

## Probability Worksheet #9 (All)

Name: Answer Key Period: \_\_\_\_\_ Date: \_\_\_\_\_

*Do the work on a separate piece of paper and show all your work. The correct answers are on at the bottom of the page*

**Find the probability for each problem below.**

<p>1. You roll a single die numbered from 1 to 6. What is the probability of rolling an odd number, expressed as a fraction? <math>\frac{3}{6} = \frac{1}{2}</math></p>	<p>2. A jar contains 12 caramels, 7 mints and 16 dark chocolates. What is the probability of selecting a mint expressed as a fraction? <math>\frac{7}{35} = \frac{1}{5}</math></p>
<p>3. The numbers 4 through 14 are placed in a bowl and drawn at random then replaced after being drawn. Is it likely or unlikely you will draw a number less than 7? <math>\frac{3}{11}</math> Unlikely</p>	<p>4. In a deck of 52 playing cards, what is the probability of drawing a spade expressed as a decimal? <math>\frac{1}{4} = 0.25</math></p>
<p>5. The letters that form the word MISSISSIPPI are placed in a bowl. What are the odds of choosing a "P"? <math>\frac{2}{11}</math></p>	<p>6. In a deck of 52 playing cards, are the odds favorable that you will draw a heart or a diamond? The odds are even</p>
<p>7. There is a jar of jelly beans with the following flavors: 12 are grape, 17 are blueberry, 5 are pineapple and 13 are coconut. What is the probability, expressed as a percent, of selecting either a grape or blueberry replacing it and then a coconut or pineapple?</p>	<p>8. There are 29 students available to represent the upperclassmen at a fair. 13 are juniors and 16 are seniors. What is the probability, as a percent that a senior and junior will be chosen?</p>
<p>9. In a deck of 52 playing cards what is the probability, as a fraction, of drawing a picture card (A,K,Q,J) replacing it and then drawing either a heart or a diamond? <math>\frac{16}{52} \times \frac{1}{2} = \frac{16}{104} = \frac{2}{13}</math></p>	<p>10. There are 12 men on the basketball team. 2 are centers, 5 are guards, the rest a forwards. What is the probability, as a percent, that out of two players chosen at random they would be a guard and a forward? 19%</p>
<p>11. You have a jar of marbles in front of you with the following colors: 7 - red, 12 - blue, 6 - yellow and 9 - white. What are the odds of selecting marble that is not blue, replacing it and then one that is blue? <math>\frac{66}{223}</math></p>	<p>12. There are 15 men on the roster of the baseball team. 2 are catchers, 6 are infielders, 4 are outfielders and the remainder are pitchers. What is the probability that out of two players chosen at random they would be a pitcher and a infelder? <math>\frac{3}{35}</math></p>

#7)  $\frac{29}{47} \times \frac{18}{47} = \frac{522}{2209} = 0.236 = 24\%$

#8)  $\frac{16}{29} \times \frac{13}{28} = \frac{208}{812} = 0.256 = 26\%$

Find the probability for each problem below.

<p>13. You roll a single die numbered from 1 to 6. Is it likely you will roll a number greater than 4 the first time and a number less than 2 the 2nd? <i>Unlikely <math>\frac{1}{18}</math></i></p>	<p>14. You have the following coins in your pocket: 5 quarters, 6 dimes, 2 nickels and 12 pennies. What is the probability, as a decimal, you will draw a dime and then a penny? <i>0.12</i></p>
<p>15. The letters that form the word ALGEBRA are placed in a bowl. What is the probability, as a percent, of choosing a letter other than "A" and then choosing an "A"? <i>24%</i></p>	<p>16. In a deck of 52 playing cards, what is the probability, as a fraction, of drawing either a heart or a diamond than a spade or a club if each card is returned to the deck before drawing the next one? <i><math>\frac{1}{4}</math></i></p>
<p>17. You have a jar of jelly beans in front of you with 12 - lime, 17 - papaya, 5 - mango and 13 - bubble gum. What is the probability, as a fraction, of selecting either a lime or bubble gum followed by a papaya? <i><math>\frac{425}{2162}</math></i></p>	<p>18. You roll a die and then flip a coin. What is the probability, as a percent, of getting an even number on the die and then a head on the coin? <i>25%</i></p>
<p>19. In a deck of 52 playing cards what is the probability, as a fraction, of drawing a picture card (A, K, Q, and J) that is also a diamond then a card numbered 2-9? <i><math>\frac{32}{663}</math></i></p>	<p>20. You flip a coin three times in a row. What is the probability you will get three heads? <i><math>\frac{1}{8}</math></i></p>
<p>21. You have a jar of marbles in front of you 2 are cordovan, 9 are yellow, 3 are white and 7 are red. What is the probability, as a decimal, of selecting a marble that is white or yellow, followed by a marble that is cordovan? <i>0.06</i></p>	<p>22. In your wallet you have the following paper money: 7 singles, 3 fives, 2 tens and 6 twenties. What is the probability, as a percent, you will draw a 5 and then a 20? <i>6%</i></p>
<p>23. After shooting foul shots for 5 minutes, the player had made 35 shots out of 60. Is it likely or unlikely that if he needs to make two free throws to win the game in a row he will do so? <i>Unlikely 34%</i></p>	<p>24. The letters that form the word MATHEMATICS are placed in a bowl. Are the odds favorable or unfavorable that he will choose a letter that is a vowel followed by a "T"? <i>Unfavorable</i></p>

*$\frac{4}{51}$*

Name \_\_\_\_\_

**PROBABILITY & COMPOUND EVENTS #1-KEY**

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**Directions:** A compound event represents a series of events happening at the same time, or in order. To calculate the probability of compound events, you can multiply the probabilities of each individual event. Depending on your teacher's preference, you can write this probability as a fraction or a decimal.

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**EVENT**

**PROBABILITY**

1) Flipping a coin and getting tails three times in a row  
**0.125**

$\frac{1}{2} * \frac{1}{2} * \frac{1}{2} = \frac{1}{8}$  or

2) Rolling a die and getting a 4 twice in a row  
**0.028**

$\frac{1}{6} * \frac{1}{6} = \frac{1}{36}$  or

3) Spin a spinner numbered 1-8, and you land on 8 twice in a row  
**0.016**

$\frac{1}{8} * \frac{1}{8} = \frac{1}{64}$  or

4) A 70% free throw shooter makes two in a row  
**0.343**

$.7 * .7 * .7 = \frac{343}{1000}$  or

5) Picking a blue marble three times in a row (replacing it in the bag each time)  
from a bag of 4 blues, 4 reds, and 4 greens  
**0.037**

$\frac{4}{12} * \frac{4}{12} * \frac{4}{12} = \frac{1}{27}$  or

6) Pulling a red card from a deck of cards, replacing it, and pulling another red card  
**0.063**

$\frac{1}{4} * \frac{1}{4} = \frac{1}{16}$  or

7) Picking two numbers from 1-10 and getting a multiple of 3 both times  
**0.09**

$\frac{3}{10} * \frac{3}{10} = \frac{9}{100}$  or

8) Flipping a coin, rolling a die, then flipping the coin again and getting tails,  
a four, then tails again  
**0.042**

$\frac{1}{2} * \frac{1}{6} * \frac{1}{2} = \frac{1}{24}$  or

9) Rolling a die and getting a number other than 4 twice in a row  
**0.694**

$\frac{5}{6} * \frac{5}{6} = \frac{25}{36}$  or

10) Spin a spinner numbered 1-8 two times, land on two the first time and  
land on a factor of 8 the second time  
**0.25**

$\frac{1}{2} * \frac{4}{8} = \frac{1}{4}$  or

11) A 70% free throw shooter misses two in a row  
**0.027**

$.3 * .3 * .3 = \frac{27}{1000}$  or

12) Picking a blue marble, a green marble, and another blue marble (replacing  
it in the bag each time) from a bag of 2 blues, 4 reds, and 4 greens  
**0.016**

$\frac{2}{10} * \frac{4}{10} * \frac{2}{10} = \frac{2}{125}$  or

**LESSON 10 Are You Ready? Recording Sheet**  
**Probability**

Choose the best term from the list to complete each sentence.

- even number    odd number    percent    ratio
- A(n) ratio is a comparison of two numbers by division.
  - A(n) even number is divisible by two.
  - A(n) percent is a ratio that compares a number to 100.

Simplify.

- $\frac{6}{9} = \frac{2}{3}$
- $\frac{12}{15} = \frac{4}{5}$
- $\frac{8}{10} = \frac{4}{5}$
- $\frac{20}{24} = \frac{5}{6}$
- $\frac{2}{4} = \frac{1}{2}$
- $\frac{7}{35} = \frac{1}{5}$
- $\frac{12}{22} = \frac{6}{11}$
- $\frac{72}{81} = \frac{8}{9}$

Write each fraction as a decimal.

- $\frac{3}{5} = 0.6$
- $\frac{9}{20} = 0.45$
- $\frac{57}{100} = 0.57$
- $\frac{12}{25} = 0.48$
- $\frac{3}{25} = 0.12$
- $\frac{1}{2} = 0.5$
- $\frac{7}{10} = 0.7$
- $\frac{9}{5} = 1.8$

Write each decimal as a percent.

- 0.14 = 14%
- 0.08 = 8%
- 0.75 = 75%
- 0.38 = 38%
- 0.27 = 27%
- 1.89 = 189%
- 0.234 = 23.4%
- 0.0025 = 0.25%

Multiply. Write each answer in simplest form.

- $\frac{1}{2} \cdot \frac{1}{4} = \frac{1}{8}$
- $\frac{2}{3} \cdot \frac{3}{5} = \frac{2}{5}$
- $\frac{3}{10} \cdot \frac{1}{2} = \frac{3}{20}$
- $\frac{5}{6} \cdot \frac{3}{4} = \frac{5}{8}$
- $\frac{5}{14} \cdot \frac{7}{17} = \frac{5}{34}$
- $-\frac{1}{8} \cdot \frac{3}{8} = -\frac{3}{64}$
- $-\frac{2}{15} \cdot (-\frac{2}{3}) = \frac{4}{45}$
- $\frac{1}{4} \cdot (-\frac{1}{6}) = -\frac{1}{24}$

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**LESSON 10-1 Exploration Recording Sheet**  
**Probability**

The *probability* of an event happening can be expressed as a percent between 0% and 100%. The probability that an event is impossible is expressed as 0%. The probability that an event is certain to happen is expressed as 100%.

The table below shows a seven-day weather forecast, including the probability of precipitation (POP). The event in this case is rain, and the probability is a number expressed as a percent between 0% and 100%.

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
POP	0%	0%	15%	50%	20%	30%	0%
High	75°	80°	72°	58°	68°	63°	70°
Low	47°	55°	45°	40°	42°	40°	45°

- For which days does the forecast indicate no possibility of rain?  
Sunday, Monday, Saturday

- For which day does the forecast indicate that rain is as likely to happen as not?  
Wednesday

- On which day is it more likely to rain, Thursday or Friday?  
Friday

- On which day is it less likely to rain, Tuesday or Thursday?  
Tuesday

**Think and Discuss**

- Discuss whether the amount of rain on Tuesday (POP 15%) could be greater than the amount of rain on Thursday (POP 20%), assuming that it rains on both days.

Possible answer: Yes, the probability does not refer to quantity.

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**LESSON 10-1 Practice A**  
**Probability**

A bag contains six green pencils, three red pencils, and three yellow pencils. All of the pencils are the same size and weight. Complete each statement.

- You would be more likely to pull a green pencil than a red pencil from the bag.
- You would be equally likely to pull a red pencil or a yellow pencil from the bag.
- You would be less likely to pull a yellow pencil than a green pencil from the bag.
- It would be impossible to pull a blue pencil from the bag.

Match each event to its likelihood.

- All the students in Ms. Becker's class passed the math test. Alex is in Ms. Becker's class. How likely is it that Alex did not pass the math test?
- There are 7 red cards and 7 black cards in a box. How likely is it to pull a red card?
- Marla has gymnastics on Saturday mornings. How likely is it that Marla is at gymnastics on Saturday morning?
- None of the students in Mr. Green's class is absent today. Matthew is in Mr. Green's class. How likely is it that Matthew is in school today?
- Chuck has a piano lesson on Friday afternoon. How likely is it that Chuck is at the park on Friday afternoon?
- There are 17 girls and 15 boys in Mrs. Rivera's art class. Each student writes his or her name on a slip of paper and puts it in a box. If one name is drawn from the box, would you expect it to be a girl's name or a boy's name?

- A likely
- B unlikely
- C as likely as not
- D impossible
- E certain

girl's name

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**LESSON 10-1 Practice B**  
**Probability**

A bag contains five orange disks, five red disks, three green disks, and six yellow disks. All of the disks are the same size.

- Would you be more likely to pull a red disk or a yellow disk from the bag? yellow disk
- Would you be more likely to pull an orange disk or a green disk from the bag? orange disk
- Would you be more likely to pull an orange disk or a red disk from the bag? equally likely to pull either disk

Determine if each event is impossible, unlikely, as likely as not, likely, or certain.

- A number cube numbered 1–6 is rolled once. How likely is it that you would randomly roll a number less than 7? certain
- A number cube numbered 1–6 is rolled once. How likely is it that you would randomly roll a number greater than 1? likely
- There are 10 cards in a box numbered 1–10. A card is pulled at random from the box. How likely is it that a card with an even number is pulled from the box? as likely as not
- Miranda's bowling average is 115. She bowls 122 and 119 in her first two games. How likely is it that she will bowl at least 100 in her next game? likely
- A play starts at 8 P.M. and lasts for 2 hours 25 minutes. Yuko went to the play. If it is 1:35 P.M., how likely is it that Yuko is at the play? unlikely
- A sporting goods store is open from 9 A.M. until 9 P.M. on weekdays and from 10 A.M. to 6 P.M. on weekends. How likely is it that Dustin can shop at the sporting goods store on Saturday night? impossible
- The letters of the alphabet are written on cards in a box. A card is pulled at random from the box. Would you expect it to be a vowel or a consonant? consonant
- Stan has 4 pairs of black socks and 4 pairs of brown socks. Assuming he picks a pair at random, how likely is it that he is wearing the black socks today? as likely as not

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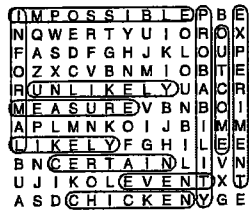
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**LESSON 10-1 Puzzles, Twisters & Teasers**

**10-1 Put Up Your Ducks!**

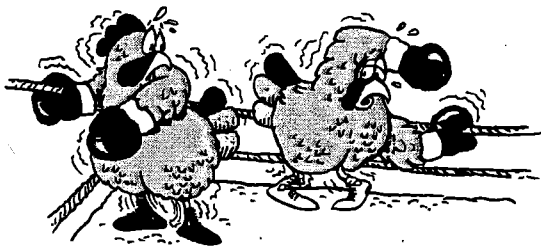
Circle words from the list in the word search (horizontally, vertically or diagonally). Find a word that answers the riddle and write it on the line.

informal measure probability outcome event  
impossible likely unlikely certain experiment



Why don't hens fight each other?

They're all chicken.



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**LESSON 10-2 Exploration Recording Sheet**

**10-2 Experimental Probability**

You can flip a coin to demonstrate *experimental probability*.

$$\text{experimental probability} = \frac{\text{number of times an event occurs}}{\text{total number of trials}}$$

1. Flip a coin 20 times, and record the results in the table. **Answers will vary.**

Event	Number
Heads (H)	
Tails (T)	

2. Use the number of times each event occurred to calculate the probability of each event. **Answers will vary.**

Event	Experimental Probability
Heads (H)	$\frac{H}{20} = \frac{\square}{20}$
Tails (T)	$\frac{T}{20} = \frac{\square}{20}$

**Think and Discuss**

3. **Discuss** what you think would happen to the experimental probability if you flipped a coin 100 times.

**Possible answer:** You should expect to get heads and tails each about 50 times.

4. **Explain** what the sum of the two experimental probabilities in the table in Exercise 2 equals.

**Sum would equal 1.**

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**LESSON 10-2 Practice A**

**10-2 Experimental Probability**

Find the experimental probability in the box. Each answer can be used only once.

$\frac{4}{11}$	$\frac{7}{9}$	$\frac{4}{7}$	$\frac{11}{15}$	$\frac{2}{9}$	$\frac{3}{7}$	$\frac{4}{15}$	$\frac{7}{11}$
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1. Jolene is playing basketball. She scores on 11 out of the 15 baskets she shoots.

a. What is the experimental probability that Jolene will get a basket on the next shot?  $\frac{11}{15}$

b. What is the experimental probability that Jolene will not get a basket on the next shot?  $\frac{4}{15}$

2. Jamie is playing baseball. He gets a hit 7 out of 9 times at bat.

a. What is the experimental probability that Jamie will get a hit his next time at bat?  $\frac{7}{9}$

b. What is the experimental probability that Jamie will not get a hit his next time at bat?  $\frac{2}{9}$

3. Lou Ann is practicing for an archery tournament. She hits the target 7 out of 11 times.

a. What is the experimental probability that Lou Ann will hit the target on the next shot?  $\frac{7}{11}$

b. What is the experimental probability that Lou Ann will not hit the target on the next shot?  $\frac{4}{11}$

4. Kyle is practicing throwing horseshoes. He gets a ringer 3 out of 7 times.

a. What is the experimental probability that Kyle will get a ringer on his next throw?  $\frac{3}{7}$

b. What is the experimental probability that Kyle will not get a ringer on his next throw?  $\frac{4}{7}$

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**LESSON 10-2 Practice B**

**10-2 Experimental Probability**

Find the experimental probability.

1. Jaclyn is a soccer goalie. If she has 21 out of 23 saves in practice, what is the experimental probability that she will have a save on the next shot on goal?  $\frac{21}{23}$

2. If Harris hit the bull's-eye 3 out of 8 times at archery practice, what is the experimental probability that he will hit the bull's-eye on his next try?  $\frac{3}{8}$

3. After a movie premiere, 99 of the first 130 people surveyed said they liked the movie.

a. What is the experimental probability that the next person surveyed will say he or she liked the movie?  $\frac{99}{130}$

b. What is the experimental probability that the next person surveyed will say he or she did not like the movie?  $\frac{31}{130}$

4. For the past 30 days, Naomi has been recording the number of customers at her restaurant between 10 A.M. and 11 A.M. During that hour, there have been fewer than 20 customers on 25 out of 30 days.

a. What is the experimental probability that there will be fewer than 20 customers on the thirty-first day?  $\frac{5}{6}$

b. What is the experimental probability that there will be more than 20 customers on the thirty-first day?  $\frac{1}{6}$

5. Nestor works at an ice cream stand. Of the first 27 sundaes that he made one day, 15 had chocolate ice cream. What is the experimental probability that the next sundae he made had chocolate ice cream?  $\frac{5}{9}$

6. Nathan inspects new pants at a factory. Of the first 56 pairs of pants he inspected 48 were acceptable. What is the experimental probability that the next pairs of pants will be acceptable?  $\frac{6}{7}$

7. Sara has gone to work for 62 days. On 36 of those days she has arrived at work before 8:30 A.M. On the rest of the days she has arrived after 8:30 A.M. What is the experimental probability that she will arrive at work after 8:30 A.M. the next day she goes to work?  $\frac{13}{31}$

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**LESSON 10-2 Puzzles, Twisters & Teasers**

**10-2 All Bark, No Bite!**

Write the data from the stem-and-leaf plot as decimal numbers. Then match the letters to the answers to solve the riddle.

Stem	Leaves	
5	2 3	<u>5.2</u> = T <u>5.3</u> = A
6	5 7 9	<u>6.5</u> = O <u>6.7</u> = B <u>6.9</u> = L
7	1	<u>7.1</u> = R
8	1	<u>8.1</u> = G
9	3	<u>9.3</u> = K
10	3 4	<u>10.3</u> = N <u>10.4</u> = I

Key: 5 | 2 means 5.2

Where does a dog keep its car?

In a B A R K I N G L O T  
 6.7 5.3 7.1 9.3 10.4 10.3 8.1 6.9 6.5 5.2



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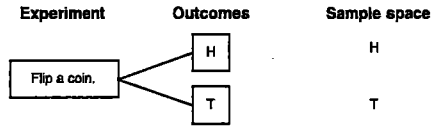
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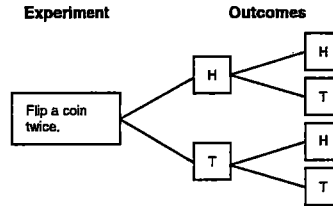
**LESSON 10-3 Exploration Recording Sheet**

**10-3 Make a List to Find Sample Spaces**

When you flip a coin, the possible outcomes are heads (H) or tails (T). Together, all possible outcomes of an experiment make up a *sample space*.



If you flip a coin twice, these are the possible outcomes.



1. List all the possible outcomes in the sample space.

HH, HT, TH, TT

2. Suppose you roll a 1–6 number cube. List all the possible outcomes in the sample space.

1, 2, 3, 4, 5, 6

3. Suppose you roll a 1–6 number cube and then flip a coin. List all the possible outcomes in the sample space.

1H, 1T, 2H, 2T, 3H, 3T, 4H, 4T, 5H, 5T, 6H or 6T

**Think and Discuss**

4. Describe how you organized the outcomes in number 3.

Possible answers: Made a table or tree diagram.

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**LESSON 10-3 Practice A**

**10-3 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?

(H, 1), (H, 2), (H, 3), (H, 4), (H, 5), (H, 6),

(T, 1), (T, 2), (T, 3), (T, 4), (T, 5), (T, 6)

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?

turkey on wheat, turkey on rye, ham on wheat,

ham on rye, tuna on wheat, tuna on rye

3. Marisol has to decide whether to study Italian, French, or Spanish, and whether to take golf, tennis, or archery in gym class. What are the possible choices that Marisol has?

Italian and golf, French and golf, Spanish and golf, Italian and tennis,

French and tennis, Spanish and tennis, Italian and archery,

French and archery, Spanish and archery

Choose the letter for the best answer.

4. Chad and Victoria are playing a game with a quarter and a spinner divided into sixths. Each player spins the spinner and tosses the coin. How many outcomes are possible in the game?

A 2                      C 10  
 B 8                      D 12

5. 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 large is the sample space?

F 12                      H 4  
 G 7                      J 3

6. 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                      C 10  
 B 6                      D 24

7. 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?

F 3                      H 9  
 G 6                      J 12

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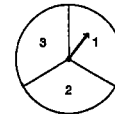
**LESSON 10-3 Practice B**

**10-3 Make a List to Find Sample Spaces**

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

(1, H), (2, H), (3, H), (1, T), (2, T),

(3, T); 6 possible outcomes



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 large is the sample space?

hot dog with an apple, hot dog with a pear, hot dog with grapes,

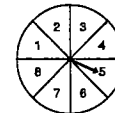
hamburger with an apple, hamburger with a pear,

hamburger with grapes, pizza with an apple, pizza with a pear,

pizza with grapes; 9 possible outcomes

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?

16 outcomes



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?

12 different calzones

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?

15 ways

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?

8 ways

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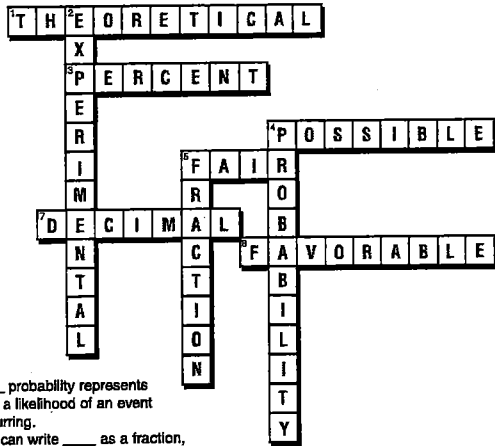
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**LESSON** **Puzzles, Twisters & Teasers**

**10-4** **Probability Problems!**

**Across**

- You can learn to find the \_\_\_\_\_ probability of an event.
- You can write a \_\_\_\_\_ as a decimal or a fraction.
- The theoretical probability of an event equals the number of favorable outcomes divided by the number of \_\_\_\_\_ outcomes.
- If each possible outcome of an experiment is equally likely, the experiment is said to be \_\_\_\_\_.
- You can write a \_\_\_\_\_ as a fraction or a percent.
- A \_\_\_\_\_ outcome is one that you are looking for when you conduct an experiment.



**Down**

- \_\_\_\_\_ probability represents only a likelihood of an event occurring.
- You can write \_\_\_\_\_ as a fraction, a decimal, or a percent.
- You can write a \_\_\_\_\_ as a decimal or as a percent.

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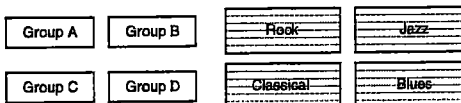
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**LESSON** **Exploration Recording Sheet**

**10-5** **Probability of Independent and Dependent Events**

Each of four groups of students, A, B, C, and D, must choose one of the following types of music to write a report on: jazz, classical, rock, and blues. The types of music are written on four index cards, and once a card is chosen, it cannot be returned.



- If group A chooses first, what is the probability that blues will be chosen?

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

- Suppose group A chooses blues. When group B draws next, what is the probability that rock will be chosen?

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

- Suppose group B chooses rock. When group C draws, what is the probability that jazz will be chosen?

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

- Suppose group C chooses jazz. When group D draws, what is the probability that classical will be chosen?

$$1$$

**Think and Discuss**

- Discuss** why one group's draw is affected by what the previous group drew.

**Possible answer:** The number of choices decreases after each draw.

- Explain** why the probability that the last group will pick the last type of music must be 100%.

**Possible answer:** That is the only card left so the probability is 100%.

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**LESSON** **Practice A**

**10-5** **Probability of Independent and Dependent Events**

Decide if each set of events is independent or dependent. Explain your answer.

- spinning a spinner and rolling a number cube

**Independent; Spinning a spinner does not affect the outcome of rolling a number cube.**

- picking a raffle ticket from a box and then picking a second raffle ticket without replacing the first raffle ticket

**Dependent; There are fewer raffle tickets in the box for the second ticket picked.**

Find the probability of each set of events. Choose the letter for the best answer.

- drawing a black checker from a bag of 6 black checkers and 4 red checkers, replacing it, and drawing another black checker

A  $\frac{2}{3}$       C  $\frac{2}{5}$   
 B  $\frac{6}{25}$       D  $\frac{3}{5}$

- rolling a six on the first roll of a 1-6 number cube and rolling an odd number on the second roll of the same cube

F  $\frac{1}{12}$       H  $\frac{1}{6}$   
 G  $\frac{1}{8}$       J  $\frac{1}{2}$

- flipping a tail on a coin and spinning a 5 on a spinner with sections of equal area numbered 1-5

A  $\frac{1}{2}$       C  $\frac{1}{7}$   
 B  $\frac{1}{5}$       D  $\frac{1}{10}$

- drawing a 1, 2, or 3 from 9 cards numbered 1-9, replacing the card, and drawing a 7, 8, or 9

F  $\frac{1}{3}$       H  $\frac{1}{8}$   
 G  $\frac{3}{8}$       J  $\frac{1}{12}$

- There are 4 black marbles and 2 white marbles in a bag. What is the probability of choosing a black marble, not replacing it, then choosing a white marble?

$$\frac{4}{15}$$

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**LESSON** **Practice B**

**10-5** **Probability of Independent and Dependent Events**

Decide if each set of events is independent or dependent. Explain your answer.

- spinning a spinner and choosing a Scrabble® tile

**Independent; Spinning a spinner does not affect the outcome of choosing a Scrabble® tile.**

- choosing a sock from a drawer of socks, then choosing a second sock without replacing the first

**Dependent; There are fewer socks in the drawer for the second sock picked.**

- picking a raffle ticket from a box, replacing the ticket, then picking a second raffle ticket

**Independent; There are the same number of raffle tickets in the box for the second ticket picked.**

Find the probability of each set of events.

- drawing a red checker from a bag of 9 black checkers and 4 red checkers, replacing it, and drawing another red checker

$$\frac{4}{25}$$

- drawing a black checker from a bag of 9 black checkers and 6 red checkers, replacing it, and drawing a red checker

$$\frac{6}{25}$$

- rolling a 1, 2, or 3 on the first roll of a 1-6 number cube and rolling a 4, 5, or 6 on the second roll of the same cube

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

- Randy has 4 pennies, 2 nickels, and 3 dimes in his pocket. If he randomly chooses 2 coins, what is the probability that both are dimes?

$$\frac{1}{12}$$

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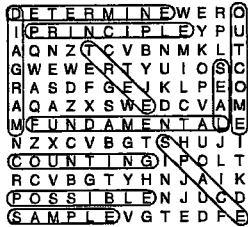
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**LESSON 10.3** Puzzles, Twisters & Teasers

**10.3** Sealed With a Fish

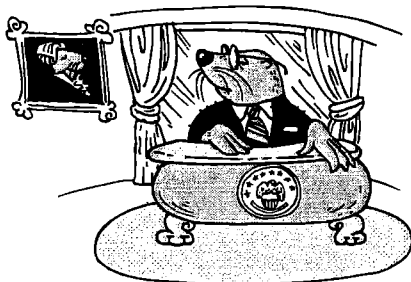
Circle words from the list in the word search (horizontally, vertically or diagonally). Find a word that answers the riddle and write it on the line.

- sample space counting principle fundamental  
determine possible outcome tree diagram



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

The presidential S E A L.



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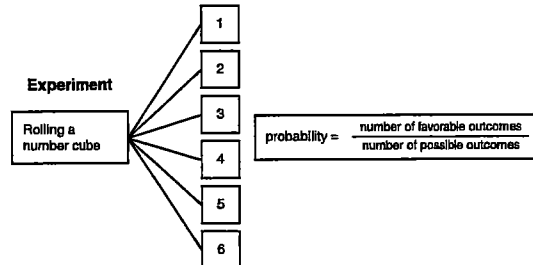
**LESSON 10.4** Exploration Recording Sheet

**10.4** Theoretical Probability

The *theoretical probability* of flipping a fair coin and getting heads is 50%, or  $\frac{1}{2}$ . An experiment is *fair* if each possible outcome of the experiment is equally likely.

When you roll a fair number cube, there are 6 outcomes that are equally likely.

Possible outcomes



Use the formula for theoretical probability to answer each question.

- What is the theoretical probability of rolling a 4?  
 $\frac{1}{6}$
- What is the theoretical probability of rolling an *even number*?  
 $\frac{1}{2}$
- What is the theoretical probability of rolling an *odd number*?  
 $\frac{1}{2}$

**Think and Discuss**

- Explain how you determined each probability.

**Possible answer:** Counted the number of favorable outcomes and the number of possible outcomes; substituted into formula.

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**LESSON 10.4** Practice A

**10.4** Theoretical Probability

Tina has 3 quarters, 1 dime, and 6 nickels in her pocket. Find the probability of randomly drawing each of the following coins. Write your answer as a fraction, as a decimal, and as a percent.

	Fraction	Decimal	Percent
1. quarter	$\frac{3}{10}$	0.3	30%
2. dime	$\frac{1}{10}$	0.1	10%
3. nickel	$\frac{6}{10} = \frac{3}{5}$	0.6	60%

Find the probabilities. Write your answer as a fraction, as a decimal, and as a percent. Round to the nearest tenth of a percent.

- Patrick has a set of 20 cards. There are 12 red cards and 8 yellow cards in the set. Patrick draws one card at random and then replaces it in the deck. What is the probability that the card he drew is yellow?  
 $\frac{8}{20} = \frac{2}{5}$ , 0.4, 40%
- A 1–6 number cube is rolled. What is the probability of rolling a 5?  
 $\frac{1}{6}$ , 0.167, 16.7%
- A standard deck of playing cards has 52 cards. These cards are divided into four 13-card suits: hearts, clubs, spades, and diamonds. Find the probability of drawing a queen or a king at random from a deck of shuffled cards.  
 $\frac{8}{52} = \frac{2}{13}$ , 0.154, 15.4%
- Find the probability of drawing a heart or a diamond at random from a deck of shuffled cards.  
 $\frac{26}{52} = \frac{1}{2}$ , 0.5, 50%

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**LESSON 10.4** Practice B

**10.4** Theoretical Probability

Find the probabilities. Write your answer as a fraction, as a decimal, and as a percent. Round to the nearest tenth of a percent.

- In the first grade, each student has 12 red counters, 12 white counters, 12 green counters, and 12 blue counters. What is the probability of randomly drawing a white counter?  
 $\frac{12}{48} = \frac{1}{4}$ , 0.25, 25%
- If you toss two fair nickels, what is the probability that one will land on tails and one will land on heads?  
 $\frac{2}{4} = \frac{1}{2}$ , 0.5, 50%
- Maurice has a set of 24 cards. There are 18 orange cards and 6 black cards in the set. Maurice draws one card at random and then replaces it in the deck.
  - What is the probability that the card he draws is orange?  
 $\frac{18}{24} = \frac{3}{4}$ , 0.75, 75%
  - What is the probability that the next card he draws will NOT be orange?  
 $\frac{6}{24} = \frac{1}{4}$ , 0.25, 25%
- A standard deck of playing cards has 52 cards. These cards are divided into four 13-card suits: hearts, clubs, spades, and diamonds. Find the probability of drawing a jack, queen, or king at random from a deck of shuffled cards.  
 $\frac{12}{52} = \frac{3}{13}$ , 0.231, 23.1%
- A 1–6 number cube is rolled. Find the probability of rolling a number greater than 1.  
 $\frac{5}{6}$ , 0.833, 83.3%

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