Probability part 1 – W/C 8th June 2020

Dear year 9,

I hope you are staying happy and healthy! ☺

*Thank you to everyone who has sent their reflection sheets over, it is incredibly important that you complete all tasks so I can see that you understand. I'm still waiting on a few so please ensure you catch up, fill in the form and send it back **ASAP**!*

As I explained last week, we have now started on your GCSE work and, although things are very different and challenging this year, we must push ahead as best we can! Its ever more important that you do not fall behind, the scheme of work is fast paced- the topics will not be taught again until we meet them on your GCSE paper revision next summer!

Firstly, please mark your answers from last week's task 1:

Task 1: Copy and complete the table below in your book:

Number of sides	Name	Sum of exterior angles	For Regular Polygons	
			Interior angle	Exterior Angle
n		(n – 2) x 180 ←	Sum ÷ n	360 ÷ n (or 180 - Int angle)
3	Triangle	180°	180 ÷ 3 = 60°	360 ÷3 = 120°
4	Quadrilateral	(4-2) x 180 = 360°	360 ÷ 4 = 90°	360 ÷4 = 90°
5	Pentagon	(5-2) x 180 = 540°	540 ÷ 5 = 108°	360 ÷5 = 72°
6	Hexagon	(6-2) x 180 = 720°	720 ÷ 6 = 120°	360 ÷6 = 60°
7	Heptagon	(7-2) x 180 = 900°	900 ÷ 7 = 128.6°	360 ÷7 = 51.4°
8	Octagon	(8-2) x 180 = 1080°	1080 ÷ 8 = 135°	360 ÷8 = 45°
10	Decagon	(9-2) x 180 = 1260°	1260 ÷ 9 = 140°	360 ÷9 = 40°

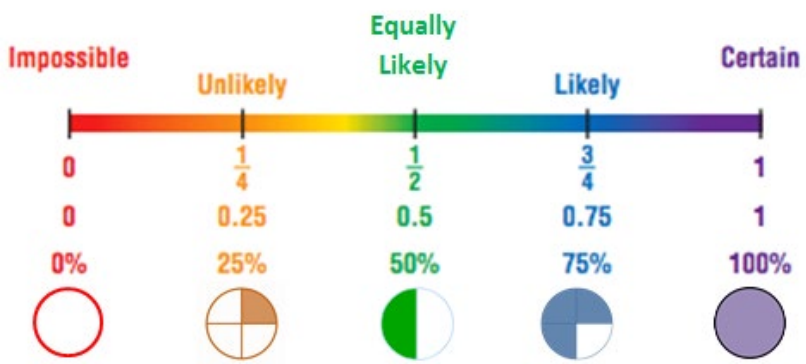
Remember that the interior and exterior angle always add up to 180°

Over the next couple of weeks, we will focus on **PROBABILITY.** You will have met some of the content in the summer term of year 8 but some things will be new.

Probability is the likelihood or chance of an event happening, written as P(event). You may hear probability described in words such as impossible, unlikely or certain but for GCSE we need to use numbers in the form or fractions, decimals and percentage.

Task 1: Copy the following key notes into your class books.

PROBABILITY SCALE:



Calculating probability

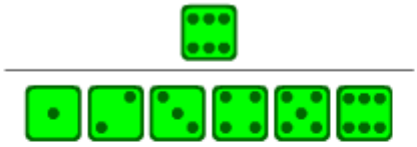
If the outcomes of an event are equally likely then we can calculate the probability using the formula:

$$\text{Probability of an event} = \frac{\text{Number of successful outcomes}}{\text{Total number of possible outcomes}}$$

For example, a bag contains 1 yellow, 3 green, 4 blue and 2 red marbles.

What is the probability of pulling a green marble from the bag without looking?

$P(\text{green}) = \frac{3}{10}$ or 0.3 or 30%

 • rolling a six		$\frac{1}{6}$
 • stopping on purple	$\frac{P}{P\ G\ B\ R\ Y}$	$\frac{1}{5}$

Now log on to Mymaths and work through the lesson AND linked homework: Probability Introduction.

Task 2:

? What is the probability that I could guess your birthday?

If you said 1/365 or 1/366 you would be correct ☺

With 365 days in a (non-leap) year, how likely is it that you will share a birthday with someone in your Maths class?

Watch the BBC Bitesize clip to explore this probability https://www.bbc.co.uk/bitesize/clips/z4hc87h

Interesting hey? Let's explore probability with two or more events. For example, if I roll two dice, what are the possible outcomes? How can I list these outcomes in a systematic way and how can I understand the probability of these different outcomes?

Please copy the key note below into your books.

Sample Space: is a list of all the possible outcomes from two different events that aren't mutually exclusive.

eg: Tossing 2 coins at the same time will give us different combinations of outcomes.

We use a Sample Space Diagram to list all the outcomes.

Coin 2 \ Coin 1	H	T
H	H H	T H
T	H T	T T

What is the probability of:
P(HH) = ¼

P(HT) = ½

eg: Tossing a coin and a dice.

Coin \ Dice	1	2	3	4	5	6
H	H 1	H 2	H 3	H 4	H 5	H 6
T	T 1	T 2	T 3	T 4	T 5	T 6

What is the probability of:
P(H,3) = $^{1}/_{12}$

P(T,Even) = $^{3}/_{12}$ = $^{1}/_{4}$

Log onto your portal on **Mymaths and complete the lesson and homework on Listing Outcomes**. You may choose to write some extra key notes / your workings into your orange class book.

Task 3:

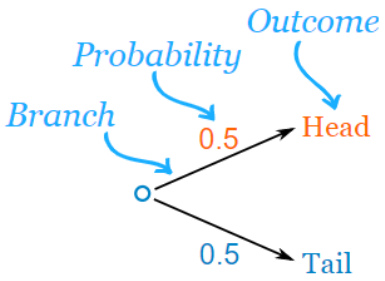
Another way to explore the probability of more than one event is by using tree diagrams. This is a new topic ☺ We firstly need to understand a key differentiation between DEPENDENT and INDEPENDENT events and MUTUALLY EXLUSIVE events. Please copy this key note into your book:

Independent events	**Events that do not affect or are not affected by another event or events. Each event has exactly the same probability.**
Dependent events	**Events that affect or are affected by another event or events.**
Mutually exclusive events	**Events that cannot happen at the same time. The probabilty for mutually exclusive events is 0.**

We can use tree diagrams to understand all of the possible outcomes and their associated probability for both independent and dependent (more challenging) events.

Please copy this key note into your book (on next page!):

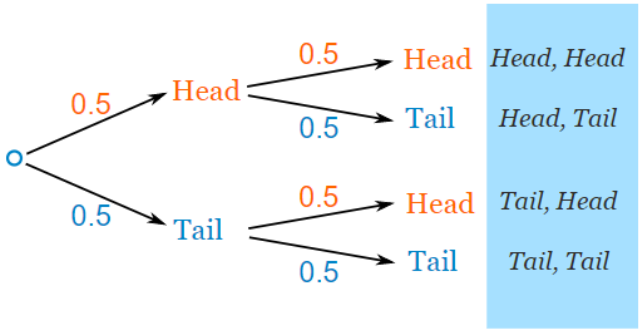
Here is a tree diagram for the toss of a coin:



There are two "branches" (Heads and Tails)

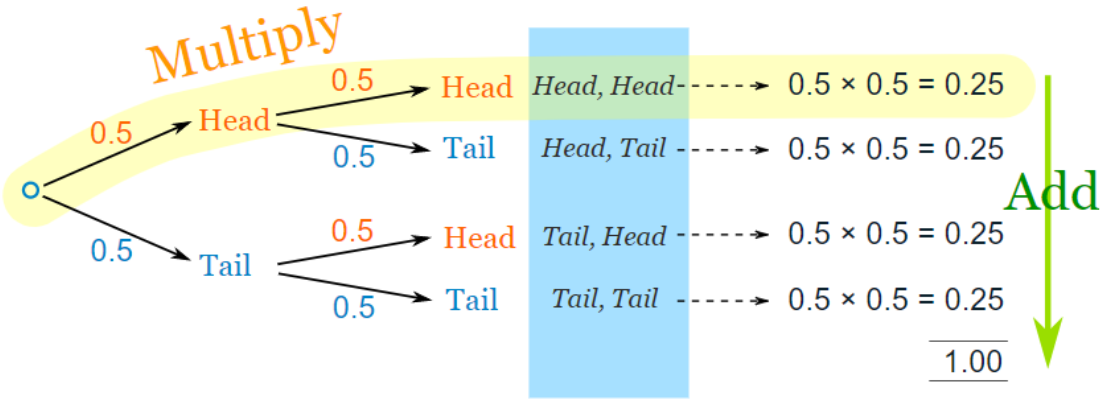
- The probability of each branch is written on the branch
- The outcome is written at the end of the branch

We can extend the tree diagram to two tosses of a coin:



How do we calculate the overall probabilities?

- We **multiply** probabilities **along the branches**
- We **add** probabilities down **columns**



Now we can see such things as:

- The probability of "Head, Head" is 0.5×0.5 = **0.25**
- All probabilities add to **1.0** (which is always a good check)
- The probability of getting at least one Head from two tosses is 0.25+0.25+0.25 = **0.75**

Now please log on to Mymaths and work through the lesson AND linked homework on Making Tree diagrams.

All three Mymaths tasks to be completed by Sunday 14th June with at least 70% accuracy please. As always, if you have any difficulty then please get in touch with me via e-mail.

Sending very best wishes to you all,

Mrs Todd ☺