Year 9 Maths: Topics 3,4&5
Money, Probability, 3D Shapes

Week 1

This week we are going to finish the Maths and Money topic from before half term. We will look at exchange rates for buying / selling abroad.

Exchange rates change money into a different currency using ratios.

E.g. If £1 = $1.20 and I want to work out £50 in $, I will multiply 1.20 by 50 = $60.

We will also learn about the taxes we have to pay on our wages such as income tax.

Tax is money paid to the government and will be calculated as a percentage and subtracted from the original amount.

We will also look at bulk buying products and working out the best buys when special offers are on. A good way of comparing them is to work out the price of one unit.

Week 2

Our next topic is probability. **Probability** is the chance of something happening. We will recap that we can write the probability of something happening as a fraction, decimal or percentage. Probabilities always add up to 1 or 100%.

We will go on to look at relative frequency.

Relative frequency = $\frac{Number\ of\ successful\ outcomes}{Total\ number\ of\ trials}$

Relative frequency can help you decide if the test was fair. The more trials you do the more accurate your answer will be.

We will also be calculating the **expected outcome** of an event. E.g. If I toss a coin 148 times how many tails would I expect to get?

Because the probability of getting a tail is $\frac{1}{2}$ we need to half 148, which is 74.

Week 3

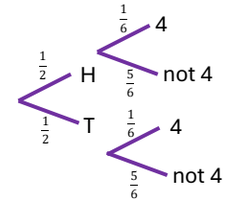
This week we will look at **independent events.** This is when the outcome of one event does not affect the outcome of the other. E.g. the probability of getting a 4 on a dice and a head on a coin.

P(both) = P(1st event) x P(2nd event)

We will learn to display the outcomes on a **tree diagram**. E.g.

$P(H\&4) = P(H) \times P(4)$

$P(H\&4) = \frac{1}{2} \times \frac{1}{6} = \frac{1}{12}$



We will also look at the probability of your name being drawn out of a hat when the names are not replaced using a tree diagram.

Week 4

We will start the topic off by checking we know the names of common 2D and 3D shapes. The D stands for dimensions.

We will also check our vocabulary

Vertices – corners of a shape

Faces – sides of the shape

Edges – join the vertices together

Prism – A 3D shape where the object is the same shape all the way along e.g. cylinder or cuboid.

We will look at nets of 3D shapes.

A **net** is what the shape would look like if it was opened up and laid flat.

We will look at **plans** and **elevations** which show what the object looks like from different angles.

Week 5

This week our focus turns to area. **Area** is the amount of space a shape takes up. We will recap how to find the area of 2D shapes.

Rectangle: Length x width

Triangle: $\frac{1}{2}$ ×base x height

Circle: πr^2

We will then use this to find the surface area of prisms. The **surface area** is the space needed to cover the outside of the shape.

We will work this out by finding the area of each face of a shape and adding them altogether.

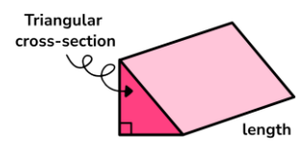
Area is measured in cm^2.

Week 6

This week we will look at volume. **Volume** is the amount of space inside a 3D shape. We will find the volume of prisms. To do this we find the area of the cross section and multiply it by the length.

V = area of cross section x length

The **cross section** is the end of the shape.



Volume is measured in cm^3

Higher learners will look at finding the volume of more complex shapes such as cones, pyramids and spheres.

E.g. Cone: $V = \frac{1}{3}\pi r^2 h$

Pyramid: V = $\frac{1}{3}$ × base area × height

Sphere: $V = \frac{4}{3}\pi r^3$

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Week 1

Questions	Answers
What do exchange rates convert?	They convert money into different currencies
What is currency?	Different types of money used around the world.
What is tax?	Money paid to the government.
What kind of tax do we have to pay on our wages?	Income tax
What is a good way of comparing special offers to work out the best value?	By working out the price of one unit.

Week 2

Questions	Answers
What is probability?	The chance of something happening or not happening.
What do all probabilities add up to?	1 or 100%
Why do we use relative frequency?	To see if the test is fair
How can we improve our accuracy when testing conjectures?	By completing more trials
What do expected outcomes tell us?	How many we would roughly expect to get if we carried out the test

Week 3

Questions	Answers
What are independent events?	When the outcome of one event does not affect the outcome of another.
How do you work out the probability of independent events?	P(both) = P(1st event) x P(2nd event)
What kind of diagram do we use to help us work out the probabilities?	A tree diagram
What is the probability of getting a head on a coin and a 6 on a dice?	$\frac{1}{12}$
Give an example of probabilities when it is not replaced	A raffle / names out of a hat.

Week 4

Questions	Answers
What does the D stand for in 2D and 3D?	Dimensions
What is the mathematical name for the corners of a shape?	Vertices
What are the faces of a shape?	The sides of the object
If an object is the same shape all the way along, what word can we use to describe it?	A prism
What is the net of a shape?	The shape unfolded and flattened out

Week 5

Questions	Answers
What is area?	The amount of space a shape takes up
How do you find the area of a triangle?	A= $\frac{1}{2}$ ×base x height
πr^2 is the area of which shape?	Circle
What is surface area?	The space needed to cover the outside of the shape.
How do you work out the surface area of an object?	Find the area of each face of the shape and add them together.

Week 6

Questions	Answers
What do we call the amount of space an object takes up?	Volume
How do you find the volume of a prism?	V = area of cross section x length
What does the cross section mean?	The end of the shape
What unit is volume measured in?	cm^3
How do you find the volume of a cone?	V= $\frac{1}{3}\pi r^2 h$