

## SDCC Mathematics Year 8

The KS3 Mathematics course has been developed to provide students with a strong grounding in the key knowledge and skills that they will need to be successful not only in their GCSE course but also in later life – in further and higher education and employment.

### Course Information

The Year 8 scheme of learning:

- Builds on the work done by students in Year 7
- Has algebra and geometry at the heart of it, with a strong focus on reasoning and problem-solving
- Provides students with the opportunity to work together as a whole group as they progress through the curriculum
- Extends higher attaining students by providing challenges to deepen their understanding rather than having them simply rush onto the next topic.

### Term One: Proportional Reasoning and Representations

#### Ratio and Scale

In this unit, students are introduced to ratio and use this to solve problems in a variety of contexts. Pi is then introduced as a ratio and used in calculations in circles.

#### Multiplicative Change

Students use their knowledge of ratio and link this to proportion and scale factors to solve problems in direct proportion. There are links to currency conversion and scale diagrams, including maps.

#### Multiplying and Dividing Fractions

This unit builds on prior knowledge of fractions and introduces the reciprocal to allow students to perform additional operations with fractions. Some students develop this further by performing operations on algebraic fractions.

#### Working in the Cartesian Plane

Straight line graphs are revised and used to develop understanding of equations of straight lines and graphs of direct proportion. Students will also use graphs to model different situations. Some students will look further at non-linear graphs and mid-points of line segments.

#### Representing Data

The work on graphs is developed to introduce scatter graphs and correlation to students. Different types of data will be introduced and alternative ways of representing these such as two-way tables to find missing data.

#### Tables and Probability

Students will use sample spaces to list outcomes for one and two events and find the probabilities of these happening. Venn diagrams will also be developed to find the probability of events occurring.

### Term Two: Algebraic Techniques and Developing Number

#### Brackets, Equations and Inequalities

Students will develop their algebra skills by expanding and factorising single brackets. Brackets will then be introduced in equations and inequalities which students will solve. In addition to this, students will be forming their own expressions, formulae and identities to represent different situations.

#### Sequences

Sequences with more complex rules, including brackets and squared terms, will be introduced for students to generate.

#### Indices

Students will develop their understand of indices and simplify these by using index laws.

#### Fractions and Percentages

Percentage increase and decrease will be evaluated and linked to decimals to allow students to use percentage multipliers to solve percentage problems.

#### Standard Index Form

Students will learn how to convert between numbers in standard form and ordinary numbers. This will develop into comparing and calculating with numbers in standard form.

#### Number Sense

Students will develop their mental strategies, including estimating and rounding calculations. Some students will develop this further to include error intervals.

### Term Three: Developing Geometry and Reasoning with Data

#### Angles in Parallel Lines and Polygons

The Year 7 angle rules will be developed to work out angles in special quadrilaterals and to introduce proof of geometric facts.

#### Area of Trapezia and Circles

Students will learn how to calculate the area of a trapezium, a circle, and parts of a circle. This will develop into the area of compound shapes.

#### Line Symmetry and Reflection

Line symmetry will be revisited and used to reflect shapes in horizontal, vertical and diagonal lines.

#### The Data Handling Cycle

Students will collect and represent data in statistical diagrams, including dual bar charts, pie charts, and histograms.

#### Measures of Location

The distribution of data and how to represent this using the appropriate average, including grouped data will be looked at in detail. Some students will find unknown values using the mean or changes in the mean.

## Assessment

Informal assessment is ongoing in Mathematics and it informs our lesson planning.

We also assess students' progress more formally, using written assessment. These are scheduled for:

- Week beginning 2<sup>nd</sup> December 2019
- Week beginning 16<sup>th</sup> March 2020
- Week beginning 29<sup>th</sup> June 2020


## How will we be learning?

Our aim is that teaching is student led using inquiry and investigation to develop reasoning and problem-solving skills to foster independent learners with a passion for maths. We endeavour to develop the intellectual maturity of our students to enable them to take risks and overcome the challenges that they encounter.

Home learning is set weekly to consolidate and extend the learning in class and this is completely personalised to every student by using Sparx. Students will be introduced to Sparx in their maths lessons and additional support is available at homework club.

## Try this at home

In addition to the home learning set on Sparx, you may like to try the following;

-  **MyMaths**: Use booster packs to enhance your progress. We recommend times table boosters, four boosters and five boosters, and six boosters. Ask your teacher which is most suitable.
- **Practise basic skills** regularly. It's important that you know your times tables from 1 to 12, and related division facts. E.g. if you know  $12 \times 7 = 84$ , then what is  $84 \div 12$ ?
- **Use maths in real life**: Take any opportunity to discuss the maths that is around you. What are the actual chances of winning the lottery? If it takes 4 hrs and 12 minutes to fly from London to Istanbul, what must the average speed be? Is it cheaper to drive or take the train to London?
- **Extend your learning further**: There are lots of problems to solve on nrich website <https://nrich.maths.org/8516>. Alternatively, why not try a Junior Maths Challenge paper <https://www.ukmt.org.uk/individual-competitions/junior-challenge/>