

| Key Vocabulary | |
|-------------------------|---|
| Probability | The chance that a particular outcome of an event will occur. |
| Theoretical probability | Ratio worked out on reasoning $\frac{\text{number of wanted outcomes}}{\text{total number of outcomes}}$ |
| Event | A set of possible outcomes resulting from a particular experiment |
| Outcome | One of the possible results of a probability experiment |
| Impossible | Never going to happen |
| Unlikely | Not much chance of the event occurring |
| Evens chance | The same chance of occurring as not occurring |
| Likely | A good chance of occurring |
| Certain | Will definitely happen |
| Equally likely | All events have the same chance of occurring |
| Mutually exclusive | Two events which cannot happen at the same time |
| Experiment | The name given to any controlled, repeatable process. |
| Sample space | A term used in maths to mean all possible outcomes |

Key facts / Diagrams

0 0.25 0.5 0.75 1
 Impossible Unlikely Even chance Likely Certain
 $\frac{1}{4}$ $\frac{1}{2}$ $\frac{3}{4}$

- Probabilities always add up to one
- Probabilities can be written as a fraction, decimal or percentage

Probability Notation

What are the chances of picking a green circle?

$$\text{Probability (event)} = \frac{\text{Number of desired outcomes}}{\text{Total / Possible outcomes}}$$

Picking a green circle = $\frac{\text{Number of greens}}{\text{Total circles}}$

$$P(\text{green}) = \frac{4}{8} = \frac{1}{2} = 50\% = 0.5$$

Common misconceptions

- Some pupils will initially think that, for example, the probability of it raining tomorrow is $\frac{1}{2}$ as it either will or it won't.
- Some students may write a probability as odds (e.g. 1:6 or '1 to 6'). There is a difference between probability and odds, and therefore probabilities must only be written as fractions, decimals or percentages.
- Some pupils may think that, for example, if they flip a fair coin three times and obtain three heads, then it must be more than likely they will obtain a head next.

Worked examples

Each letter of the word "CALCULATION" is written on a card. If one card is drawn at random, write down the probability of it being:

a) "L" b) "T" c) a vowel d) "R"

a) $\frac{2}{11}$ b) $\frac{1}{11}$ c) $\frac{5}{11}$ d) 0 chance