking at the last digit. **A number is an even number if the last digit is even.** The last digits of these numbers are 3, 5, and 6. Of these, the only even digit is 6, so the even number is **456**.

If a whole number is not an even number, then it is an **odd number**. We can make a list of odd numbers by beginning with the number 1. Then we add two to get the next odd number, add two more to get the next odd number, and so on. The sequence of odd numbers is

1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, ...

Example 2

Use the digits 2, 7, and 6 to write a three-digit odd number greater than 500. Use each digit only once.

Since 2 and 6 are even, the number must end in 7. To be greater than 500, the first digit must be 6. The answer is **627**.

Example 3

Model How many different three-digit numbers can you write using the digits 0, 1, and 2? Each digit may be used only once, and the digit 0 may not be used in the hundreds place. List the numbers from least to greatest, and label the numbers you write as even or odd.

We list the numbers and identify each number as even or odd.

Four numbers are possible:

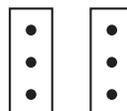
102 even

120 even

201 odd

210 even

An even number of objects can be separated into two equal groups. Six is an even number. Here we show six dots separated into two equal groups:

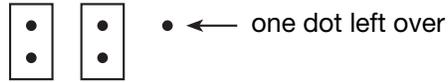


Thinking Skill

Generalize

Will the sum of any two odd numbers be an odd number or an even number? Explain how you know.

If we try to separate an odd number of objects into two equal groups, there will be one extra object. Five is an odd number. One dot is left over because five dots will not separate into two equal groups.



Example 4

The same number of boys and girls were in the classroom. Which of the following numbers could be the total number of students in the classroom?

25 26 27

An even number of students can be divided into two equal groups. Since there are an equal number of boys and girls, there must be an even number of students in the classroom. The only even number listed is **26**.

Lesson Practice

Classify Write “even” or “odd” for each number:

- a. 563
- b. 328
- c. 99
- d. 0
- e. Use the digits 3, 4, and 6 to write an even number greater than 500. Use each digit only once.
- f. **Explain** How can you tell whether a number is even?
- g. How many different three-digit numbers can you write using the digits 4, 0, and 5? Each digit may be used only once, and the digit 0 may not be used in the hundreds place. List the numbers in order and label each number as even or odd.

Written Practice

Distributed and Integrated

Represent In problems 1 and 2, use digits to write each number.

*1. five hundred forty-two
(7)

*2. six hundred nineteen
(7)

*3. The numbers 4, 7, and 11 form a fact family. Write two addition facts and two subtraction facts using those three numbers.
(6)

Represent In problems 4 and 5, use words to write each number.

*4. $\underset{(7)}{903}$

*5. $\underset{(7)}{746}$

*6. $\underset{(10)}{\text{Which three-digit odd number greater than 600 has the digits 4, 6, and 7?}}$

Find each missing addend in problems 7–10.

7. $\begin{array}{r} 4 \\ n \\ + 3 \\ \hline 14 \end{array}$

8. $\begin{array}{r} p \\ 4 \\ + 2 \\ \hline 13 \end{array}$

9. $\begin{array}{r} 5 \\ q \\ + 7 \\ \hline 14 \end{array}$

10. $\begin{array}{r} r \\ 3 \\ + 2 \\ \hline 11 \end{array}$

11. $\begin{array}{r} 15 \\ - 7 \\ \hline \end{array}$

12. $\begin{array}{r} 14 \\ - 7 \\ \hline \end{array}$

13. $\begin{array}{r} 17 \\ - 8 \\ \hline \end{array}$

14. $\begin{array}{r} 11 \\ - 6 \\ \hline \end{array}$

*15. $\begin{array}{r} \$25 \\ + \$38 \\ \hline \end{array}$

16. $\begin{array}{r} \$19 \\ + \$34 \\ \hline \end{array}$

*17. $\begin{array}{r} 42 \\ + 8 \\ \hline \end{array}$

18. $\begin{array}{r} 17 \\ + 49 \\ \hline \end{array}$

*19. **Generalize** Write the rule and the next three numbers of this counting sequence:

18, 21, 24, _____, _____, _____, ...

*20. **Predict** What is the eighth number in this counting sequence?

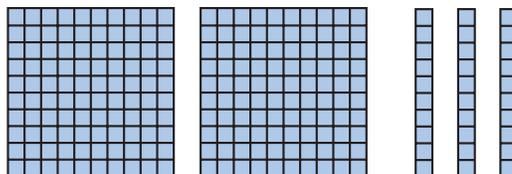
6, 12, 18, 24, ...

*21. **Formulate** If Jabari has \$6 in a piggy bank, \$12 in his wallet, and \$20 in his drawer, how much money does Jabari have in all three places? Write an equation for this problem.

22. $\underset{(1)}{2 + 3 + 5 + 7 + 8 + 4 + 5}$

*23. $\underset{(5)}{\text{Write today's date in month/day/year form.}}$

*24. **Represent** Use words to write the number shown by this model:



Focus on

• Number Lines

When we “draw a line” with a pencil, we are actually drawing a **line segment**. A line segment is part of a line.

Line segment

A **line** continues in opposite directions without end. To illustrate a line, we draw an arrowhead at each end of a line segment. The arrowheads show that the line continues.

Line

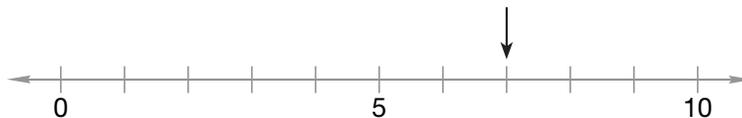
To make a **number line**, we begin by drawing a line. Next, we put **tick marks** on the line, keeping an equal distance between the marks.



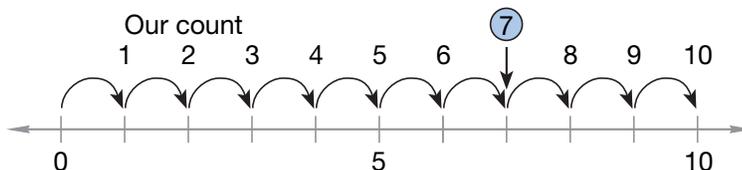
Then we label the marks with numbers. On some number lines every mark is labeled. On other number lines only some of the marks are labeled. The labels on a number line tell us how far the marks are from zero.

Example 1

To what number is the arrow pointing?



If we count by ones from zero, we see that our count matches the numbers labeled on the number line. We know that the distance from one tick mark to the next is 1.

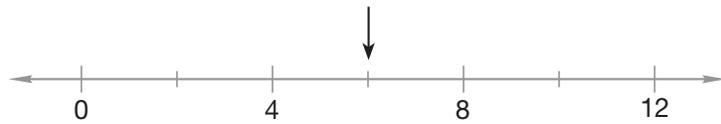


We find that the arrow points to the number 7.

On some number lines the distance from one tick mark to the next is not 1. We may need to count by twos, by fives, by tens, or by some other number to find the distance between tick marks.

Example 2

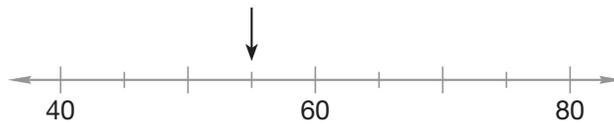
To what number is the arrow pointing?



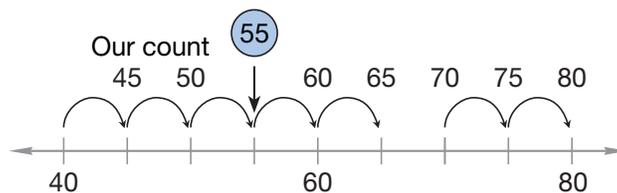
If we count by ones from tick mark to tick mark, our count does not match the numbers labeled on the number line. We try counting by twos and find that our count does match the number line. The distance from one tick mark to the next tick mark on this number line is 2. The arrow points to a mark that is one mark to the right of 4 and one mark to the left of 8. The number that is two more than 4 and two less than 8 is **6**.

Example 3

To what number is the arrow pointing?



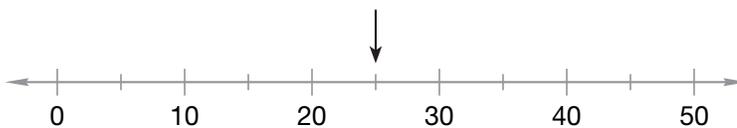
Zero is not shown on this number line, so we will start our count at 40. Counting by ones does not fit the pattern. Neither does counting by twos. Counting by fives does fit the pattern.



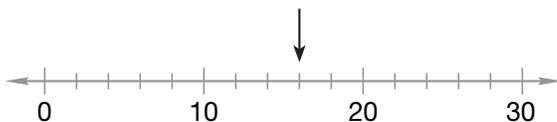
We find that the arrow points to the number **55**.

To what number is each arrow pointing in problems **1** and **2**?

1.



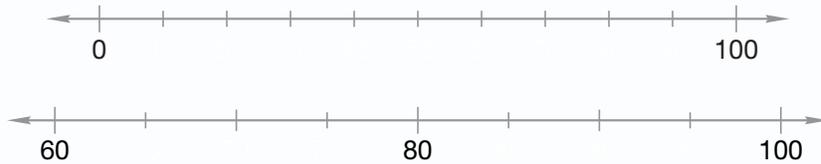
2.



Activity

Drawing Number Lines

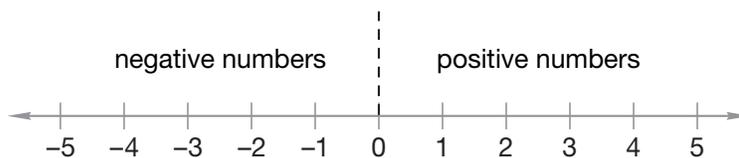
- a. Carefully copy the two number lines below onto your paper. Then write the number represented by each tick mark below the tick marks on your paper.



- b. Draw a number line from 0 to 10 labeling 0 and 10. Then draw tick marks for 2, 4, 6, and 8, but do not label the tick marks.

See below.

Numbers greater than zero are called **positive numbers**. A number line may also show numbers less than zero. Numbers less than zero are called **negative numbers**. Zero is neither positive nor negative. To write a negative number using digits, we place a negative sign (minus sign) to the left of the digit.



Example 4

- a. Use words to write -10 .
- b. Use digits to write negative twelve.
- a. negative ten
- b. -12

We use negative numbers to describe very cold temperatures. For example, on a cold winter day, the temperature in Lansing, Michigan, might be “five degrees below zero”, which would be written as -5 degrees.

Negative numbers are also used in other ways. One way is to show a debt. For example, if Tom has \$3 and needs to pay Richard \$5, he can pay Richard \$3, but Tom will still owe Richard \$2. We can write $-\$2$ to describe how much debt Tom has.

Example 5

At noon the temperature was 4 degrees. By nightfall the temperature had decreased 7 degrees. What was the temperature at nightfall?

We can use a number line to solve this problem. We start at 4 and count down 7.



The temperature at nightfall was **-3 degrees.**

Example 6

Write the next four numbers in each counting sequence:

a. ..., 10, 8, 6, 4, _____, _____, _____, _____, ...

b. ..., 9, 7, 5, 3, _____, _____, _____, _____, ...

Even and odd numbers may be negative or positive.

a. This is a sequence of even numbers. We count down by twos and write the next four even numbers. Notice that zero is even.

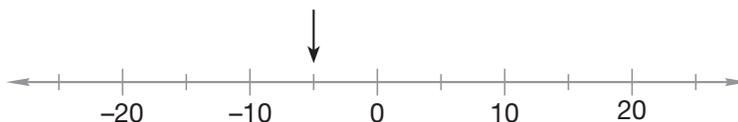
..., 10, 8, 6, 4, 2, 0, -2, -4, ...

b. This is a sequence of odd numbers. We count down by twos and write the next four odd numbers.

..., 9, 7, 5, 3, 1, -1, -3, -5, ...

Example 7

To what number is the arrow pointing?



Counting by fives fits the pattern. The arrow points to a number that is five less than zero, which is **-5 .**

3. **Represent** At 3 p.m. the temperature was 2 degrees. At 5 p.m. the temperature was 6 degrees colder. What was the temperature at 5 p.m.?

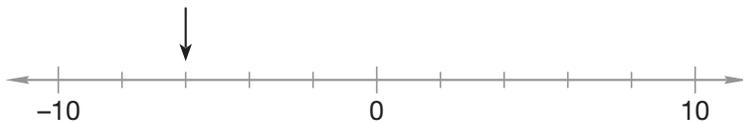
4. **Represent** Amy had \$2, but she needed to pay Molly \$5. Amy paid Molly \$2 and owes her the rest. What negative number describes how much debt Amy has?
5. Write the number that is fifteen less than zero
- using digits.
 - using words.
6. **Conclude** Write the next four numbers in this counting sequence:
 ..., 20, 15, 10, 5, _____, _____, _____, _____, ...

To what number is each arrow pointing in problems 7 and 8?

7.



8.



A number line can help us **compare** two numbers. When we compare two numbers, we decide whether one of the numbers is **greater than**, **equal to**, or **less than** the other number.

To show the comparison for two numbers that are not equal, we may use the greater than/less than symbols:

$$> \quad <$$

The **comparison symbol** points to the smaller number. We read from left to right. If the pointed end comes first, we say “is less than.”

$$3 < 4 \quad \text{“Three is less than four.”}$$

If the open end comes first, we say “is greater than.”

$$4 > 3 \quad \text{“Four is greater than three.”}$$

A number line is usually drawn so that the numbers become greater as we move to the right. When comparing two numbers, we might think about their positions on the number line. To compare 2 and -3 , for example, we see that 2 is to the right of -3 . This means that 2 is greater than -3 .



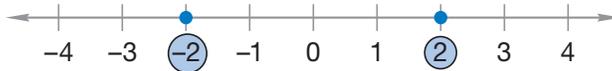
$$2 > -3$$

 **Generalize** As we move to the right on a number line, the numbers become greater in value. What related statement can we say about moving to the left on a number line?

Example 8

Compare: $2 \bigcirc -2$

The numbers 2 and -2 are not equal. On a number line we see that 2 is greater than -2 .



We replace the circle with the proper comparison symbol:

$$2 > -2$$

Connect Is -2 greater than zero or less than zero? Explain why.

Example 9

- Use words to write the comparison $5 > -10$.
- Use digits and a comparison sign to write “negative three is less than negative two.”
 - Five is greater than negative ten.
 - $-3 < -2$

Compare:

9. $-3 \bigcirc 1$

10. $3 \bigcirc 2$

11. $2 + 3 \bigcirc 3 + 2$

12. $-4 \bigcirc -5$

13. **Represent** Use words to write the comparison $-1 < 0$.

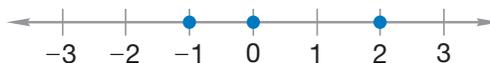
14. **Represent** Use digits and a comparison symbol to write “negative two is greater than negative three.”

Example 10

Arrange these numbers in order from least to greatest:

$$2, -1, 0$$

Numbers appear on a number line in order, so using a number line can help us write numbers in order.



We see the numbers arranged from least to greatest are $-1, 0, 2$.

Arrange the numbers from least to greatest:

15. $0, -2, -3$

16. $10, -1, 0$



One common attribute was used to group the following numbers:

245 27 -61 149

These numbers do not belong in the group:

44 -38 720 150

Explain why the numbers were sorted into these two groups.
Then write a negative number that belongs in the first group, and explain why your number belongs.