

# Maths - Foundation Tier

## Module 1

**Topic Title:** Algebra, Graphs and Transformations

**Brief Summary of Content Studied:**

Find the gradient of a line. Identify and interpret the gradient from an equation.

Understand that parallel lines have the same gradient. Understand what  $m$  and  $c$  represent in  $y = mx + c$ .

Find the equations of straight-line graphs. Sketch graphs given the values of  $m$  and  $c$ .

Draw and interpret graphs from real data.

Use distance–time graphs to solve problems.

Draw distance–time graphs.

Interpret rate of change graphs. Draw and interpret a range of graphs.

Understand when predictions are reliable.

Use a column vector to describe a translation.

Describe reflections on a coordinate grid.

Describe a rotation.

Identify the scale factor of an enlargement.

Find the centre of enlargement.

Describe an enlargement.

Transform shapes using more than one transformation.

Describe combined transformations of shapes on a grid.

**Knowledge Organiser:**

[https://docs.google.com/presentation/d/1N50\\_U8Z\\_WvZKLqNqq5cGENcEqVP4NRsCNLFfXxFVYZ4/edit?usp=sharing](https://docs.google.com/presentation/d/1N50_U8Z_WvZKLqNqq5cGENcEqVP4NRsCNLFfXxFVYZ4/edit?usp=sharing)

## Module 2

**Topic Title:** Ratio and Proportion

**Brief Summary of Content Studied:**

Use ratio notation. Solve problems using ratios. Use ratios to convert between units. Write and use ratios for shapes and their enlargements. Divide a quantity into 2 parts in a given ratio. Divide a quantity into 3 parts in a given ratio. Solve word problems using ratios. Use ratios involving decimals.

Compare ratios. Work out which product is better value for money

Understand the link between the unit ratio and the gradient.

Develop an understanding of the trigonometric ratios

Solve problems using trigonometric ratios in right-angled triangles

Calculate sides and angles using trigonometric ratios

**Knowledge Organiser:**

<https://docs.google.com/presentation/d/1gr-NZBAUPiJD8MYPyC1ZS-AU1z39wH-IUKkcmbGnID8/edit?usp=sharing>

# Maths - Foundation Tier

## Module 3

**Topic Title:** Probability

**Brief Summary of Content Studied:**

Calculate simple probabilities from equally likely events. Understand mutually exclusive and exhaustive outcomes. Use two-way tables to record the outcomes from two events. Work out probabilities from sample space diagrams. Find and interpret probabilities based on experimental data. Make predictions from experimental data.

Work out probabilities using tree diagrams. Understand independent events.

Understand when events are not independent. Solve probability problems involving events that are not independent.

## Module 4

**Topic Title:** Plans, elevations, accurate drawings and constructions

**Brief Summary of Content Studied:** Recognise 3D shapes and their properties. Describe 3D shapes using the correct mathematical words. Understand the 2D shapes that make up 3D objects. Identify and sketch planes of symmetry of 3D shapes. Understand and draw plans and elevations of 3D shapes.

Sketch 3D shapes based on their plans and elevations.

Make accurate drawings of triangles using a ruler, protractor and compasses.

Identify congruent triangles.

Draw diagrams to scale. Correctly interpret scales in real-life contexts.

Use scales on maps and diagrams to work out lengths and distances.

Know when to use exact measurements and estimations on scale drawings and maps.

Draw lengths and distances correctly on given scale drawings.

Accurately draw angles and 2D shapes using a ruler, protractor and compasses.

Construct a polygon inside a circle.

Recognise nets and make accurate drawings of nets of common 3D objects.

Draw accurately using rulers and compasses. Bisect angles and lines using rulers and compasses.

Draw loci for the path of points that follow a given rule. Identify regions bounded by loci to solve practical problems. Find and use three-figure bearings. Use angles at parallel lines to work out bearings.

# Maths - Foundation Tier

## Module 5

**Topic Title:** Circles and 3-D shapes

**Brief Summary of Content Studied:**

Calculate the circumference of a circle. Solve problems involving the circumference of a circle.

Calculate the circumference and radius of a circle. Work out percentage error intervals.

Work out the area of a circle. Work out the radius or diameter of a circle.

Solve problems involving the area of a circle.

Give answers in terms of  $\pi$ .

Understand and use maths language for circles and perimeters. Work out areas of semicircles and quarter circle and perimeters.

Solve problems involving sectors of circles.

Solve problems involving areas and perimeters of 2D shapes.

Work out the volume and surface area of cylinders.

Work out the volume of a pyramid. Work out the surface area of a pyramid.

Work out the volume and surface area of a sphere and cone.

Work out the volume and surface area of composite solids.

## Module 6

**Topic Title:** Percentages, growth and decay and distance, speed and time

**Brief Summary of Content Studied:**

Calculate a percentage profit or loss. Express a given number as a percentage of another in more complex situations. Find the original amount given the final amount after a percentage increase or decrease. Find an amount after repeated percentage change. Solve growth and decay problems.

Solve problems involving compound measures. Convert between metric speed measures. Calculate average speed, distance and time.

Use formulae to calculate speed and acceleration.