LESSON **Practice**

11-3

Make a List to Find Sample Spaces

1. Lindsay flips a coin and rolls a 1–6 number cube at the same time. What are the possible outcomes? They have been started for you.

   **(H, 1)** _____

   (T, 1) _____

2. Jordan has a choice of wheat bread or rye bread and a choice of turkey, ham, or tuna for lunch. What are all the possible choices of sandwiches he can have?

   _____

   _____

Choose the letter for the best answer.

3. Chad and Victoria are playing a game with a quarter and a spinner divided into sixths, numbered 1–6. Each player spins the spinner and tosses the coin. How many outcomes are possible in the game?

   A 8

   B 10

   C 12

4. For a snack, Sophie can choose milk, apple juice, orange juice, or punch. To go with her drink, she can choose a chocolate cupcake, oatmeal cookie, or crackers. How many choices are in the sample space?

   A 12   C 3

   B 7

5. Marva has a spinner divided into fourths and a 1–6 number cube. She spins the spinner and rolls the number cube. How many outcomes are possible in the game?

   A 4

   B 6

   C 24

6. Larry has a choice of vanilla, chocolate, or strawberry ice cream. The choices of toppings are nuts, sprinkles, or coconut. How many one-topping sundaes can he make?

   A 6   C 12

   B 9

Holt McDougal Mathematics

LESSON 11-3

Practice B

Sample Spaces

1. Marcus spins the spinner at the right and flips a dime at the same time. What are the possible outcomes? How many outcomes are in the sample space?

   _____

   _____
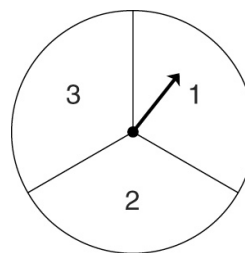
2. For lunch, Britney has a choice of a hot dog, a hamburger, or pizza and a choice of an apple, a pear, or grapes. What are all the possible choices of lunch she can have? How many outcomes are in the sample space?

   _____

   _____

   _____

   _____

3. Susan and Ryan are playing a game that involves spinning the spinner at the right and flipping a penny. How many outcomes are possible in the game?

   _____
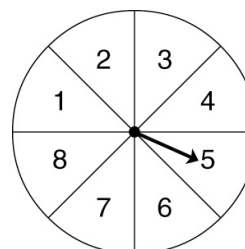
4. An Italian restaurant offers small, medium, and large calzones. The choices of fillings are cheese, sausage, spinach, or vegetable. How many different calzones can you order?

   _____

5. There are 5 ways to go from Town X to Town Y. There are 3 ways to go from Town Y to Town Z. How many different ways are there to go from Town X to Town Z, passing through Town Y?

   _____

6. Rasheed has tan pants, black pants, gray pants, and blue pants. He has a brown sweater and a white sweater. How many different ways can he wear a sweater and pants together?

   _____

Holt McDougal Mathematics

LESSON
11-3

# Practice C

Sample Spaces

1. Joanna spins the spinners at the
   right at the same time. What are
   the possible outcomes? How many
   outcomes are in the sample space?

   _____

   _____

   _____

   _____
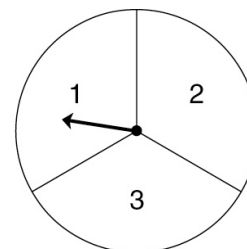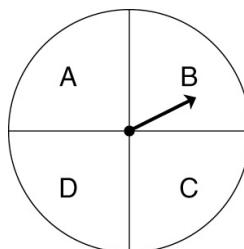
2. For breakfast, Armando has a choice of pancakes, eggs, or
   cereal and a choice of milk, hot cocoa, or juice. What are all the
   possible choices of breakfast he can have? How many
   outcomes are in the sample space?

   _____

   _____

   _____

3. Shannon and Tyler are playing a game
   that involves spinning the spinner shown
   at the right and tossing a 1–6 number
   cube. How many outcomes are possible
   in the game?

   _____
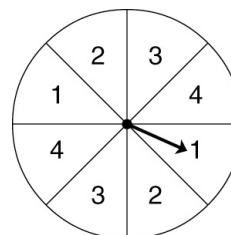
4. If you flip a penny, toss a 1–6 number cube, and flip
   a quarter, how many outcomes are possible?   _____

5. A Chinese restaurant has a special on Friday nights.
   For $20, you can choose one dish from 6 choices in
   column A and one dish from 5 choices in Column B.
   In addition, you can choose egg drop or wonton soup.
   How many different specials can you order?   _____

6. Lisa has a beige skirt, a black skirt, and a denim skirt.
   She has a red sweater and a white sweater, and she
   has a white blouse, a blue blouse, and a green blouse.
   How many different ways can she wear a skirt, sweater,
   and blouse together?   _____

LESSON
11-3

Problem Solving

Make a List to Find Sample Spaces

Write the correct answer.

1. If you order one topping, how many different choices of bagel and toppings can you order?

   Solution:

   To find the total number of combinations of a bagel with one topping, make a list.

Pl, C	Pl, H	Pl, B	Pl, J
P, C	P, H	P, B	P, J
R, C	R, H	R, B	R, J
S, C	S, H	S, B	S, J
E, C	E, H	E, B	E, J

   Count all the outcomes.

   You can have 20 choices of a bagel with one topping.

Bagels	Toppings
Plain Poppy Raisin Sesame Egg	Cream cheese Honey Butter Jam

2. Santana only likes cream cheese or jam on his bagel. How many choices does he have for a one-topping bagel?

   Make a list.

   (Pl, C) (P, _____) (_____, C)

   (_____, _____) (_____, _____)

   (Pl, J) (P, _____) (_____, J)

   (_____, _____) (_____, _____)

   Count all the outcomes.

   Santana has _____ choices.

Benny's Bagels

Choose the letter for the best answer.

3. The movie multiplex is showing 12 movies. Each movie is shown at five different times during the day. How many choices of movies and showtimes are there?

   A 12   C 60

   B 17

5. In a Little League game, Geri can bat first, second, or third. When at bat, she could strike out, walk, or get a
   hit. How many outcomes are in the sample space for these events?

   A 3

   B 6

C 9

Holt McDougal Mathematics

4. There are three chair lifts to the top of a mountain. There are six ski trails to the bottom of the mountain. How many possible choices of lifts and trails do the skiers have?

  A 9   C 2

  B 18

6. Ty is flipping a coin. If he flips the same result twice in a row, he will study. If he flips 2 different results, then he will go jogging. How likely is it that he will study?

  A as likely as not
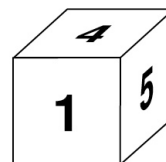
  B likely

  C unlikely

Review for Mastery
Sample Spaces

The set of all possible outcomes to an experiment is called the **sample space**.

A coin is tossed, and a number cube is rolled. What are all the possible outcomes? How many outcomes are in the sample space? There are two ways to show the sample space for an experiment. You can make a list, or you can make a tree diagram.

Make a list.

1. The possible outcomes for tossing a coin are _____ (H) and _____ (T).

2. The possible outcomes for rolling a number cube are ____, ____, ____, ____, ____, and ____

3. The sample space is (H, 1), (H, 2), (H, 3), (H, 4), (H, 5), (H, 6), (T, 1), (T, 2), (T, 3), (T, 4), (T, 5), (T, 6). There are ____ possible outcomes in the sample space.

Make a tree diagram.

4.
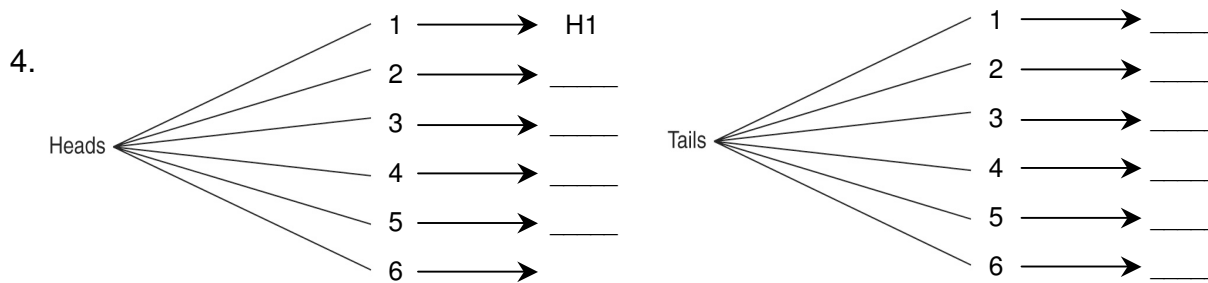
You can also find the number of possible outcomes by using the Fundamental Counting Principle.

                    Holt McDougal Mathematics

Multiply the possible outcomes of each event.

5. flipping the coin   rolling the number cube

   _____ outcomes   _____ outcomes

   _____ • _____ = _____ possible outcomes

Challenge

Mutually Exclusive Cards?

Two events are *mutually exclusive* if they cannot occur at the same time.

Example: In a deck of 52 cards, there are 26 red and 26 black cards.

> *Event A*: Draw a red card. *Event B*: Draw a black card. The events are mutually exclusive. They cannot occur at the same time because a card cannot be red and black.

> *Event A*: Draw a red card. *Event B*: Draw a number card. The events are not mutually exclusive. They can occur at the same time since a number card may be red.

For each pair of events, tell whether the two events are mutually exclusive for a single experiment. If they are not, explain why.

1. In a deck of cards, there are 40 number cards and 12 face cards. *Event A*: Draw a number card. *Event B*: Draw a face card.

   _____

2. In a deck of cards, there are 26 black cards and 12 face cards. *Event A*: Draw a black card. *Event B*: Draw a face card.

   _____

3. In a deck of cards, there are 4 kings and 4 queens. *Event A*: Draw a king. *Event B*: draw a queen.

   _____

4. In a deck of cards, there are 13 diamonds and 13 hearts. *Event A*: Draw a diamond. *Event B*: Draw a heart.

   _____

Holt McDougal Mathematics

5. In a deck of cards, there are 13 diamonds and 13 face cards.
   Event A: Draw a diamond. *Event B*: Draw a face card.

   _____

6. In a deck of cards, there are 40 number cards and 4 jacks.
   Event A: Draw a number card. *Event B*: Draw a jack.

   _____

7. In a deck of cards, there are 4 tens and 13 clubs.
   Event A: Draw a ten. *Event B*: Draw a club.

   _____

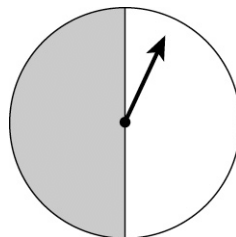<table>
<tr><td>LESSON
11-3</td></tr>
</table>

Reading Strategies
Read a Chart

To measure the probability of an outcome, you must find all the possible outcomes to the experiment. A **sample space** lists all possible outcomes to an experiment.

This spinner can land on white or black.

Each line of this chart lists a possible outcome from two spins.

Spin 1	Spin 2
Black	Black
White	Black
Black	White
White	White

Use the chart for Exercises 1–5. Answer each question.

1. What does a sample space help do?

   _____

2. With an outcome of black on Spin 1, what outcomes are possible on Spin 2?

   _____

3. With an outcome of black on Spin 1, one outcome for Spin 2 is black. This is shown as "black–black." How would you write the other possible outcome after Spin 2?

_____

4. With an outcome of white on Spin 1, what are the possible outcomes for Spin 2?

_____

5. How many possible outcomes are there for two spins?

_____

Puzzles, Twisters & Teasers
Sealed With a Fish

Circle words from the list in the word search (horizontally, vertically or diagonally). Find a word that answers the riddle and write it on the line.

sample	space	counting	principle	fundamental
determine	possible	outcome	tree	diagram

```
D E T E R M I N E W E R O
I P R I N C I P L E Y P U
A Q N Z T C V B N M K L T
G W E W E R T Y U I O S C
R A S D F G E J K L P E O
A Q A Z X S W E D C V A M
M F U N D A M E N T A L E
N Z X C V B G T S H U J I
C O U N T I N G I P O L T
R C V B G T Y H N J A I K
P O S S I B L E N J U C D
S A M P L E V G T E D F E
```

What is gray, eats fish, and lives in Washington, D.C.?

The presidential _____ _____ _____ _____.

Holt McDougal Mathematics

Holt McDougal Mathematics