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Mathematics

Quarter 4 – Module 15:
Describing Experimental Probability

ALTERNATIVE DELIVERY MODE
ADM

Mathematics – Grade 5
Alternative Delivery Mode
Quarter 4 – Module 15: Describing Experimental Probability
First Edition, 2020

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Describing Experimental Probability

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Introductory Message

This Self-Learning Module (SLM) is prepared so that you, our dear learners, can continue your studies and learn while at home. Activities, questions, directions, exercises, and discussions are carefully stated for you to understand each lesson.

Each SLM is composed of different parts. Each part shall guide you step-by-step as you discover and understand the lesson prepared for you.

Pre-tests are provided to measure your prior knowledge on lessons in each SLM. This will tell you if you need to proceed on completing this module or if you need to ask your facilitator or your teacher's assistance for better understanding of the lesson. At the end of each module, you need to answer the post-test to self-check your learning. Answer keys are provided for each activity and test. We trust that you will be honest in using these.

In addition to the material in the main text, Notes to the Teacher are also provided to our facilitators and parents for strategies and reminders on how they can best help you on your home-based learning.

Please use this module with care. Do not put unnecessary marks on any part of this SLM. Use a separate sheet of paper in answering the exercises and tests. And read the instructions carefully before performing each task.

If you have any questions in using this SLM or any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator.

Thank you.

What I Need to Know

Good day Mathletes! This module was designed and written to help you gain understanding and test your ability in describing experimental probability. We knew that a probability is the mathematics of chance. Probability is used to describe how likely or unlikely it is that something will happen. Probability may be given in fraction, decimal, or percent. The value of probability ranges from 0-1 (0 means the event is impossible to happen, while 1 means the event is certain to happen). Knowing how to describe probability and how to use them in real-life situations is important. In real life, whenever we do an experiment, two things can happen, either the one we expect or the one that we do not. When the result is what we expected, then it is the favorable outcome.

So, what are you waiting for? Stay focused and start-up.

At the end of this module, you are expected to:
- describe experimental probability;
- appreciate the importance of experimental probability.

Before going any further, let us check your understanding about describing experimental probability.

What I Know

Directions: Read carefully each statement below. Choose the letter that corresponds to the best answer. Write the chosen letter on a separate sheet of paper.

1. What is the probability that an odd number of dots show up if a die is rolled?
   A) impossible
   B) certain
   C) as likely as unlikely
   D) unlikely

2. A coin is tossed 10 times: A head is recorded 8 times and a tail 2 times. Describe the experimental probability of getting tail.
   A) impossible
   B) certain
   C) likely
   D) unlikely

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3. A coin is tossed 60 times. The head appeared 27 times. Describe the experimental probability of getting heads.
   - A) impossible
   - B) certain
   - C) likely
   - D) unlikely

4. A bag has 1 blue, 3 green, 2 red, and 2 yellow marbles. What is the probability of drawing 3 green marbles?
   - A) impossible
   - B) certain
   - C) likely
   - D) unlikely

5. When 2 coins are flipped, what is the probability of getting at least one head?
   - A) impossible
   - B) certain
   - C) as likely or as unlikely
   - D) unlikely

6. You will be late for school tomorrow.
   - A) impossible
   - B) certain
   - C) likely
   - D) as likely or as unlikely

7. You will obtain 7 when rolling a regular die.
   - A) impossible
   - B) certain
   - C) likely
   - D) unlikely

8. Pulling a red marble from a bag with 10 yellow marbles, 6 red marbles and 1 green marble.
   - A) impossible
   - B) certain
   - C) likely
   - D) unlikely

9. The pointer of a spinner numbered 1,2 3,3,3,3,3,6,6, stopping on 3.
   - A) impossible
   - B) certain
   - C) most likely
   - D) unlikely

10. Drinking 1 liter of water in 5 seconds.
   - A) impossible
   - B) certain
   - C) likely
   - D) unlikely

Lesson 1: Describing Experimental Probability

In order to describe experimental probability, you need to master the skills on reducing fraction to lowest term, changing fraction to percent and vice versa, and changing decimal to percent and vice versa, because these will help you gain understanding the concept of the lesson. In this module, you will learn how to describe experimental probability and discover their relationship with decimals, fractions and percent. Are you ready?
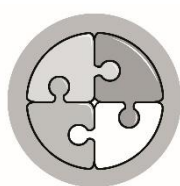
What's In

In the previous lessons, you were able to learn the concept of changing fractions to decimals from decimals to percent.

Note that, to change percent to decimal, write the percent as fraction, then divide the numerator by the denominator. A shorter method is to remove the % symbol, then move two decimal places to the left. To change decimal to percent, multiply the decimal to 100, then affix the % symbol. A shortcut would be moving the decimal point to the right and affixing the % symbol. To change from fraction to percent, change into decimal first by dividing the numerator by the denominator, move the decimal point two places to the right, then affix the percent symbol.

Let us refresh your memory and try to answer the following exercises below by changing fractions to decimals and to percent.

		Decimal	Percent
1.	1/2	_____ ,	_____
2.	9/25	_____ ,	_____
3.	1/4	_____ ,	_____
4.	3/4	_____ ,	_____
5.	3/20	_____ ,	_____

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What's New

From the previous lesson, you were taught on how to change fractions to decimals and from decimals to percent. In this lesson, we will deal with describing experimental probability.

Probability is the mathematics of chance. When we do something and we are expecting a result by chance or we are not certain of what the result will be. In probability, we call it an experiment. The uncertain result is called an outcome.

Consider this problem.

There are 100 candies in a jar and 10 of which are bubble gums. What is the probability of getting a bubble gum?
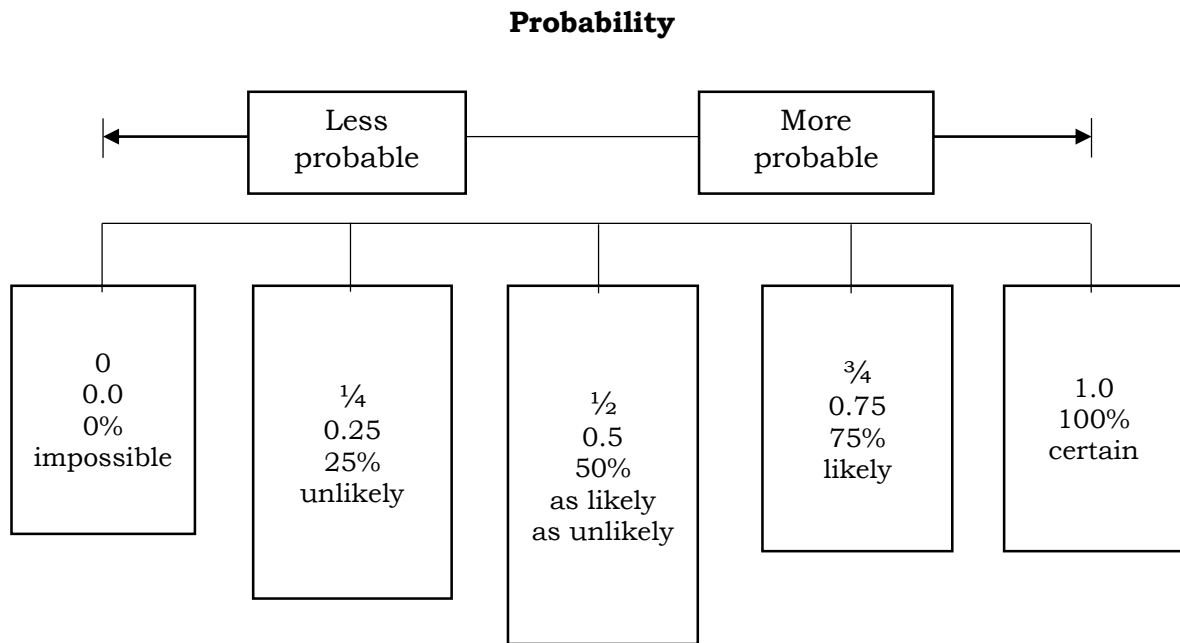
What Is It

Probability is used to describe how likely or unlikely it is that something will happen. Probability may be given in fraction, decimal, or percent. The value of probability ranges from 0-1 (0 means the event is impossible to happen, while 1 means the event is certain to happen).

Probability will help us decide how often something is likely to happen, but it will never help you exactly when the event will happen unless the probability is 0 (it will never happen) or 1 (it will surely happen).

The event is unlikely to happen when its probability is closer to 0, like winning a jackpot in a lottery where you only have a million chance of winning. The most likely to happen an event is, the closer its probability to 1.

Probability

	Less probable			More probable	

0 0.0 0% impossible	¼ 0.25 25% unlikely	½ 0.5 50% as likely as unlikely	¾ 0.75 75% likely	1.0 100% certain

Example 1

The weather forecaster says that the probability that it will rain today is 75%. Does it mean that there is a great chance that it will rain today?

Let us use the number line to show the probability of an event.

UNLIKELY   **LIKELY**   100%

0%

0   ½   3/4   1

25%   50%   75%

IMPOSSIBLE   **CERTAIN**
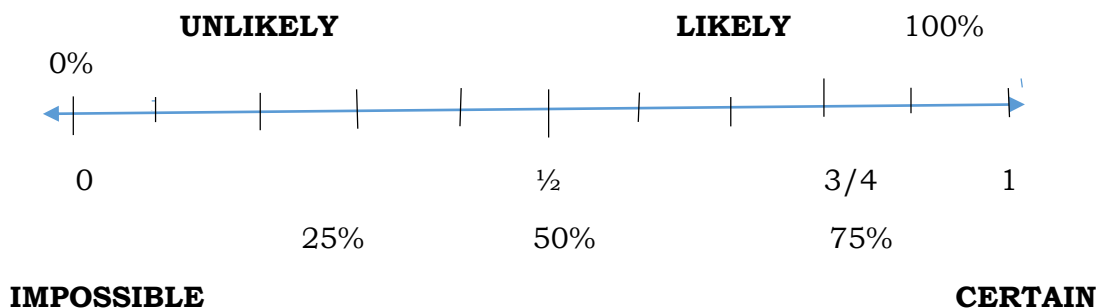
Going back to the problem presented in the "What's New",

By the fundamental counting principle, there are 10 out of 100 possible results or outcomes. Using the formula, we have:

$$P = \frac{favorable\ outcomes}{total\ possible\ outcomes}$$

$$= \frac{10}{100}$$

$$= \frac{1}{10}$$

= 0.1 or 10%

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Therefore, the probability of getting a bubble gum is 1/10 or 10% or it has 10 out of 100 chances of getting a bubble gum.

Example 2

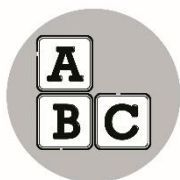In a deck of 52 well-shuffled playing cards, what is the probability of getting a king?

In the given problem, the total possible outcomes is 52. The favorable outcome is getting a king. In a deck, there are 52 cards, there are four suits and each suit has a king. So, there are four kings. Thus,

$$P = \frac{favorable\ outcomes}{total\ possible\ outcomes}$$

$$= \frac{4}{52}$$

$$= \frac{1}{13}$$
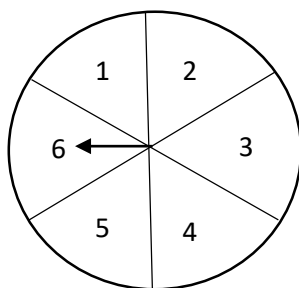
= 0.077 or 7.7%

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What's More

Activity 1

Directions: Look at the spinner below. Write and describe the probability of landing on:

1. 1
2. 3 and 5
3. even number
4. 7
5. 2 and4

Activity 2

Directions: Describe experimental probability by answering the questions that follow the situation.

Jimmy and Naomi are rolling a regular 0-5 number cube. Jimmy wins if 0 is rolled. Naomi wins if 1,2,3,4, or 5 is rolled.

1. Who do you think will win more often?
2. What fraction of the time do you think Jimmy will win?
3. What is Naomi's probability of winning?
4. If they roll the cube 6 times, would you expect Jimmy to win?
5. Should you be surprised if Jimmy did not win exactly 1 time out of 6 tries?

Activity 3

A dice is rolled. Determine the probability of the following outcomes:

a. Even numbers
b. Number less than 5
c. Number 6

What I Have Learned

A. Fill in the blanks.

A probability is said to be a mathematics of (1) _____. Probability is used to describe how likely or unlikely it is that something will happen. (2)_____ may be given in fraction, decimal, or percent. The (3) _____ of probability ranges from 0-1 (0 means the event is impossible to happen, while (4) _____ means the event is certain to happen).

Probability will help us decide how often something is likely to happen, but it will never help you exactly when the event will happen unless the probability is (5) _____(it will never happen) or 1 (it will surely happen).

The event is unlikely to happen when its probability is closer to 0, like winning a jackpot in a lottery where you only have a million chance of winning. The most likely to happen an event is, the closer its probability to 1.

What I Can Do

Probability is the mathematics of chance. Probability is used to describe how likely or unlikely it is that something will happen.

Directions: Use 0 (impossible), 1/4(unlikely), ½ (as likely as unlikely), ¾ (most likely) and 1 (certain) to describe each of the following statements. You can use an extra sheet of paper for your solutions.

1. The sports' analyst says that Manny Pacquiao has 75% chance of winning his fight.
2. The weather forecaster says there is 50% chance of rain today.
3. The sun will rise tomorrow.
4. Heavy rains during typhoon.
5. A carabao will climb a tree.

Assessment

Directions: State the probability of each outcome. Write *impossible, unlikely, as likely as unlikely, likely, certain.*

_____ 1. Without looking, what is the probability that a green pen is drawn from a box of green pen?

_____ 2. What is the probability that a tomato is drawn from a box of apples and oranges?

_____ 3. From tossing a coin, what is the probability that the head shows up?

_____ 4. What is the probability that an odd number of dots show up if a dice is rolled?

_____ 5. A coin is tossed and showed heads.

_____ 6. Your house will grow legs and walk.

_____ 7. A mother gives birth

_____ 8. A frog will swim in the water.

_____ 9. You will finish reading this sentence.

_____ 10. What is the probability that an even number of dots show up if a dice is rolled?

Additional Activities

You made it! Finally, you're on the last activity. Answer it all correctly so you could climb at the top and get your trophy.

Directions: The letters of the word **PROBABILITY** are put in a jar. Find the probability of picking the indicated letter or letters. Write in fraction form.

1. P (B) - _____

2. P (D) - _____

3. P (A) - _____

4. P (all the vowels) - _____

5. P (all the consonants) - _____

Answer Key

Assessment

1. Certain
2. Impossible
3. As likely as unlikely
4. As likely as unlikely
5. As likely as unlikely
6. Impossible
7. Certain
8. Certain
9. Certain
10. As likely an unlikely

Additional Activities

1. 2/11
2. 0/11
3. 1/11
4. 4/11
5. 7/11

Activity 3

1. 1/2
2. 2/3
3. 1/6

What I Have Learned

1. chance
2. Probability
3. value
4. 1
5. 0

What I can do

1. 3/4
2. ½
3. 1
4. 1
5. 0

Activity 2

1. Naomi
2. 1/6
3. 5/6
4. No
5. No

What's In

1. 0.5 ...... 50%
2. 0.36 .... 36%
3. 0.25.........25%
4. 0.75........75%
5. 0.15 ....15%

What I Know

1. C   6. D
2. D   7. A
3. D   8. D
4. D   9. C
5. C   10. A

Activity 1

1. 1/6
2. 2/6
3. 3/6
4. 3/6
5. 2/6

What's More

References

Lumbre, Angelina P., and Alvin C. Ursua. 2016. *21St Century Mathematics 5 Textbook*. Quezon City: Vibal Group, Inc.

Perez, Marjoseph H.,and Donnel P. Placer,Jaime R. Burgos, 2016. *21st Century MATHletes 6 Textbook*. Quezon City: Vibal Group, Inc.

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