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BASIC 8

WEEKLY LESSON PLAN – WEEK 10

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)	B8.4.2.1.2. Express the probabilities of the events as fractions, decimals, percentages and/or ratios. e.g.by using a tree diagram, table or other graphic organizer		**Performance Indicator:** Learners can convert fractions to decimals.		
Week Ending	01-09-2023				
Class	B.S.8	**Class Size:**		**Duration:**	
Subject	Mathematics				
Reference	Mathematics Curriculum, Teachers Resource Pack, Learners Resource Pack, Textbook.				
Teaching / Learning Resources	Chart, Metre Rule, Compass, divider, Poster, Pictures.		**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	Discuss with Learners on how to determine sample space of an experiment.	1. Assist Learners to calculate the probability of a win P(W) and the probability of a loss in an experiment. 2. Demonstrate on how to determine number of elements in a sample space using formula. 3. Learners brainstorm to calculate examples of finding elements in sample space. 4. Discuss with Learners on finding total number of outcomes in a sample space. **Sample space formula** Sample space refers to all possible outcomes of an experiment. It is denoted by S. A sample space may have number of possible outcomes. The number of outcomes depends upon the experiment. If a sample space has the finite number of outcomes, it is called as the discrete or finite sample space.	Learners brainstorm to differentiate between sample points and sample spaces. **Exercise;** State the formula for calculating sample space.

For random experiments, the sample space is written within "{}" curly braces.

Here, we are defining some events with all possible outcomes or sample space.

- When a dice is thrown, there are six possible outcomes, i.e., Sample space (S) = (1, 2, 3, 4, 5, and 6).
- When a coin is tossed, the possible outcomes are Head and Tail. So, in this case, the sample space (S) will be = (H, T).
- When two coins are tossed, there are four possible outcomes, i.e., S = (HH, HT, TH, TT).

The elements of a sample space may be letters, words, numbers, symbols, etc. A sample space can be finite, countably infinite, or uncountably infinite.

There is a difference between a sample space and an event. Let's see a brief description of an event.

Event: The subset of sample space is called an event. Event is generally denoted by the letter 'E'. We can understand the difference between the event and a sample space by the below example -

Suppose a dice is thrown, so the sample space (S) for this dice is = {1, 2, 3, 4, 5, 6} but the event can be {1, 3, 5} representing the set of odd numbers, and {2, 4, 6} representing the set of even numbers.

Now, let's solve some questions of finding out the sample space.

Ques - 1) What will be the sample space of the interval [3, 9]?

Ans - 1) The sample space (S) for the given interval is = {3, 4, 5, 6, 7, 8, 9}

Ques - 2) What will be sample space when two dice are thrown together?

Ans - 2) On rolling two dice together, we will get 36 outcomes. So the possible sample space will be -

		S = {(1, 1) (1, 2) (1, 3) (1, 4) (1, 5) (1, 6) (2, 1) (2, 2) (2, 3) (2, 4) (2, 5) (2, 6) (3, 1) (3, 2) (3, 3) (3, 4) (3, 5) (3, 6) (4, 1) (4, 2) (4, 3) (4, 4) (4, 5) (4, 6) (5, 1) (5, 2) (5, 3) (5, 4) (5, 5) (5, 6) (6, 1) (6, 2) (6, 3) (6, 4) (6, 5) (6, 6)}	
TUESDAY	Discuss with Learners on the meaning of "Permutations".	1. Learners brainstorm to identify examples of Permutations. 2. Discuss the concept of " Binomial Coefficient" with the Learners. 3. Assist Learners to solve examples of finding the binomial coefficient of events. **Permutations** A permutation is an ordering of an n-tuple. For instance, the n-tuple (1, 2, 3) has the following permutations: (1, 2, 3),(1, 3, 2),(2, 1, 3) (2, 3, 1),(3, 1, 2),(3, 2, 1) The number of unique orderings of an n-tuple is n factorial: $n! = n \times (n-1) \times (n-2) \times \cdots \times 2$ **Binomial Coefficient or "n choose k"** The binomial coefficient, written as $\binom{n}{k}$ and spoken as "n choose k", is the number of ways you can select k items out of a list of n choices. Formula: $\binom{n}{k} = \frac{n!}{k!(n-k)}$ **Example**: You have cards numbered 1 through 10. If you pick five cards at random, what is the probability that you selected exactly the cards 1, 2, 3, 4, 5 (not necessarily in that order)? **Answer**: We'll use the formula $P(A) = \frac{\lvert A \rvert}{\lvert \Omega \rvert}$. There is only one combination that gives us cards 1,2,3,4,5, so $\lvert A \rvert = 1$. The total number of possible 5 card selections is $\lvert \Omega \rvert = \binom{10}{5} = \frac{10!}{5!(10-5)!} = 252$ So, finally the probability is $P(A) = \frac{\lvert A \rvert}{\lvert \Omega \rvert} = \frac{1}{252} \approx 0.00397 = 0.397\%$	Through questions and answers, conclude the lesson. **Exercise;** 1. Write the permutation for the following; i. (x, y, z) ii. (3, 5, 7) iii. (1,3,5) 2. State the formula for calculating binomial coefficient.
THURSDAY	Review Learners knowledge on the previous lesson.	1. Demonstrate on how to represent probability as fractions and decimals. 2. Discuss with Learners on the techniques for converting fractions to decimals, fractions to percentages and percentages to decimals. 3. Assist Learners to convert between fractions, decimals and Percentages. **The Relationship between Fractions, Decimals, and Percents – Making Conversions**	Through questions and answers, conclude the lesson.

Since a percent is a ratio a ratio can be written as a fraction, and a fraction can be written as a decimal. This means any of these forms can be converted to any of the others. Look at the chart below for detailed information on how to make conversions between fractions, decimals, and percents.

Conversion Techniques – Fractions, Decimals, Percents

To Convert a Fraction	To Convert a Decimal	To Convert a Percent
To a decimal: Divide the numerator by the denominator.	**To a fraction:** Read the decimal and reduce the resulting fraction.	**To a decimal:** Move the decimal point 2 places to the left and drop the % symbol.
To a percent: Convert the fraction first to a decimal, then move the decimal point 2 places to the right and add the % symbol.	**To a percent:** Move the decimal point 2 places to the right and add the % symbol.	**To a fraction:** Drop the % sign and write the number "over" 100. Reduce, if possible.

Review the examples below which provide detailed steps for converting to fractions, decimals and percents.

Example

Problem	**Convert 12% to a simplified fraction and to a decimal.**	
Convert to fraction.	$12\% = \frac{12}{100}$	Drop the % sign and write the number "over" 100. Reduce, if possible.

				$\frac{12}{100} = \frac{12 \div 4}{100 \div 4} = \frac{3}{25}$	Reduce the fraction by dividing the numerator and denominator by the common factor 4.
			Convert to decimal.	$12\% = \frac{12}{100} = 0.12$	You can also just move the decimal point in the whole number 12 two places to the left to get 0.12.
			Answer		

Example		
Problem	**Convert 0.75 to a percent and to a simplified fraction.**	
Convert to percent.	0.75 = 75%	Move the decimal point 2 places to the right and affix the % symbol.
Convert to fraction.	$0.75 = \frac{75}{100}$	To write 0.75 as a fraction, you read the decimal, 75 hundredths,

and in fraction form.

$$\frac{75}{100} = \frac{75 \div 25}{100 \div 25} = \frac{3}{4}$$

Reduce the fraction by dividing the numerator and denominator by 25, a common factor.

Answer

Example

Problem	**Convert $\frac{3}{5}$ to a decimal and to a percent.**	
Convert to decimal.	$\frac{3}{5} = 3 \div 5$ $5\overline{)3.0}\ .6$	Divide the numerator by the denominator. 3 ÷ 5 = 0.6.
Convert to percent.	0.6 = 60%	To write the decimal as a percent, move the decimal point 2 places to the right and affix the % symbol.

Answer

Example

Problem **Convert $1\frac{7}{8}$ to a decimal and to a percent.**

Convert to decimal.	$1\frac{7}{8} = 1 + \frac{7}{8}$	Write the mixed fraction as 1 plus the fractional part.
	$\frac{7}{8} = 7 \div 8 = 8\overline{)7.000}^{.875}$	Write the fractional part as a decimal by dividing the numerator by the denominator. 7 ÷ 8 = 0.875.
	1 + 0.875 = 1.875	Add 1 and the decimal number.
Convert to percent.	1.875 = 187.5%	Move the decimal point 2 places to the right and add the % symbol.

Answer

Example

Problem **Convert 275% to a decimal and to a simplified fraction.**

		Convert to decimal.	275% = 2.75	Move the decimal point 2 places to the left and drop the % symbol.
		Convert to fraction (mixed number)	2.75 = 2 + 0.75	Write the decimal as a sum of the whole number and the fractional part.
			$0.75 = \frac{75}{100}$	Write the decimal part as a fraction.
			$\frac{75}{100} = \frac{75 \div 25}{100 \div 25} = \frac{3}{4}$	Reduce the fraction by dividing the numerator and denominator by a common factor of 25.
			$2 + \frac{3}{4} = 2\frac{3}{4}$	Add the whole number part to the fraction.
		Answer		

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