

Maths Knowledge Organiser

Language

Probability	The likelihood/chance of something happening. Is expressed as a number between 0 (impossible) and 1 (certain). Can be expressed as a fraction, decimal, percentage or in words (likely, unlikely, even chance etc.)	
Probability Notation	P(A) refers to the probability that event A will occur.	P(Red Queen) refers to the probability of picking a Red Queen from a pack of cards.
Theoretical Probability	$\frac{\text{Number of Favourable Outcomes}}{\text{Total Number of Possible Outcomes}}$	Probability of rolling a 4 on a fair 6-sided die = $\frac{1}{6}$.
Relative Frequency	$\frac{\text{Number of Successful Trials}}{\text{Total Number of Trials}}$	A coin is flipped 50 times and lands on Tails 29 times. The relative frequency of getting Tails = $\frac{29}{50}$.
Expected Outcomes	To find the number of expected outcomes, multiply the probability by the number of trials.	The probability that a football team wins is 0.2 How many games would you expect them to win out of 40? $0.2 \times 40 = 8 \text{ games}$
Mutually Exclusive	Events are mutually exclusive if they cannot happen at the same time. The probabilities of an exhaustive set of mutually exclusive events adds up to 1.	Examples of mutually exclusive events: - Turning left and right - Heads and Tails on a coin Examples of non mutually exclusive events: - King and Hearts from a deck of cards, because you can pick the King of Hearts
Biased	Biased means that something is unfair. On a fair dice, the probability of getting each of the numbers is $\frac{1}{6}$.	On a biased dice, one number is more likely to come up than all of the rest. If $P(3) = \frac{4}{7}$ this would mean that it is a biased dice as you are more likely to land on a 3 than any other number.
Fair Dice	A fair dice is a normal 6 sided dice where each number has the same chance of being rolled	Possible outcomes: 1, 2, 3, 4, 5, 6
Pack of Cards	52 cards in a deck. 4 suits: Diamonds (red), Hearts (red), Spades (black) and Clubs (black) 13 cards per suit: 1 (ace), 2, 3, 4, 5, 6, 7, 8, 9, 10, Jack, Queen, King Number Cards: 1 – 10 Picture/Face Cards: Jacks, Queens and Kings	

Organisation

Frequency Tree	A diagram showing how information is categorised into various categories. The numbers at the ends of branches tells us how often something happened (frequency). The lines connected the numbers are called branches.	
Venn Diagrams	A Venn Diagram shows the relationship between a group of different things and how they overlap. You may be asked to shade Venn Diagrams as shown below and to the right.	
Probability Notation	P(A) refers to the probability that event A will occur. P(A') refers to the probability that event A will <u>not</u> occur. P(A ∪ B) refers to the probability that event A <u>or</u> B <u>or</u> both will occur. P(A ∩ B) refers to the probability that <u>both</u> events A and B will occur.	P(Red Queen) refers to the probability of picking a Red Queen from a pack of cards. P(Blue') refers to the probability that you do not pick Blue. P(Blonde ∪ Right Handed) refers to the probability that you pick someone who is Blonde or Right Handed or both. P(Blonde ∩ Right Handed) refers to the probability that you pick someone who is both Blonde and Right Handed.
Venn Diagram Notation	∈ means 'element of a set' (a value in the set) { } means the collection of values in the set. ξ means the 'universal set' (all the values to consider in the question) A' means 'not in set A' (called complement) A ∪ B means 'A or B or both' (called Union) A ∩ B means 'A and B (called Intersection)	Set A is the even numbers less than 10. A = {2, 4, 6, 8} Set B is the prime numbers less than 10. B = {2, 3, 5, 7} A ∪ B = {2, 3, 4, 5, 6, 7, 8} A ∩ B = {2}