The Sutton Academy

Knowledge Rich Curriculum Plan

Year 10 Foundation – Probability

Lesson	Intended Knowledge:	Tiered Vocabulary	Prior Knowledge:	Steps to Success:	Feedback
To learn how to describe and represent probabilities.	• Students will know how to distinguish between events which are impossible, unlikely, even chance, likely, and certain to occur. • Students will know that impossible is represented by 0, even chance by 0.5 and certain by 1. • Students will know how to accurately represent probabilities on a 0-1 probability scale. For example the probability of throwing a head on a fair coin is 0.5 and is represented in the middle of the number line. • Students will know how to represent an approximate probability on a probability scale. • Students will know how to write probabilities in words or fractions, decimals and percentages; for example unlikely can be represented as 25%, 0.25 and ¼ • Students will know how to find the probability of an event. • Students will know the probability of an event is $\frac{number\ of\ events}{number\ of\ possible\ outcomes}$	**Probability** - the extent to which an event is likely to occur **Cultural capital**	• Students need to know how to express one number as a fraction of another.	**Steps to Success – Probability of an event** **Step 1:** Identify the number of times the particular event can happen. **Step 2:** Identify the total number of possible outcomes. **Step 3:** Use the formula below to calculate the probability of the event happening. $\text{Probability of an event happening} = \frac{\text{Number of ways it can happen}}{\text{Total number of outcomes}}$ ***N.B*** *DO NOT simplify any fractions!*	
To learn how to complete probability tables and find expected frequency.	• Students will know how to calculate a missing probability from a list or table. • Students will know how to calculate two equal missing probabilities from a list or table. • Students will know how to use relative frequency to estimate the number of times an event will occur, for both experimental and theoretical probabilities. • Students will know how to use the 'OR' rule to determine the probability of one or more outcomes and will know how to use this to find an estimate for the number of times an event occurs. **Opportunity for challenge:** • Students will know how to calculate a missing probability from a list or table where algebra is used or the probability of one event is two/three times the probability of another.	**Expected Frequency –** the number of times an event may occur on average given a number of attempts	• Students need to know how to add decimals. • Students need to know how to subtract a decimal from 1. • Students need to know how to multiply a decimal by an integer.	**Steps to Success - Probabilities tables** **Step 1:** Add up all the given probabilities. **Step 2:** Subtract your total probability from1. **Steps to Success – Expected Frequency** **Step 1:** Highlight the probability of the event you need. **Step 2:** Multiply this probability to the number of trials given in the question.	
To learn how to list all the outcomes for events and use a sample space diagram.	• Students will know how to list all the outcomes for events systematically. • Students will know how to list all the outcomes for an event and use their list to find the probabilities of certain events. • Students will know how to construct and use sample space diagrams to find probabilities.	**Systematically –** to approach a problem in a methodical, organized and logical way by following a clear pattern **Sample space** – a way to organise all possible outcomes of an event	• Students need to know how to find the probability of an event.	**Steps to Success – Listing Outcomes** **Step 1:** Record all the outcomes for one of the objects. In the example of a single dice this would be 1,2,3,4,5 and 6. **Step 2:** With each outcome for the first object, record one of the outcomes for the second object. If the second item was a coin then the example outcomes could now say 1H, 2H, 3H, 4H, 5H and 6H. **Step 3:** Repeat the list of outcomes for all the **alternative** outcomes from the second object.	
To learn how to draw, complete and use two-way tables.	• Students will know how to complete a two-way table with a given list of information. • Students will know how to design and complete a two-way table from a given list of information. • Students will know how to calculate probabilities from a two-way table.	**Two-Way Table –** a way to display frequencies for two categorical variables **Cultural capital**	• Students need to know how to add and subtract using the column method. • Students need to know how to find the probability of an event.	**Steps to Success – Two-way tables** **Step 1:** Fill in any information that you know, some information may already be completed for you. **Step 2:** Complete calculations (addition/subtraction) to find the missing values. Target a row or column that has only one gap. **Step 3:** Check that all the rows and columns add to the correct totals. You may only need to check the total row and column for this. **Step 4:** If needed find the probability of the event using the formula: $\text{Probability of an event happening} = \frac{\text{Number of ways it can happen}}{\text{Total number of outcomes}}$	

Lesson	Intended Knowledge:	Tiered Vocabulary	Prior Knowledge:	Steps to Success:	Feedback
To learn how to complete and use frequency trees.	• Students will know how to complete a partially completed frequency tree. • Students will know how to fill in and complete a frequency tree with a given list of information. • Students will know how to calculate probabilities from a frequency tree.	**Frequency Tree –** a diagram used to show how a group of people/things can be broken up into certain categories **Cultural capital**	• Students need to know how to add and subtract using the column method. • Students need to know how to find the probability of an event.	**Steps to Success – Frequency trees** **Step 1:** Fill in any information that you know, some information may already be completed for you. **Step 2:** Complete calculations (addition/subtraction) to find the missing values. Target a branch that has only one gap. **Step 3:** Check that the final numbers in each branch add to the same value as the beginning of the frequency tree. **Step 4:** If needed find the probability of the event using the formula: $\text{Probability of an event happening} = \frac{\text{Number of ways it can happen}}{\text{Total number of outcomes}}$	
To learn how to draw, complete and use a probability tree diagram for independent events.	• Students will know how to show given information on a probability tree diagram. • Students will know that each set of branches add to 1. • Students will know construct a probability tree for two events. • Students will know how to write missing probabilities on a probability using both decimals and fractions. • Students will know how to use a probability tree diagram to find the outcome of two independent events. • Students will know how to use a probability tree diagram to calculate the probability when more than one possible outcome needed.	**Independent** – not subject to control by anything else **Independent Events** – when the occurrence of one event does not affect the chances of the occurrence of the other event **Cultural capital**	• Students will need to know how to multiply decimals and fractions.	**Steps to Success – Probability trees for independent events** **Step 1:** Draw your first branches, you need as many lines as there are outcomes for the event. **Step 2:** Write each of the different outcomes at the end of each of the branches. **Step 3:** Write the probabilities for each outcome on each of the branches. Remember the probabilities of all outcomes should add up to 1. **Step 4:** Draw out the branches for the next event and assign the probabilities in the same way. **Step 5:** Identify the outcome you want to find the probability of and list all the possible ways that the outcome can be achieved. **Step 6:** Calculate the probability for each way that it can be achieved by multiplying the probabilities on the branches. **Step 7:** If there was more than one way of achieving the outcome then add all the probabilities together once you have calculated them.	
To learn how to complete and use a Venn diagram.	• Students will know how to complete a partially completed Venn diagram • Students will know how to put information into a Venn diagram from a list of information. • Students will know how to use a Venn diagram to find the probability of an event.	**Venn Diagram** - a diagram representing mathematical or logical sets as circles within an enclosing rectangle (the universal set), common elements of the sets being represented by intersections of the circles. **Intersection** – A point, area or line that is common to two or more things. For a Venn diagram the intersection is the overlap between the two circles **Cultural capital**	• Students need to know how to sort simple information into a Venn diagram.	**Steps to Success – Venn diagrams** **Step 1:** Read the information carefully. Slightly different wording can change the entire question. **Step 2:** Start with filling in the overlap first. **Step 3:** Fill in the over parts of the circles. Be careful as you may need to subtract the value in the overlap away from the totals for the circle. **Step 4:** Find the value for the outside of the circles. You may need to add the values of the circles together and subtract them from the total amount given in the question.	
Exam Preparation 12					