

7

Lesson Exemplar for Mathematics

Quarter 4

Lesson

7

Lesson Exemplar for Mathematics Grade 7
Quarter 4: Lesson 7 (Week 7)
SY 2024-2025

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Development Team

Writer:

- Renér D. Daya (University of Mindanao)

Validator:

- Richard M. Lorente (Bicol University)

Management Team

Philippine Normal University
Research Institute for Teacher Quality
SiMERR National Research Centre

Every care has been taken to ensure the accuracy of the information provided in this material. For inquiries or feedback, please write or call the Office of the Director of the Bureau of Learning Resources via telephone numbers (02) 8634-1072 and 8631-6922 or by email at blr.od@deped.gov.ph.

MATHEMATICS / QUARTER 4 / GRADE 7

I. CURRICULUM CONTENT, STANDARDS, AND LESSON COMPETENCIES	
A. Content Standards	The learners should have knowledge and understanding of outcomes from experiments.
B. Performance Standards	By the end of the lesson, the learners are able to gather data from experiments and represent the data in different forms.
C. Learning Competencies and Objectives	Learning Competencies By the end of the lesson, the learners ... 1. Express outcomes in words and/or symbols and represent outcomes in tables and/or graphs. 2. Solves problems using the outcomes of experiments. Learning Objectives 1. Accurately identify all the possible outcomes in an experiment using systematic listing. 2. Correctly solve problems involving outcomes in an experiment using systematic listing. 3. Accurately solve problems using the outcomes of experiments. 4. Correctly illustrate the probability of simple events. 5. Accurately solve problems involving the probability of simple events.
D. Content	• Determining Outcomes of an Experiment by Systematic Listing • Solving Problems Using Outcomes of Experiments • Probability of Simple Events
E. Integration	

II. LEARNING RESOURCES
Cuemath (2024, June 7). Sample Space. https://cuemath.com/questions/the-set-of-all-possible-outcomes-of-an-experiment-is/ Khan Academy (2024, June 7). Simple probability. https://www.khanacademy.org/math/cc-seventh-grade-math/cc-7th-probability-statistics/cc-7th-basic-prob/e/probability_1 Libre Texts Statistics (2024, June 6). <i>Sample Spaces, Events, and Their Probabilities</i>. https://stats.libretexts.org/Bookshelves/Introductory_Statistics/Introductory_Statistics_(Shafer_and_Zhang)/03%3A_Basic_Concepts_of_Probability/3.01%3A_Sample_Spaces_Events_and_Their_Probabilities Math is Fun (2024, June 7). Probability. https://www.mathsisfun.com/data/probability.html Maths Genie (2024, June 6). <i>Systematic Listing</i>. https://www.mathsgenie.co.uk/resources/2-systematic-listing.pdf

III. TEACHING AND LEARNING PROCEDURE		NOTES TO TEACHERS												
A. Activating Prior Knowledge	DAY 1 1. Short Review A. Identify the experiment, outcome, sample space, and event in the following situations. 1. What is the likelihood of the die landing on a number lower than 4 when thrown? a. Experiment: b. Outcome: c. Sample space: d. Event: 2. Feedback (Optional)	On day 1 of this lesson, the teacher will give a short review about identifying experiments, sample space, outcomes, and events. After giving the short activity, check the answers of the learners and provide feedback on it to smoothly connect the main lesson.												
B. Establishing Lesson Purpose	1. Lesson Purpose To highlight the lesson's purpose, use the essential questions below to engage learners and show the lesson's importance based on their experiences. Essential Questions: 1. When do counting and listing become organized and systematic? 2. How does systematic listing differ from using a table or tree diagram? 3. How can we determine the probability of simple events in various word problems? 4. How can we identify the outcomes of a simple event, and how does this help in calculating its probability? 2. Unlocking Content Vocabulary Define Me! <table><tr><th>Terms</th><th>Definition</th></tr><tr><td>Systematic listing</td><td></td></tr><tr><td>Simple Event</td><td></td></tr><tr><td>Success</td><td></td></tr><tr><td>Probability</td><td></td></tr><tr><td>Outcomes</td><td></td></tr></table>	Terms	Definition	Systematic listing		Simple Event		Success		Probability		Outcomes		This section is intended for short class discussions for the students to recall and learn new terms that are related to the given topics of the lesson. Note: Essential questions in this part do not necessarily need to be answered. These questions will only serve as a guide and an engaging factor in proceeding to the lesson proper. Teachers can use images depicting each term's definition to aid learners in visualizing and expressing
Terms	Definition													
Systematic listing														
Simple Event														
Success														
Probability														
Outcomes														

	Key Points: • Systematic listing is an organized method of arranging information to ensure that no possible outcomes are overlooked. • A simple event is any possible result of a random experiment. • Success refers to the occurrence of the intended event outcome. • Outcomes are the possible results or occurrences of an event. In the context of probability or statistics, outcomes represent the different potential situations or occurrences that can happen as a result of an experiment, trial, or event. • Probability is the measure of the likelihood that a particular event will occur. It is quantified as a number between 0 and 1, with 0 indicating that the event will not happen and 1 indicating certainty that the event will happen. The probability of a simple event, denoted by $P(E)$, is calculated using the formula $P(E) = \frac{n(E)}{N}$ where $n(E)$ is the number of times an event will occur, and N is the total number of possible outcomes.	their comprehension of the concepts. Use the “Define Me” table to gather ideas from learners. This approach will promote interactive discussion. Note: Always engage learners in an interactive discussion to make them more participative.
C. Developing and Deepening Understanding	SUB-TOPIC 1: Determining Outcomes of an Experiment by Systematic Listing. 1. Explicitation Systematic Listing - this refers to an organized method of arranging information to ensure that no possible outcomes are overlooked. Example: List all the possible combinations when two coins were tossed. We are aware that there is a chance that both coins could show heads, so we'll begin by listing the first set of outcomes as (head, head). If we change the second coin to tails, the subsequent possible outcome would be (head, tail). Repeating the process, we can write, (Head, Head) (Head, Tail) (Tail, Head) (Tail, Tail) 2. Worked Example Example 1. List the combinations of three-digit numbers that can be formed using the digits 1, 2, and 3, with the condition that repetition of digits is permitted. Solution: To list all three-digit numbers systematically, begin with the smallest number and proceed by altering the digits starting from the rightmost position.	Class discussion in the presentation of new terminologies related to the topic. A step-by-step of showing the process (Q & A, if possible) is necessary to be presented by the teacher with the assurance that all students will understand the lesson.

111	211	311
112	212	312
113	213	313
121	221	321
122	222	322
123	223	323
131	231	331
132	232	332
133	233	333

Therefore, there are **27** possible combinations of 3-digit numbers can be formed using the digits 1, 2, and 3.

Example 2. On a school sports fest day, students must take part in one track event and one field event. List the possible combinations of track and field events systematically. Below is the list of events.

Track Events	Field Events
Hurdles (H) Relay (R) Sprint (S)	Long Jump (L) Javelin (J) Tripple Jump (T)

Solution: To list all possible combinations of sports events, begin with the first event under track events to pair with field events.

H, L	R, L	S, L
H, J	R, J	S, J
H, T	R, T	S, T

Therefore, the above list comprises **9** possible combinations.

3. Lesson Activity

Let the students answer the items below:

1. Empoy has three balls numbered with the same color: 7, 2, and 5. List all the possible combinations of numbers systematically.

Let the students work by tandem or small group to answer the exercises.

2. During your school's sports festival, students are required to participate in one indoor event and one outdoor event. Systematically list the potential combinations of track and field events.

Below are the available events. Below is the list of indoor and outdoor events.

Indoor Event	Outdoor Event
Badminton	Football
Table tennis	Swimming
Volleyball	Relay
Futsal	Long Jump

Allow the students to present their answer to the whole class for discussion.

DAY 2

SUB-TOPIC 2: Outcomes and Probability of Simple Events

1. Explicitation

Outcomes are the possible results or occurrences of an event. In the context of probability or statistics, outcomes represent the different potential situations or occurrences that can happen as a result of an experiment, trial, or event.

Probability is the measure of the likelihood that a particular event will occur. It is quantified as a number between 0 and 1, with 0 indicating that the event will not happen and 1 indicating certainty that the event will happen.

The probability of a simple event, denoted by $P(E)$, is calculated using the formula $P(E) = \frac{n(E)}{N}$ where $n(E)$ is the number of times an event will occur, and N is the total number of possible outcomes.

2. Work Example

Example 1: In rolling a die, find the probability of getting an odd number.

$$P(\text{Event}) = \frac{n(E) - \text{number of favorable outcome}}{N - \text{total number of possible outcomes}}$$

Take note that here are 3 odd numbers, namely 1, 3, and 5 and there are 6 possible outcome, namely 1, 2, 3, 4, 5, and 6.

$$\text{Thus, } P(\text{Odd number}) = \frac{3}{6} = \frac{1}{2}$$

The probability of getting an odd number is 3 out of 6 or 0.5 or 50%.



Example 2. In Kokoy's drawer, there are 4 red shirts, 7 blue shirts, and 8 green shirts. What is the probability that he will choose to wear a green shirt?

Solution:

Step 1. Determine the number of possible outcomes.

Note: The outcomes in Kokoy's drawer are the individual shirts he can choose from: 4 white shirts, 7 green shirts, and 8 blue shirts. Since there are 4 red shirts, 7 blue shirts, and 8 green shirts in Kokoy's drawer, he has a total of 19 shirts to choose from. Hence, the total number of possible outcomes is 19. In symbol, $N = 19$.

Step 2. Determine the number of times the event will occur.

The event is "Kokoy's will wear a green shirt. Since there are 8 green shirts, $n(E) = 8$.

Step 3. Calculate the probability using the formula.

$$P(\text{Event}) = \frac{n(E) - \text{number of favorable outcome}}{N - \text{total number of possible outcomes}}$$

$$P(\text{green shirt}) = \frac{8}{19}$$

Thus, the probability that Kokoy will wear a green shirt is $\frac{8}{19}$.

3. Lesson Activity

After the discussion, let the students answer the following items.

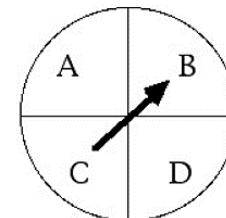
1. Ana has 3 candies, 5 chocolates and 2 chewing gums in a bag. What is the probability of picking a candy?
2. A number cube with faces numbered 1, 2, 3, 4, 5, 6 is rolled. Find the probability of obtaining a number greater than 4.

DAY 3

3. Lesson Activity

The teacher can give a short recall on the previous lesson by asking the students on how to determine the probability of a simple event. Then allow the students to do the activity below as a drill exercises.

1. A spinner with four sections labeled A, B, C, and D is used. The table displays the outcomes of multiple spins. Determine the probability of spinning each letter as a simple event. Present your answer in fraction, decimal, and percentage forms.



Lesson activities can be done by pair.

Answer to Lesson Activity:

1. $P(A) = 15/40, 0.375, 37.5\%$
 $P(B) = 10/40, 0.25, 25\%$
 $P(C) = 6/40, 0.15, 15\%$
 $P(D) = 9/40, 0.225, 22.5\%$
2. a. $9/34$
b. $4/17$

	<table><tr><td>Letter</td><td>A</td><td>B</td><td>C</td><td>D</td></tr><tr><td>Frequency</td><td>15</td><td>10</td><td>6</td><td>9</td></tr></table> Solution: Teacher's Feedback: 2. An auditor for a club is to be chosen from 8 Grade 7 students, 9 Grade 8 students, 12 Grade 9 students, and 5 Grade 10 students. What is the probability that the selected auditor is: a. a Grade 8 student? b. a Grade 7 student? Simplify your answer if possible. Solution: (a) Solution: (b) Teacher's Feedback:	Letter	A	B	C	D	Frequency	15	10	6	9	
Letter	A	B	C	D								
Frequency	15	10	6	9								
D. Making Generalizations	1. Learners' Takeaways The learners will be asked to complete the table by answering the following questions. 1. When do counting and listing become organized and systematic? 2. How does systematic listing differ from using a table or tree diagram? 3. How can we determine the probability of simple events in various word problems? 4. How can we identify the outcomes of a simple event, and how does this help in calculating its probability? 2. Reflection on Learning Ask the students to share their reflection using the guide question: Are there any challenges or misconceptions you encountered while studying the lesson on probability? If there any, what are those?	To identify learners' takeaways, teacher may use the questions from the lesson purpose.										

IV. EVALUATING LEARNING: FORMATIVE ASSESSMENT AND TEACHER’S REFLECTION				NOTES TO TEACHERS		
A. Evaluating Learning	DAY 4 1. Formative Assessment 1. Two dice are rolled. List and count all the possible outcomes of the following. a. Sum of 5. b. Sum of 8 c. Sum of less than 7. d. absolute difference of 4. 2. There are 7 green, 5 pink, 10 violet, and 4 red balls in a box. A ball was picked at random. What is the probability that it is: a. red? b. violet? c. not green? d. not pink? 3. Two dice are thrown. Find the probability that the same number will show in both dice.					Answer Key : 1. a. (1, 4), (2, 3), (3, 2),(4, 1) So, there are 4 pairs in total. b. (2, 6), (3, 5),(4, 4), (5, 3),(6, 2) So, there are 5 pairs in total. c. Sum of 2: (1, 1) Sum of 3: (1, 2), (2, 1) Sum of 4: (1, 3), (2, 2), (3, 1) Sum of 5: (1, 4), (2, 3), (3, 2), (4, 1) Sum of 6: (1, 5), (2, 4), (3, 3), (4, 2), (5, 1) So, there are 15 pairs in total. d. (1, 5), (5, 1) (2, 6), (6, 2) So, there are 4 pairs in total. 2. a. Probability of picking a red ball: 2/13 b. Probability of picking a violet ball: 5/13 c. Probability of not picking a green ball: 19/26 d. Probability of not picking a pink ball: 21/26 3. 6/36 or 1/6
	B. Teacher’s Remarks	Note observations on any of the following areas: strategies explored	Effective Practices	Problems Encountered	The teacher may take note of some observations related to the effective practices and problems encountered after utilizing the different	

	materials used			strategies, materials used, learner engagement, and other related stuff. Teachers may also suggest ways to improve the different activities explored/lesson exemplar.
	learner engagement/ interaction			
	others			
C. Teacher's Reflection	<i>Reflection guide or prompt can be on:</i> <u>principles behind the teaching</u> <i>What principles and beliefs informed my lesson?</i> <i>Why did I teach the lesson the way I did?</i> <u>students</u> <i>What roles did my students play in my lesson?</i> <i>What did my students learn? How did they learn?</i> <u>ways forward</u> <i>What could I have done differently?</i> <i>What can I explore in the next lesson?</i>			Teacher's reflection in every lesson conducted/facilitated is essential and necessary to improve practice. You may also consider this as an input for the LAC/Collab sessions.