Year 9 Maths Learning Map

- TERM 1 -

Reasoning with Algebra

Straight line graphs

Students will study y =mx + c as the general form of the equation of a straight line, interpreting m and c in abstract and real-life contexts, and reducing to this form in simple cases.

Equations and inequalities

Students will explore rearranging formulae, seeing how this links to solving equations and reinforcing their understanding of the difference between equations, formulae, identities and expressions.

Testing conjectures

The opportunities of reasoning is encouraged through this block. We will revisit primes, factors and multiples, which provides a wealth of opportunity to make and test simple conjectures. You will test and create conjectures while looking at relationships in a 100 square and Pascal's triangle. Students will also develop their algebraic skills through developing chains of reasoning and learning how to expand a pair of binomials.

Constructing in 2 and 3 dimensions

Three dimensions shapes

We will revisit vocabulary associated with 3-d shapes and use practical equipment such as cubes, squared and isometric paper. As well as surface area and volume, students will also explore plans and elevations.

Construction and Congruency

We will look formally at the idea of locus and the standard constructions using a straight edge and a pair of compasses. This is a practical unit and is useful to explore loci using objects and rulers as well as the paper based approach.

- TERM 2 -

Reasoning with Number

Numbers

Students will develop their knowledge of the number system to include rational and real numbers, with the higher strand also looking at simple surds.

Using percentages

Students will look at 'reverse' percentage problems with higher attainers stretched by looking at repeated percentage change with the use of decimal multipliers.

Mathematics and money

Students practise their number skills in various financial contexts in this block. The language of financial mathematics, already covered in years 7 and 8, are further developed.

Simple ideas of tax and wages are introduced, and the percentages studied in the last block are applied in various contexts including simple and compound interest.

Reasoning with Geometry

Deduction

In this block students revise and extend their knowledge of angles rules and properties of shapes, applying them to increasingly complex problems. The block also builds on the ideas of the earlier 'Testing conjectures' block looking at deduction in a geometric rather than algebraic and numerical contexts. Students also revise the constructions covered in year 8 and look more deeply at how and why these work.

Rotation and Translation

Building on the study of line symmetry and reflection in year 8, students will now look at rotational symmetry and rotation. You will then move on to study translations, which are described in vector form. You also will compare the different effects of the transformations studied so far, noticing that the objects and images are congruent.

- TERM 3 -

Reasoning with Proportion

Enlargement and similarity

Students develop their knowledge of transformations to include enlargement, learning the mathematical meaning of the word similar, moving up to negative scale factors as appropriate. All students should experience finding unknown sides in the similar shapes and this can be extended to formal similar triangles problems and trigonometry in the 30/60/90 triangle.

Ratio and Proportion

Students formally study inverse proportion for the first time, and if following the higher strand you will look at graphs of inverse relationships.

Rates

You will use inverse relationships to explore speed, distance and time in detail. You will also look at graphs and the link between the speed/distance/time formulae and density/mass/volume. You will go on to explore other compound units including exploring flow problems such as how long it will take to fill/empty tanks of different shapes at different rates. Higher strand will look at converting metric and imperial conversions here.

Representations and Revision

Probability

You will use the multiplication rule to calculate independent events. You will look at diagrams such as sample space diagrams, Venn diagrams and two way tables. Tree diagrams, considering both with and without replacement, and included as higher steps.

Algebraic representation

Students extend their knowledge of graphs to look at interpretation and creation of different types of graphs. The first non-linear graph explored is the quadratic graph, where students are encouraged to look at the symmetry of the curve and read off x/y values. You will explore reciprocal and exponential graphs.

LINKS TO PRIOR LEARNING

This block builds on the year 8 content where students plotted simple straight line graphs. Students revisit and extend their knowledge of forming and solving linear equations and inequalities, including those related to different parts of the mathematics curriculum.
This will be the first time students will study 3-D shapes formally at KS3.
In this last block of construction it will build on the studied in year 7 and year 8 units.

LINKS TO PRIOR LEARNING

The numbers block provides plenty of opportunity for students to revisit and practice their number skills both with and without a calculator as necessary. Standard form and HCF/LCM are also revisited.
Building on the revision of fractions from the last block, students relate these to fractions and decimals, extending their learning from year 8.

LINKS TO PRIOR LEARNING

General trigonometry is introduced at the start of year 10. Building on students' experience in previous years, here they solve all types of ratio problems and make the links with direct proportion and graphs. You will also revisit 'Best Buys' comparing unit pricing from earlier in the year with alternative methods such as using scaling.
Students in the probability section will build on the year 7 and year 8 probabilities of single and combined events.