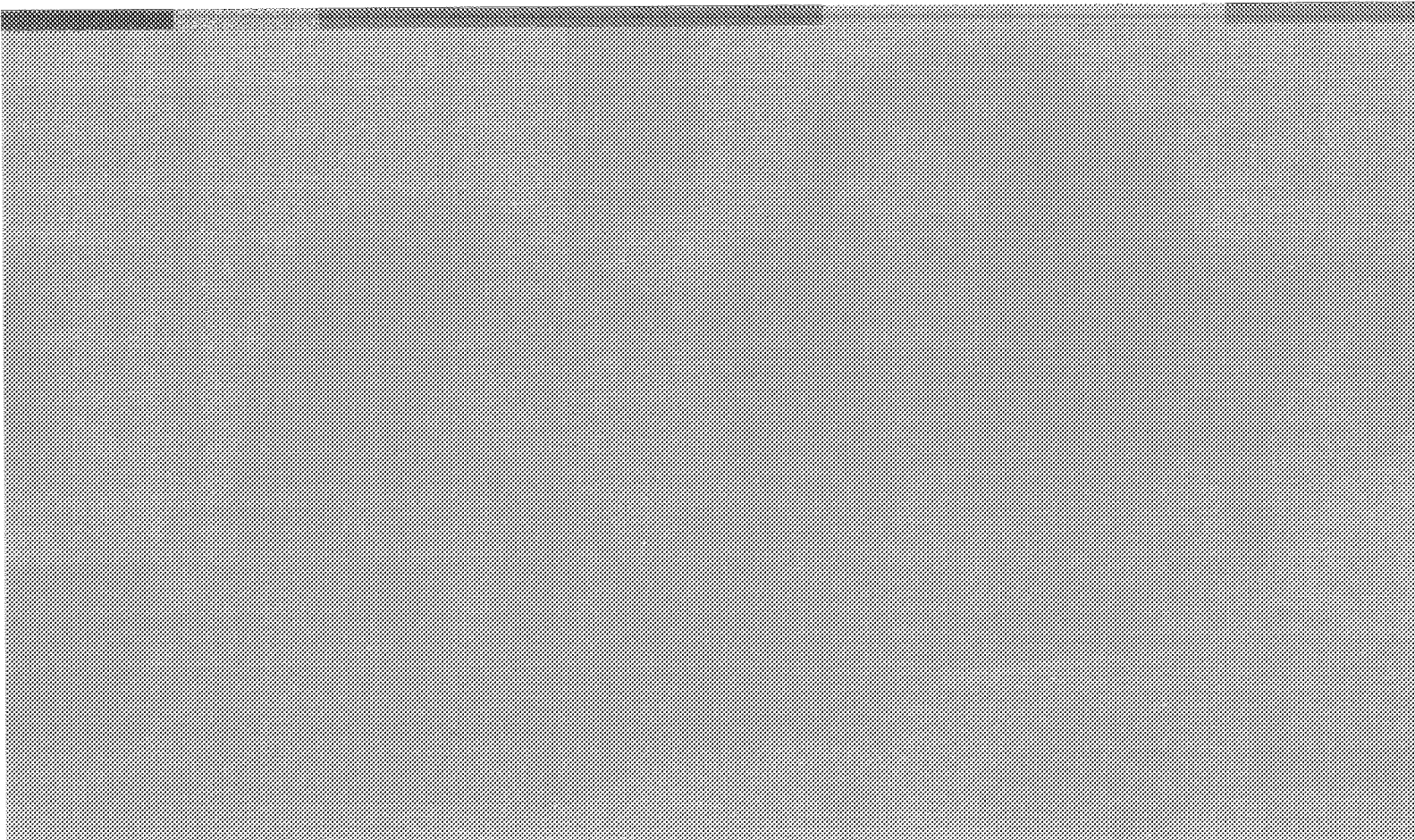


## **7th Grade Worksheet Bundle:**

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# Study Island 7th Grade Math - Understanding Probability

## Question 1 .

Which of the following is a true statement?

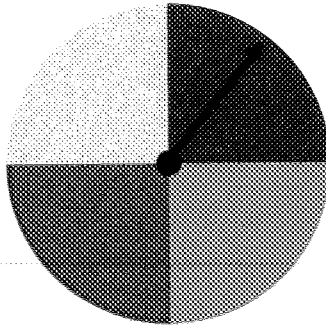
- A. A probability near 1 indicates an unlikely event.
- B. A probability near 0 indicates a likely event.
- C. A probability near  $\frac{1}{2}$  indicates an unlikely event.
- D. A probability near 1 indicates a likely event.

## Question 2 .

Two experiments are defined below. An event is defined for each of the experiments.

Experiment I: Elena spins the spinner shown in the image.

Event A: The arrow is on the red quarter of the spinner when it stops spinning.



Experiment II: Sam flips a fair coin twice.

Event B: The coin lands on tails the first flip, and the coin lands on heads the second flip.

Which statement about Event A and Event B is true?

- A. It is not possible to determine which event is more likely to occur.
- B. Event A is more likely to occur than Event B.
- C. Event A is less likely to occur than Event B.
- D. Both events are equally likely to occur.

## Question 3 .

The probability of randomly selecting a green marble from a bag of 20 marbles is  $\frac{1}{20}$ . Which of the following describes the likelihood of selecting a green marble?

- A. likely
- B. unlikely
- C. neither unlikely nor likely

**Question 4 .**

Richard is playing a game where he draws one playing card each out of two stacks of four cards. The image below shows all possible products for the two numbers on the cards.

**Product of Two Cards**

		Value of Card 2			
		1	2	5	9
Value of Card 1	4	4	8	20	36
	3	3	6	15	27
	1	1	2	5	9
	7	7	14	35	63

Is Richard more likely to draw two cards with a product that is an even number or two cards with a product that is a single digit?

- A. Richard is more likely to draw two cards with a product that is a single digit, because

$$\frac{11}{16} > \frac{7}{16}$$

- B. Richard is more likely to draw two cards with a product that is an even number,

because  $\frac{9}{16} > \frac{7}{16}$ .

- C. Richard is more likely to draw two cards with a product that is a single digit, because

$$\frac{9}{16} > \frac{7}{16}$$

- D. Richard is equally likely to draw two cards with a product that is an even number, or a

product that is a single number, because  $\frac{9}{16} = \frac{9}{16}$ .

**Question 5 .**

**Directions: Drag the tiles to the correct boxes to complete the pairs. Not all tiles will be used.**

Match each event with its likelihood of occurrence.

an event that is certain

an event that is likely

an event that is  
equally likely as unlikely

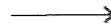
an event that is impossible

an event that is unlikely

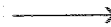
Randomly selecting a  
vowel in the word,  
"RAISED"



Randomly selecting an  
odd number in the set  
{3, 5, 7, 11, 13}



Randomly selecting  
"drums" in the list,  
"guitar, piano, cello, flute"



Randomly selecting  
a boy in a list of  
21 boys and 12 girls



**Question 6 .**

Fiona has a box full of art supplies. The probability of randomly picking up a paint brush is 0.5.

Which of the following describes the likelihood of picking a paint brush?

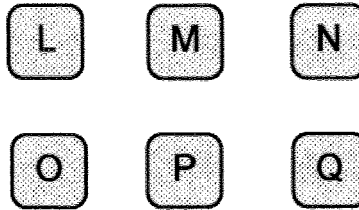
- A. unlikely
- B. neither unlikely nor likely
- C. likely

**Question 7 .**

Two experiments are defined below. An event is defined for each of the experiments.

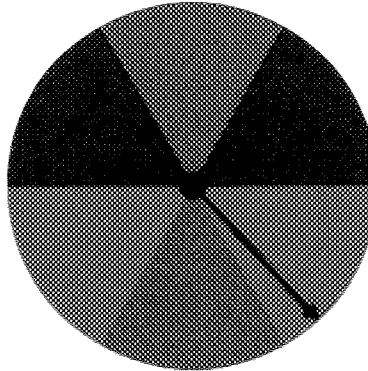
Experiment I: Lisa randomly picks a tile from the set shown in the image.

Event A: Lisa picks an M or a Q.



Experiment II: Josh spins the spinner shown in the image.

Event B: The arrow is on a green or red sector of the spinner when it stops spinning.



Which statement about Event A and Event B is true?

- A. Event A is more likely to occur than Event B.
- B. Event A is less likely to occur than Event B.
- C. It is not possible to determine which event is more likely.
- D. Both events are equally likely to occur.

**Question 8 .**

Raymond has a bag full of old coins. The probability of randomly picking up a coin with an eagle on one side is 0.12.

Which of the following describes the likelihood of picking a coin with an eagle on one side?

- A. likely
- B. neither unlikely nor likely
- C. unlikely

**Question 9 .**

Travis performed an experiment in which he spun a spinner multiple times. The sections of the spinner are red, orange, yellow, green, and blue. The results of his experiment are shown below.

<b>Spinner Result</b>	<b>Frequency</b>
red	10
orange	15
yellow	8
green	20
blue	7

Based on the experiment above, which of the following statements is true?

- A. It is twice as likely for the next spin to land on green as opposed to red.
- B. It is less likely for the next spin to land on red as opposed to yellow.
- C. It is equally likely for the next spin to land on yellow or blue.
- D. It is more likely for the next spin to land on orange as opposed to green.

**Question 10 .**

The probability of randomly selecting a white flower from a garden that has green, pink, yellow, and white flowers is 6%.

Which of the following describes the likelihood of selecting a white flower?

- A. likely
- B. unlikely
- C. neither unlikely nor likely

# Explanations: Math - Understanding Probability

1. The probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring.

The closer a probability is to 0, the lesser the likelihood of the event occurring. The closer a probability is to 1, the greater the likelihood of the event occurring.

Therefore, a **probability near 1 indicates a likely event**.

2. First, find the probability of Event A. There are 4 quarters on the spinner and only one of the quarters is red.

So, the probability that the arrow is on the red quarter of the spinner when it stops spinning is  $\frac{1}{4}$ .

Next, find the probability of Event B. There are 4 different outcomes of flipping a coin twice and the coin landing on tails the first flip and on heads the second flip is only one of the outcomes.

So, the probability that the coin lands on tails the first flip and on heads the second flip is  $\frac{1}{4}$ .

Thus, **both events are equally likely to occur** because  $\frac{1}{4} = \frac{1}{4}$ .

3. Since the probability is closer to 0 than it is to  $\frac{1}{2}$ , the likelihood of selecting a green marble is **unlikely**.

4. First, find the probability that Richard draws two cards with a product that is an even number.

The table shows that there are seven products that are even numbers.

So, the probability that Richard draws two cards with a product that is an even number is  $\frac{7}{16}$ .

Next, find the probability that Richard draws two cards with a product that is a single digit.

The table shows that there are nine products that are single digits.

So, the probability that Richard draws two cards with a product that is a single digit is  $\frac{9}{16}$ .

Therefore, **Richard is more likely to draw two cards with a product that is a single digit, because  $\frac{9}{16} > \frac{7}{16}$ .**

5. The probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. A probability near 0 indicates an unlikely event, a probability of  $\frac{1}{2}$  indicates an event that is just as unlikely as likely, and a probability near 1 indicates a likely event. Determine the likelihood of each event.

*Randomly selecting a vowel in the word, "RAISED"*

There are 3 vowels in the 6-letter word. Therefore, the likelihood of the event occurring is  $\frac{3}{6}$ , or  $\frac{1}{2}$ . This means the **event is equally likely as unlikely** to occur.

*Randomly selecting an odd number in the set, {3, 5, 7, 11, 13}*

There are 5 odd numbers in the set of 5 numbers. Therefore, the likelihood of the event occurring is  $\frac{5}{5}$ , or 1. This means the **event is certain** to occur.

*Randomly selecting "drums" in the list, "guitar, piano, cello, flute"*

The word, "drums" appears 0 times in the list of 4 words. Therefore, the likelihood of the event occurring is  $\frac{0}{4}$ , or 0. This means the **event is impossible** to occur.

*Randomly selecting a boy in a list of 20 boys and 10 girls*

There are 20 boys in a group of 30 boys and girls. Therefore, the likelihood of the event occurring is  $\frac{20}{30}$ , or  $\frac{2}{3}$ . This means **the event is likely** to occur.

6. Rewrite the given probability of 0.5 as a fraction.

$$0.5 = \frac{5}{10} = \frac{1}{2}$$

Since the probability is equal to  $\frac{1}{2}$ , it is the same distance from both 0 and 1. Therefore, the likelihood of picking a paint brush is **neither unlikely nor likely**.

7. First, find the probability of Event A. There are 6 tiles that contain one tile marked M and one tile marked Q.

So, the probability that Lisa picks an M or a Q is  $\frac{2}{6}$  or  $\frac{1}{3}$ .

Next, find the probability of Event B. There are 6 sectors on the spinner containing 2 green sectors and 2 red sectors.

So, the probability that the arrow lands on a green or red sector of the spinner when it stops spinning is  $\frac{4}{6}$  or  $\frac{2}{3}$ .

Thus, **Event A is less likely to occur than Event B** because  $\frac{1}{3} < \frac{2}{3}$ .

8. Rewrite the given probability of 0.12 as a fraction.

$$0.12 = \frac{12}{100} = \frac{3}{25}$$

Since the probability is closer to 0 than it is to  $\frac{1}{2}$ , the likelihood of picking a coin with an eagle on one side is **unlikely**.

9. In the experiment, the spinner landed on green 20 times and landed on red 10 times.

Since the spinner landed on green twice as many times as it landed on red, based on the experiment, **it is twice as likely for the next spin to land on green as opposed to red**.

10. Rewrite the given probability of 6% as a fraction.

$$6\% = \frac{6}{100} = \frac{3}{50}$$

Since the probability is closer to 0 than it is to  $\frac{1}{2}$ , the likelihood of selecting a white flower is **unlikely**.



Name: \_\_\_\_\_

# Single-Step Percent Problems

Read each question below. Circle the letter of the correct answer.

- 18 is what percent of 25?  
A. 70%                      B. 72%                      C. 75%                      D. 82%
- What is 60 % of 50?  
A. 20                      B. 25                      C. 30                      D. 40
- Chris has 12 belts. Nine of the belts are wide and the rest are narrow. What percent of the belts are narrow?  
A. 75%                      B. 34%                      C. 30%                      D. 25%
- Marla pays \$42.25 for dinner. If she leaves a 20% tip, how much will she spend on dinner and the tip?  
A. \$48.59                      B. \$50.07                      C. \$50.70                      D. \$52.81
- What is 16% of 425?  
A. 68                      B. 85                      C. 340                      D. 357
- Dan got 44 of 55 problems correct on a math test. What percent did he correctly answer?  
A. 75%                      B. 80%                      C. 82%                      D. 85%
- Sasha bought a hardcover book for \$14.99. The sales tax is 7%. How much did Sasha spend for the hardcover book?  
A. \$16.44                      B. \$16.40                      C. \$16.04                      D. \$16.00
- Ray bought a shirt on sale for \$18.00. The original price was \$24.00. What percent was the discount?  
A. 75%                      B. 40%                      C. 35%                      D. 25
- Mario bought a pair of sneakers for 25% off the regular price of \$89.99. What is the sale price of the sneakers?  
A. \$67.49                      B. \$68.39                      C. \$69.29                      D. \$71.99
- Lin works at an animal shelter. After three months on the job, her hourly rate increased from \$7.75 to \$8.45 an hour. What percent did her hourly rate increase?  
A. 3%                      B. 5%                      C. 8%                      D. 9%

Name: \_\_\_\_\_

# Converting Units

Read each question below. Circle the letter of the correct answer.

- Complete:  $80 \text{ mm} = \underline{\hspace{2cm}} \text{ cm}$   
A. 800                      B. 80                      C. 8                      D. 0.8
- Complete:  $90 \text{ m} = \underline{\hspace{2cm}} \text{ cm}$   
A. 900                      B. 90                      C. 9                      D. 0.9
- Complete:  $7 \text{ days} = \underline{\hspace{2cm}} \text{ h}$   
A. 192                      B. 168                      C. 84                      D. 0.25
- Complete:  $45^\circ \text{ C} = \underline{\hspace{2cm}}^\circ \text{ F}$   
A. 81                      B. 77                      C. 25                      D. 13
- Complete:  $8.5 \text{ gal} = \underline{\hspace{2cm}} \text{ pt}$   
A. 17                      B. 34                      C. 68                      D. 136
- Complete:  $4.5 \text{ L} = \underline{\hspace{2cm}} \text{ mL}$   
A. 0.045                      B. 0.45                      C. 450                      D. 4,500
- Select the conversion factor that you would use to convert quarts to gallons.  
A.  $4 \text{ gal}/1 \text{ qt}$                       B.  $1 \text{ gal}/4 \text{ qt}$                       C.  $1 \text{ qt}/4 \text{ gal}$                       D.  $4 \text{ qt}/4 \text{ gal}$
- Select the conversion factor that you would use to convert miles to feet.  
A.  $5,280 \text{ ft}/1 \text{ mi}$                       B.  $1760 \text{ ft}/1 \text{ mi}$                       C.  $1 \text{ mi}/5280 \text{ yd}$                       D.  $1 \text{ mi}/1760 \text{ ft}$
- A brand of apple juice costs \$2.56 for 64 oz. Find the unit rate.  
A.  $25 \text{ oz}/\text{cent}$                       B.  $40 \text{ cents}/\text{oz}$                       C.  $4.0 \text{ cents}/\text{oz}$                       D.  $0.25 \text{ oz}/\text{cent}$
- An employee earns \$76 for 8 hours. Find the employee's pay per hour.  
A. \$9.00                      B. \$9.50                      C. \$10.00                      D. \$10.50