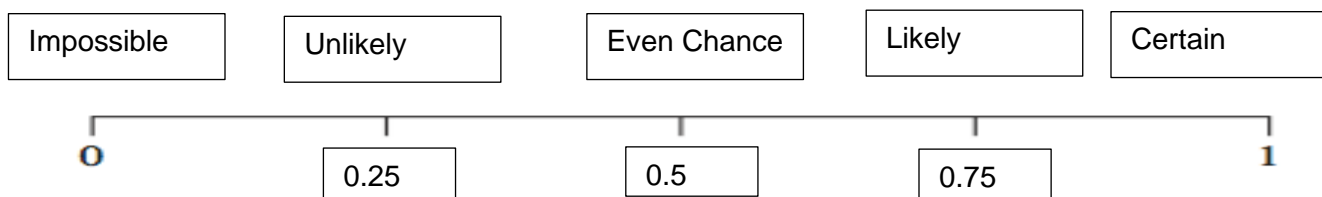


Year 9 Probability Knowledge Organiser

The probability scale



Probability of a single event



Probability = $\frac{\text{number of times event happens}}{\text{total number of possible outcomes}}$

$$P(\text{Blue}) = \frac{4}{10}$$

Probability notation P(event)

There are 4 blue sectors
There are 10 sectors overall

Probability can be a fraction, decimal or percentage value

$$\frac{4}{10} = \frac{40}{100} = 0.40 = 40\%$$

Sum of probabilities



$$P(\text{blue}) = \frac{1}{5}$$

$$P(\text{not blue}) = \frac{4}{5}$$

The sum of probabilities is

Dark	Milk	White
0.15	0.35	



The table shows the probability of selecting a type of chocolate

$$P(\text{white choc}) = 1 - 0.15 - 0.35 = 0.5$$

Probability from sample space diagrams: Sample space diagrams provide a systematic way to display outcomes from events



The possible outcomes from tossing a coin

The possible outcomes from rolling a dice

	1	2	3	4	5	6
H	1H	2H	3H	4H	5H	6H
T	1T	2T	3T	4T	5T	6T

What is the probability that an outcome has an even number and a tails?

$$P(\text{Even number and Tails}) = \frac{3}{12}$$

Numerator: the event

Denominator: the total number of outcomes

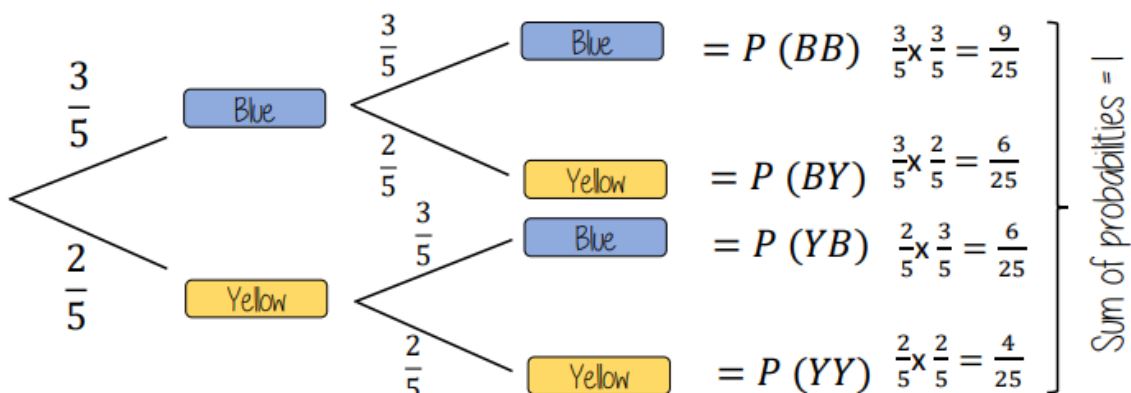
Independent events

The outcome of two events happening.
The outcome of the first event does not affect the outcome of the other event.

$$P(A \text{ and } B) \\ = P(A) \times P(B)$$

Tree diagram for independent trees

Zainab has a bag with 3 blue counters and 2 yellow counters. She picks a counter and replaces it before the second pick.



Relative frequency

$$\text{Relative Frequency} = \frac{\text{Frequency of event}}{\text{Total number of outcomes}}$$

Probability can be used to find **expected outcomes**.

Find the expected outcomes for green if there are 100 counters:

$$0.3 \times 100 = 30$$

Colour	Frequency	Relative Frequency
Green	6	0.3
Yellow	12	0.6
Blue	2	0.1
	20	