

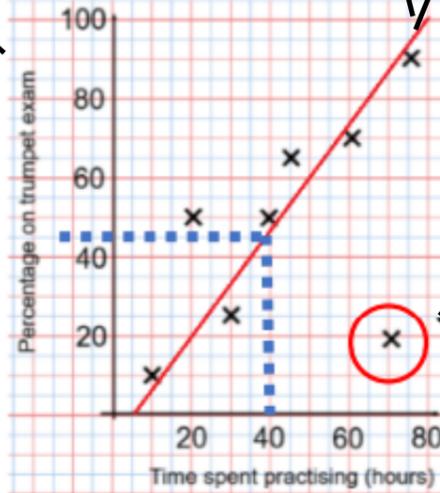
Year 8 Summer 2

KEYWORDS:

- Probability** The chance that something will happen
- Correlation** The mathematical definition for the type of relationship
- Interpolation** Using the line of best fit to estimate values INSIDE the
- Event** A set of outcomes of an experiment to which a probability is assigned
- Causality** When one variable influences another
- Relationship** The link between two variables
- Extrapolation** Using the line of best fit to predict an
- Variable** A quantity that may change within the context of the problem

Scatter graphs

LINE OF BEST FIT: This is used to make estimates about information in your scatter graph.



It does not need to go through every point or origin. The line goes all the way across the graph. Roughly the same number of points on both sides.

An **OUTLIER**. This is a point that does not fit the rest of the data.

All axes should always be labelled and fit all the values. Make sure the scale is equally spaced out.

Make sure to explain the link between the data verbally.

Video S8

Sample space diagrams

These diagrams provide a systematic way to record and display all outcomes from events.

Example:

This is a sample space that shows all outcomes from when a dice is rolled and a coin is flipped.

The possible outcomes of rolling a dice

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

The possible outcomes of flipping a coin

Video 126

Tree diagrams

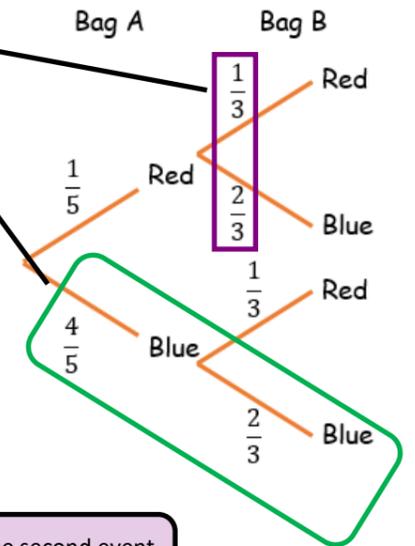
A way of recording the outcomes of multiple events and calculating their probability.

This tree shows **INDEPENDENT** events as bag B is not affected by the outcome of bag A

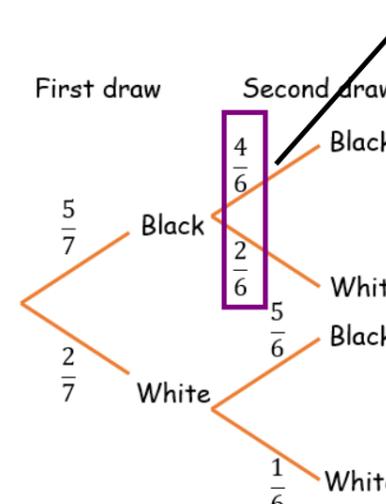
All outcomes of the same event should add up to 1.

Multiply along the branches to calculate the probability of those outcomes happening.

$$P(BB) = \frac{4}{5} \times \frac{2}{3} = \frac{8}{15}$$



This tree shows **DEPENDENT** events as the second event IS affected by the first (eg: not colour not replaced).



Again all outcomes of the same event should add up to 1.

Again multiply along the branches to calculate the probability of those outcomes happening.

$$BW = \frac{5}{7} \times \frac{2}{6} = \frac{10}{42}$$

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$$\text{so } P(\text{one B}) = \frac{10}{42} + \frac{10}{42} = \frac{20}{42}$$

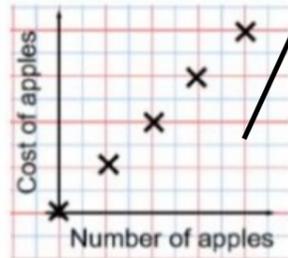
If there is more than one route, add the probabilities together.

Videos 57, 151 and 175

Correlation

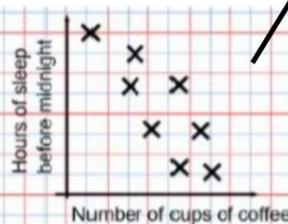
Positive correlation

As one variable increases so does the other variable.



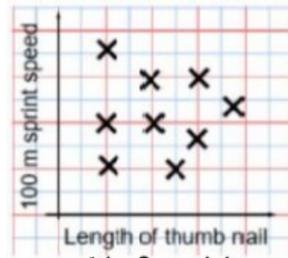
Negative correlation

As one variable increases the other variable decreases.



No correlation

There is no relationship between the two variables.



Video S8

Relative frequency/Experimental probability

This is calculated from the number of times an event happens divided by the total number of trials in an actual experiment.

$$\frac{\text{Number of Successful Trials}}{\text{Total Number of Trials}}$$

Outcomes	Heads	Tails	$P(\text{tails}) = \frac{29}{50}$
Number of times	21	29	

Not to be confused with theoretical probability that can be calculated from knowing all possible outcomes.

$$\frac{\text{Number of Favourable Outcomes}}{\text{Total Number of Possible Outcomes}}$$

Video P7

<https://vle.mathswatch.co.uk/vle/>

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