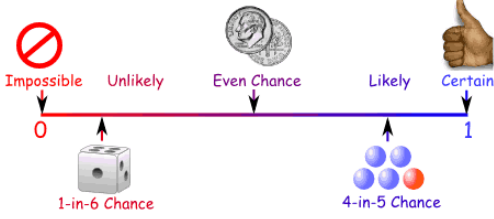


Topic: Probability

Topic/Skill	Definition/Tips	Example																																																	
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? $0.2 \times 40 = 8 \text{ games}$																																																	
Exhaustive	Outcomes are exhaustive if they cover the entire range of possible outcomes. The probabilities of an exhaustive set of outcomes adds up to 1.	When rolling a six-sided die, the outcomes 1, 2, 3, 4, 5 and 6 are exhaustive, because they cover all the possible outcomes.																																																	
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																																																	
Sample Space	The set of all possible outcomes of an experiment.	<table border="1" data-bbox="1043 1615 1369 1895"><tr><td>+</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr><tr><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr><tr><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr><tr><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr><tr><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td></tr><tr><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td></tr></table>	+	1	2	3	4	5	6	1	2	3	4	5	6	7	2	3	4	5	6	7	8	3	4	5	6	7	8	9	4	5	6	7	8	9	10	5	6	7	8	9	10	11	6	7	8	9	10	11	12
+	1	2	3	4	5	6																																													
1	2	3	4	5	6	7																																													
2	3	4	5	6	7	8																																													
3	4	5	6	7	8	9																																													
4	5	6	7	8	9	10																																													
5	6	7	8	9	10	11																																													
6	7	8	9	10	11	12																																													
Sample	A sample is a small selection of items from a population.	A sample could be selecting 10 students from a year group at school.																																																	

	A sample is biased if individuals or groups from the population are not represented in the sample.	
Sample Size	The larger a sample size, the closer those probabilities will be to the true probability.	A sample size of 100 gives a more reliable result than a sample size of 10.
Product Rule for Counting	If there are x ways of doing something and y ways of doing something else , then there are xy ways of performing both .	To choose one of $\{A, B, C\}$ and one of $\{X, Y\}$ means to choose one of $\{AX, AY, BX, BY, CX, CY\}$ The rule says that there are $3 \times 2 = 6$ choices.
Independent Events	The outcome of a previous event does not influence/affect the outcome of a second event .	An example of independent events could be <u>replacing</u> a counter in a bag after picking it.
Dependent Events	The outcome of a previous event does influence/affect the outcome of a second event .	An example of dependent events could be not replacing a counter in a bag after picking it. <u>'Without replacement'</u>
Probability Notation	P(A) refers to the probability that event A will occur . P(A') refers to the probability that event A will not occur . P(A $\cup$ B) refers to the probability that event A or B or both will occur . P(A $\cap$ B) refers to the probability that both 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 $\cup$ Right Handed) refers to the probability that you pick someone who is Blonde or Right Handed or both. P(Blonde $\cap$ Right Handed) refers to the probability that you pick someone who is both Blonde and Right Handed.
AND rule for Probability	When two events, A and B, are independent : $P(A \text{ and } B) = P(A) \times P(B)$	What is the probability of rolling a 4 and flipping a Tails? $P(4 \text{ and } Tails) = P(4) \times P(Tails)$ $= \frac{1}{6} \times \frac{1}{2} = \frac{1}{12}$
OR rule for Probability	When two events, A and B, are mutually exclusive : $P(A \text{ or } B) = P(A) + P(B)$	What is the probability of rolling a 2 or rolling a 5? $P(2 \text{ or } 5) = P(2) + P(5)$ $= \frac{1}{6} + \frac{1}{6} = \frac{2}{6} = \frac{1}{3}$

Where else is the Probability topic used: Data handling Ratio and proportion	Links to other subjects: Sciences
---	---

