Year 7 Knowledge Organiser
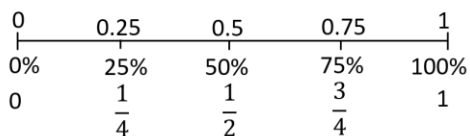# INTRODUCING PROBABILITY

Key Concept

Chance

Impossible — Unlikely — Even Chance — Likely — Certain

Probability

0	0.25	0.5	0.75	1
0%	25%	50%	75%	100%
0	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1
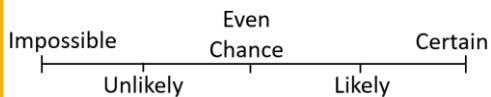
Probabilities can be written as:
- Fractions
- Decimals
- Percentages

Key Words
Probability: The chance of something happening as a numerical value.
Impossible: The outcome cannot happen.
Certain: The outcome will definitely happen.
Even chance: The are two different outcomes each with the same chance of happening.
Expectation: The amount of times you expect an outcome to happen based on probability.
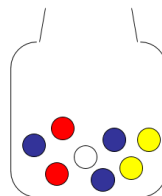
Examples

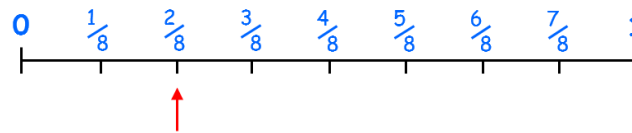1) What is the probability that a bead chosen will be **yellow**.
Show the answer on a number line.

$$Probability = \frac{Number\ of\ favourable\ outcomes}{Total\ number\ of\ outcomes}$$

$$P(Yellow) = \frac{2}{8} = \frac{1}{4}$$

0	$\frac{1}{8}$	$\frac{2}{8}$	$\frac{3}{8}$	$\frac{4}{8}$	$\frac{5}{8}$	$\frac{6}{8}$	$\frac{7}{8}$	1

2) How many **yellow** beads would you **expect** if you pulled a bead out and replaced it 40 times?

$$\frac{1}{4} \times 40 = \frac{1}{4} of\ 40 = 10$$

Tip
Probabilities always add up to 1.

Formula
Expectation = Probability × no. of trials
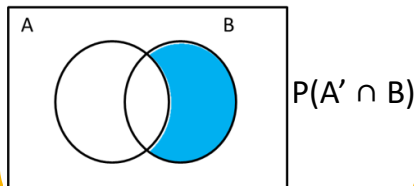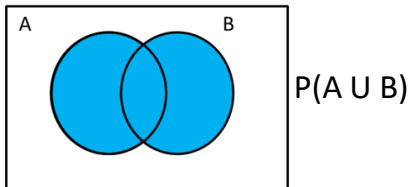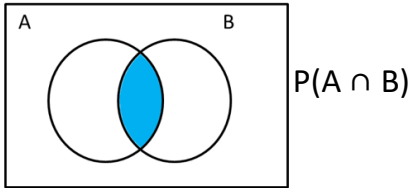
Questions
In a bag of skittles there are 12 red, 9 yellow, 6 blue and 3 purple left.
Find: a) P(Red) b) P(Yellow) c) P(Red or purple)   d) P(Green)

ANSWERS: 1) a) $\frac{12}{30} = \frac{2}{5}$ b) $\frac{9}{30} = \frac{3}{10}$ c) $\frac{15}{30} = \frac{1}{2}$ d) 0

Year 7 Knowledge Organiser
FURTHER PROBABILITY

Key Concept

P(A ∩ B)

P(A ∪ B)

P(A' ∩ B)

hegartymaths

359,360, 374-388, 422-424

Key Words

Probability: The chance of something happening as a numerical value.
Impossible: The outcome cannot happen.
Certain: The outcome will definitely happen.
Even chance: The are two different outcomes each with the same chance of happening.
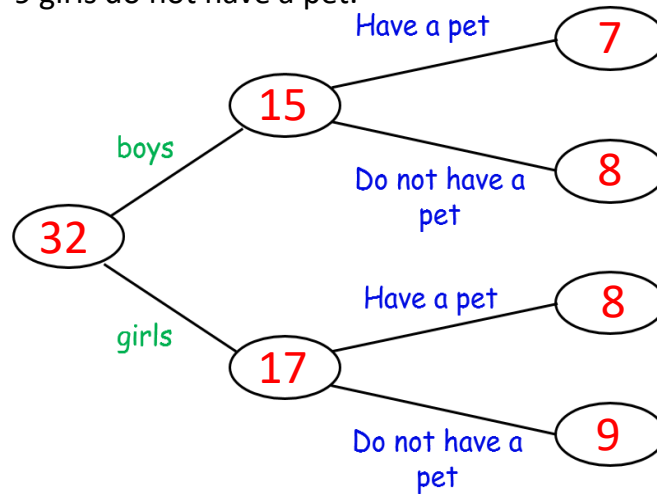**Mutually Exclusive:** Two events that cannot both occur at the same time.

Formula

$$P(A \cap B) = P(A) \times P(B)$$
$$P(A \cup B) = P(A) + P(B)$$
$$or \ (non \ ME) \quad P(A \cup B)$$
$$= P(A) + P(B) - P(A \cap B)$$

Examples

In Hannah's class there are 32 students.
15 of these students are boys.
7 of the boys have a pet.
9 girls do not have a pet.

$$P(boy) = \frac{15}{32}$$

$$P(Girl \ with \ pet) = \frac{8}{32}$$

Questions

1) Draw a two-way table for the question above.
2) Find the probability that a pupil chosen is a boy with no pets.
3) A girl is chosen, what is the probability she has a pet?

ANSWERS: 2) $\frac{8}{32}$ 3) $\frac{8}{17}$