

# Year 10 Foundation +/- Higher Learning map



|               |  |                      |                             |  |                               |                        |
|---------------|--|----------------------|-----------------------------|--|-------------------------------|------------------------|
| <b>Autumn</b> | <b>Similarity</b>                              |                      |                             | <b>Developing Algebra</b>                            |                               |                        |
|               | Congruence, similarity and enlargement         |                      | Pythagoras and trigonometry | Representing solutions of equations and inequalities |                               | Simultaneous equations |
| <b>Spring</b> | <b>geometry</b>                                |                      |                             | <b>Proportions and Proportional change</b>           |                               |                        |
|               | Angles and bearings                            | Working with circles | Vectors                     | Ratios and fractions                                 | Percentages and interest      | Probability            |
| <b>Summer</b> | <b>Delving into data</b>                       |                      |                             | <b>Using number</b>                                  |                               |                        |
|               | Collecting, representing and interpreting data |                      |                             | Non-calculator methods                               | Types of number and sequences | Indices and roots      |

# Year 10 Foundation +/- Higher Autumn Learning map

## Similarity



| Congruence, Similarity and Enlargement   | Trigonometry  |
|--|---|
| <ul style="list-style-type: none"> <li>• <b>Enlarge a shape by a positive and fractional scale factor</b></li> <li>• Identify similar shapes</li> <li>• <b>Work out missing sides and angles in a pair given similar shapes</b></li> <li>• Use parallel lines to work out missing angles</li> <li>• Establish a pair of triangles are similar</li> <li>• Understand the difference between similarity and congruence</li> <li>• Understand and use conditions for congruent triangles</li> </ul> | <ul style="list-style-type: none"> <li>• Explore ratio in similar right-angled triangles</li> <li>• Work fluently with the hypotenuse, opposite and adjacent</li> <li>• Use the tangent ratio to find missing side lengths</li> <li>• Use the sine and cosine ratio to find missing side lengths</li> <li>• Use the sine, cosine and tangent ratio to find missing angles</li> <li>• <b>Calculate sides in right-angles triangles using Pythagoras' theorem</b></li> <li>• Select the appropriate method to solve right-angled triangle problems</li> <li>• Work with key angles in right-angles triangles</li> </ul> |
| <ul style="list-style-type: none"> <li>• Enlarge a shape by a negative scale factor</li> <li>• Explore areas and volumes of similar shapes</li> <li>• Solve mixed problems involving similar shapes</li> <li>• Prove a pair of triangles are congruent</li> </ul>  | <ul style="list-style-type: none"> <li>• Use trigonometry in 3D shapes</li> <li>• Use the formula <math>\frac{1}{2}ab\sin c</math> to find the area of a triangle</li> <li>• Understand and use the sine and cosine rule to find missing lengths and angles</li> <li>• Choosing and using the sine and cosine rule</li> </ul>   |

# Year 10 Foundation +/ Higher Autumn Learning map

## Developing Algebra



| Representing Solutions of Equations and Inequalities   | Simultaneous Equations  |
|--|---|
| <ul style="list-style-type: none"> <li>• Understand the meaning of a solution</li> <li>• <b>Form and solve one-step and two-step equations and inequalities</b></li> <li>• Show solutions to inequalities on a number line</li> <li>• Interpret representations on number lines as inequalities</li> <li>• <b>Draw straight line graphs</b></li> <li>• Find solutions to equations using straight line graphs</li> <li>• <b>Form and solve equations with unknowns on both sides</b></li> <li>• Form and solve inequalities with unknowns on both sides</li> <li>• Form and solve more complex equations and inequalities</li> <li>• Solve quadratic equations by factorisation</li> </ul> | <ul style="list-style-type: none"> <li>• Understand that equations can have more than one solution</li> <li>• Determine whether a given <math>(x, y)</math> is a solution to a pair of linear simultaneous equations</li> <li>• Solve a pair of linear simultaneous equations by: substituting a known variable, substituting an expression, using graphs, subtracting equations, adding equations, adjusting one equation, adjusting both equations</li> <li>• <b>Use a given equation to derive related facts</b></li> <li>• Solve a pair of linear simultaneous equations by: adjusting one equation, adjusting both equations</li> <li>• Form and solve a pair of linear simultaneous equations from given information</li> </ul> |
| <ul style="list-style-type: none"> <li>• Represent solutions to inequalities using set notation</li> <li>• Represent solutions to single inequalities on a graph</li> <li>• Represent solutions to multiple inequalities on a graph</li> <li>• Solve quadratic inequalities in one variable</li> </ul>   | <ul style="list-style-type: none"> <li>• Determine whether a given <math>(x, y)</math> is a solution to both a linear and quadratic equation</li> <li>• Solve a pair of simultaneous equations (one linear, one quadratic) using graphs and algebraically</li> <li>• Solve a pair of simultaneous equations involving a third unknown</li> </ul>  |

# Year 10 Foundation +/- Higher Spring Learning map



## Geometry

| Angles and Bearings  | Working with Circles   | Vectors   |
|--|--|---|
| <ul style="list-style-type: none"> <li>• <b>Use cardinal directions and related angles</b></li> <li>• <b>Draw and interpret scale diagrams</b></li> <li>• Understand and represent bearings</li> <li>• Measure and read bearings</li> <li>• Make scale drawings using bearings</li> <li>• Calculate bearings using angle rules</li> <li>• Solve bearings problems using Pythagoras and trigonometry</li> </ul> | <ul style="list-style-type: none"> <li>• <b>Recognise and label parts of a circle</b></li> <li>• Calculate fractional parts of a circle</li> <li>• Calculate the length of an arc</li> <li>• Calculate the area of a sector</li> <li>• Understand and use the volume of a cylinder, cone and sphere</li> <li>• Understand and use the surface area of a cylinder, cone and sphere</li> </ul> | <ul style="list-style-type: none"> <li>• Understand and represent vectors</li> <li>• use and read vector notation</li> <li>• Draw and understand vectors multiplied by a scalar</li> <li>• Draw and understand addition and subtraction of vectors</li> </ul>                                     |
| <ul style="list-style-type: none"> <li>• Solve bearings problems using the sine and cosine rules</li> </ul>  | <ul style="list-style-type: none"> <li>• Circle theorem: Angles at the centre and circumference</li> <li>• Circle theorem: Angles in a semicircle</li> <li>• Circle theorem: Angles in the same segment</li> <li>• Circle theorem: Angles in a cyclic quadrilateral</li> <li>• <b>Solve area and volume problems involving similar shapes</b></li> </ul>                                     | <ul style="list-style-type: none"> <li>• Explore vector journeys in shapes</li> <li>• Explore quadrilaterals using vectors</li> <li>• Understand parallel vectors</li> <li>• Explore collinear points using vectors</li> <li>• Use vectors to construct geometric arguments and proofs</li> </ul> |

# Year 10 Foundation +/- Higher Spring Learning map

## Proportions and Proportional Change



| Ratios and Fractions   | Percentages and Interest   | Probability   |
|--|--|---|
| <ul style="list-style-type: none"> <li>• Compare quantities using a ratio</li> <li>• Link ratios and fractions</li> <li>• Share in a ratio (given total or one part)</li> <li>• Use ratios and fractions to make comparisons</li> <li>• Link ratios and graphs</li> <li>• Solve problems with currency conversion</li> <li>• Link ratios and scales</li> <li>• Use and interpret ratios of the form 1:n and n:1</li> <li>• Solve the 'best buy' problems</li> <li>• Combine a set of ratios</li> <li>• Link ratio and algebra</li> <li>• Mixed ratio problems</li> </ul> | <ul style="list-style-type: none"> <li>• Convert and compare fractions, decimals and percentages</li> <li>• Work out percentages of amounts (with and without a calculator)</li> <li>• Increase and decrease by a given percentage</li> <li>• Express one number as a percentage of another</li> <li>• Calculate simple and compound interest</li> <li>• Repeated percentage change</li> <li>• Find the original value after a percentage change</li> <li>• Solve problems involving growth and decay</li> <li>• Solve problems involving percentages, ratios and fractions</li> </ul> | <ul style="list-style-type: none"> <li>• Know how to add, subtract and multiply fractions</li> <li>• Find probabilities using equally likely outcomes</li> <li>• Use the property that probabilities sum to 1</li> <li>• using experimental data to estimate probabilities</li> <li>• Find probabilities from tables, Venn diagrams and frequency trees</li> <li>• Construct and interpret sample space for more than one event</li> <li>• Calculate probability with independent events</li> <li>• Use tree diagrams for independent and dependent events</li> </ul> |
| <ul style="list-style-type: none"> <li>• Ratio in area problems</li> <li>• Ratio in volume problems</li> </ul>   | <ul style="list-style-type: none"> <li>• Understand iterative processes</li> </ul>   | <ul style="list-style-type: none"> <li>• Construct and interpret conditional probabilities (Tree diagrams, Venn diagrams and two-way tables)</li> </ul>   |

# Year 10 Summer Learning map

## Delving into Data



### Collecting, Representing and Interpreting Data

- Understand populations and samples
  - Primary and secondary data
  - Construct and interpret frequency tables, frequency polygons, line and bar charts (including composite bar charts)
  - **Construct and interpret two-way tables and pie charts**
  - Criticise charts and graphs
  - **Find and interpret averages from a list and from a table**
  - **Construct and interpret time series graphs**
  - Construct and interpret stem and leaf diagrams
  - Compare distributions using charts and measures
  - **Construct and interpret scatter graphs**
  - **Draw and use a line of best fit**
  - Understand extrapolation
- 
- Construct a stratified sample
  - Construct and interpret histograms
  - Construct and interpret cumulative frequency diagrams
  - Use cumulative frequency diagrams to find measures
  - Construct and interpret box plots
  - Compare distributions using complex charts and measures

# Year 10 Foundation +/- Higher Summer Learning map

## Using Number



| Non-Calculator Methods  | Types of Number and Sequences  | Indices and Roots  |
|---|--|--|
| <ul style="list-style-type: none"> <li>• <b>Mental/written methods of integer/decimal addition, subtraction, multiplication and division</b></li> <li>• <b>The four rules of fraction arithmetic</b></li> <li>• Exact answers</li> <li>• <b>Rounding to decimal places and significant figures</b></li> <li>• <b>Estimating answers to calculations</b></li> <li>• Understand and use limits of accuracy</li> <li>• Use number sense</li> <li>• Solve financial maths problems</li> <li>• Break down and solve multi-step problems</li> </ul> | <ul style="list-style-type: none"> <li>• <b>Understand the difference between factors and multiples</b></li> <li>• <b>Understand primes and express a number as a product of its prime factors</b></li> <li>• <b>Find the HCF and LCM of a set of numbers</b></li> <li>• Describe and continue arithmetic and geometric sequences</li> <li>• Explore other sequences</li> <li>• <b>Find the rule for the <math>n^{\text{th}}</math> term of a linear sequence</b></li> </ul> | <ul style="list-style-type: none"> <li>• <b>Square and cube numbers</b></li> <li>• Calculate higher powers and roots</li> <li>• <b>Powers of ten and standard form</b></li> <li>• <b>The addition and subtraction rules for indices</b></li> <li>• Understand and use the power zero and negative indices</li> <li>• Work with powers of powers</li> <li>• <b>Calculate with numbers in standard form</b></li> </ul> |
| <ul style="list-style-type: none"> <li>• Rational and irrational numbers (convert recurring decimals here)</li> <li>• Understand and use surds</li> <li>• Calculate with surds</li> <li>• Upper and lower bounds</li> </ul>   | <ul style="list-style-type: none"> <li>• Describe and continue sequences involving surds</li> <li>• Find the rule for the <math>n^{\text{th}}</math> term of a quadratic sequence</li> </ul>   | <ul style="list-style-type: none"> <li>• Understand and use fractional indices</li> </ul>  |