Mathematics	Y10 Foundation	Chapter 13 (N5, P1, P2, P3, P4, P5, P6, P7, P8)	The Bigger Picture: Probability	Lessons 18

Essential Knowledge	Teaching Points
• Distinguish between events which are impossible, unlikely, even chance, likely, and certain to occur; • Mark events and/or probabilities on a probability scale of 0 to 1; • Write probabilities in words or fractions, decimals and percentages; • Find the probability of an event happening using theoretical probability; • Use theoretical models to include outcomes using dice, spinners, coins; • List all outcomes for single events systematically; • Work out probabilities from frequency tables; • Work out probabilities from two-way tables; • Record outcomes of probability experiments in tables; • Add simple probabilities; • Identify different mutually exclusive outcomes and know that the sum of the probabilities of all outcomes is 1; • Using 1 – p as the probability of an event not occurring where p is the probability of the event occurring; • Find a missing probability from a list or table including algebraic terms. • Find the probability of an event happening using relative frequency; • Estimate the number of times an event will occur, given the probability and the number of trials – for both experimental and theoretical probabilities; • List all outcomes for combined events systematically; • Use and draw sample space diagrams; • Work out probabilities from Venn diagrams to represent real-life situations and also 'abstract' sets of numbers/values; • Use union and intersection notation; • Compare experimental data and theoretical probabilities; • Compare relative frequencies from samples of different sizes; • Find the probability of successive events, such as several throws of a single dice; • Use tree diagrams to calculate the probability of two independent events; • Use tree diagrams to calculate the probability of two dependent events	• Use this as an opportunity for practical work. • Remind students probabilities written in fraction form should be cancelled to their simplest form • Emphasise the use of the 0–1 scale to measure probability. • Encourage students to write a list of all the outcomes for an experiment. • Make sure students know and apply the fact that the sum of probabilities for all outcomes is 1 • Probability without replacement is best illustrated visually and by initially working out probability 'with' replacement. • Encourage students to work 'across' the branches working out the probability of each successive event. The probability of the combinations of outcomes should = 1. • Emphasise that were an experiment repeated it will usually lead to different outcomes, and that increasing sample size generally leads to better estimates of probability and population characteristics.
Assumed Prior Knowledge/ Links / Interleaving	
• Students should know how to add and multiply fractions and decimals. • Students should have experience of expressing one number as a fraction of another number	

• Students should be able to convert between fractions, decimals and percentages • Students should be able to create a two way table and apply this knowledge to sample space diagrams	
Potential Barriers to Access /Misconceptions	**Opportunities for Reasoning/Problem Solving/Proofs**
• Not using fractions or decimals when working with probability trees • Not being able to express ratios as fractions • Students incorrectly multiply decimals eg 0.3 x 0.4 = 1.2 • Students incorrectly multiply fractions and find a common denominator instead • Students understanding of even chance is limited, if 3 options are given and they all have the same chance students often believe this is even as they are all the same	• If the probability of outcomes are x, $2x$, $4x$, $3x$ calculate x. • Calculate the probability of an event from a two-way table or frequency table. • Decide if a coin, spinner or game is fair • Students should be given the opportunity to justify the probability of events happening or not happening. • Lotteries provides a real life link to probability. Work out the probabilities of winning on different lotteries
Key Mathematical Vocabulary	Probability, dependent, independent, conditional, tree diagrams, sample space, outcomes, theoretical, relative frequency, fairness, experimental