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BASIC 8

WEEKLY LESSON PLAN – WEEK 9

Strand:	Data	**Sub-Strand:**	Probability

Content Standard:	B8.4.2.1 Identify the sample space for a probability experiment involving two independent events and express the probabilities of given events as fractions, decimals, percentages and/or ratios to solve problems.

Indicator (s)	B8.4.2.1.1. Perform a probability experiment involving two independent events such as drawing coloured bottle tops from a bag with replacement and list the elements of the sample space	**Performance Indicator:** Learners can identify examples of experiments in Probability.

Week Ending	25-08-2023				
Class	B.S.8	**Class Size:**		**Duration:**	
Subject	Mathematics				
Reference	Mathematics Curriculum, Teachers Resource Pack, Learners Resource Pack, Textbook.				
Teaching / Learning Resources	Chart, Poster, picture, Video.	**Core Competencies:**	• Implement strategies with accuracy • Ability to combine Information and ideas from several sources to reach a conclusion • Implement strategies with accuracy		

DAY/DATE	**PHASE 1 : STARTER**	**PHASE 2: MAIN**	**PHASE 3: REFLECTION**
MONDAY	Learners brainstorm to identify examples of probability of two independent events.	1. Demonstrate on performing examples of experiments in probability. 2. Discuss the formula for calculating probability with the Learners. 3. Assist Learners to differentiate between an event and an experiment in probability. **Experimental Probability Formula** Experimental Probability for an Event A can be calculated as follows: P(E) = = $\frac{Numberofoccuranceoftheevent A}{Totalnumberoftrials}$	Reflect on the difference between events and experiments in probability.

A coin is flipped a total of 50 times. Heads appeared 20 times. Now, what is the **experimental probability** of getting heads?

E**xperimental probability** of getting heads =

P (Heads) =20/50=2/5

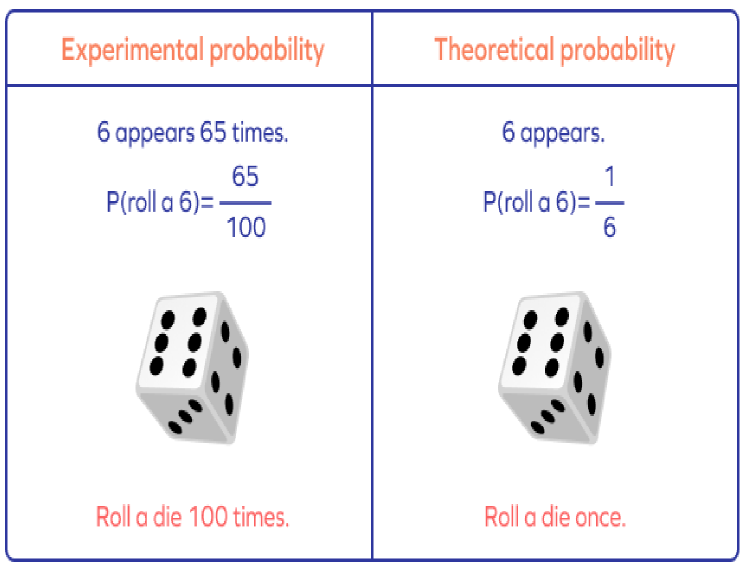
P (Tails) =30/50=3/5

Experimental Probability vs. Theoretical Probability

Theoretical probability expresses what is expected. On the other hand, experimental probability explains how frequently an event occurred in an experiment.

If you roll a die, the theoretical probability of getting any particular number, say 3, is 16.

However, if you roll the die 100 times and record how many times 3 appears on top, say 65 times, then the experimental probability of getting 3 is 65/100.



Q : Three coins are tossed simultaneously

P is the event of getting at least 2 heads

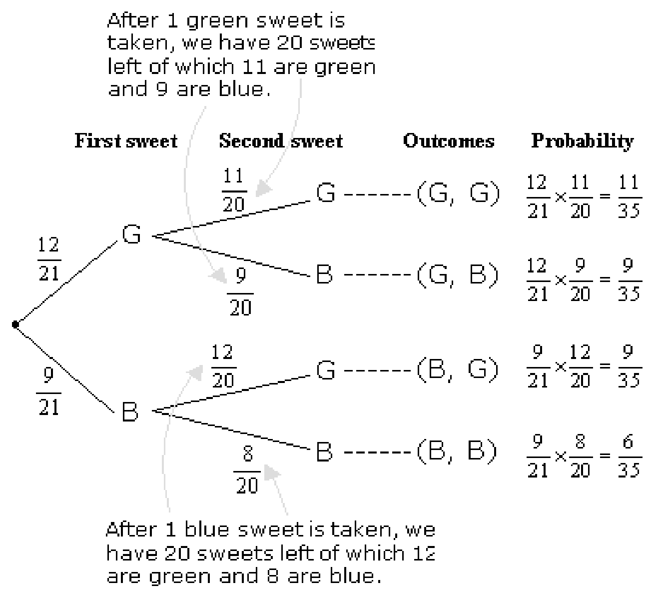
Q is the event of getting no heads

		R is the event of getting heads on the second coin Which of the pairs is mutually exclusive? Sol : n (S) = 2 x 2 x 2 = 8 n (P) = HHT, HTH, THH, HHH = 4 n (Q) = TTT = 1 n (R) = THT, HHH, HHT, THH = 4 So Q & R and P & R are mutually exclusive as they have nothing in their intersection. **Question-** What is an event in probability? **Answer-** When we look at probability, we see that an event is a set of outcomes of an experiment to which there is an assigned probability. **Question-** What are the different types of compound events? **Answer**– The different types of compound events are two. One is mutually exclusive compound events and the other is mutually inclusive compound events. A mutually exclusive one is when two events cannot take place at the same time. **Question-** What is a simple event probability? **Answer-** Simple events are where an experiment takes place at a time which will create a single outcome. We make use of P(E) to denote the probability of simple events. Over here, E is the event and probability lies between 0 and 1. For instance, a coin toss. **Question-** What is an event in probability example? **Answer-** As we know the set of outcomes that we get from an experiment is an event. So an example would be when we toss a coin. The result of this means the coin can either land on the 'heads' side or 'tails'	

TUESDAY	Briefly explain the concept of "Probability without replacement" or "dependent probability".	1. Discuss with Learners on the steps to follow to find probability without replacement or dependent probability. 2. Assist Learners to differentiate between "Probability with replacement' and "Probability without replacement". 3. Demonstrate on how to use probability tree diagram **Probability Without Replacement Or Dependent Probability**; In some experiments, the sample space may change for the different events. For example, a marble may be taken from a bag with 20 marbles and then a second marble is taken **without replacing** the first marble. The sample space for the second event is then 19 marbles instead of 20 marbles. This is called probability without replacement or dependent probability. We can use a tree diagram to help us find the probability without replacement. **How To Find The Probability Without Replacement Or Dependent Probability;** Step 1: Draw the Probability Tree Diagram and write the probability of each branch. (Remember that the objects are not replaced) Step 2: Look for all the available paths (or branches) of a particular outcome. Step 3: Multiply along the branches and add vertically to find the probability of the outcome. **Example:** A jar consists of 21 sweets. 12 are green and 9 are blue. William picked two sweets at random. a) Draw a tree diagram to represent the experiment. b) Find the probability that i) both sweets are blue. ii) one sweet is blue and one sweet is green.	Learners brainstorm to copy and complete probability tree diagram that represent events. **Exercise;** 1. Adam has a bag containing four yellow gumdrops and one red gumdrop. He will eat one of the gumdrops, and a few minutes later, he will eat a second gumdrop. a) Draw the tree diagram for the experiment. b) What is the probability that Adam will eat a yellow gumdrop first and a green gumdrop second? c) What is the probability

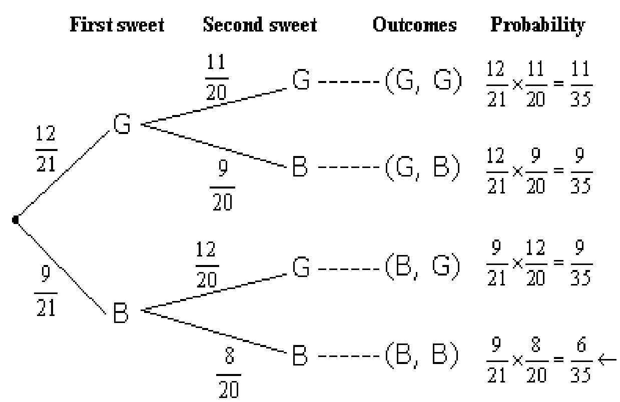
c) William randomly took a third sweet. Find the probability that:
i) all three sweets are green?
ii) at least one of the sweet is blue?

Solution:
a) Although both sweets were taken together it is similar to picking one sweet and then the second sweet without replacing the first sweet.



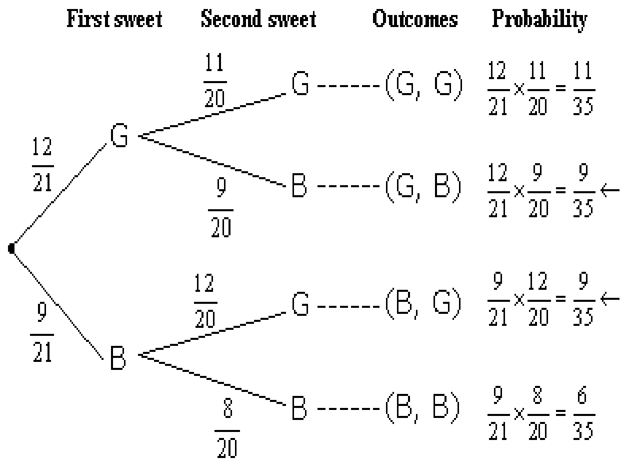
Check that the probabilities in the last column add up to 1.

$$\frac{11}{35}+\frac{9}{35}+\frac{9}{35}+\frac{6}{35}=1$$



that Adam will eat two yellow gumdrops?
d) What is the probability that Adam will eat two gumdrops with the same color?
e) What is the probability that Adam will eat two gumdrops of different colors?

2. A jar contains 4 black marbles and 3 red marbles. Two marbles are drawn without replacement.
a) Draw the tree diagram for the experiment.
b) Find probabilities for P(BB), P(BR), P(RB), P(WW), P(at least one Red), P(exactly one red)
3. Two marbles are drawn without replacement from a jar containing 4 black and 6 white marbles.

		b) i) P(both sweets are blue) = P(B, B) $= \frac{9}{21} \times \frac{8}{20} = \frac{6}{35}$  ii) P(one sweet is blue and one sweet is green) = P(G, B) or P(B, G) $= \frac{9}{35} + \frac{9}{35} = \frac{18}{35}$ c) i) P(all three sweets are green) = P(G, G, G) $= \frac{12}{21} \times \frac{11}{20} \times \frac{10}{19} = \frac{22}{133}$ ii) P(at least 1 sweet is blue) = 1 – P(all three sweets are green) $= 1 - \frac{22}{133}$ $= \frac{111}{133}$	a) Draw the tree diagram for the experiment. b) Find the probabilities for P(at least one black marble), P(same color), P(BW), P(exactly one black marble)
THURSDAY	Review Learners knowledge on the previous lesson.	1. Demonstrate on how to calculate probabilities from odds. 2. Assist Learners to solve word problems involving determining probabilities from odd. 3. Learners brainstorm to calculate for expected values of events using formula. **Determining Probabilities from Odds** The odds against Robin Murphy being admitted to the college of her choice are 9: 2. Find the probability that	Through questions and answers, conclude the lesson.

		(a) Robin is admitted and (b) Robin is not admitted. SOLUTION: a) We have been given odds against and have been asked to find probabilities. Odds against being admitted = --------- P(is admitted) / P(fails to be admitted) Since the odds statement is 9: 2, the denominators of both the probability of success and the probability of failure must be 9 + 2 or 11. To get the odds ratio of 9: 2 the probabilities must be t and -fl. Since odds against is a ratio of failure to success, the t and ft represent the probabilities of failure and success, respectively. Thus, the probability that Robin is admitted (success) is k b) The probability that Robin is not admitted (failure) is t	

Name of Teacher: ***School:*** ***District:***