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DepED
DEPARTMENT OF EDUCATION

Lesson Exemplar for Mathematics

Quarter 4
Lesson
8

Lesson Exemplar for Mathematics Grade 8
Quarter 4: Lesson 8 (Week 8)
SY 2025-2026

Development Team

Writer:
- Yahweh M. Pasahol (Pedro Guevara Memorial National High School)

Validator:
- PNU – RITQ Development Team

Management Team

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

MATHEMATICS / QUARTER 4 / GRADE 8

I. CURRICULUM CONTENT, STANDARDS, AND LESSON COMPETENCIES	
A. Content Standards	The learners demonstrate knowledge and understanding of experimental and theoretical probability.
B. Performance Standards	By the end of the quarter, the learners are able to calculate the probability of a single event and the probability of simple combined events. (DP)
C. Learning Competencies and Objectives	***Learning Competency*** At the end of the lesson, the learners are able to: 1. calculate the probability of simple combined events by listing or by possibility diagrams or tree diagrams. 2. solve problems involving experimental probability and/or theoretical probability using the Fundamental Counting Principle. *Lesson Objective 1: Differentiate a simple event from a compound event.* *Lesson Objective 2: Use a list, table, or tree diagram to solve simple compound events problems.* *Lesson Objective 3: Identify the different kinds of events.* *Lesson Objective 4: Solve problems involving compound events.*
D. Content	1. Differentiate Simple and Compound Events 2. Calculating Probability of Compound Events 3. Solving Problems Involving Probability of Compound Events
E. Integration	

II. LEARNING RESOURCES
724 Coin Toss icon Royalty-Free photos and stock Images | Shutterstock. (n.d.). Shutterstock. https://www.shutterstock.com/search/coin-toss-icon Eid, M. (n.d.). *Compound Events | 13.6K plays | Quizizz*. https://quizizz.com/admin/quiz/5a8c994355a7c7001f5cd1cc/compound-events Holliday, B., J. Cuevas, G., & Luchin, B. (2007). *Texas Algebra 2*. The McGraw-Hill Companies, Inc. https://www.lcps.org/cms/lib4/VA01000195/Centricity/Domain/16426/M6%2068B%20-%20Compound%20Probability%20Answers.pdf Limited, A. (n.d.). *A vector illustration of multi ethnic girls having a sleepover*. Alamy Images. https://www.alamy.com/stock-photo-a-vector-illustration-of-multi-ethnic-girls-having-a-sleepover-89677850.html?imageid=CBA56F3A-DF5E-4D99-853D-1C4EB5575F69&p=197692&pn=1&searchId=aa61b6a794dd3236cd9aaeac77b9e201&searchtype=0

Nivera, G., PhD. (2018). *Grade 8 Mathematics Patterns and Practicalities*. Salesiana Book by Don Bosco Press Inc.
Oronce, O. A. (2007). *E-math IV' 2007 Ed. (advanced algebra and trigonometry)* (1st ed.). Rex Bookstore.
Roberts, D. R. a. F. (n.d.). *Events Practice (Mutually exclusive, independent, dependent) - MathBitsNotebook(A2)*. MathBits.com (MathBitsNotebook.com) - Fred and Donna Roberts. https://mathbitsnotebook.com/Algebra2/Probability/PBEventsPractice.html
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III. TEACHING AND LEARNING PROCEDURE		NOTES TO TEACHERS
A. Activating Prior Knowledge	**DAY 1** **1. Short Review** **Activity 1: Try the Die!** A fair die is rolled. Find the probability in fraction form. 1. A six comes out 2. An even number greater than 3 comes out. 3. A prime number comes out. 4. A number less than 6 comes out 5. An even number greater than 6 comes out 6. A one comes out 7. A composite number comes out 8. A number greater than 0 comes out 9. A square number comes out. 10. A negative number comes out. **2. Feedback (Optional)**	**Activity 1 Answers:** 1. $\frac{1}{6}$ 6. $\frac{1}{6}$ 2. $\frac{1}{3}$ 7. $\frac{1}{3}$ 3. $\frac{1}{2}$ 8. 1 4. $\frac{5}{6}$ 9. $\frac{1}{3}$ 5. 0 10. 0 *Some learners might think that 1 is a prime no. Reiterate that 1 is neither prime nor composite.
B. Establishing Lesson Purpose	**1. Lesson Purpose** **Truth or Dare** Bea, Yanee, Rosy, Tricia, and Wendy are having a sleepover party. They decided to play "Truth or Dare". They form a circle, and a person spins a bottle. When the tip of the bottle lands on someone, she then draws a card to determine if she will tell the truth or do a dare. Search image of having sleep over party. Sample figure: https://fr.dreamstime.com/photo-stock-filles-ayant-sleepover-image37887060	**Answers:** 1. (depends on student's responses) 2. 2 events, spinning a bottle and choosing a card 3. $\frac{1}{10}$ 4. No because it consists of two events.

	Question: 1. Have you tried this game? 2. How many events are there in their activity? 3. What is the chance that Rosy will be chosen and that she will pick a "dare card"? 4. Is this problem still classified as a simple event? Why? Spinning a bottle and picking a card are two simple events that cannot happen at the same time. **2. Unlocking Content Vocabulary** • **EVENT –** a subset of a sample space • **SIMPLE EVENT –** an event with only one outcome. • **COMPOUND EVENT –** an event that has more than one possible outcome. • **INDEPENDENT EVENT –** two or more simple events in which the outcome of one event does not affect the outcome of other events • **DEPENDENT EVENT –** two or more simple events in which the outcome of one event that does affect the outcome of other events • **MUTUALLY EXCLUSIVE EVENTS –** events that cannot occur at the same time.	
C. Developing and Deepening Understanding	**SUB-TOPIC 1: Differentiate Simple and Compound Events** **1. Explicitation** Observe the given pictures. Search image of tossing a coin. Sample figure: https://www.shutterstock.com/image-vector/cartoon-style-drawing-hand-tossing-coin-2004757985 Picture A Search image of spinning a bottle and rolling a die. Sample figure: https://www.wikihow.com/Play-Spin-the-Bottle#/Image:Play-Spin-the-Bottle-Step-9-Version-2.jpg Picture B	

	Questions: 1. What activity is done in Picture A? 2. What activities are done in Picture B? 3. How does Picture A differ from Picture B? 4. Do both pictures illustrate simple events? Why?	**Answers:** 1. tossing a coin 2. spinning a bottle and rolling a die 3. Picture A has only one event
	2. Worked Example In the "Explicitation," Picture A shows only one activity. It is tossing a coin. This illustrates a simple event. Picture B, on the other hand, performs two activities. Spinning a bottle and rolling a die are done simultaneously. This shows a compound event. **Example 1:** A white and a red pair of dice are rolled. The following are the events: A = {(1,2)} B = {(1,2),(2,1) C = {(1,1),(1,2),(1,3),(2,1)} D = {(1,1),(2,2),(3,3),(4,4),(5,5),(6,6)}	
	Question: 1. Which event illustrates a simple event? 2. Which event illustrates a compound event?	**Answers:** 1. A is a simple event since it has only one outcome. 2. B, C, and D are compound events. B has 2 outcomes, C has 4 outcomes, and D has 6 outcomes.
	Example 2: A deck of well-shuffled cards is given. The following are the events: A. A black card comes out. B. A 5 or black card comes out. C. Two face cards come out. D. An ace comes out.	
	Question: 1. Which event illustrates a simple event? 2. Which event illustrates a compound event?	**Answers:** 1. A and D are simple events. 2. B and C are compound events. B has the events getting a 5 or a black card. C has the events getting two face cards.
	Analyze the three sets of events: A. A fair die is rolled, and an unbiased coin is tossed. B. Four different colored balls are in a bag. Two balls are to be drawn from the bag in succession (without replacing the first ball before the second	

ball is drawn).

C. A single card is drawn from a standard 52-card deck. Drawing a card that is both black and a club is possible.

Questions:

1. Do the events illustrate compound events?
2. How does each event differ from each other?

Compound events can have different kinds.

- Event A is an example of INDEPENDENT EVENT. It is because the occurrence of one does not affect the probability of the occurrence of the other.
- Event B illustrates a DEPENDENT EVENT because the occurrence of one does affect the probability of the occurrence of the other. Event C shows a MUTUALLY EXCLUSIVE EVENT because an event cannot happen at the same time.

Example 3: A box of chocolates contains five pieces each of milk, dark, and white chocolates. You randomly select and eat three chocolates. The first piece is milk chocolate, the second is dark chocolate, and the third is white chocolate.

Question:

1. Is Example 3 a simple or compound event?
2. If it is a compound event, what kind of compound event does it illustrate?

Answers:

1. Compound event
2. Dependent event

Example 4: A cooler contains ten bottles of sports drinks: four lemon-lime-flavored, three orange-flavored, and three fruit-punch-flavored. Three times, you randomly grab a bottle, return it to the cooler, and then mix up the bottles. The first time, you get a lemon-lime drink. The second and third times, you get a fruit-punch drink.

Question:

1. Is Example 4 a simple or compound event?
2. If it is a compound event, what kind of compound event does it illustrate?

Answers:

1. Compound event
2. Independent event

Example 5: A fair die id rolled. What is the probability that a 2 or a 5 comes out?

Question:

Answers:

	1. Is Example 4 a simple or compound event? 2. If it is a compound event, what kind of compound event does it illustrate?	1. Compound event 2. Mutually exclusive
	3. Lesson Activity **Activity 2:** A. Identify if the given illustrates a simple event or a compound event. Write SE for simple events and CE for compound events. 1. A class has 12 boys and 17 girls. A girl is chosen at random. 2. You flip a coin and then roll a fair six-sided die. The coin lands heads-up, and the die shows a one. 3. A coin is tossed, and it shows a head. 4. A bag contains eight red marbles and four blue marbles. You randomly pick a marble and then pick a second marble without returning the marble to the bag. The first marble is red, and the second marble is blue. 5. A deck of cards contains cards numbered from 1 to 81. A card is picked at random, and the card chosen is a number that is divisible by 5. 6. A card is drawn at random from a standard deck of 52 cards. The card drawn is either an ace or a king. 7. Two cards are drawn without replacement From a standard deck of cards. 8. Two cards are drawn with replacement From a standard deck of cards. 9. Alex will pick a new pet at an animal shelter. Today, the shelter has 8 dogs, 7 cats, and 5 rabbits available for adoption. He randomly picks an animal to adopt, and it would be a cat or a dog. 10. A fair die is rolled. A multiple of three comes out. B. For your answers in A that are compound events, identify the kind of compound event it illustrates.	**Activity 2 Answers:** **A.** 1. SE 2. CE 3. SE 4. CE 5. SE 6. CE 7. CE 8. CE 9. CE 10. SE **B.** 1. 2. Indpendent 3. 4. Dependent 5. 6. Mutually exclusive 7. Dependent 8. Independent 9. Mutually exclusive 10.
	DAY 2 **SUB-TOPIC 2: Calculating Probability of Compound Events** **1. Explicitation**	Note:

Now that you know how to classify a compound event, how do you find the probability of a compound event?

It is important to know the sample space in solving for the probability of an event.

If you were to write the set of all possible outcomes when a die is thrown and a coin is tossed, how would you do it?

The teacher may recall different ways of writing the possible outcomes in a sample space, such as a listing or tree diagram.

2. Worked Example

Example 1: You flip a coin and then roll a fair six-sided die. What is the probability that a coin lands heads-up and the die shows an even number?

Solution: (Using a Table)

	1	2	3	4	5	6
Head (H)	H1	H2	H3	H4	H5	H6
Tail (T)	T1	T2	T3	T4	T5	T6

n(E)= 3, n(S) = 12

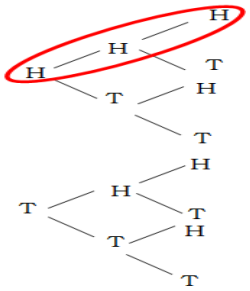
P(E) = $\frac{n(E)}{n(S)}$; **P(E) =** $\frac{3}{12}$ or $\frac{1}{4}$ **or 25% or 0.25**

Example 2: An unbiased coin is tossed three times.

a. What is the probability that the coin will land heads 3 times?
b. What is the probability that the coin lands head on the first and last toss?

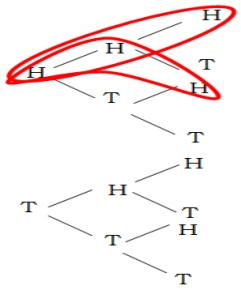
Solution: (Using Tree Diagram)

a.



n(S) = 8
n(E) = 1
P(E) = $\frac{n(E)}{n(S)} = \frac{1}{8}$ **or 12.5% or 0.125**

b.



n(S) = 8
n(E) = 2
P(E) = $\frac{n(E)}{n(S)}$ **=** $\frac{2}{8}$ *or* $\frac{1}{4}$ **or 25% or 0.25**

Observe that the examples are compound events. What if the problem is:

Example 3: When a fair die is rolled, what is the probability that a 3 or a 4 comes out?

Solution:
S = {1, 2, 3, 4, 5, 6}
n(S) = 6
n(E) = 2
P(E) = $\frac{n(E)}{n(S)} = \frac{2}{6}$ *or* $\frac{1}{3}$ **or 33.3% or 0.333**

3. Lesson Activity

Activity 3: Find the probability of the following events. You can use a table, listing, or tree diagram to help solve the problem. Express your answer in fraction form.

1. A pair of dice is rolled. What is the probability that:
   a) the sum of the two outcomes is 7.
   b) a 3 or a 5 comes out
   c) both outcomes are even
   d) a pair of 6 comes out
   e) a multiple of 3 and a prime number comes out

Activity 3: Answers

1.
a. $\frac{1}{6}$
b. $\frac{1}{3}$
c. $\frac{1}{4}$
d. $\frac{1}{36}$
e. $\frac{11}{36}$
f. $\frac{7}{36}$

2.
a. $\frac{1}{4}$
b. $\frac{3}{4}$
c. $\frac{1}{2}$
d. $\frac{3}{4}$

f) The sum of the 2 numbers is 9 or 10.

2. Two coins are tossed. Find the probability of getting:
   a) two heads
   b) at least one head
   c) exactly one tail
   d) at most one tail

3. Three coins are tossed. Find the probability that:
   a) three heads come out
   b) exactly two heads come out
   c) at least one tail comes out
   d) at most one tail comes o

3.
a. $\frac{1}{8}$
b. $\frac{3}{8}$
c. $\frac{7}{8}$
d. $\frac{3}{4}$

DAY 3

SUB-TOPIC 3: Solving Problems Involving Probability of Compound Events

1. Explicitation

- What is the probability of getting 2 hearts without replacement from a standard deck of cards?
- Will it still be easy if you list all the possible outcomes and then choose 2 hearts from the list?

For compound events,

a) INDEPENDENT EVENT
   $P(A \cap B) = P(A) \cdot P(B)$
   - The probability of two independent events is found by multiplying the first event's probability by the second event's probability.

b) DEPENDENT EVENT
   $P(B \text{ and } A) = P(A) \times P(B \text{ after } A)$
   - $P(B \text{ after } A)$ can also be written as $P(B|A)$.

c) MUTUALLY EXCLUSIVE EVENT
   $P(A \text{ or } B) = P(A) + P(B)$

- If two events A and B are mutually exclusive, then the probability A or B occurs is the sum of their probabilities.

2. Worked Example

Example 1: When rolling a die and flipping a coin, what is the probability that a three and a tail come out?

Solution: (Independent Event)

P(A) = $\frac{1}{6}$ (3 comes out when a die is rolled)

P(B) = $\frac{1}{2}$ (a tail comes out when a coin is tossed))

P(three and a tail) = $\frac{1}{6}\ \frac{1}{2}$ **=** $\frac{1}{12}$ **or 8.33% or 0.083**

Example 2: Find the probability of getting a king or queen from a standard deck of cards.

Solution: (Mutually Exclusive Events)

P(A) = $\frac{4}{52}$ *or* $\frac{1}{13}$ (a king from a deck of 52 cards)

P(B) = $\frac{4}{52}$ *or* $\frac{1}{13}$ (a queen from a deck of 52 cards)

P(king or queen) = P(A) + P(B) = $\frac{1}{13} + \frac{1}{13}$ **=** $\frac{2}{13}$ **or 15.4% or 0.154**

Example 3: A set of number cards from 1 to 20 are placed in a bag. Without replacing any card drawn, what is the probability that the first card drawn is an odd number and the second card drawn is an even number?

Solution: (Dependent Event)

P(A) = $\frac{10}{20}$ *or* $\frac{1}{2}$ (there are 10 odd numbers from 1 to 20)

P(B) = $\frac{10}{19}$ (there are 10 even numbers from 1 to 20, but one card is already drawn)

P(odd, then even) = $\frac{1}{2} \cdot \frac{10}{19}$ **=** $\frac{5}{19}$ **or 26.3% or 0.263**

Activity 4 Answers:

1. $\frac{1}{16}$

2. a) $\frac{161}{900}$

   b) $\frac{161}{870}$

	3. Lesson Activity **Activity 4:** Solve the following problems. 1. Ben is spinning a wheel which is divided into 4 equal parts and numbered 1 to 4. What is the probability that his first spin will land on 1 and then 3 on his second spin? 2. You randomly select two marbles from a bag that contains 14 green, 7 blue, and 9 red marbles. What is the probability that the first marble is blue and the second marble is not blue if: (a) you replace the first marble before selecting the second and; (b) you do not replace the first marble? 3. What is the probability of rolling a 3 and then not a 3 on a fair die? 4. A fair six-sided die is rolled twice. What is the theoretical probability that the first number that comes up is greater than or equal to the second number? 5. A ball is selected at random from a box containing 3 orange, 3 pink, and 4 blue balls. Find the probability that a ball selected is either blue or orange.	3. $\frac{5}{36}$ 4. $\frac{7}{12}$ 5. $\frac{7}{10}$
D. Making Generalizations	**DAY 4** **Learners' Takeaways and Reflection on Learning** 1. How does simple events differ from compound events? 2. When can you say that a compound event is: a. independent? b. dependent? c. mutually exclusive? 3. Do objects with replacement and without replacement have the same sample space? Why?	

IV. EVALUATING LEARNING: FORMATIVE ASSESSMENT AND TEACHER'S REFLECTION	**NOTES TO TEACHERS**
A. Evaluating Learning	
1. Formative Assessment Activity 1 – 4	
2. Summative Assessment A. Choose the letter of the correct answer. 1. You roll 4 on a die and spin blue on a spinner. What kind of compound event does it illustrate? A. independent B. dependent C. mutually exclusive	**Answers:** A. 1. A 2. B 3. C

2. Your teacher chooses a student to lead the group, another student to lead the second group, and another student to lead the third group. What kind of compound event does this illustrate?
   A. independent B. dependent C. mutually exclusive

3. All of the following are mutually exclusive events when a die is rolled, EXCEPT
   A. Rolling a number less than 4 or rolling a number greater than 4.
   B. Rolling a 2 or rolling an even number.
   C. Rolling a 2 or rolling an even number.

4. A coin and a die is rolled. Find the probability that a tail and a 3 comes out.
   A. $\frac{1}{12}$ B. $\frac{1}{6}$ C. $\frac{1}{3}$

5. A pack of candy-coated chocolate is in a bowl. There are four green, six red, two orange, five pink, and three blue. What is the probability of selecting a pink, eating it, and then selecting an orange?
   A. $\frac{2}{19}$ B. $\frac{1}{9}$ C. $\frac{1}{19}$

6. Kim flipped the coin thrice What is the probability that she got 3 tails?
   A. $\frac{1}{8}$ B. $\frac{1}{4}$ C. $\frac{1}{2}$

7. A pair of dice is rolled. Two possible events are rolling a number which is a multiple of 3, and rolling a number which is a multiple of 5. Are these two events mutually exclusive?
   A. Yes B. No C. Maybe

8. When a pair of dice is rolled, which of the following shows how the probability of getting a 2 and an odd number is solved?
   A. $\frac{1}{6}+\frac{1}{2}=\frac{2}{3}$ B. $\frac{1}{6}\cdot\frac{1}{2}=\frac{2}{3}$ C. $\frac{1}{6}\cdot\frac{1}{3}=\frac{1}{18}$

9. A box contains 15 slips of paper. Eight of them are white and are numbered from 1 to 8. Seven of them are black and are numbered from 1 to 7. What is the probability that a slip of paper drawn is an even number?
   A. $\frac{8}{15}$ B. $\frac{7}{15}$ C. $\frac{1}{3}$

4. A
5. C
6. A
7. A
8. B
9. B
10. A

B.
1. $\frac{14}{19}$
2. $\frac{14}{39}$
3. $\frac{7}{64}$

10. A ball is drawn from a bag of colored balls and then replaced. A second ball is drawn again. Are these two events independent?
A. Yes B. No C. Maybe

B. Solve the following problems.

1. Carl has a stack of 8 baseball cards, 5 basketball cards and 6 soccer cards. If he selects a card at random from his stack of cards, what is the probability that it is a baseball or a soccer card?
2. At a picnic, Anne reaches into an ice-filled cooler containing 8 regular soft drinks and 5 diet soft drinks. She got a can of regular soft drink and consumed it. What is the probability that she will get another regular soft drink the second time?
3. A spinner is divided into 8 equal parts and numbered 1 to 8. What is the probability that the pointer will land on a number greater than one, then on one?

3. Homework (Optional)

B. Teacher's Remarks	*Note observations on any of the following areas:*	**Effective Practices**	**Problems Encountered**	The teacher may take note of some observations related to the effective practices and problems encountered after utilizing the different strategies, materials used, learner engagement, and other related stuff. Teachers may also suggest ways to improve the different activities explored/lesson exemplar.
	strategies explored			
	materials used			
	learner engagement/ interaction			
	others			
C. Teacher's Reflection	*Reflection guide or prompt can be on:* • *principles behind the teaching* *What principles and beliefs informed my lesson?*			Teacher's reflection in every lesson conducted/facilitated is essential and necessary to

	Why did I teach the lesson the way I did? • *<u>students</u>* *What roles did my students play in my lesson?* *What did my students learn? How did they learn?* • *<u>ways forward</u>* *What could I have done differently?* *What can I explore in the next lesson?*	improve practice. You may also consider this as an input for the LAC/Collab sessions.