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SAMPLE LESSON: MATHEMATICS

Class: Form 2

Title of Module: Elementary Statistics and Probability

Title of Chapter: Probability

Title of Lesson: Introducing Probability

Duration of Lesson: 55 minutes



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SCHOOL: TTP COP;

TERM: 2nd ;

DATE -----

Class: Form 2; Number on Roll: _____; Girls: _____; Boys: _____

Module: Elementary Statistics and Probability

Topic: Probability

Lesson 1: Introducing Probability;

Duration: 60 mins

Objectives:

Be able to:

- Master some vocabularies (Probability, events, impossible events, Certain, Likely, Unlikely, fair, bias, Outcome, sample space, equally likely).
- List all possible outcomes (sample space) for a given event;
- Place events on a probability scale based on the likelihood of the event happening

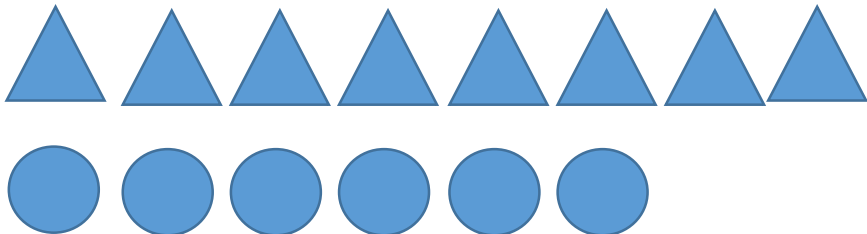
Rationale: Probability is meant to assist us to better understand situations where we are called upon to make prediction. We can cite many such situations; doctors may want to establish risks of a disease in a medical research, gamblers may wish to establish chances of winning a lottery, those in the Insurance business may be interested in calculating life expectancy for actuarial purposes etc. We may wish to predict the outcome after a game e.g. tossing a coin, playing cards, rolling dice etc. Probability helps us make predictions in such cases.

Probability is very much applicable in our day-to-day lives. Terms commonly used that are associated with probability are many some of which are: **chance, certain, uncertain, good chance, poor chance, likely, unlikely, fair, biased, might, may be, impossible, possible, probable, sure, not sure, definitely** among others. Each of these vocabularies will be introduced and learned gradually throughout the topic, whenever possible.

Preparation for the 3 lessons on probability for this class:

1. Games prepared (If you intend to use a game)
2. Gather Materials such as:

Coins of 50frs and 100frs As many as you can provide. (If your students are not to be trusted, tell them the day before that they will need coins during the next lesson. They will therefore bring)	 
Dice Bring dice according to number of groups	  
Buttons of different colours. Buy buttons of different colours. Make small bags and put them in before coming to class. These can be used for different activities over the years	

Cut shapes such as these		
Create spinners from manilla papers and colour the sectors or number them		
Photocopy Worksheets according to intended number of groups		

3. Read through lesson plan and print out if necessary
4. Type and print out problem situation OR write out on cardboard paper (large characters) that will be posted on the wall for all to see.

References:

1. <https://www.bing.com/search?q=spinner+for+games&form=EDNTHT&mkt=en-us&httpsmsn=1&refig=e7060f073dc1451dbcbaa690e12e2ec2&sp=2&q=HS&pq=sp&sk=HS1&sc=8-2&cvid=e7060f073dc1451dbcbaa690e12e2ec2&cc=US&setlang=en-US>
2. <https://www.onlinemathlearning.com/probability-of-an-event.html>
3. https://www.mathsisfun.com/probability_line.html
4. Modular Mathematics for GCSE, *Brain Gaultier and Leslye Buchanan*, (1994) Oxford University Press
5. Mathematics 7, Nelson Thornes (2003)
6. Ordinary Level Mathematics, Piankeh Albert, (2011), Mbosso Publishers Bamenda

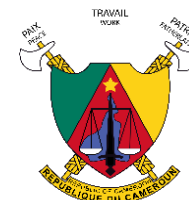


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Stages / Duration	Teaching / Learning Activities		Learning Points	Observations
	Teacher's Activities	Learners' activities		
Introduction 5 mins	Greetings students, today we are starting something new. Ask 2 students to say what each of them predicted on this day. "Whether you their maths teacher will come late or not and why" Introduction: Whether you like it or not, you are a fortune teller of a sort. How? Every day, you are constantly predicting what will happen. We also make choices in life. What do we base our decision to choose on? Ask the learners these questions. -With 200frs given to you by your parents for your food during break, you choose what to buy. What will you base you choice on? - A farmer will decide to plant either in March or April or May. Why -Someone who cooks food and sells will decide on what food to prepare more based on what?	Get to order for the lesson Students individually give their opinions based on their reasoning. Learners volunteer to respond or give their reflection	Students copy what is here in their note books What do you base your prediction on? The two students above based their prediction on what they have observed about their teacher coming late or on time. Your choice of what to buy with 200frs is based on - A farmer will decide to plant either in March or April or May. Why? The farmer's decision on which month to plant is based on when he thinks there will be rain or/and on past harvest. Someone who cooks food and sells will decide on what food to prepare more based on what? The food seller will cook more of what most people buy to eat. So, in life, you choose and choose and choose and every choice is a prediction of how likely you think an event or series of events is to happen. The measurement of how likely it is for something to happen is call PROBABILITY	Pay attention to students' spoken language and correct along Encourage learners to use vocabularies being introduced at each stage correctly



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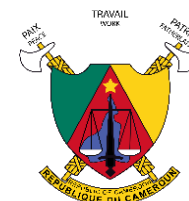


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	Wrap up this part by asking the questions and saying: So, in life, you choose and choose and choose and every choice is a prediction of how likely you think an event or series of events is to happen. We can actually measure how likely it is for something to happen, and that measurement is call PROBABILITY Then write the Topic Probability on the board and the title of the lesson for the day	Learners copy the learning point in their note books Students copy this last part of the introduction into their note books	You use probability in daily life to make decisions when you don't know for sure what the outcome will be. The study of probability is a useful and interesting branch of mathematics. In our daily lives, we encounter situations where decisions are to be made using past experiences. Probability is also applied when making decisions in business, games of chance etc.	
Problem Situation Wrong choice 5 mins	Listen to this real life situation and reflect on the scenario. Call out a student to read to others. Joan and Joel are twins and usually walk each day to school. They are each given 500frs each day for food in school. This morning, because they watched a late football match, they got up late and left the house late and without having breakfast. Joan used part of her 500frs to take a taxi to school and Joel trekked as usual. Joel	Learners reflect on the problem situation. They discuss among themselves	We make choices in life and at times these choices could be good or bad based on what we want. At times we even regret about our decision. However, if choices are made based on past experiences, most of the time the decisions taken are most likely going to be the better or best.	Allow learners sufficient time to reflect and think on this Problem situation Caution and focus learners



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	got to school late and missed the first lesson and was punished. During break, Joan came begging to share in Joel's food because she did not have enough money. -Why did Joan take a taxi to school? -What was the consequence of Joan using part of her food money? -What was the consequence on Joel's decision not to take a taxi? -What were their decisions based on?		Therefore, knowing or estimating the probability or likelihood or the chance of an event helps in making worthwhile decisions.	so that they do not go out of control or make statements that can hurt one of them in class.
Activity 1: Tossing a coin 15 mins	Define the different faces of the coin with the students. Agree with the students on which face is the head and which face is the tail. Put students in groups according to their sitting positions in class so that much time is not wasted during the lesson. Distribute copies of worksheets to groups and invite groups to follow the instructions on the worksheet: You are given a coin, throw it up and let it fall freely (allow other members of the group to also toss the coin). 1. Toss the coin five times.	Learners carry out the activity	When a coin is tossed, the rest positions are either a Head or a Tail Tossing a coin is an Event The head or a tail appearing is an Outcome The possible results of an experiment or result of an event is an Outcome. The event of tossing a coin has 2 possible outcomes.	While groups are working observe the groups to

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	2. What are the possible “rest” positions of the coin? 3. Toss the coin 20 times and record your observation in the table below. Let your observation be the face facing up or the face you are seeing. <table><tr><td>No of throw</td><td>1</td><td>2</td><td>3</td><td>4</td><td>....</td></tr><tr><td>Outcome</td><td></td><td></td><td></td><td></td><td></td></tr></table> 4. How many times has each rest position appeared? 5. You are to toss the coin the 21st time. Do you know which face will show? Why? Why not? Wrap up activity 1 bridging the different vocabs in context. A head can appear as a tail can equally appear. So each of the outcomes has the same chance of happening. The event of throwing a head or throwing a tail are said to be EQUALLY LIKELY events. It can also be said, the events have Even chance of happening	No of throw	1	2	3	4		Outcome							Having a head or a tail when a coin is tossed is an outcome. Other Examples: 2. Rolling a die is an event and having a face that shows a given number of dots is an outcome. 3. Choosing a letter from the English alphabet is an Event and having a vowel or a consonant is an outcome. 4. Having an even or an odd number when a number is selected is an outcome. 5. Having a baby boy or a baby girl at each delivery is an outcome. When a coin is tossed, it is possible to have either a Head or a Tail At each toss, any of the faces can show up. Thus, the event of tossing and having a head or tossing and having a tail are EQUALLY LIKELY events because they have the same or Even chance of appearing. The possible outcomes for tossing a coin are: Head, Tail. This set of possible outcomes can be written as {Head; Tail} or simply (H; T) This set is called the SAMPLE SPACE.	focus learners not only to enjoy the fun but to reflect on and attach meaning to what they are doing to.
No of throw	1	2	3	4												
Outcome																



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	The possible outcomes for tossing a coin are: Head, Tail. This set of possible outcomes can be written as {Head; Tail} or simply (H; T) This set is called the SAMPLE SPACE .		Vocabularies learned: Probability, Event, Outcome, Equally Likely events, even chance, Sample space.	
Activity 2: Rolling a dice	Give each group a die. Tell them it is the normal die used in playing games such as snakes and ladder, monopoly, ludo etc. Tell the students to roll the dice once. Ask each group the following questions: 1. What is the number of dots that is on the face your group is seeing? 2. How many possible rest positions are there? 3. Copy and finish this list of possible outcomes: 1, 2, __, __, __, __. 4. Which of the faces is more likely to show up? Why? 5. Give the sample space for rolling a dice 6. How many times can we have a face showing letter A? 7. How many times can we have the face showing an egg? 8. Now consider that the dice has 3 dots on all the faces. At each rolling of the die, What will the outcome be? Say whether each of the following is an Impossible event or an event that is Certain:		The event of rolling a dice and having a face with either 1 or 2 or 3 or 4 or 5 or 6 dots are equally likely events. 1. Each group gives what they see. 2. There are 6 possible rest position, 3. Possible outcomes are: 1, 2, 3, 4, 5, 6 4. None of the faces is most likely to show up because the events are equally likely. 5. Sample space for a dice is: {1, 2, 3, 4, 5, 6} 6. No face of the die is having letter A on it So the event of having letter A is an impossible event because no matter how many times we roll this die, we will not have letter A. 7. No face has an egg on it so no matter how many times the dice is rolled, we can never have an egg. It is therefore also an Impossible event . 8. If all the faces of the die have 3 dots, the event of having a 3 at each throw is Certain . No matter how many times we roll the die, we will always have a face with 3 dots.	Ensure that members of each group take turns to roll the dice. You could use a bag with buttons of two different colours to bring it impossible events, most likely, less likely and Certain events you could use a bag with some geometrical shapes or with fruits.



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Use of more Vocabularies: Less Likely, More likely,	Wrap up activity 1 and activity 2 The coin in activity 1 and the dice in activity 2 are considered to be fair and not biased. That is the possibility of having one face is the same as the possibility of having the other face. The events of having any of the outcomes are therefore equally likely events and have an Even Chance of occurring. Here are some statements for your reflection. In your groups discuss the following statements using the words likely, impossible, and certain, more likely or less likely or any other word. a) If you go to the school library you will see books b) It will rain every day for two years. c) If you roll a dice you will get a number less than 6 d) If you roll a dice you will get a number more than 6. e) Schools will be open on Christmas day. f) If you roll a dice you will have an even number. g) Selecting at random a girl in a classroom of 50 girls and 20 boys h) Selecting at random a girl in a classroom of 05 girls and 40 boys. i) Charlotte puts 10 red, 3 black and 5 yellow buttons in a bag. She takes out one button without	Learners get into groups. Learners discuss the different situations presented	The events of having any of the outcomes are therefore equally likely events and have an Even Chance of occurring. a) If you go to the school library you will see books. It is certain b) It will rain every day for two years. It is Impossible c) If you roll a dice you will get a number less than 6. It is likely to happen d) If you roll a dice you will get a number more than 6. Impossible e) Schools will be open on Christmas day. Impossible f) If you roll a dice you will have an even number. It is likely g) Selecting a girl in a classroom of 50 girls and 20 boys. More likely h) Selecting a girl in a classroom of 05 girls and 40 boys. Less likely i) The red button is more likely to come out because they are more in number than the other colours. The black buttons are less likely to come out because they are few.	Encourage learners to make statements using these words Give learners sufficient time to think and discuss Could also use a practical activity introducing the notions of More Likely, Less Likely, impossible or Certain events. Could use buttons of

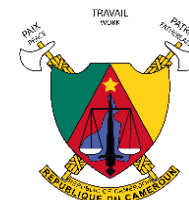


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	looking. Which colour of button is she more likely to get? Why? Which colour of button is she less likely to get? Why? j) The next car you will see coming will be on wheels. k) The day after Wednesday is Monday. l) The month after May is June.		j) The next car you will see coming will be on wheels. It is Certain k) The day after Wednesday is Monday. Impossible l) The month after May is June. Certain Some events are Certain, some are Impossible, some are Most likely and some are Less likely to happen depending on the condition.	different colours or different shapes in a bag.
Conclusion	The key Vocabularies learned today are Event, Outcome, equally Likely, even chance, fair, certain, bias, impossible, Sample Space, Probability of an event		Key Words: Probability' Event, Outcome, equally Likely, even chance, fair, certain, bias, impossible, Sample Space, Most likely, Less Likely, Probability of an event	introduce more vocabs as the lesson progresses.
Home Work	1. Say whether these events have an even chance of happening. a) Drawing a red card from a well shuffled pack of cards. b) Sany will get an even number when he rolls a dice. c) Janice will get a head when she tosses a coin. 2. Manyui puts 5 purple beads and 1 yellow beads in a bag. Manyui takes a bead without looking. a)What colour bead is she likely to get? b)Explain why	Copy Home work in their assignment books	1. a) even chance because we have 26 red cards and 26 black cards. b)even chance because we have 3 even numbers and 3 odd numbers c)even chance 2. a) Manyui is more likely to get the a purple bead b) Because there are more purple beads than yellow beads.	