

**THIRD TERM  
WEEKLY LESSON NOTES  
WEEK 11**

**REVISION AND END OF TERM ASSESSMENT**

<b>Week Ending:</b> 08-09-2023	<b>DAY:</b>	<b>Subject:</b> Mathematics
<b>Duration:</b> 60MINS		<b>Strand:</b> Data
<b>Class:</b> B8	<b>Class Size:</b>	<b>Sub Strand:</b> Chance or Probability
<b>Content Standard:</b> B8.4.2.1 Identify the sample space for a probability experiment involving two independent events and express the probabilities of given events.		<b>Indicator:</b> B8.4.2.1.1. Perform a probability experiment involving two independent events such as drawing colored bottle tops from a bag with replacement and list the elements of the sample space.
<b>Performance Indicator:</b> Learners can understand the concept of independent events and be able to perform a probability experiment involving two independent events.		<b>Lesson:</b> 1 of 2
<b>Core Competencies:</b> Communication and Collaboration (CC) Critical Thinking and Problem solving (CP)		
<b>References:</b> Mathematics Curriculum Pg. 161		
<b>Phase/Duration</b>	<b>Learners Activities</b>	<b>Resources</b>
<b>PHASE 1: STARTER</b>	<p>Revise with learners on the previous lesson.</p> <p>Brainstorm learners to discuss what probability is and why it's important in daily life. Introduce the terms "event", "sample space", and "independent events".</p> <p>Share performance indicators with learners and introduce the lesson.</p>	
<b>PHASE 2: NEW LEARNING</b>	<p>Guide learners to explain the key terms in context.</p> <ul style="list-style-type: none"> <li>• Independent Events: Describe that two events, A and B, are independent if the occurrence of A does not affect the occurrence of B.</li> <li>• Sample Space: The set of all possible outcomes of an experiment.</li> <li>• Demonstration: Show a single draw from the bag. Put it back (replacement). Repeat.</li> </ul> <p>Place different colored bottle tops in a bag. Ask a student to draw one bottle top, note its color, and put it back into the bag. Repeat for a second draw.</p> <p>If using red (R), blue (B), and green (G) bottle tops, ask students to list all the possible outcomes of two draws. RR, RB, RG, BR, BB, BG, GR, GB, GG. Ask students:</p>	A bag Colored bottle tops (e.g., red, blue, green)

- What's the probability of drawing two reds in a row?
- What's the probability of drawing a red and then a blue?

Allow students to perform the experiment in pairs.  
 Each student will draw two bottle tops in succession, replacing after each draw.  
 They should record their results.

After several trials, students should calculate their experimental probabilities for each combination.

Write these questions on the board.

In an experiment, Emmanuel was asked to pick one bottle top from a bag, three times, which contains 3 red, 2 green and 1 pink bottle tops.

- List the elements of the sample space of the events.
- The sample space of the event of picking a red bottle top, R, with replacement is?
- The probability of picking a red bottle top is .....

Learners in pairs solve and present their solution to the class for discussions.

Solution

**i. List the elements of the sample space of the events.**

Given that Emmanuel picks one bottle top three times with replacement, the possible outcomes for each draw are:

- Red (R)
- Green (G)
- Pink (P)

For three consecutive draws, the sample space (all possible outcomes) is:

RRR, RRG, RRP, RGR, RGG, RGP, RPR, RPG, RPP,  
 GRR, GRG, GRP, GGR, GGG, GGP, GPR, GPG, GPP,  
 PRR, PRG, PRP, PGR, PGG, PGP, PPR, PPG, PPP

**ii. The sample space of the event of picking a red bottle top, R, with replacement is?**

If we're only looking at the event of picking a red bottle top with replacement, and Emmanuel is picking three times:

The sample space for picking red all three times is: RRR

**iii. The probability of picking a red bottle top is .....**

To determine this:

$$\text{Probability} = (\text{Number of favorable outcomes}) / (\text{Total possible outcomes})$$

	<p><i>In the bag, there are:</i></p> <ul style="list-style-type: none"> <li>- 3 red bottle tops</li> <li>- 2 green bottle tops</li> <li>- 1 pink bottle top</li> </ul> <p><i>Total bottle tops = 3 + 2 + 1 = 6</i></p> <p><i>Probability of picking a red bottle top = (Number of red bottle tops) / (Total bottle tops)</i></p> <p><i>= 3/6</i></p> <p><i>= 1/2 or 0.5</i></p> <p><i>So, the probability of picking a red bottle top is 0.5 or 1/2.</i></p> <p><b>Learners in their groups solve the following;</b></p> <p><b>E.g. 2</b> Consider the following two events: (a) throwing of a fair six-sided die and (b) tossing a fair coin</p> <ol style="list-style-type: none"> <li>i. What is the sample space for (a) and for (b)?</li> <li>ii. Does the occurrence of event (a) affect the occurrence of event (b)?</li> <li>iii. What is the probability of an even number showing up in (a)?</li> <li>iv. What is the probability of a head showing up in (b)?</li> <li>v. What is the relationship between the two events?</li> </ol> <p><b>E.g. 3</b> Ampofo and Serwa are two learners from a school. Ampofo walks to school daily and Serwa travels to school on a bus daily.</p> <ol style="list-style-type: none"> <li>i. Does the event of Ampofo affect that of Serwa?</li> <li>ii. Can the two events occur together?</li> </ol> <p><b><u>Assessment</u></b></p> <p>1. In a bag, you have 4 red (R) bottle tops, 3 blue (B) bottle tops, and 3 green (G) bottle tops. You draw two bottle tops in succession, with replacement.</p> <ol style="list-style-type: none"> <li>a) What is the probability of drawing two blues in a row?</li> </ol> <p>2. Using the same bag as above, you draw two bottle tops in succession, without replacement.</p> <ol style="list-style-type: none"> <li>a) What is the probability of drawing a red followed by a blue?</li> </ol> <p>3. You now add 2 yellow (Y) bottle tops to the bag, making a total of 12 bottle tops. You draw two bottle tops in succession, with replacement.</p> <ol style="list-style-type: none"> <li>a) What is the probability of drawing a yellow followed by a green?</li> </ol>	
<p><b>PHASE 3: REFLECTION</b></p>	<p>Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson.</p> <p>Take feedback from learners and summarize the lesson.</p>	

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<b>Content Standard:</b> B8.4.2.1 Identify the sample space for a probability experiment involving two independent events and express the probabilities of given events.		<b>Indicator:</b> B8.4.2.1.2. Express the probabilities of the events as fractions, decimals, percentages and/or ratios.
<b>Performance Indicator:</b> Learners can express probabilities of events in different formats, including fractions, decimals, percentages, and ratios using graphic organizers.		<b>Lesson:</b> 1 of 2
<b>Core Competencies:</b> Communication and Collaboration (CC) Critical Thinking and Problem solving (CP)		
<b>References:</b> Mathematics Curriculum Pg. 162		
<b>Phase/Duration</b>	<b>Learners Activities</b>	<b>Resources</b>
<b>PHASE 1: STARTER</b>	Revise with learners on the previous lesson.  Share performance indicators with learners and introduce the lesson.	
<b>PHASE 2: NEW LEARNING</b>	Start with a simple probability scenario, e.g., flipping a coin.  Ask students: "If you flip a coin, what are the chances it will land on heads?" Discuss the answers. Most will probably say "50-50" or "half and half".  Introduce the various ways this probability can be expressed: fraction ( $\frac{1}{2}$ ), decimal (0.5), percentage (50%), and ratio (1:1).  Demonstrate how to convert between these formats. <ul style="list-style-type: none"> <li>Fraction to Decimal: <math>\frac{1}{2}=0.5</math> <math>\frac{1}{2}=0.5</math></li> <li>Decimal to Percentage: <math>0.5=50</math></li> <li>Fraction to Ratio: <math>\frac{1}{2}=1:1</math></li> </ul> Discuss why different contexts might prefer one format over another (e.g., sales discounts in percentages, odds in ratios, etc.).  Using a dice roll, draw out a tree diagram for rolling a 6 in two consecutive rolls. Calculate and label probabilities at each stage.  Create a table for a card drawing experiment. Record probabilities for drawing face cards (King, Queen, Jack) from a deck.  Together, calculate the probability in a fraction, convert it to a decimal, then to a percentage, and finally express it as a ratio. Students replicate the process with guidance.  Students choose or are assigned a specific graphic organizer (tree diagram, table, etc.).	Blank paper or graph paper for each student Rulers & pencils Colored pencils or markers Dice, coins, or cards for hands-on probability experiments

	<p>They record their probabilities on the organizer, then convert and express the probability in all formats (fraction, decimal, percentage, ratio). Circulate the room to assist and ensure understanding.</p> <p>Learners in pairs solve the questions writing on the board.</p> <p><b>Example:</b> The arrow on the spinner if spun twice and the number of wins recorded; i. identify the sample space. ii. calculate the probability of a win <math>P(W)</math> and the probability of a lose, <math>P(L)</math>.</p> <p><u>Solution</u> Let's assume: - The spinner has 4 sections in total. - 2 sections are labeled as "win" (W) and the other 2 as "lose" (L).</p> <p><b>i. Identify the sample space.</b></p> <p>If the spinner is spun twice, the sample space (all possible outcomes) consists of: WW, WL, LW, LL</p> <p><b>ii. Calculate the probability of a win <math>P(W)</math> and the probability of a loss <math>P(L)</math></b></p> <p>For a single spin: <math>P(W) = \text{Number of win sections} / \text{Total number of sections} = 2/4 = 1/2</math> <math>P(L) = \text{Number of lose sections} / \text{Total number of sections} = 2/4 = 1/2</math></p> <p><u>Assessment</u> 1. A box contains 3 blue pens and 4 pink pens. A pen is taken from the box, its colour noted, and then replaced. Another pen is taken and its colour noted. i. What is the sample space of the 1st and the 2nd trials? ii. Draw a probability tree diagram to represent the event.</p> <p>2. A die is thrown at most three times. If 6 is scored the game stops. i. Copy and complete the probability tree diagram. ii. Explain why some of the branches of the tree diagram have disappeared</p>	
<p><b>PHASE 3: REFLECTION</b></p>	<p>Use peer discussion and effective questioning to find out from learners what they have learnt during the lesson.</p> <p>Take feedback from learners and summarize the lesson.</p>	