

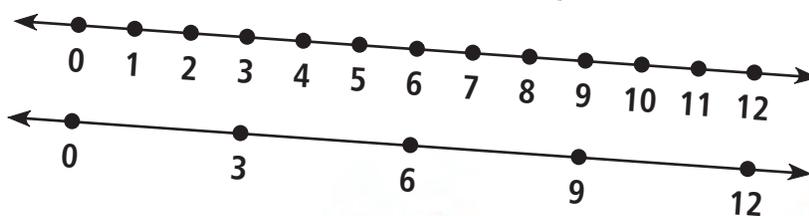
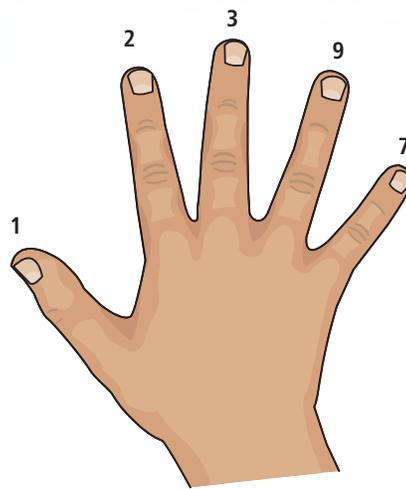
# 1 Building Operations

## Dear Student,

You have already had a lot of experience with counting, but have you ever thought about why it is silly to count like this?

In this chapter, you will use your experience with counting to investigate topics, such as **number lines**.

You can use your counting skills to build your skills using operations, such as **addition** and **subtraction**.



Mathematically yours,  
The authors of *Think Math!*

# Animal Extremes

Animals come in all shapes and sizes. Here are some of the BIGGEST animals in the world. Are any of them your favorite animal?

Tallest bird:  
ostrich, 9 feet tall

Longest marine mammal:  
blue whale, 100 feet long

Tallest mammal:  
giraffe, 18 feet tall

Longest fish: white  
shark, 45 feet long

Longest snake: python,  
26–32 feet long

## FACT • ACTIVITY 1

Use the animal information for Problems 1–4.

- 1 One blue whale is 10 feet shorter than the longest blue whale. How long is it?
- 2 The largest elephant can be 13 feet tall at shoulder height. How much shorter is it than the tallest giraffe?
- 3 One young elephant is 5 feet tall at its shoulder. How many feet must it grow to be as tall as an ostrich?
- 4 Draw a number line like the one below and mark the height of an ostrich and a giraffe on your number line.



**A** savannah is one of the landforms found in Africa. It is a dry and windy grassland with small plants and few trees. Giraffes are the tallest animal in the savannah. An adult giraffe can weigh as much as 3,000 pounds, and grow as tall as 18 feet.



## FACT • ACTIVITY 2

**For 1–4 use the number line and the animal facts to help complete the number sentences and find the answers.**

- 1 Owls range from 5 to 28 inches tall. What is the difference in inches between the shortest and tallest owls?  $28 - 5 = \blacksquare$
- 2 How much shorter is a 26-foot python than the longest python?  $\blacksquare - 26 = \blacksquare$
- 3 Find the difference in length between the longest fish and the longest python.  $\blacksquare \bullet \blacksquare = \blacksquare$
- 4 Would the tallest ostrich fit through your classroom door without bending its neck? Use a yardstick (3 feet long) to find out.
  - Is the tallest ostrich taller or shorter than your classroom door?
  - Explain how skip counting by 3s helped you.

## CHAPTER PROJECT

Use the library or other sources to find and choose a marine mammal, a land mammal, a snake, a fish, and a bird. Write the name and length or height of each of your animals. You might also want to draw a picture of your animals. Then write number sentences that compare each of your animals to the longest or tallest animal of the same type on page 2.

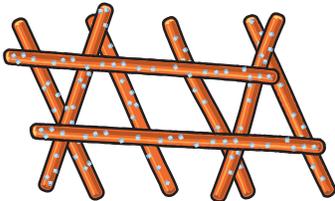
## ALMANAC Fact

A giraffe's tongue is 18 to 20 inches long and blue-black. Its feet are as large as a dinner plate!

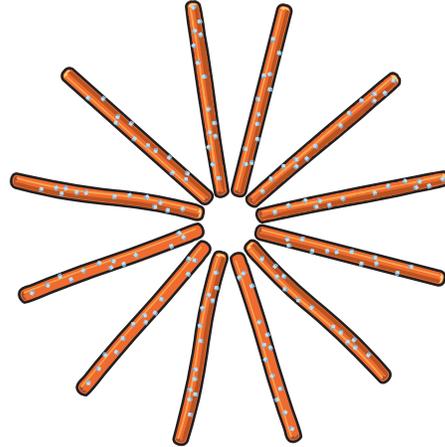
## Strategies for Counting

Find the number of pretzels in each group.  
Look for shortcuts that can help you.

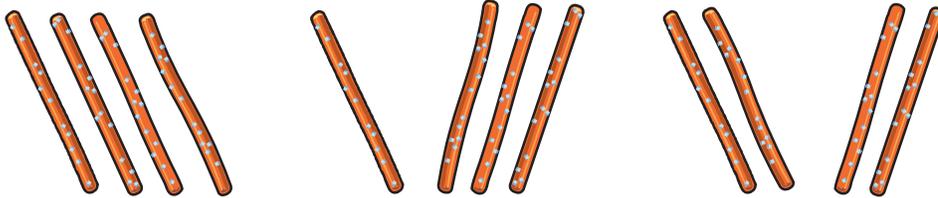
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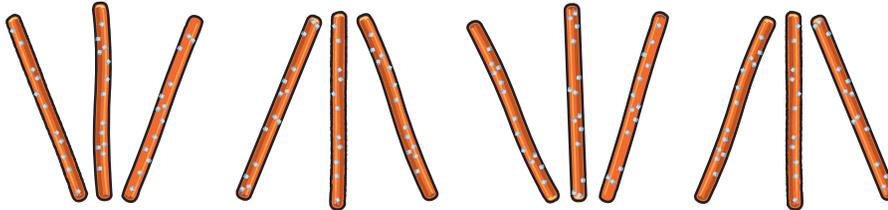
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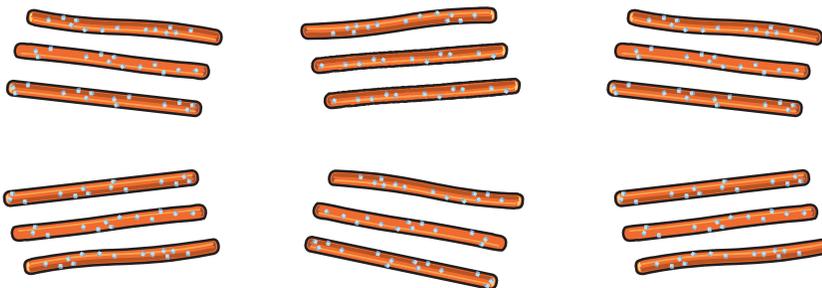
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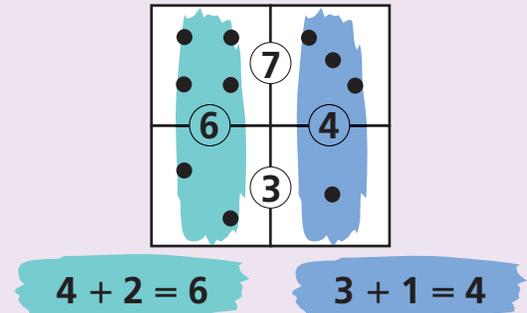
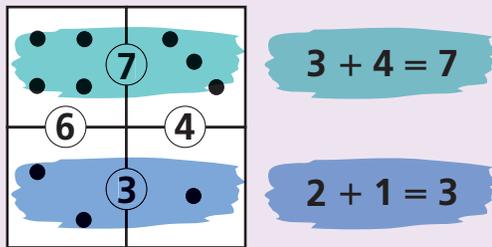


6 Which groups have the same number of pretzels?

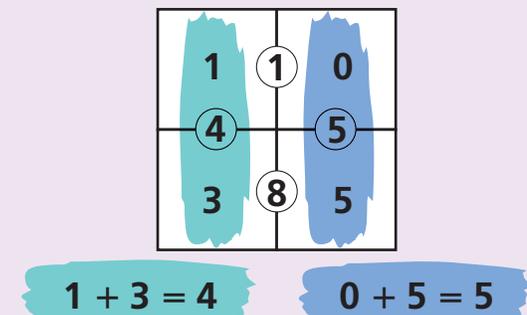
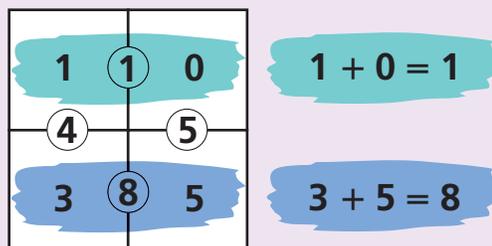
## REVIEW MODEL

## Introducing Addition Puzzles

In an addition puzzle like the one shown below, the sum of the objects in two touching boxes is written in the circle between them.

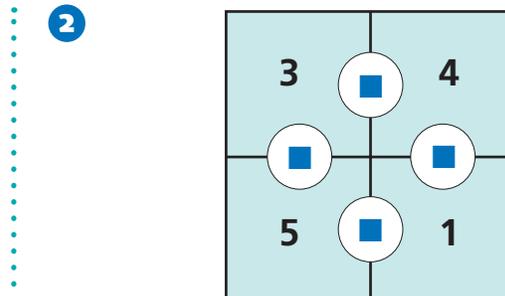
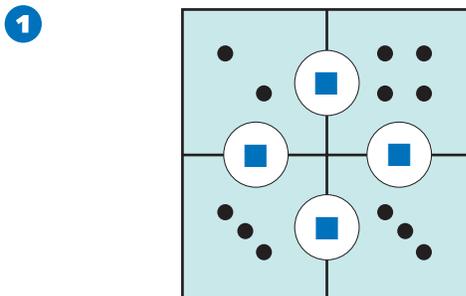


In an addition puzzle like the one shown below, the sum of the numbers in two touching boxes is written in the circle between them.



### ✓ Check for Understanding

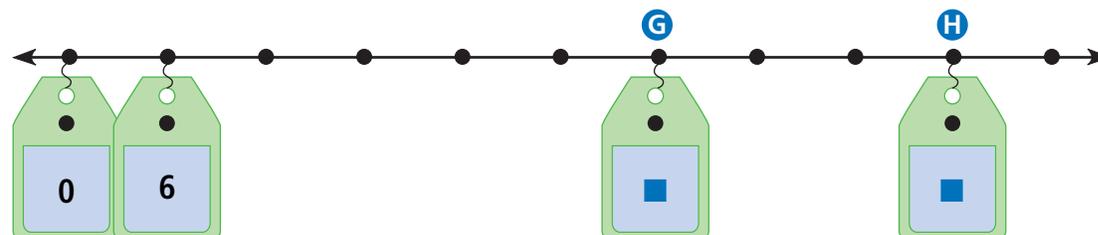
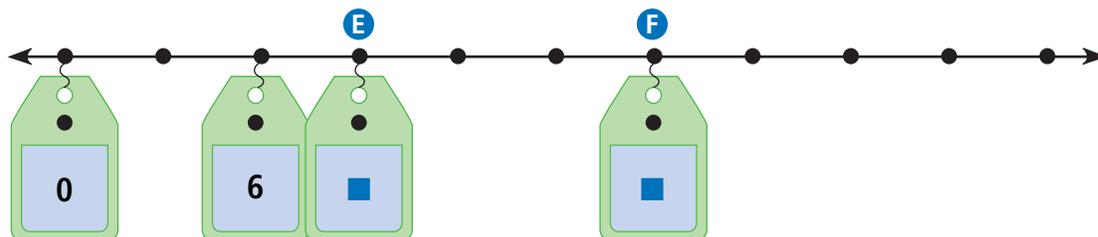
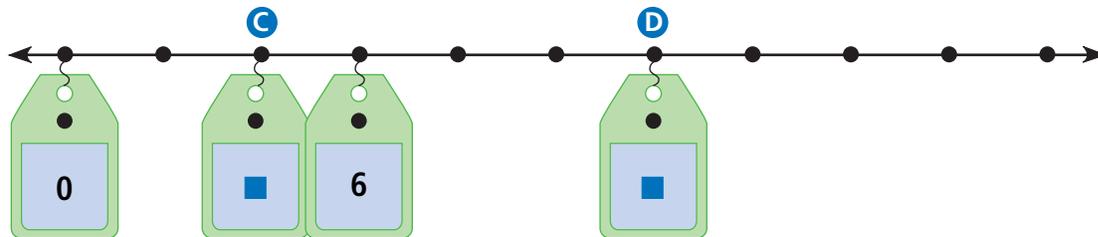
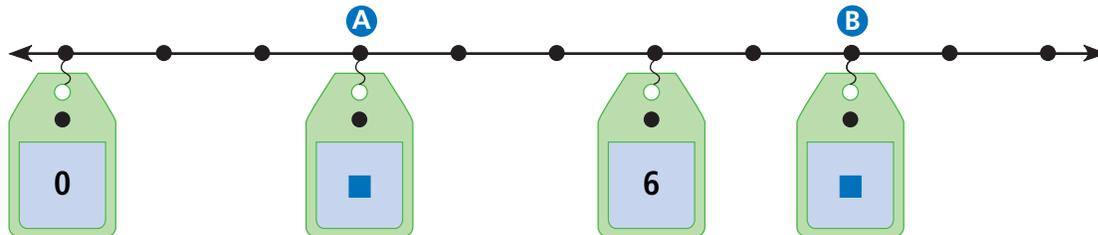
Find the missing sums.



## EXPLORE

## Locating 6 on a Number Line

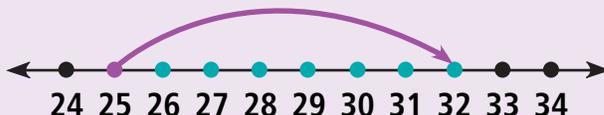
How does the position of the number 6 make each number line different?  
Find the missing number for each tag.



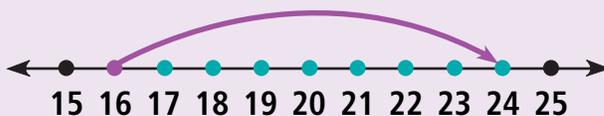
# REVIEW MODEL

## Using a Number Line to Add and Subtract

You can use a number line to add and subtract.

<p style="text-align: center;"><math>25 + 7 = \blacksquare</math></p>  <p>Start at 25. Jump <b>forward</b> 7 spaces. Land on 32. So, <math>25 + 7 = 32</math>.</p>	<p style="text-align: center;"><math>40 - 6 = \blacksquare</math></p>  <p>Start at 40. Jump <b>backward</b> 6 spaces. Land on 34. So, <math>40 - 6 = 34</math>.</p>
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You can use a number line to find a missing number.

<p style="text-align: center;"><math>16 + \blacksquare = 24</math></p>  <p>Start at 16. Jump <b>forward</b> and land on 24. Find the number of spaces you jumped. So, <math>16 + 8 = 24</math>.</p>	<p style="text-align: center;"><math>34 - \blacksquare = 29</math></p>  <p>Start at 34. Jump <b>backward</b> and land on 29. Find the number of spaces you jumped. So, <math>34 - 5 = 29</math>.</p>
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### ✓ Check for Understanding

Use the number line to complete the number sentence.



1  $33 + 8 = \blacksquare$

2  $46 - 9 = \blacksquare$

3  $41 + \blacksquare = 50$

4  $50 - \blacksquare = 44$

## EXPLORE

## Number Patterns

Think about patterns for the marked numbers.

1	2	<del>3</del>	4	5	<del>6</del>	7	8	<del>9</del>	10
11	<del>12</del>	13	14	<del>15</del>	16	17	<del>18</del>	19	20
<del>21</del>	22	23	<del>24</del>	25	26	<del>27</del>	28	29	<del>30</del>
31	32	<del>33</del>	34	35	<del>36</del>	37	38	<del>39</del>	40
41	<del>42</del>	43	44	<del>45</del>	46	47	<del>48</del>	49	50
<del>51</del>	52	53	<del>54</del>	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130

- Look at the numbers in order that are circled **blue**.  
If the pattern continues, what number would be circled next?
- If the pattern continues, what would be the next number with a **green X**?
- If the pattern continues, what would be the next number with both a **blue circle** and a **green X**?

## REVIEW MODEL

## Completing Number Sentences

Number sentences contain numbers, operation signs, and an equal sign.

Some number sentences are *true*.

Examples:

$4 + 5 = 9$

$15 - 8 = 7$

Some number sentences are *false*.

Examples:

$2 + 3 = 8$

$13 - 5 = 10$

Complete the number sentence.

Paula has 14 coins in her right pocket and 6 coins in her left pocket. How many more coins does Paula have in her right pocket than in her left pocket?

$14 \bullet 6 = 8$

Which operation sign will make the sentence *true*?

Try +.  $14 \text{ ( + ) } 6 = 8$  False.

Try -.  $14 \text{ ( - ) } 6 = 8$  True.

So, the correct operation sign is -.

### ✓ Check for Understanding

Write + or - to complete the number sentence.

1  $3 \bullet 5 = 8$

2  $7 \bullet 4 = 3$

3  $12 \bullet 8 = 4$

4  $9 \bullet 8 = 17$

5  $10 \bullet 5 = 15$

6  $18 \bullet 9 = 9$

7 Write a true addition sentence.

8 Write a true subtraction sentence.

## REVIEW MODEL

## Problem Solving Strategy

## Act It Out

Jenny picked 6 flowers. Then she picked 7 more. Hector has 8 flowers. How many more flowers will Hector need to have the same number of flowers as Jenny?

**Strategy:** Act It Out**Read to Understand**

What do you know from reading the problem?

Jenny picked 6 flowers and 7 flowers. Hector has 8 flowers.

**Plan**

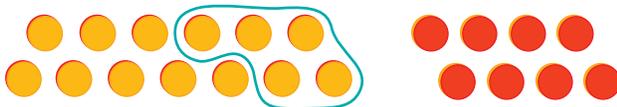
How can you solve the problem?

You can use counters to act out the problem.

**Solve**

How can you act it out?

Place 6 counters in a group, and then place 7 more counters in the same group. Place 8 counters in another group. Compare the two groups.



There are 5 more counters in the first group than in second group. So, Hector will need 5 more flowers to have the same number as Jenny.

**Check**

Look back at the problem. Did you answer the question that was asked? Does the answer make sense?

## Problem Solving Practice

Use the strategy *act it out* to solve.

- 1 Andre is arranging 6 shells in 2 display boxes. How many ways can Andre separate the shells into 2 boxes?
- 2 There are 6 children in a group. Each child has 4 crayons. How many crayons are there in all?

## Mixed Strategy Practice

Use any strategy to solve. Explain.

- 3 The sum of two numbers is 20. Their difference is 4. What are the numbers?
- 4 Mr. Perez wrote the numbers 86, 81, 76, 71, and 66 on the board. What are the next two numbers in his pattern?
- 5 Lenny has 3 blue marbles, 4 red marbles, and 1 green marble in his bag. What fractional part of his bag of marbles is red?
- 6 Sasha has 5 stuffed dogs, 7 stuffed cats, and 3 stuffed bears. She gives 8 of the stuffed animals to her baby sister. How many stuffed animals does Sasha have left?
- 7 George's math group is skip-counting by fours. Each person says one number. They start with 12 and end with 36. How many people are in George's group?
- 8 When Megan planted the rose bush in her garden, it was 8 inches tall. Now it is 21 inches tall. How many inches has the rose bush grown?

## Problem Solving Strategies

### ✓ Act It Out

- ✓ Draw a Picture
- ✓ Guess and Check
- ✓ Look for a Pattern
- ✓ Make a Graph
- ✓ Make a Model
- ✓ Make an Organized List
- ✓ Make a Table
- ✓ Solve a Simpler Problem
- ✓ Use Logical Reasoning
- ✓ Work Backward
- ✓ Write a Number Sentence

Choose the best term for each sentence.  
Use Word List A.

- 1 A number is made up of at least one \_\_\_\_?
- 2 The number 3,481 has 8 \_\_\_\_?
- 3 A(n) \_\_\_\_? has four related number sentences.
- 4 The operation sign is “-” for a(n) \_\_\_\_?
- 5 The size of a jump on a number line is the number of \_\_\_\_?
- 6 To subtract  $8 - 5$  on a number line, start at 8 and count 5 spaces \_\_\_\_?
- 7 You can use a number line to \_\_\_\_? by twos, threes, or fives.

Complete each analogy. Use Word List B.

- 8 Hundreds is to thousands as \_\_\_\_? is to tens.
- 9 Subtraction sentence is to backward as \_\_\_\_? is to forward.

### Talk Math

Talk with a partner about what you have learned about operations. Use the vocabulary terms *number sentence*, *sum*, and *operation sign*.

- 10 You are given one addition sentence. How can you find the other number sentences in the fact family?
- 11 How can you use a number line to add?
- 12 How can you use a number line to subtract?

### Word List A

addition  
sentence  
associative  
backward  
commutative  
digit  
fact family  
forward  
multiple  
number line  
ones  
skip-count  
spaces  
subtraction  
sentence  
tens  
thousands

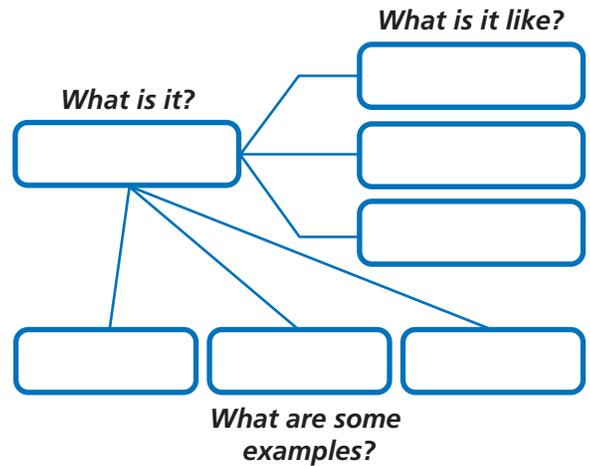
### Word List B

addition  
sentence  
commutative  
digit  
ones

## Word Definition Map

13 Create a word definition map for the term *number line*.

- A What is it?
- B What is it like?
- C What are some examples?



## Word Line

14 Create a word line for the terms *hundreds*, *ones*, *tens*, and *thousands*.

Words:

Sequence:

### What's in a Word?



**SUM** The word *sum* sounds just like the word *some*. Both words describe amounts. However, *sum* is an exact amount, but *some* is not. The sentence, "Ken buys *some* juice," could mean that Ken buys a glass of juice or a gallon of juice. When you need to know the *sum* of two or more numbers, you want an exact number. For example, a banker needs to know exact *sums* of money rather than *some* amount of money.



**Technology**

Multimedia Math Glossary

[www.harcourtschool.com/thinkmath](http://www.harcourtschool.com/thinkmath)

# GAME

## Number Line Grab

### Game Purpose

To practice labeling number lines, skip-counting, and adding one-digit numbers

### Materials

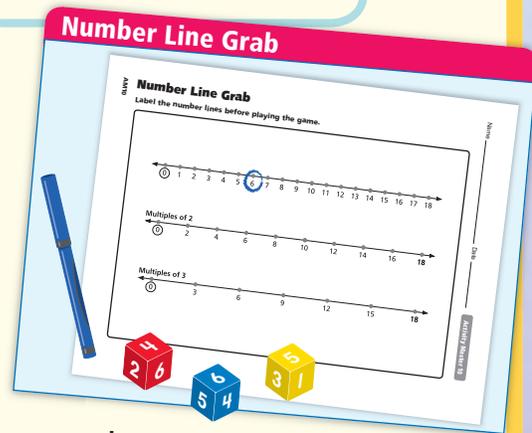
- 3 number cubes (numbered 1–6)
- 2 different color markers, pencils, or crayons
- Activity Master 10: *Number Line Grab*

### How To Play the Game

- 1 Work with a partner. Complete the number lines on Activity Master 10.
- 2 Choose a marker. Toss one of the number cubes. The player with the larger number goes first.
- 3 Toss all three number cubes. Choose a number to circle on any number line from these 3 choices:
  - a number that matches one of the numbers tossed.
  - a number that is the sum of two of the tossed numbers.
  - the number that is the sum of all three tossed numbers.

**Example:** If you toss these numbers: 

**Possible numbers to circle:** 1, 3, 5, 4 ( $1 + 3$ ), 6 ( $1 + 5$ ), 8 ( $3 + 5$ ), or 9 ( $1 + 3 + 5$ )
- 4 Take turns tossing the number cubes and circling a number that is not already circled on any number line. If there is no number to circle, you lose a turn.
- 5 The first player to circle 12 numbers is the winner.



# GAME

## Missing Operation Signs

### Game Purpose

To practice addition and subtraction

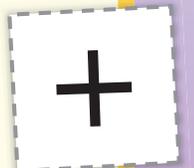
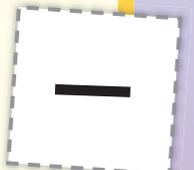
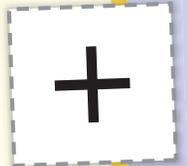
### Materials

- 2 different color markers, pencils, or crayons
- paper bag
- Activity Master 11: *Missing Operation Signs*
- Activity Master 12: *Missing Operation Signs*



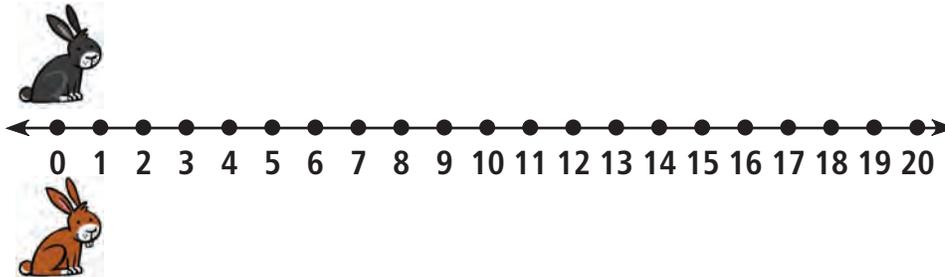
### How To Play The Game

- 1 Play with a partner. Cut out the cards from Activity Master 11. Mix them up, and choose 20. Put those cards inside a paper bag.
- 2 Choose a marker. Decide who will play first.
- 3 Without looking, take a card from the bag.
  - Find a sentence on Activity Master 12 that is missing the operation sign on your card.
  - Write the operation sign in the sentence.
  - If you cannot find a sentence for your card, you lose a turn.
  - Set aside the operation card—do not put it back in the bag.
- 4 Take turns taking cards from the bag and writing the operation signs in the sentences.
- 5 Use all the cards if you can. The game ends when there are no cards left in the bag.
- 6 The winner is the player who has filled in more sentences.



# CHALLENGE

Robby and Ricky Rabbit like to play a jumping game on the number line. They start each game at 0 and do not go above 20.



For each game, tell how many times Robby and Ricky will land on the same number. Then write all the numbers on which they will both land.

**Game 1** Robby makes jumps of 3 spaces.  
Ricky makes jumps of 5 spaces.

**Game 2** Robby makes jumps of 2 spaces.  
Ricky makes jumps of 3 spaces.

**Game 3** Robby makes jumps of 3 spaces.  
Ricky makes jumps of 6 spaces.

**Game 4** Robby makes jumps of 2 spaces.  
Ricky makes jumps of 6 spaces.

**Game 5** Robby makes jumps of 6 spaces.  
Ricky makes jumps of 10 spaces.

**Sometimes their sister Randy Rabbit plays the jumping game with them.**

**Game 6** Randy makes jumps of 2 spaces. Robby makes jumps of 3 spaces. Ricky makes jumps of 4 spaces. Will all three rabbits ever land on the same number? If so, tell the number of times and the landing numbers.

