

# Modeling Fractions

 **Texas Essential Knowledge and Skills**


- (3.2)(A) construct concrete models of fractions  
 (3.2)(C) use fraction names and symbols to describe fractional parts of whole objects


## Power Up


### facts

Power Up 41

### jump start

-  Count up by 25s from 0 to 200.  
 Count up by fourths from 0 to 2.

-  It's morning. Draw hands on your clock to show 8:59.  
 Write the time in digital form.

-  The afternoon temperature was  $16^{\circ}\text{C}$ . At night it was 9 degrees cooler. Mark your thermometer to show the temperature at night.

### mental math

- a. **Estimation:** Round \$175 to the nearest hundred dollars.  
 b. **Number Sense:**  $18 - 8$   
 c. **Time:** A decade is 10 years. How many years are in 2 decades?  
 d. **Money:** Find the value of these bills and coins:



### problem solving

Ted wrote this sequence to help him find the number of feet in 1 yard, 2 yards, 3 yards, and so on. Which number is incorrect in his sequence? Why?

3, 6, 9, 12, 15, 17, 21, 24, 27

## New Concept

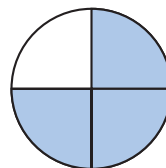
We have used fractions to describe parts of an hour and parts of a dollar.

*Thirty minutes is  $\frac{1}{2}$  of an hour.*

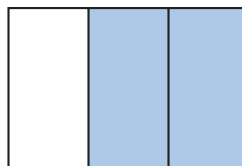
*A quarter is  $\frac{1}{4}$  of a dollar.*

We have also used models to illustrate fractions.

$\frac{3}{4}$  of the circle is shaded.



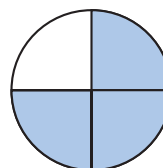
$\frac{2}{3}$  of the rectangle is shaded.



In this lesson we will make fraction manipulatives. First, we will learn some vocabulary.

- The **denominator** of a fraction shows how many equal parts make the whole.
- The **numerator** shows how many parts we are describing.

numerator  $\longrightarrow$  3  
denominator  $\longrightarrow$  4 is shaded.



### Activity

#### **Fraction Manipulatives**

Materials: **Lesson Activities 15 and 16**, crayons or colored pencils, scissors, paper envelope or locking plastic bag

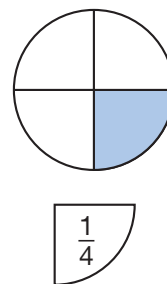
1. Your teacher will give you four fraction circles on two sheets of paper.
2. Use crayons or colored pencils to color each circle a different color. Use only one color for a circle. Color both the front and back of the circle.

- After you color all the circles, cut out each one. Then cut each circle into pieces by cutting on the lines.
- You will use your fraction manipulatives for the examples and for later lessons and problem sets.
- Store your fraction manipulatives in an envelope or plastic bag when you are not using them.

### Example 1

**Name the fraction of a circle shown using digits and words.**

We see that the circle is divided into 4 equal parts. One of the parts is shaded. We find the fraction piece that is one of four equal parts. The fraction is  $\frac{1}{4}$ , which we read “**one fourth.**”

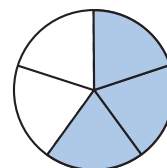


**Analyze** What is the denominator of the fraction? What does it tell you?

### Example 2

**Name the fraction shown.**

We see that the circle is divided into 5 equal parts. Three of the parts are shaded. The fraction shown is  $\frac{3}{5}$ , which we read “**three fifths.**”

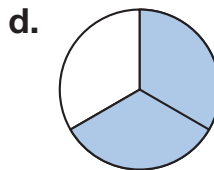
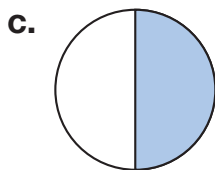


**Analyze** What is the numerator of the fraction? What does it tell you?

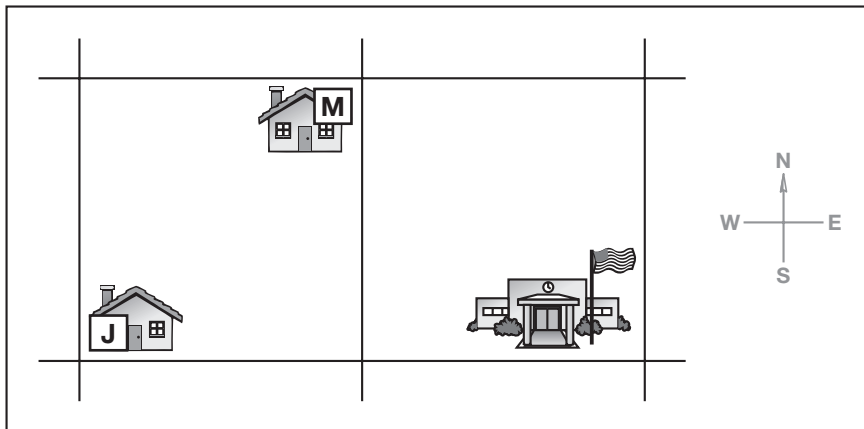
### Lesson Practice

- What is the denominator of the fraction  $\frac{4}{5}$ ?
- What is the numerator of the fraction  $\frac{2}{3}$ ?

Use your fraction manipulatives to model each fraction shown below. Then name the fraction using digits and words.



1. Rosa's ticket cost \$4.75. Her brother's ticket cost \$3.25. What was the total price of the two tickets?  
(18, 22)
  
2. Bradley read 32 pages before dinner. He read some more pages after dinner. Bradley read 58 pages in all. How many pages did he read after dinner? Write a number sentence, and then answer the question.  
(36)
  
3. There were 238 fans at the game. Write that number using words.  
(12)
  
4. Round the number of fans in problem 3 to the nearest hundred.  
(15)
  
5. This map shows John's house, Mike's house, and school. Today Mike is stopping at John's house before going to school. If Mike does not retrace his steps or return to his house, what route will Mike take to John's house and on to school?  
(31)



6. This map shows three towns on a highway. Use your ruler to measure the distance in inches:  
(35)
  - a. From Adams to Baker
  - b. From Baker to Central
  - c. From Adams to Central
  
7. If each inch on the map in problem 6 represents ten miles, then how many miles is it from Adams to Central?  
(inv. 4)

8. What number is indicated on this number line?



9. The ride cost 65¢. Nick paid with three quarters. List the coins he should get back.  
(14, 25)

10. To find the number of feet in 8 yards, Shannon said the following sequence of numbers. What is the eighth number of the sequence?  
(2)

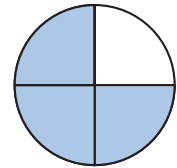
3, 6, 9, 12, ...

11. An insect has 6 legs. Andy found the number of legs on 7 insects by making a table. Copy and extend the table to find Andy's answer.  
(2)

<b>Insects</b>	1	2	3	4	5	6	7
<b>Legs</b>	6	12	18				

12. Name the fraction shown using digits and words.  
(41)

13. **Represent** Draw two perpendicular lines that are each  $3\frac{1}{4}$  inches long.  
(35, Inv. 4)



Add or subtract, as shown:

14.  $200 + 300 + 400$   
(24)

15.  $\$5.25 + \$3.17$   
(22)

16.  $45 + 92 + 11$   
(24)

17.  $\$800 - \$225$   
(28)

18. Find the missing number:  $\square - 20 = 55$ .  
(40)

19. **Analyze** Arrange these collections of coins in order from lowest value to highest value.  
(17, 25)

6 dimes

9 nickels

2 quarters

20. **Represent** Sketch a map to help you with this problem:  
(31)

*Bill and Ted rode their bikes home from school in opposite directions. Bill rode seven blocks east. Ted rode five blocks west. How many blocks and in what direction would Bill ride from his home to Ted's home?*

# • Drawing Fractions

## Texas Essential Knowledge and Skills



- (3.2)(A) construct concrete models of fractions
- (3.2)(C) use fraction names and symbols to describe fractional parts of whole objects
- (3.12)(A) use a thermometer to measure temperature

## Power Up

### facts

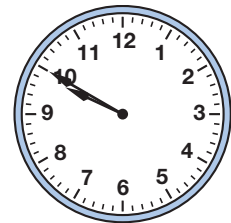
Power Up 42

### jump start

- 123 Count down by 2s from 30 to 0.  
Count up by 4s from 0 to 40.
-  It's afternoon. Draw hands on your clock to show 12:25. Write the time in digital form.
-  The temperature inside the movie theater was  $65^{\circ}$  F. It was 20 degrees warmer outside the theater. Mark your thermometer to show the outside temperature.

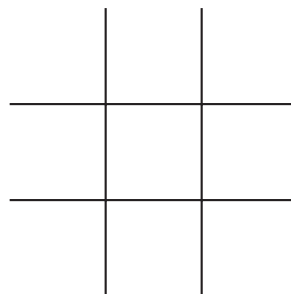
### mental math

- a. **Money:** Raj bought a marker for 80¢. He paid \$1.00. How much change did he receive? Write your answer with a cent sign.
- b. **Number Sense:**  $40 + 50$
- c. **Measurement:** How many inches are in 2 feet?
- d. **Time:** It is morning. What time will it be 3 hours after the time shown on the clock?



### problem solving

How many different ways can you place three Xs in a row on a tic-tac-toe board? Draw the ways.



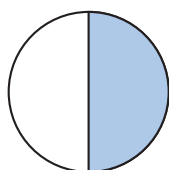
## New Concept

When we draw pictures to show fractions, we are careful to divide the picture into equal parts.

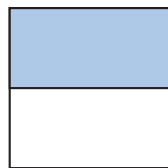
### Example 1

**Draw a figure and shade  $\frac{1}{2}$  of it.**

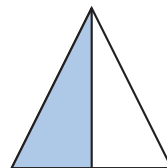
We are careful to divide the figures into two equal parts before shading. Here we show a few examples of  $\frac{1}{2}$ .



$\frac{1}{2}$  circle



$\frac{1}{2}$  square

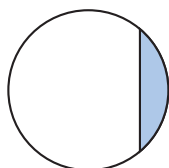


$\frac{1}{2}$  triangle

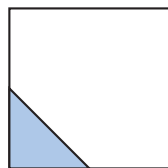


$\frac{1}{2}$  rectangle

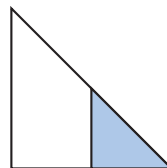
The shapes below do not show  $\frac{1}{2}$  because the parts are not equal.



not  $\frac{1}{2}$



not  $\frac{1}{2}$



not  $\frac{1}{2}$



not  $\frac{1}{2}$

**Generalize** Show other ways to shade  $\frac{1}{2}$  of a square.

### Example 2

**Draw and shade  $\frac{1}{3}$  of a rectangle.**

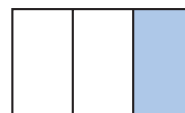
We draw a rectangle and divide it into three equal parts. Then we shade one of the parts.



Rectangle



3 equal parts

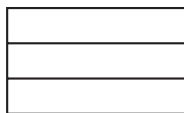


1 part shaded

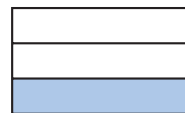
Here is another way we could shade  $\frac{1}{3}$  of the rectangle:



Rectangle



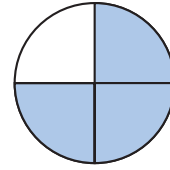
3 equal parts



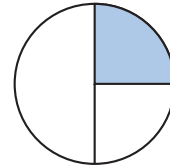
1 part shaded

**Example 3****Draw and shade  $\frac{3}{4}$  of a circle.**

First we draw a circle. Next we divide the circle into four equal parts. Then we shade three of the parts.

**Lesson Practice**

- Draw a square and shade  $\frac{1}{2}$  of it.
- Draw a circle and shade  $\frac{1}{4}$  of it.
- Draw a rectangle and shade  $\frac{2}{3}$  of it.
- Is  $\frac{1}{3}$  of this circle shaded? Why or why not?

**Written Practice***Distributed and Integrated*

- Formulate** Simon was running a marathon, which is a 26-mile race. After running 12 miles he stopped to drink some water. How many miles did he have to go to finish the marathon? Write a number sentence, and then answer the question.

(36)
- The keyboard cost \$385. Sales tax was \$21. Find the total price of the keyboard with tax.

(16, 18)
- Round the total price in problem 2 to the nearest hundred dollars.

(2A)
- To what number is the arrow pointing on the number line below?

(33)
- Explain** What does the number 5 in the fraction  $\frac{2}{5}$  tell you?

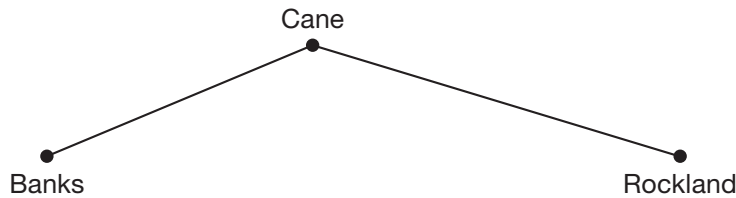
(41, 42)



6. <sup>(34)</sup> One wall of Mac's bedroom is 4 yards long. How many feet is 4 yards?

<b>Yards</b>	1	2	3	4
<b>Feet</b>	3	6		

7. <sup>(42)</sup> **Represent** Draw a rectangle and shade  $\frac{1}{4}$  of it.
8. <sup>(35, Inv. 4)</sup> This map shows three towns on a highway. One-quarter inch on the map represents one mile. Use your ruler to measure the distance between towns. Then answer the questions.



- a. How many miles is it from Rockland to Cane?
- b. How many miles is it from Cane to Banks?
- c. Joyce drove from Rockland to Banks. On her way she drove through Cane. How many miles did Joyce drive?
9. <sup>(32)</sup> Write 800,744 using words.
10. <sup>(25)</sup> Stella owed 59¢. She paid with one quarter, three dimes, and a nickel. List the coins she should get back.
11. <sup>(32)</sup> The distance around the earth at the equator is about 25,000 miles. Use words to write that number.
12. <sup>(2)</sup> **Predict** There are 4 quarters in a dollar. Stella counted by 4s to find the number of quarters in \$12. What is the 12<sup>th</sup> number in this sequence?
- 4, 8, 12, 16, ...
13. <sup>(2)</sup> Simon counted by 12s to find the number of inches in 4 ft. What is the 4th number that we say when counting by 12s?
14. <sup>(40)</sup> Find the missing number:  $100 - \square = 30$ .

Add or subtract, as shown.

15.  $93 + 47 + 58$   
(24)

16.  $\$300 - \$250$   
(28)

17.  $400 + 400$   
(16)

18.  $\$500 - \$336$   
(28)

19. **Multiple Choice** How much money is  $\frac{1}{4}$  of a dollar plus  $\frac{1}{10}$  of a dollar?  
(29)

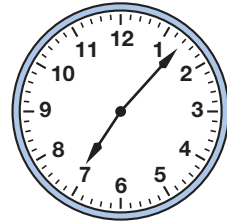
A 25¢

B 10¢

C 35¢

D 40¢

20. After dinner, Sam sat down to read a book and noticed the clock. What time was it?  
(38)



**Early Finishers**

*Real-World Connection*

Mark needs to buy crayons for his science project. He needs at least 48 crayons to complete the project. He has \$6.00 to spend. One store is selling a box of 64 crayons for \$3.98. A different store is selling a box of 24 crayons for \$1.99. Which is the better buy? Explain your answer.

# Comparing Fractions, Part 1

## Texas Essential Knowledge and Skills




- (3.2)(A) construct concrete models of fractions
- (3.2)(B) compare fractional parts of whole objects in a problem situation using concrete models
- (3.2)(C) use fraction names and symbols to describe fractional parts of whole objects

## Power Up

### facts

Power Up 43

### jump start

-  Count up by 100s from 0 to 1,000.  
Count up by 7s from 0 to 56.
-  It's morning. Draw hands on your clock to show 3:46.  
Write the time in digital form.
-  Write a fact family using the numbers 5, 9, and 14 in the workspace on your paper.

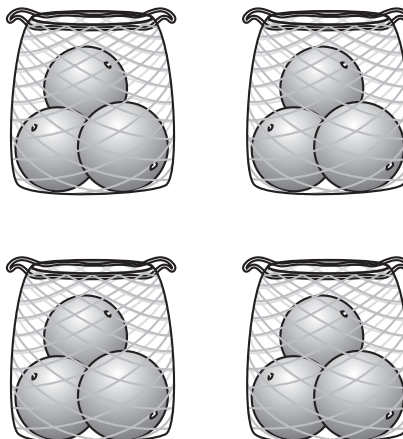
### mental math

- a. **Money:** Which has greater value?  
2 dimes or 24¢
- b. **Number Sense:**  $25 - 10$
- c. **Number Sense:**  $7 + 14$
- d. **Patterns:** What number is missing from the pattern shown below?

60	_____	50	45	40
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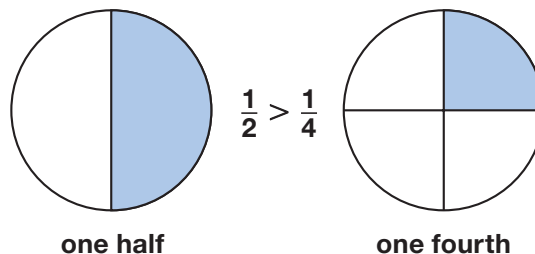
### problem solving

Mr. Ogburn put the oranges into 4 bags. He put 3 oranges in each bag. Altogether, how many oranges did he put into bags? Write a number sentence for this story.



## New Concept

We compare two fractions by deciding if the fractions are equal or if one fraction is greater than the other fraction. For example,  $\frac{1}{2}$  is greater than  $\frac{1}{4}$ .



Notice that  $\frac{1}{2}$  is greater than  $\frac{1}{4}$  even though the denominator of  $\frac{1}{4}$  is greater than the denominator of  $\frac{1}{2}$ . This makes sense because 1 out of 2 parts is a larger fraction than 1 out of 4 parts.

### Activity

#### Comparing Fractions

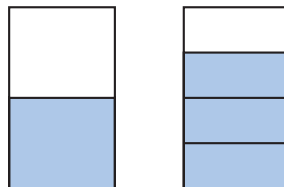
Use your fraction manipulatives to find which fraction of each pair is greater or whether the fractions are equal.

1.  $\frac{1}{2}$  and  $\frac{1}{3}$
2.  $\frac{2}{3}$  and  $\frac{2}{5}$
3.  $\frac{2}{3}$  and  $\frac{3}{4}$
4.  $\frac{1}{2}$  and  $\frac{2}{4}$

#### Example 1

Draw two rectangles the same size. Shade  $\frac{1}{2}$  of one rectangle and  $\frac{3}{4}$  of the other rectangle. Look at your drawing to compare  $\frac{1}{2}$  and  $\frac{3}{4}$ .

First we draw and shade two rectangles.



Next we look at the rectangles. We compare *how much* of the whole rectangle is shaded, not the number of parts that are

shaded. We see that more than half of the rectangle is shaded when  $\frac{3}{4}$  is shaded. We show two ways to write the comparison.

$$\frac{3}{4} > \frac{1}{2} \quad \text{or} \quad \frac{1}{2} < \frac{3}{4}$$

### Example 2

The class is painting a mural on a sheet of plywood. Look at the part of the mural that is painted in each answer choice below. Which shows the greatest part painted?

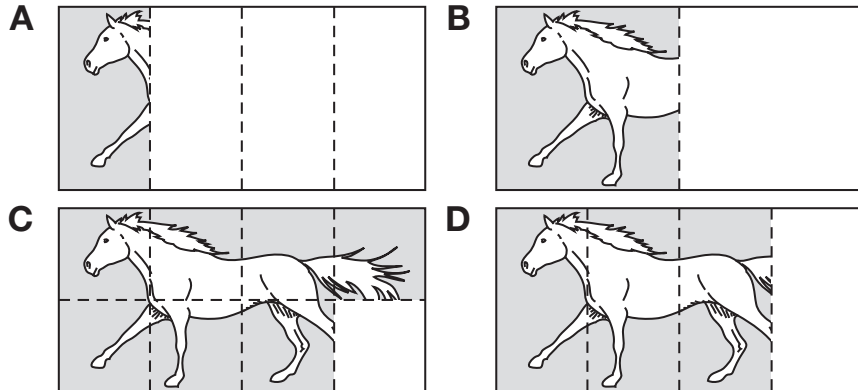



Figure **C** shows the greatest part painted.

**Connect** For choices **A** through **D**, what fraction of each figure is painted?

### Lesson Practice

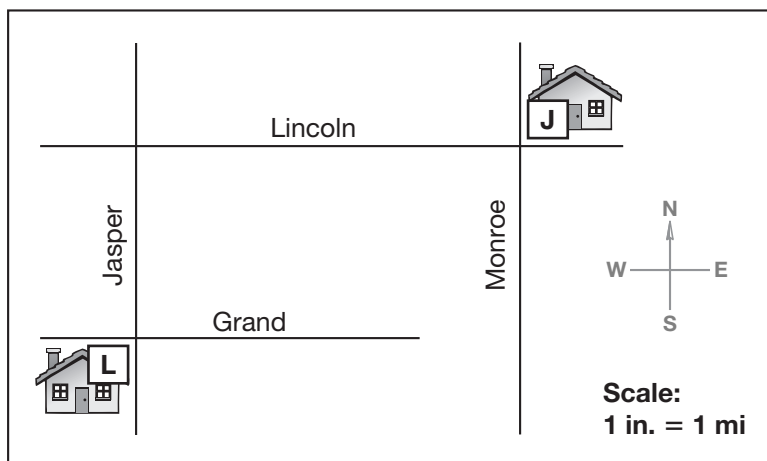
- Draw two circles that are the same size. Shade  $\frac{1}{2}$  of one circle and  $\frac{2}{4}$  of the other circle. Look at your drawings to compare  $\frac{1}{2}$  and  $\frac{2}{4}$ . Use your fraction manipulatives to check your work.
- Use your fraction manipulatives to compare  $\frac{1}{4}$  and  $\frac{1}{5}$ . Then write the comparison.
- Draw two rectangles the same size. Shade  $\frac{1}{4}$  of one rectangle and  $\frac{1}{2}$  of the other rectangle. Then write the comparison. Use your fraction manipulatives to check your work.

1. **Formulate** <sup>(36)</sup> Sally drove to visit her grandmother who lived 385 miles away. She stopped after 160 miles to get gas. How much farther did she have to drive? Write a number sentence and then answer the question.
  
2. <sup>(18, 20)</sup> Gas for her car cost \$28. Sally paid with a \$20 bill and a \$10 bill. How much money should Sally get back?
  
3. <sup>(27)</sup> Sally's grandmother lives 385 miles away. Sally's cousin lives 326 miles away. Sally's older brother is at college 410 miles away. Which of the three relatives lives nearest Sally? Which of the relatives lives farthest from Sally?
  
4. <sup>(39)</sup> Sally's grandmother was born in 1945. How old was she in 1995?
  
5. <sup>(32)</sup> The odometer on Sally's car shows this display.
 



  - a. How far has the car been driven? Write the number using a comma.
  - b. Use words to state the number of miles the car has been driven.
  
6. <sup>(12, 32)</sup> The Martins bought a house that cost three hundred eighty thousand dollars. Use digits and a dollar sign to write that amount of money.
  
7. <sup>(40)</sup> Sarina picked a big basket of peaches. She gave 14 peaches to her grandmother for a peach pie. Then Sarina had 52 peaches left. How many peaches did Sarina pick in all? Write and solve a some went away number sentence to find the answer.
  
8. **List** <sup>(2)</sup> Count by eights from 8 to 96. Write the list on your paper.

This map shows where Leslie and Jenny live. Use this map for problems 9–11.



9. <sup>(Inv. 4)</sup> The map is drawn so that one inch represents one mile. If Leslie drives from her house to Jenny's house, about how far does she drive?
10. <sup>(31)</sup> Write directions that describe how to get to Jenny's house from Leslie's house using compass directions and miles.
11. <sup>(Inv. 4)</sup> Look at the map and name a street parallel to Grand.
12. <sup>(24)</sup>  $62 + 32 + 22$
13. <sup>(19)</sup>  $650 - 70$
14. <sup>(22)</sup>  $\$8.45 + \$0.70$
15. <sup>(19)</sup>  $\$250 - \$200$
16. <sup>(31, 36)</sup> **Analyze** Sketch a map to help you with this problem.  
*From Colorado Springs, Ivan drove north 100 miles to Boulder, passing through Denver. From Denver to Boulder is 30 miles. From Denver to Colorado Springs is which direction and how far?*
17. <sup>(41)</sup> Use your fraction manipulatives to show  $\frac{2}{3}$ . Then draw a picture of the model on your paper.
18. <sup>(43)</sup> Use your fraction manipulatives to compare  $\frac{2}{3}$  and  $\frac{3}{4}$ . Write the comparison.

19. Find the missing number:  $175 - \square = 32$ .  
(40)

20. What is the value of the 4 in 342,891?  
(32)

**Early  
Finishers**

*Real-World  
Connection*

In parts of Texas the temperature can have big changes in a single day. On a day in February the temperature rose  $47^{\circ}\text{F}$ . The high temperature was  $82^{\circ}\text{F}$ . What was the low temperature that day? Write a number sentence to show how you found your answer.



# Fractions of a Group

 **Texas Essential Knowledge and Skills**

(3.2)(A) construct concrete models of fractions


(3.2)(C) use fraction names and symbols to describe fractional parts of sets of objects


## Power Up


### facts

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### jump start

 Count down by 6s from 60 to 0.  
Count down by 9s from 90 to 0.

 It's morning. Draw hands on your clock to show 6:39. Write the time in digital form.

 Draw a  $1\frac{3}{4}$ -inch segment on your worksheet.

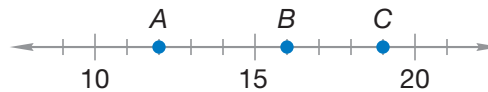
### mental math

a. **Number Sense:**  $19 - 8$

b. **Number Sense:**  $22 - 9$

c. **Money:**  $\$1.00 - \$0.25$

d. **Number Line:** What number is shown by point  $B$ ?



### problem solving

There were 3 boys and 2 girls at the library. Each child checked out 2 books. Altogether, how many books did the children check out?

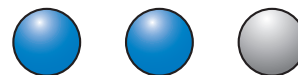
## New Concept

We have used fractions to describe parts of a whole. Sometimes we use fractions to describe parts of a set of items.

$\frac{1}{4}$  of the letters are vowels:

**MATH**

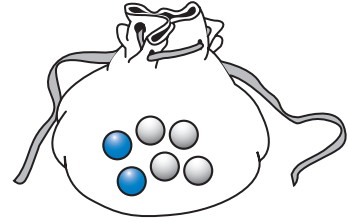
$\frac{2}{3}$  of the marbles are blue:



In the examples above, the **denominator** shows the number of items in the set. The **numerator** shows the number of items that are described.

**Example 1**

**What fraction of the marbles in the bag are blue? Use words and digits to name the fraction.**



There are 6 marbles in the bag. Two of the 6 marbles are blue. So **two sixths** ( $\frac{2}{6}$ ) of the marbles in the bag are blue.

**Analyze** Are more or less than half of the marbles blue? Explain.

**Example 2**

**Toni has finished  $\frac{7}{8}$  of an addition quiz. Which quiz below could be Toni's?**

**A**

3	5	6	3
+ 4	+ 7	+ 4	+ 2
7	12	10	5
4	7	2	7
+ 7	+ 8	+ 6	+ 6
			13

**B**

3	5	6	3
+ 4	+ 7	+ 4	+ 2
7	12	10	5
4	7	2	7
+ 7	+ 8	+ 6	+ 6
11	15	8	13

**C**

3	5	6	3
+ 4	+ 7	+ 4	+ 2
7	12	10	5
4	7	2	7
+ 7	+ 8	+ 6	+ 6
11	15		

**D**

3	5	6	3
+ 4	+ 7	+ 4	+ 2
7	12	10	5
4	7	2	7
+ 7	+ 8	+ 6	+ 6
11	15	8	

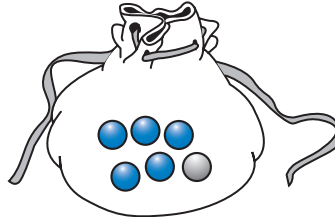
Each addition quiz has 8 questions. Since Toni has finished  $\frac{7}{8}$  of the test, she has answered 7 of the 8 questions. So Toni's quiz could be **D**.

## Lesson Practice

- a. What fraction of the names of the days of the week begin with the letter S?

Sunday  
Monday  
Tuesday  
Wednesday  
Thursday  
Friday  
Saturday

- b. What fraction of the marbles in the bag are blue?



- c. Brad has 3 red shirts, 4 blue shirts, and 1 green shirt. What fraction of his shirts are red?
- d. What fraction of the letters in the word SAXON are vowels? Use words and digits to name the fraction.

## Written Practice

*Distributed and Integrated*

- <sup>(20)</sup> Shoes are on sale at *Sam's Shoes*. All shoes regularly priced at \$49 are on sale for \$10 off the regular price. What is the sale price of the shoes? Write a number sentence, and then answer the question.
- <sup>(18)</sup> Ginger is buying two pairs of shoes for the sale price in problem 1. What is the total price of the shoes?
- <sup>(40)</sup> Nita had \$70. She bought a pair of gloves and got \$32 back from the cashier. How much did Nita spend on the gloves? Write a some went away number sentence to find the answer.
- <sup>(9, 40)</sup> Find the missing number in each number sentence:
  - $\square + 35 = 149$
  - $49 - \square = 28$
  - $m - 200 = 567$

5. When the Olsens' car was four months old, its odometer showed this display.



- a. How far has the car been driven? Write the number using a comma.
- b. Use words to name the number of miles.
6. **Represent** Draw a square and shade  $\frac{1}{2}$  of it.

Use the clock shown for problems 7 and 8.

7. **Multiple Choice** What time is shown on the clock?

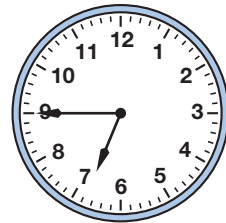
(3, 5)

A 7:45

B 7:15

C A quarter to 7

D A quarter after 7



8. What fraction of the names of the months of the year begin with the letter J?

(1, 44)

9. The paper cost 63¢. Nathan paid with two quarters and 3 nickels. List the coins he should get back.

(25)

10. The population of Durant is sixteen thousand, four hundred sixty. Use digits to write that number.

(32)

11. **List** Count by 25s from 25 to 250. Write the list on your paper.

(2)

Add or subtract, as shown:

12.  $41 + 42 + 23$

(24)

13.  $\$150 - \$90$

(19)

14.  $8 + 8 + 8 + 8$

(10)

15.  $\$250 - \$237$

(19)

16. Draw a circle and divide it into thirds. Shade  $\frac{1}{3}$ .

(42)

17. Room A collected 458 aluminum cans for the recycling drive. Room B collected 724 cans. How many more cans did Room B collect? Write a greater-lesser-difference number sentence to find the answer.

(39)

18. Brooke has 42 crayons. Jason has 84 crayons. About how many  
(30) crayons do they have altogether?

19. Use your ruler to draw a line  $3\frac{1}{2}$  inches long.  
(34)

20. What fraction of the students in your class have names that begin  
(44) with the letter M?

**Early  
Finishers**

*Real-World  
Connection*

Mrs. Sullivan's third grade class is having a party. Mrs. Sullivan needs to buy enough balloons for each of the 20 students in the class. The store sells 8 balloons in a bag. How many bags of balloons should Mrs. Sullivan buy?

# • Probability, Part 1

## Texas Essential Knowledge and Skills




- (3.13)(C) use data to describe events as more likely than or less likely than
- (3.15)(A) explain and record observations using words
- (3.14)(C) select an appropriate problem-solving strategy such as making an organized list

## Power Up

### facts

Power Up 45

### jump start

-  Count up by 3s from 0 to 30 and back down to 0.
-  It's night. Draw hands on your clock to show 11:11. Write the time in digital form.
-  Write these money amounts in order from least to greatest.

\$5.80

\$5.60

\$6.15

### mental math

- a. **Number Sense:**  $23 + 9$
- b. **Number Sense:**  $5 + 12 + 5$
- c. **Calendar:** How many days are in 3 weeks?
- d. **Money:** Find the value of these bills and coins:



### problem solving

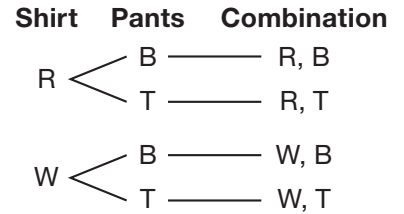
#### Focus Strategy: Make an Organized List

Rob has a red shirt, a white shirt, blue pants, and tan pants. List the combinations of 1 shirt and 1 pair of pants Rob can wear.

**Understand** We will list the different combinations of 1 shirt and 1 pair of pants.

**Plan** We can use a **tree diagram** to make an organized list.

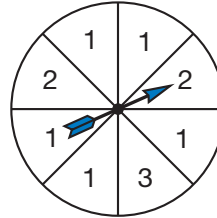
**Solve** For each shirt color, Rob can choose between two different pant colors. We use two branches from each shirt color to connect to each pant color.



**Check** We read from left to right along the branches to find the 4 combinations: 1. red shirt and blue pants; 2. red shirt and tan pants; 3. white shirt and blue pants; or 4. white shirt and tan pants.

## New Concept

Amy likes to play board games. One game she plays has a spinner that looks like this.



Most of the times Amy spins the spinner, it stops on 1. We say that stopping on 1 is **more likely** because it happens on more spins.

The spinner does not stop on 3 very often. We say that stopping on three is **less likely** because it happens on fewer spins.

**Explain** Why is it most likely that the spinner will stop on 1, and least likely that the spinner will stop on 3?

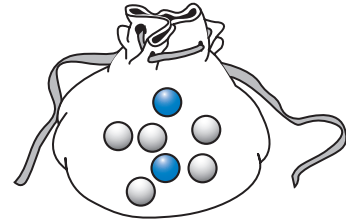
### Activity

#### Probability Demonstration

Watch your teacher's demonstration. Decide which outcomes are more likely or less likely to occur.

### Example 1

There are 7 marbles in a bag. Two marbles are blue and 5 are gray. Jason reaches into the bag and takes a marble without looking.

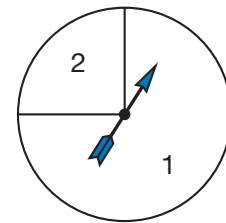


- Which color marble is Jason more likely to pick? Why?
  - Which color marble is Jason less likely to pick? Why?
- There are more gray marbles than blue marbles, so Jason is more likely to pick **gray**.
  - There are less blue marbles than gray marbles, so Jason is less likely to pick **blue**.

### Example 2

If Nathan spins the spinner one time, is it less likely to stop on 1 or 2?

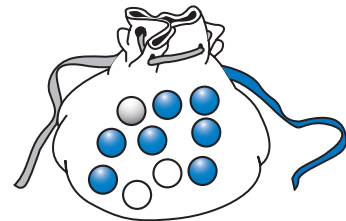
The part of the spinner with 1 is much larger than the part with 2. So the spinner is more likely to stop on 1 and less likely to stop on 2.



### Lesson Practice

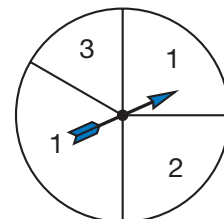
For problems **a** and **b** look at the picture of the bag of marbles.

- If one marble is taken from the bag, which color is more likely to be picked, blue or white?
- If one marble is picked, is it more likely or less likely to be gray?



For problems **c** and **d** look at the spinner.

- If Dwayne spins the spinner one time, which number is the spinner less likely to stop on, 1 or 3?
- If Isabel spins the spinner one time, what number is it most likely to stop on?





- <sup>(29)</sup> All dresses at *Fair Apparel* were on sale for half price. Cheryl bought a dress regularly priced at \$60. What was the sale price? *(Hint: Think of the number of minutes in half of an hour.)*
- <sup>(40)</sup> Jimmy bought a box of 60 dog treats. He used some of the treats to train his dog to roll over. When he was finished, there were 48 treats left in the box. How many treats did Jimmy use to train his dog? Write a some went away number sentence to find the answer.
- <sup>(9, 40)</sup> Find the missing number in each number sentence:
  - $\square + 26 = 49$
  - $700 - \square = 280$

- <sup>(44)</sup> What fraction of these stars are blue?

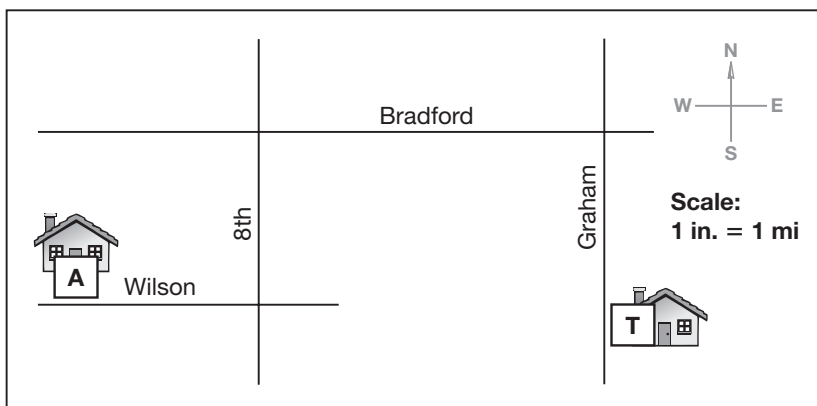


- <sup>(33)</sup> When Jefferson's car was one year old, its odometer showed this display.



- How far had the car been driven? Write the number using a comma.
  - Use words to write the number of miles.
- <sup>(45)</sup> There are 10 dimes and 3 pennies in a bag. Is Kale more likely or less likely to pick a penny from the bag?

This map shows where Andrew and Tony live. Use this map to answer problems 7–9.



7. <sup>(Inv. 4)</sup> The map is drawn so that one inch represents one mile. Traveling on the streets, about how many miles is it from Tony's home to Andrew's home?

8. <sup>(31)</sup> Write directions for Tony that describe how to get to Andrew's home. Use compass directions and number of miles.

9. <sup>(Inv. 4)</sup> Look at the map and name a street perpendicular to Wilson.

10. <sup>(32)</sup> Use words to write 412,600.

11. **List** <sup>(2)</sup> To find the number of days in 12 weeks, count by sevens. Write the twelve numbers you say on your paper.

12. **Represent** <sup>(42)</sup> Draw a figure and shade  $\frac{2}{4}$  of it.

13. **Analyze** <sup>(43)</sup> Write the fractions in order from least to greatest.

$$\frac{1}{3}, \frac{1}{5}, \frac{1}{2}, \frac{1}{4}$$

Add or subtract, as shown:

14. <sup>(10)</sup>  $5 + 8 + 7 + 4$

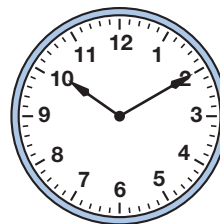
15. <sup>(19)</sup>  $\$125 - \$100$

16. <sup>(24)</sup>  $95 + 76 + 52$

17. <sup>(23)</sup>  $\$350 - \$284$

18. <sup>(40)</sup> Find the missing number:  $37 - \square = 18$ .

19. <sup>(3)</sup> Brenda looked at the clock. It was almost time for morning recess. What time was it?



20. <sup>(44)</sup> Anh has 5 quarters and 7 pennies. What fraction of the coins are pennies?

- Fractions Equal to 1
- Mixed Numbers

## Texas Essential Knowledge and Skills

- (3.2)(A) construct concrete models of fractions
- (3.2)(C) use fraction names and symbols to describe fractional parts of whole objects
- (3.2)(D) construct concrete models of equivalent fractions for fractional parts of whole objects

## Power Up

## facts

jump  
startmental  
mathproblem  
solving

## Power Up 46



- Count up by halves from 0 to 5.
- Count up by fourths from 0 to 2.



Write a fact family using the numbers 8, 4, and 12 in the workspace on your paper.



Write the year “nineteen ten” using digits.

- a. **Money:** Which has greater value?  
3 quarters or 72¢
- b. **Number Sense:** 60 minutes – 20 minutes
- c. **Time:** It is 11:30 in the morning. The track meet began 2 hours ago. What time did it begin?
- d. **Patterns:** What number is missing from the pattern shown below?

200	175	___	125	100
-----	-----	-----	-----	-----

The numbers we say when we count by 2s are **even numbers**. Even numbers have a ones digit of 2, 4, 6, 8, or 0. Counting numbers that are not even are **odd numbers**. Odd numbers have a ones digit of 1, 3, 5, 7 or 9.

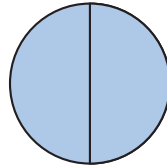
In many neighborhoods, even-numbered addresses are on one side of the street and odd-numbered addresses are on the other side of the street.

All the addresses on Anna’s side of the street are two-digit odd numbers that begin with 6. What are the possible address numbers on Anna’s side of the street?

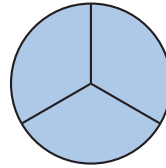
## New Concepts

### Fractions Equal to One

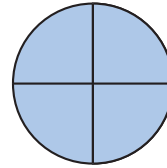
We have used fractions to name parts of a whole shape. We can also use a fraction to name a whole shape. Each of the circles below represents 1. Each is named with a different fraction.



$$\frac{2}{2} = 1$$



$$\frac{3}{3} = 1$$

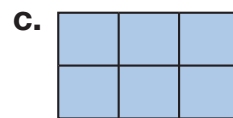
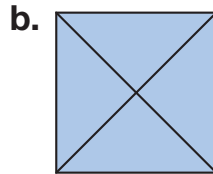
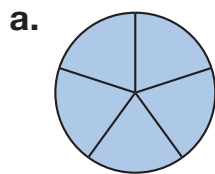


$$\frac{4}{4} = 1$$

Notice that the numerator and denominator are the same when a fraction equals 1.

#### Example 1

Write the fraction equal to 1 represented by each shaded figure.

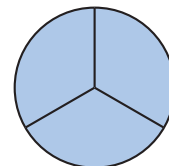
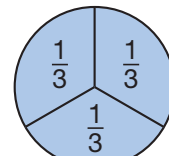


- a. Five of five equal parts are shaded,  $\frac{5}{5}$ .  
b. Four of four equal parts are shaded,  $\frac{4}{4}$ .  
c. Six of six equal parts are shaded,  $\frac{6}{6}$ .

#### Example 2

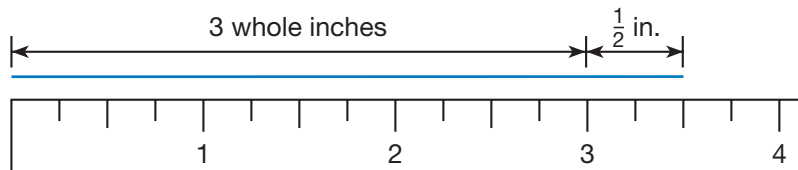
Use your fraction manipulatives to show that  $\frac{3}{3}$  equals 1. Then draw and shade a circle to illustrate  $\frac{3}{3}$ .

We use three  $\frac{1}{3}$  pieces to build the fraction. The whole circle represents 1. Notice that we do not divide a circle in half to make thirds. Instead, starting from the center, we draw three segments.

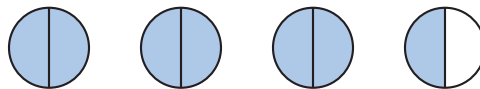


## Mixed Numbers

In Lesson 35 we learned to name lengths that are between whole numbers of inches with a whole number plus a fraction.



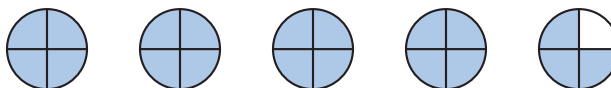
We can name amounts that are between whole numbers using a whole number plus a fraction.



There are more than three whole circles, but fewer than four whole circles. We can name this number with the whole number of circles plus the fraction number of circles:  $3\frac{1}{2}$ . We read the number as “three and one half.” A whole number plus a fraction is called a **mixed number**.

### Example 3

**Name the number of circles shown using numbers and using words.**



There are 4 whole circles plus  $\frac{3}{4}$  circle:  $4\frac{3}{4}$ . We read  $4\frac{3}{4}$  as “four and three fourths.”

### Lesson Practice

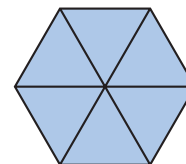
a. **Multiple Choice** Which of these fractions equals 1?

- A  $\frac{1}{2}$       B  $\frac{2}{3}$       C  $\frac{3}{4}$       D  $\frac{5}{5}$

b. Draw and shade a square to represent the fraction  $\frac{4}{4}$ .

c. Compare:  $\frac{3}{3}$  ○  $\frac{4}{4}$

d. What fraction equal to 1 is represented by this shaded figure?

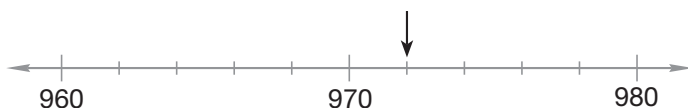


e. Write  $5\frac{3}{10}$  using words.      f. Draw circles to show  $2\frac{1}{2}$ .

1. What fraction of a dollar is represented by 10 dimes?  
(46)

2. *Sputnik*, the first man-made satellite, was launched in Russia in 1957. The first space shuttle flight was in 1981. How many years were there from *Sputnik* to the first space shuttle flight?  
(39)

3. To what number is the arrow pointing on this number line?  
(33)



4. Sammy bought a CD for \$19 plus \$2 tax. Write the total price of the CD with tax using digits and again using words.  
(12, 18)

5. There are three basketballs and four footballs in the bag. What fraction of the balls in the bag are basketballs?  
(44)

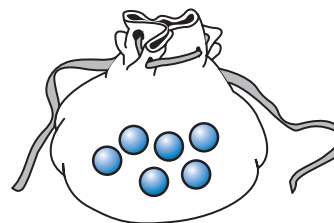
6. There are 1,440 minutes in a day. Write 1,440 in expanded form.  
(32)

7. In the fraction  $\frac{8}{9}$ , which number is the numerator? Which number is the denominator?  
(41)

8. **Represent** Draw a line segment that is  $5\frac{1}{4}$  inches long.  
(35)

9. Estimate the height of your desk in inches. Then use your ruler to measure the height of your desk.  
(37)

10. **Analyze** What fraction of the marbles in the bag are **NOT** grey?  
(44, 46)



11. Morgan turned 9 years old. Copy and continue the table to find the number of months in 9 years.

<b>Years</b>	1	2	3	4	5	6	7	8	9
<b>Months</b>	12	24	36						

Add or subtract, as shown:

12.  $976 - 200$   
(19)

13.  $812 + 30$   
(16)

14.  $\$4.38 + \$1.52$   
(22)

15.  $65 + 48 + 21$   
(24)

16.  $200 - 143$   
(28)

17.  $6 + 7 + 5 + 4$   
(10)

18.  $5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5$   
(10)

19. Find the missing number:  $180 - \square = 50$ .  
(40)

20. **Analyze** There are 10 apples in a bag. Four of the apples are green and the rest are red. What fraction of the apples are red?  
(44)

# Equivalent Fractions

**Texas Essential Knowledge and Skills**



- (3.2)(C) use fraction names and symbols to describe fractional parts of whole objects
- (3.2)(D) construct concrete models of equivalent fractions for fractional parts of whole objects

## Power Up


**facts**

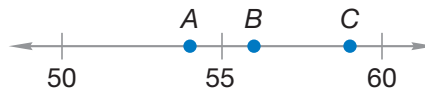
Power Up 47

**jump start**

-  Count down by 7s from 56 to 0.  
Count down by 10s from 93 to 3.
-  It's afternoon. Draw hands on your clock to show 2:02. Write the time in digital form.

**mental math**

-  Draw a 2-inch segment on your worksheet.
- a. **Number Sense:**  $200 + 400 + 200$
- b. **Number Sense:**  $27 + 10$
- c. **Money:** Mrs. Timm bought one apple for 60¢. She paid \$1.00. How much change did she receive? Write your answer with a dollar sign.
- d. **Number Line:** Which point shows the number 59?



**problem solving**

Bret has a total of 9 coins in his left and right pockets. He has at least 3 coins in each pocket. Complete this table to show the different ways he could have the coins in his pockets.

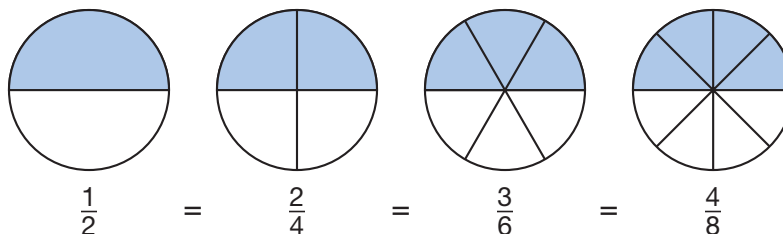
Left	Right
3	6

## New Concept

In Lesson 46 we found that there are different fractions that equal 1, such as  $\frac{2}{2}$ ,  $\frac{3}{3}$ , and  $\frac{4}{4}$ . Equal fractions are called **equivalent fractions**.



Below we show some fractions equivalent to  $\frac{1}{2}$ .



In this lesson we will build and identify equivalent fractions.

**Analyze** What one coin is equal to  $\frac{2}{4}$  of a dollar?

## Activity

### Equivalent Fractions

Materials: **Lesson Activity 17**, fraction manipulatives

In this activity you will use your fraction manipulatives to show equivalent fractions. You will not cut apart Lesson Activity 17. Instead, you will place your fraction manipulatives on the Activity Master circles. Then you will count the parts covered to answer the following questions.

1. Find the circle that shows six equal parts. Each part is  $\frac{1}{6}$  or one sixth. Fit a  $\frac{1}{3}$  fraction on the circle. How many sixths equal  $\frac{1}{3}$ ? Copy and complete this equation:

$$\frac{1}{3} = \frac{\square}{6}$$

2. Fit two  $\frac{1}{3}$  fractions on the circle that shows sixths. How many sixths equal  $\frac{2}{3}$ ? Copy and complete this equation:

$$\frac{2}{3} = \frac{\square}{6}$$

3. Find the circle that shows eight equal parts. Each part is  $\frac{1}{8}$  or one eighth. Fit a  $\frac{1}{4}$  fraction on the circle. How many eighths equal  $\frac{1}{4}$ ? Copy and complete this equation:

$$\frac{1}{4} = \frac{\square}{8}$$

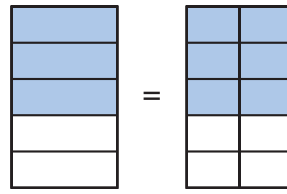
4. Fit three  $\frac{1}{4}$  fractions on the circle that shows eighths. How many eighths equal  $\frac{3}{4}$ ? Copy and complete this equation:

$$\frac{3}{4} = \frac{\square}{8}$$

When you are finished with the activity, color both sides of the fraction circles on Lesson Activity 17. Then cut them out and add them to your resealable plastic bag with your other fraction manipulatives for use in future lessons and problem sets.

**Example 1**

What equivalent fractions are represented by these rectangles?

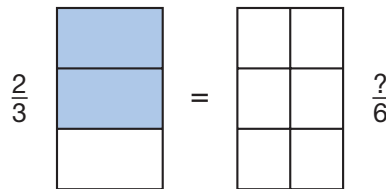


For the rectangle on the left 3 of 5 parts are shaded. For the rectangle on the right 6 of 10 parts are shaded. So,  $\frac{3}{5}$  and  $\frac{6}{10}$  are equivalent fractions.

$$\frac{3}{5} = \frac{6}{10}$$

**Example 2**

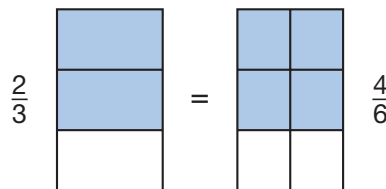
The first rectangle has three equal parts. We see that two parts are shaded. So, two thirds of the figure is shaded.



The second rectangle has six equal parts. Copy or trace the rectangles on your paper. Then shade the second rectangle to match the shaded part of the first rectangle. Study the rectangles to help you complete the equation:

$$\frac{2}{3} = \frac{\square}{6}$$

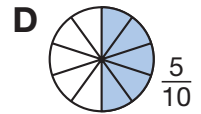
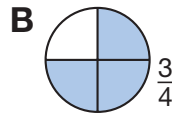
We copy and shade the rectangles to match.



The shaded rectangles show that  $\frac{2}{3} = \frac{4}{6}$ .

## Lesson Practice

- Use your fraction manipulatives to find and name three fractions equivalent to  $\frac{1}{2}$ .
- Two quarters have the same value as five dimes. Write two equivalent fractions of a dollar represented by these two sets of coins.
- Draw and shade two squares to show that  $\frac{1}{2}$  is equivalent to  $\frac{2}{4}$ .
- Multiple Choice** Which shaded figure below illustrates a fraction equivalent to  $\frac{1}{2}$ ?



## Written Practice

*Distributed and Integrated*

- <sup>(39)</sup> In 1962, John Glenn, Jr., was the first American to orbit the Earth. In 1968, three American astronauts first orbited the moon. How many years were there between these two events?
- <sup>(18, 21)</sup> The meal cost \$25. The tax was \$2. Murphy left a tip of \$4.00. What was the total price of the meal with tax and tip?
- <sup>(40)</sup> Randall gave Ivory 20 pencils. Then he had 48 pencils. How many pencils did Randall have before he gave pencils to Ivory? Write a some went away number sentence to find the answer.
- <sup>(44)</sup> **Analyze** Edward has 6 pairs of white socks, 5 pairs of black socks, and 3 pairs of blue socks. What fraction of his socks are white?
- <sup>(43)</sup> What fraction of Edward's socks in problem 4 is NOT white?
- <sup>(35, Inv. 4)</sup> **Represent** Draw two parallel segments that are  $1\frac{3}{4}$  inches long.
- <sup>(32)</sup> The distance from Seattle to Boston is about two thousand, five hundred miles. Use digits to write that number.

8. The odometer showed this display.

(32)



a. Write the number of miles with digits and a comma.

b. Use words to write the number of miles shown.

9. **Multiple Choice** Which fraction is not equal to 1?

(46)

A  $\frac{2}{2}$

B  $\frac{3}{3}$

C  $\frac{4}{5}$

D  $\frac{6}{6}$

10. **Multiple Choice** Which fraction equals  $\frac{1}{2}$ ? Use your manipulatives to help you find the answer.

(47)

A  $\frac{2}{5}$

B  $\frac{2}{3}$

C  $\frac{2}{4}$

D  $\frac{2}{6}$

11. Which number in the fraction  $\frac{4}{6}$  tells the number of equal parts in the whole?

(42)

Add or subtract, as shown:

12.  $800 - 149$

(28)

13.  $932 - 30$

(19)

14.  $\$5.76 + \$3.35$

(22)

15.  $\$560 - \$320$

(19)

16.  $84\text{¢} + 96\text{¢} + 28\text{¢}$

(21, 24)

17.  $\square - 35 = 40$

(40)

18. **Multiple Choice** How much money is  $\frac{1}{4}$  of a dollar plus  $\frac{3}{10}$  of a dollar?

(25, 29)

A 25¢

B 30¢

C 55¢

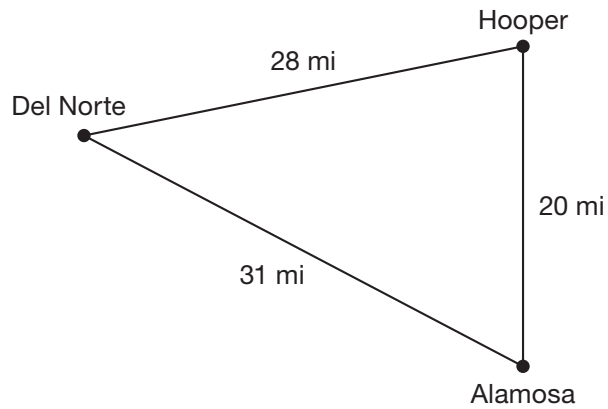
D 60¢

19. The door was 7 feet high. How many inches is 7 feet?

(34)

Feet	1	2	3	4	5	6	7
Inches	12	24	36				

20. <sup>(18, 31)</sup> The Garcias drove from Del Norte to Hooper to Alamosa and back to Del Norte. How far did the Garcias drive?



**Early Finishers**  
*Real-World Connection*

Tyrone's parents took him to Greg's Go Kart Track because he got all A's and B's on his report card. It cost \$1.50 to drive 2 laps around the track. How much will it cost to drive 8 laps?

# Finding Fractions and Mixed Numbers on a Number Line

## Texas Essential Knowledge and Skills

- (3.2)(C) use fraction names and symbols to describe fractional parts of whole objects
- (3.10) locate and name points on a number line using fractions, including halves and fourths

## Power Up

### facts

### jump start

### mental math

### problem solving

### Power Up 48



- Count up by 6s from 0 to 60.  
Count up by 9s from 0 to 90.



Write a fact family using the numbers 8, 8, and 16 in the workspace on your paper.



Write the number “nine hundred forty-six” using digits on your worksheet. What digit is in the tens place?

- Estimation:** Round \$630 to the nearest hundred dollars.
- Measurement:** How many inches are in 3 feet?
- Number Sense:**  $11 + 11$
- Money:** Find the value of these bills and coins:

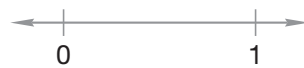


Bret has a total of 9 coins in his left and right pockets. He has 3 more coins in his right pocket than in his left pocket. How many coins does he have in each pocket?

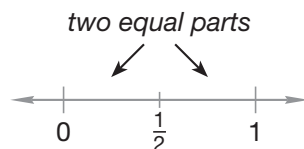
## New Concept

We have used fractions to describe parts of a whole and parts of a set. We can also use fractions to name points on a number line.

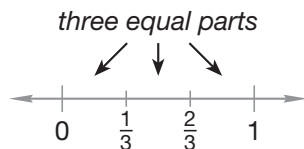
On this number line, there are tick marks for 0 and 1. There are many points between 0 and 1 that can be named using fractions.



Suppose we divide the distance from 0 to 1 into two equal parts. Then the distance from zero to the middle mark is  $\frac{1}{2}$ .



If we divide the distance from 0 to 1 into 3 equal parts, the marks between represent  $\frac{1}{3}$  and  $\frac{2}{3}$ .

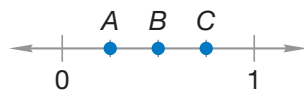


Notice that the denominator of each fraction is the total number of segments between 0 and 1. The numerator of the fraction is the number of segments from 0.

numerator  $\longrightarrow$  2  $\longrightarrow$  Number of segments from 0.  
denominator  $\longrightarrow$  3  $\longrightarrow$  Number of segments between 0 and 1.

### Example 1

**Write fractions to name points A, B, and C on this number line.**



The three tick marks between 0 and 1 divide the distance from 0 to 1 into four segments. So 4 is the denominator of each fraction.

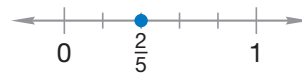
- Point A is 1 segment from 0, so A represents  $\frac{1}{4}$ .
- Point B is 2 segments from 0, so B represents  $\frac{2}{4}$ .
- Point C is 3 segments from 0, so C represents  $\frac{3}{4}$ .

### Example 2

Copy this number line on your paper and draw a dot at the point that represents  $\frac{2}{5}$ . Write  $\frac{2}{5}$  below the dot.



We copy the number line. We see that there are 5 segments between 0 and 1, so the denominator is 5. To find  $\frac{2}{5}$  we count 2 segments from zero, draw a dot, and write the fraction.

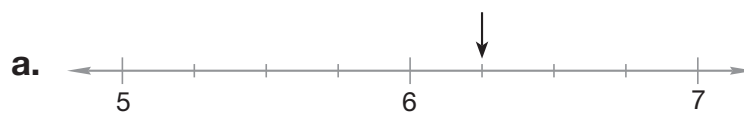


**Analyze** Use the number line above to answer this question: Which fraction is greater,  $\frac{2}{5}$  or  $\frac{4}{5}$ ? Explain your answer.

We can also locate and name mixed numbers on a number line. If a point is between two whole numbers on a number line, we use the smaller number as the whole part of the mixed number. Then we find and name the fraction part. We count the number of segments between the whole numbers to find the denominator. Then we count the number of segments from the smaller number to find the numerator.

### Example 3

To what number is each arrow pointing?



- a. The arrow is pointing to a number between 6 and 7, so the whole number part is 6. There are four segments between each number and one segment between 6 and the arrow, so the fraction part is  $\frac{1}{4}$ . The arrow is pointing to  $6\frac{1}{4}$ .
- b. The arrow is pointing to a number between 10 and 11. There are three segments between each number and two segments between 10 and the arrow. The mixed number is  $10\frac{2}{3}$ .



# Activity

## Fractions on the Number Line

Materials: **Lesson Activity 18**

Name the fractions and mixed numbers shown on **Lesson Activity 18**.

### Lesson Practice

Name the fractions shown on these number lines.



e. What two equivalent fractions are illustrated by this pair of number lines?



### Written Practice

*Distributed and Integrated*

**Formulate** Write number sentences for problems **1** and **2**. Then answer each question.

- 1. Analyze** <sup>(36, 3)</sup> There are 24 hours in a day. At 7:00 a.m., how many hours are left in the day? (*Hint: A new day starts at midnight.*)
- 2.** <sup>(36)</sup> The sale price of the pants was \$29. With tax, the total was \$31. How much was the tax?
- 3.** <sup>(44)</sup> What fraction of the students in your class are girls? What fraction are boys?
- 4.** <sup>(17, 44)</sup> Tara finished her addition facts practice test in 28 seconds. Is 28 seconds more than half of a minute or less than half of a minute? (*Hint: There are 60 seconds in one minute.*)

5. In 1912 Arizona became the 48th state. In 1960 Hawaii became the 50th state. Hawaii became a state how many years after Arizona?

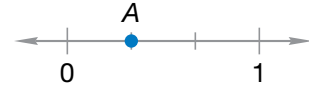
(39)

6. Which fraction is greater:  $\frac{2}{5}$  or  $\frac{3}{4}$ ?

(43)

7. Name the fraction shown on this number line.

(48)



8. Name a fraction equivalent to  $\frac{1}{4}$ .

(47)

9. Write  $4\frac{5}{6}$  using words.

(46)

10. Find the missing number:  $77 - \square = 9$

(40)

11. Draw and shade two rectangles to show that  $\frac{1}{3}$  is equivalent to  $\frac{2}{6}$ .

(47)

Add or subtract, as shown:

12.  $966 - 900$

(19)

13.  $776 + 50$

(16)

14.  $\$625 - \$375$

(19)

15.  $49\text{¢} + 94\text{¢} + 55\text{¢}$

(21, 24)

16.  $400 - 143$

(28)

17.  $\$4.56 + \$5$

(22)

18.  $83 - \square = 46$

(40)

19. Draw a number line from 600 to 700 with one tick mark every 20 numbers. Label 600 and 700. Draw a point at 620.

(4, 33)

20. **Represent** Sketch a map from this description. Then find the answer to the question.

(31)

*Abilene is 52 miles west of Eastland. Baird is 32 miles west of Eastland on the road to Abilene. Which direction and how many miles is it from Baird to Abilene?*

# Comparing Fractions, Part 2

## Texas Essential Knowledge and Skills


- (3.2)(B) compare fractional parts of whole objects/sets of objects in a problem situation using concrete models
- (3.2)(C) use fraction names and symbols to describe fractional parts of whole objects/sets of object
- (3.14)(A) identify the mathematics in everyday situations

## Power Up

### facts

Power Up 49

### jump start

-  Count up by 4s from 0 to 40.  
Count up by fourths from 0 to 2.



Write these money amounts in order from least to greatest:

\$3.35

\$2.95

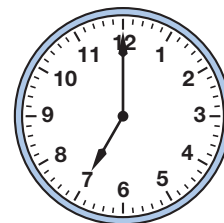
\$0.75



Draw a  $1\frac{1}{4}$ -inch line in the workspace on your worksheet.

### mental math

- Money:** \$1.00 – \$0.90
- Time:** How many years are in 3 decades?
- Number Sense:**  $30 - 9$
- Time:** It is evening. What is the time 30 minutes after the time shown on the clock?



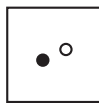
### problem solving

Look for a pattern in these figures. Which figure does not belong? Explain your answer.

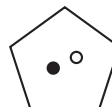
A



B



C

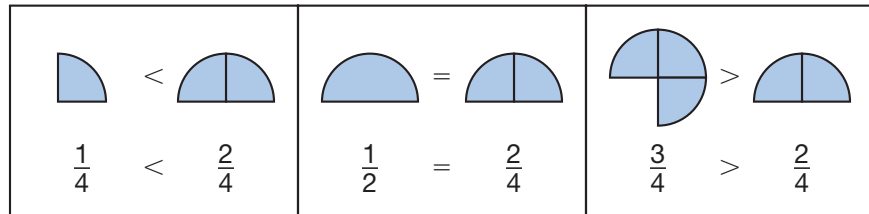


D



## New Concept

In recent lessons we have seen that two fractions may be equivalent (equal) or that one fraction may be less than or greater than another fraction.



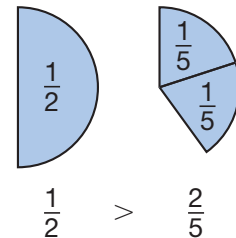
In this lesson we will continue comparing fractions using manipulatives and pictures.

### Example 1

In one minute Erin finished  $\frac{1}{2}$  of the facts practice worksheet and David finished  $\frac{2}{5}$  of the worksheet. Which student finished more? (Use your fraction manipulatives to help you answer the question.)

Using fraction manipulatives we see that  $\frac{1}{2}$  is greater than  $\frac{2}{5}$ .

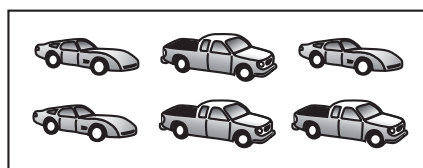
This means that **Erin** finished more of the facts practice worksheet than David.



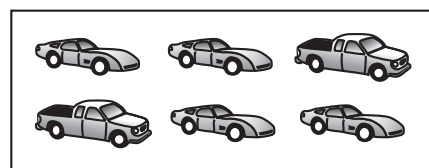
### Example 2

Rodney and Rachel both have collections of toy vehicles.

Rodney's Collection



Rachel's Collection



- What fraction of Rodney's toy vehicles are trucks?
- What fraction of Rachel's toy vehicles are trucks?
- Who has the greater fraction of trucks?

a. From the picture we see that 3 of Rodney's 6 vehicles are trucks, so  $\frac{3}{6}$  are trucks.

b. We see that  $\frac{2}{6}$  of Rachel's toy vehicles are trucks.

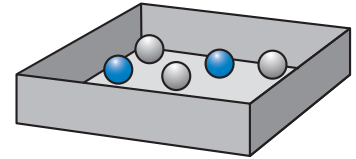
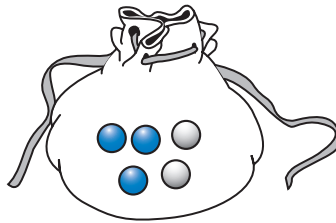
c. Since  $\frac{3}{6}$  is greater than  $\frac{2}{6}$ , **Rodney** has the greater fraction of trucks in his collection.

**Analyze** One third of the trucks in Rodney's toy box are blue. Two thirds of the trucks are red. If Rodney takes a truck out of his toy box without looking, which color is he most likely to get? Why?

### Lesson Practice

- a. Angela walks  $\frac{3}{4}$  of a mile to school. Byron walks  $\frac{3}{5}$  of a mile to school. Who walks farther to school, Angela or Byron? Use manipulatives to model each fraction and find the answer.
- b. What fraction of a dollar is three quarters? What fraction of a dollar is seven dimes? Compare the two fractions using a comparison symbol.

What fraction of the marbles in the bag are blue? What fraction of the marbles in the box are blue? Which container has the greater fraction of blue marbles?



Use manipulatives or draw pictures to compare these two fractions.

$$\frac{2}{4} \bigcirc \frac{2}{3}$$

### Written Practice

*Distributed and Integrated*

- 1** <sup>(39)</sup> Jill has 84 baseball cards. Dakota has 72 baseball cards. Who has more baseball cards? How many more? Write a greater-lesser-difference number sentence to help you find the answer.
- 2** <sup>(36)</sup> Talal bought paper for \$2.00 and a folder for \$0.75. If the total price for the paper and folder with tax was \$2.95, how much was the tax?

3. There are 2 black cars, 3 white cars, and 5 red cars in the parking lot. What fraction of the cars are not red? Compare the fraction of cars that are not red to the fraction of cars that are red using a comparison symbol.

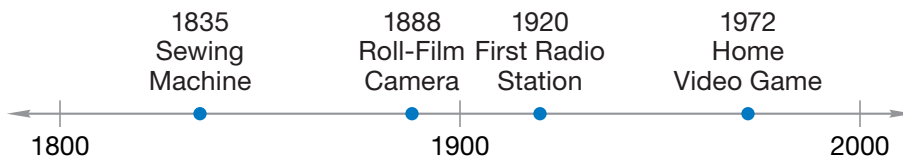
4. **Represent** Draw and shade  $\frac{3}{4}$  of a circle.

5. Which fraction is greater:  $\frac{1}{3}$  or  $\frac{2}{4}$ ? You may draw pictures or use your fraction manipulatives to help you answer the question.

6. The artichoke cost 59¢. Jaime paid for it with three quarters. List the coins he should get back.

7. Find the missing number:  $210 - \square = 99$

8. Look at this timeline to answer **a** and **b**.



a. The first roll-film camera was made how many years before the first home video game?

b. The first electronic guitar was made in 1948. Was that before or after the first radio station?

9. The odometer showed this display.



a. How many miles are shown? Write the number using digits and a comma.

b. Use words to write the number of miles shown.

10. Use your ruler to measure the segments:



a. Point A to point B

b. Point B to point C

c. Point A to point C

11. **Generalize** What number is missing in this sequence?

(2)

21, 28, \_\_\_\_\_, 42, 49, 56 ...

12. Name the fraction shown on this number line.

(48)



13. What fraction of a dollar is 3 nickels? What fraction of a dollar is 7 pennies? Compare the two fractions using a comparison symbol.

(49)

Add or subtract, as shown:

14.  $989 - 200$

(19)

15.  $38¢ + 84¢ + 45¢$

(21, 24)

16.  $1\text{ ft.} - 1\text{ in.} = \underline{\hspace{2cm}}\text{ in.}$

(34)

17.  $1\text{ yd} - 1\text{ ft} = \underline{\hspace{2cm}}\text{ ft}$

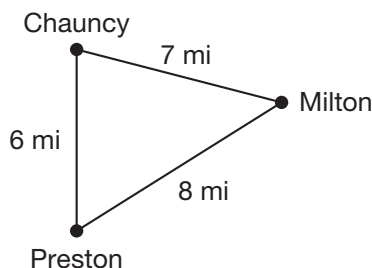
(34)

18. Estimate the length in inches from the top to the bottom of this page. Then use your ruler to measure the length of this page to the nearest inch.

(37)

19. Wilson rode his bike from Preston to Chauncy to Milton and then back to Preston. How many miles did Wilson ride his bike?

(10, 18)



20. Tonya and Sherri each had a small loaf of homemade wheat bread. Tonya cut her loaf into three equal slices. Sherri cut her loaf into six equal slices. How many of Sherri's slices are equal to one of Tonya's slices? Use your fraction manipulatives to help you find the answer.

(47)

## • Probability, Part 2

### Texas Essential Knowledge and Skills

- (3.13)(C) use data to describe events as more likely than, less likely than, or equally likely as
- (3.14)(C) select an appropriate problem-solving strategy such as making a table

## Power Up

### facts

Power Up 50

### jump start



- Count up by halves from 0 to 5.  
Count up by 5s from 1 to 51.



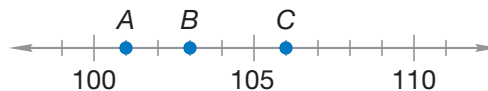
- It's afternoon. Draw hands on your clock to show 5:27.  
Write the time in digital form.



- Write "four thousand nine hundred" using digits on your worksheet.

### mental math

- a. **Number Sense:**  $8 + 15$
- b. **Number Sense:**  $17 + 9$
- c. **Patterns:** 5, 15, 25, 35, \_\_\_\_\_.
- d. **Number Line:** Which point shows the number 101?

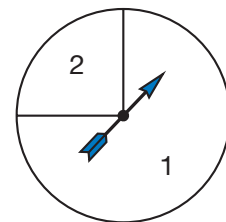


### problem solving

Fayed has eight coins with a total value of 12¢. What are the coins?

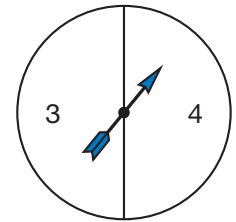
## New Concept

When we spin this spinner, we cannot be certain where it will stop. However, we see that it is **more likely** to stop on 1 than on 2. We can also say it is **less likely** to stop on 2 than on 1.



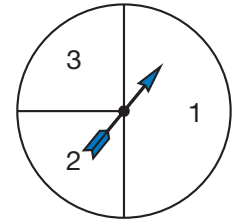


Some outcomes are **equally likely**. Since both area 3 and area 4 on this spinner are the same size, the spinner is equally likely to stop on 3 or 4.



### Example 1

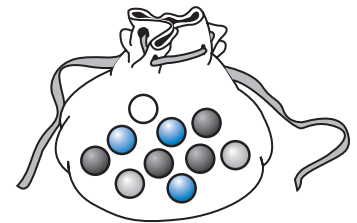
Compare the following outcomes by using the terms *more likely*, *less likely*, or *equally likely*.



- a. spinning 1 or spinning 2
  - b. spinning 2 or spinning 3
- a. Since area 1 is larger than area 2, **spinning 1 is more likely than spinning 2**. We may also say that **spinning 2 is less likely than spinning 1**.
  - b. Areas 2 and 3 are the same size, so **spinning 2 and spinning 3 are equally likely**.

### Example 2

Create a table that shows the number of each color of marble in this bag. If one marble is taken from the bag, which color is least likely to be picked? Which color is most likely to be picked?



First we draw the table and give it a title. Then we list the colors and numbers of marbles. Since there is only one white marble, the color that is least likely to be picked is **white**. Since there are more black marbles than any other single color, the color that is most likely to be picked is **black**.

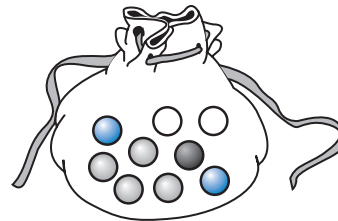
Marbles in Bag

Color	Number
White	1
Gray	2
Black	4
Blue	3

**Analyze** Look at the table above to answer this question. If you put 2 more gray marbles in the bag, which color is more likely to be picked?

## Lesson Practice

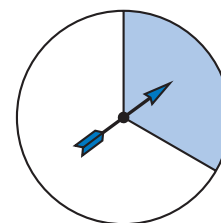
One marble will be picked from a bag with white, gray, black, and blue marbles. Look at these marbles to answer questions **a–c**.



- Which color is least likely to be picked?
- Which color is most likely to be picked?
- Which two colors are equally likely to be picked?

The spinner will be spun once. Look at the spinner to answer questions **d–f**.

- The spinner is more likely to stop on what color?
- The spinner is less likely to stop on what color?
- How can we change the face of the spinner so that the spinner is equally likely to stop on either color?



## Written Practice

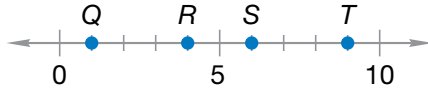
*Distributed and Integrated*

**Formulate** Write number sentences for problems **1** and **2**. Then answer each question.

- (20, 19) Two hundred seventy-four fans were in the stands when the football game began. By halftime, 64 had gone home. How many fans were still in the stands at halftime?
- (36) The computer game costs \$36 with tax. Jonathan has \$21. How much more money does he need to buy the game?
- (44) There are thirteen stripes on the American flag. Seven of the stripes are red. What fraction of the stripes are white?
- (43) Which fraction is greater:  $\frac{2}{3}$  or  $\frac{1}{2}$ ?
- (43) Which fraction is smaller:  $\frac{3}{4}$  or  $\frac{3}{5}$ ?

6. Babe Ruth hit 60 home runs in 1927. Roger Maris hit 61 home runs in 1961. How many years were there from 1927 to 1961?

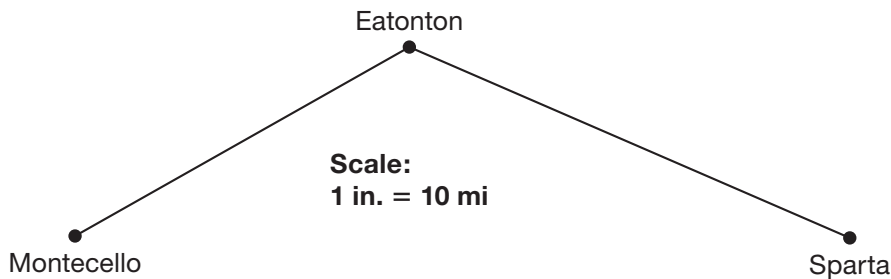
7. **Interpret** Look at the number line to answer **a** and **b**.



- a. Which point represents the number 6?
- b. Which points represent numbers less than 5?
8. Copy this number line. Then draw point *T* on the number line to represent  $7\frac{2}{3}$ .



9. This map shows the towns of Montecello, Eatonton, and Sparta. One inch represents a distance of ten miles. Use your ruler to find the number of miles from:



- a. Montecello to Eatonton
- b. Eatonton to Sparta
- c. Montecello to Sparta through Eatonton
10. Name a fraction that is equal to  $\frac{2}{4}$ . Use your fraction manipulatives to find the answer.
11. Texas became a state in 1845. California became a state in 1850. How many years earlier did Texas become a state?
12. **Analyze** What coin is half the value of a dime?

- 13.** **Conclude** What are the next three years in this sequence?

(2)

1980, 1990, 2000, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, ...

**14.**  $99\text{¢} + 62\text{¢} + 10\text{¢}$

(21, 24)

**15.**  $\$7.50 - \$2.50$

(26)

**16.**  $\square - 31 = 17$

(40)

**17.**  $\$140 - \$75$

(23)

- 18. a.** Round \$122 to the nearest hundred dollars.

(15, 30)

- b.** Round \$189 to the nearest hundred dollars.

- c.** Estimate the sum of \$122 and \$189 using your answers to **a** and **b**.

- 19.** Greta has 6 pencils in her desk. Don has 5 pencils in his. Greta sharpened 3 of her pencils. Don sharpened 2 of his pencils.

(44, 49)

- a.** What fraction of Greta's pencils are sharpened?

- b.** What fraction of Don's pencils are sharpened?

- c.** Use  $<$ ,  $>$ , or  $=$  to compare your answers for **a** and **b**.

- 20.** Jodie has a bag containing 4 blue marbles and 7 white marbles. Is Jodie more likely to pick a blue marble or a white marble?

(50)

**Texas Essential Knowledge and Skills**

- (3.13)(C) use data to describe events as more likely than, less likely than, or equally likely as
- (3.14)(D) use tools such as real objects to solve problems
- (3.16)(A) make generalizations from patterns or sets of examples and nonexamples

**Focus on**

**• Probability Games**

In this investigation you will play three probability games using a dot cube. You will decide if the games are fair.



**Probability Games**

Materials: dot cube, pencil and paper, Lesson Activity 19

Play the games with a partner. Each game needs a Player A and a Player B. Decide with your partner who will be A and who will be B. You will keep this letter for all three games. Each pair of players needs one dot cube.

**Game 1**

Take turns rolling a dot cube.

*Rules:*

- Player A gets a point if the number of dots is 1 or 6.
- Player B gets a point if the number of dots is 2, 3, 4, or 5.
- The first player with 10 points wins.

Keep track of points using tally marks ( |||| ).

Draw the table below on your paper and use it to keep score.

Player A	Player B

Player A      Player B

**Game 2**

Take turns rolling a dot cube.

*Rules:*

- Player A gets a point if the number of dots is even (2, 4, or 6).
- Player B gets a point if the number of dots is odd (1, 3, or 5).

- The first player with 10 points wins.

Draw the following table on your paper and use it to keep score.

Player A	Player B

1. Which game is more fair, Game 1 or Game 2? Why?

### Game 3

With your partner, figure out a dot cube game you think would be fair.

Draw the following table on your paper and use it to keep score.

Player A	Player B

2. In Game 1, which player is more likely to win the game, Player A or Player B? Why?
3. In Game 2, which player is more likely to win the game, Player A or Player B? Why?
4. How did you design Game 3 so that the game was fair?

We chose 6 ways for Player A to win a point and 3 ways for Player B to win a point.