



# MATHS

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Year 7	Term 1		Home
	<p><b>Place Value:</b></p> <p>Digit place value Ordering numbers (integers, decimals, negatives) Rounding to decimal places and significant figures</p> <p><b>Addition &amp; Subtraction:</b></p> <p>Written &amp; mental methods Inverse operations Perimeter</p>	<p><b>Multiplication &amp; Division:</b></p> <p>Written &amp; mental methods X &amp; ÷ by 10, 100, 1000... Inverse operations Orders of operations Prime numbers Prime factor decomposition Highest Common Factor Lowest Common Multiple Area of shapes (quadrilaterals &amp; triangles) The mean average Estimating answers</p>	
	Term 2		
	<p><b>Fractions:</b></p> <p>Represent fractions on diagrams and on a number line. Express one quantity as a fraction of another. Identify and use equivalent fractions. Compare and order fractions; use the symbols =, ≠, &lt;, &gt;, ≤, ≥ etc. Convert between mixed numbers and improper fractions. Simplify fractions. Convert between fractions and decimals - Tenths, hundredths, thousandths Associating a fraction with division to convert any fraction to a decimal. Use the concepts and vocabulary of multiples and lowest common multiple. Add and subtract any fraction: Fractions with the same denominator. Fractions with a denominator that is a multiple of the other. Fractions with different denominators Find a fraction of an amount.</p>	<p><b>Statistics 1:</b></p> <p>Understand the data handling cycle. Understand the different types of data. Collect, organise and interpret data. ☑ Tally charts ☑ Two way tables ☑ Median, mode and range ☑ Consider outliers Draw and interpret bar charts, pictograms and line graphs.</p> <p><b>Negative Numbers:</b></p> <p>Use the four operations with negative numbers. Understand the order of operations.</p>	

Term 3

**Algebra 1**

Introduction to algebra:

Understand that a letter represents a variable.

Understand the difference between an expression, equation, formula, term, function and identity.

Form expressions from situations described in words.

Use and interpret algebraic notation, including:

$ab$  in place of  $a \times b$ ,  $3y$  in place of  $y + y + y$  and  $3 \times y$ ,  $a^2$  in place of  $a \times a$ ,  $a^3$  in place of  $a \times a \times a$ ;  $a^2b$  in place of  $a \times a \times b$ ,  $b/a$  in place of  $b \div a$ , coefficients written as fractions rather than as decimals, brackets

Substitute numerical values into formulae and expressions, including scientific formulae. (including examples with negatives)

Collecting like terms.

Use algebraic methods to solve simple linear equations in one variable where the unknown appears on one side of the equation.

Generate terms of a sequence from either a term-to-term or a position-to-term rule. Recognise arithmetic sequences and find the  $n$ th term

**Geometry: Lines & Angles**

Describe, sketch and draw using conventional terms and notations: points, lines, parallel lines, perpendicular lines, right angles, regular polygons, and other polygons that are reflectively and rotationally symmetric.

Derive and illustrate properties of triangles, quadrilaterals, circles, and other plane figures [for example, equal lengths and angles] using appropriate language and technologies.

Use a protractor to measure and draw angles.

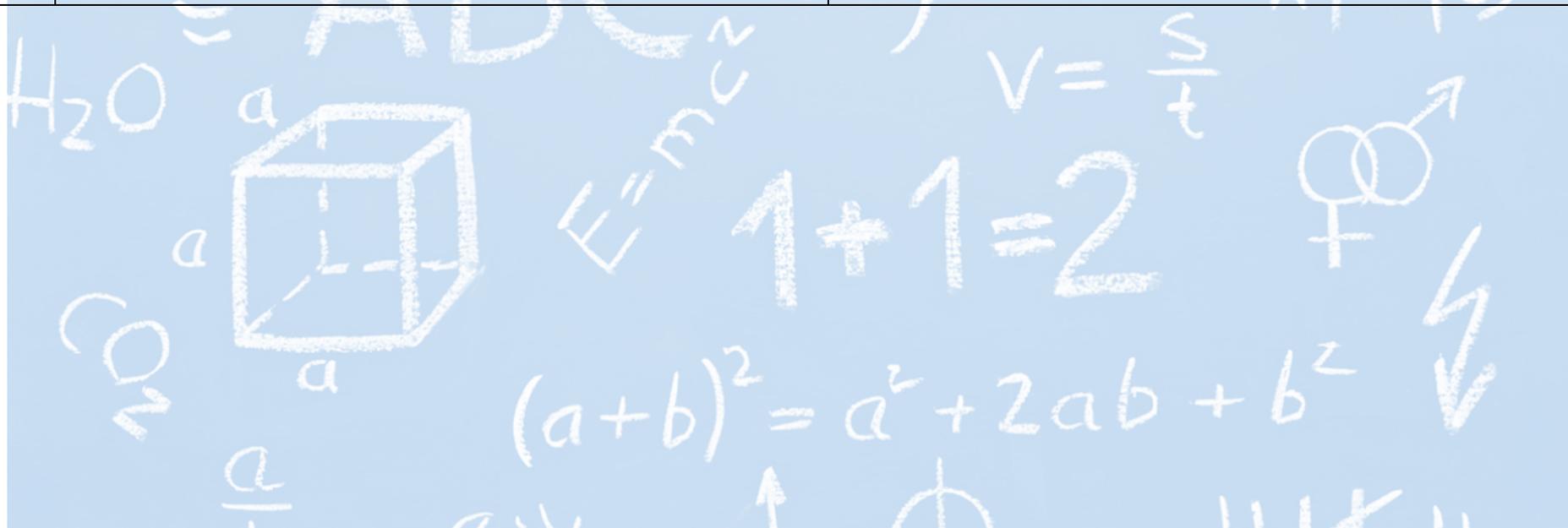
Apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles.

Understand and use alternate and corresponding angles on parallel lines. Derive and use the sum of angles in a triangle and a quadrilateral.

Derive and use the sum of angles in a triangle and use it to deduce the angle sum in any polygon, and to derive properties of regular polygons.

Year 8	Term 1	
	<p><b>Fractions 2:</b>          Multiply and divide proper and improper fractions and mixed numbers both positive and negative.</p> <p>Fraction x Integer, Fraction x Fraction, Fraction ÷ Integer, Integer ÷ Fraction, Fraction ÷ Fraction, All of the above proper, improper, mixed, positive and negative.</p> <p>Find a fraction of an amount.</p> <p>Find the whole amount, given a fraction of the amount.</p> <p>Find a fractional increase and decrease</p>	<p><b>Percentages:</b>          Define percentage as 'number of parts per hundred', interpret percentage changes as a fraction or a decimal, interpret these multiplicatively, express one quantity as a percentage of another, compare two quantities using percentages, and work with percentages greater than 100%</p> <p>This should include:</p> <ul style="list-style-type: none"> <li>☑ Define percentage as 'number of parts per hundred'</li> <li>☑ Interpret diagrams as percentages and vice versa</li> <li>☑ Interpret percentages as a fraction or as a decimal</li> <li>☑ Express one quantity as a percentage of another</li> <li>☑ Compare two quantities using percentages, and work with percentages greater than 100% E.g Claire got 16 out of 20 on a test, Simon got 21 out of 25 on a test. Who got the better score?</li> <li>☑ Interpret percentages as operators, with and without a calculator. Solve problems involving percentage change, including:             <ul style="list-style-type: none"> <li>☑ Percentage increase, decrease and original value problems and simple interest in financial mathematics.</li> </ul> </li> </ul>
	Term 2	
	<p><b>Algebra 2:</b></p> <p>Substitute numerical values into formulae and expressions, including scientific formulae. Include all prior learning specifically fractions, decimals and negatives</p> <p>Simplify and manipulate algebraic expressions to maintain equivalence by:</p> <ul style="list-style-type: none"> <li>• multiplying a single term over a bracket</li> <li>• taking out common factors</li> <li>• expanding single and double brackets.</li> <li>• simplifying expressions involving sums, products and powers, including the laws of indices</li> </ul> <p>Use algebraic methods to solve linear equations in one variable (including all forms that require rearrangement) ☑ Include equations with brackets          Include fractional equations</p> <p>Understand and use the concepts and vocabulary of inequalities.          Represent the solution set to an inequality on a number line and vice versa          Find the integer solutions of an inequality.          Solve linear inequalities in one variable.          Rearrange formulae to change the subject, where the subject appears once.</p>	<p><b>Circles &amp; Area:</b></p> <p>Convert between <math>\text{cm}^2</math> and <math>\text{m}^2</math></p> <p>Derive and apply formulae to calculate and solve problems involving area of circles, composite shapes and trapeziums.</p> <p>Calculate and solve problems involving perimeters of 2-D shapes (including circles).</p> <p>Include examples using algebra, fractions, decimals, etc</p>
	Term 3	
	Ratio, proportion & rates of change:	Statistics:

<p>Change between standard units [for example time, length, area, volume/capacity, mass]</p> <p>Use ratio notation, including reduction to simplest form. Divide a given quantity into two or more parts. Given information about one part, find the whole or other part(s).</p> <p>Understand that a multiplicative relationship between two quantities can be expressed as a ratio or a fraction.</p> <p>Use compound units such as speed, unit pricing and density to solve problems.</p> <p>Solve problems involving direct and inverse proportion, including graphical and algebraic representations. Examples may include: Recipe problems? Best buy problems? Exchange rates?</p> <p>Draw and interpret pie charts.</p>	<p>Construct and analyse stem and leaf diagrams, including back to back.</p> <p>For non-grouped data given in the form of a table, find the mean, median, mode and range.</p> <p><b>3D shapes:</b></p> <p>Use the properties of faces, surfaces, edges and vertices of cubes, cuboids, prisms, cylinders, pyramids, cones and spheres to solve problems in 3-D.</p> <p>Convert between <math>\text{cm}^3</math> and <math>\text{m}^3</math></p> <p>Know and use the fact that <math>1 \text{ litre} = 1000\text{cm}^3</math></p> <p>Derive and apply formulae to calculate and solve problems involving volume and surface area of cuboids (including cubes) and other prisms (including cylinders).</p> <p>Construct and interpret plans and elevations of 3-D shapes.</p>
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Year 9	Foundation	Higher
	<p><b>1.1 Calculations</b> Order positive and negative integers and decimals. Use the symbols =, &lt;, &gt;, Find a fraction of a number. Recall square numbers. Understand the commutative property of multiplication.</p> <p><b>1.2 Decimal numbers</b> Identify place value. Convert between metric measures.</p> <p><b>1.3 Place value</b> Round to the nearest 100, 10 and whole number. Multiply and divide by powers of 10.</p> <p><b>1.4 Factors and multiples</b> Understand the meaning of the words prime, factor, multiple and product. List the multiples of a given number.</p> <p><b>1.5 Squares, cubes and roots</b> Understand the meaning of the words prime, factor, multiple and product. Round numbers to a specified degree of accuracy.</p> <p><b>1.5 Index notation</b> Use simple powers of 10. Convert between metric units. Evaluate numeric expressions with powers.</p> <p><b>1.6 Prime factors</b> List the factors of numbers; identify which factors are prime. Evaluate numeric expressions with powers.</p> <p><b>2.1 Algebraic expressions</b> Simplify simple algebraic expressions.</p> <p><b>2.2 Simplifying expressions</b> Multiply and divide simple terms. Calculate with positive and negative integers. Use index notation.</p> <p><b>2.3 Substitution</b> Recognise equivalent expressions. Calculate with positive and negative integers. Apply the four operations.</p>	<p><b>Term 1</b></p> <p><b>1.1 Number problems and reasoning</b> Multiply numbers in a similar format to questions later in the section. List possible outcomes from two events.</p> <p><b>1.2 Place value and estimating</b> Estimate the value of a square root. Round numbers to a specified degree of accuracy. Apply the four operations.</p> <p><b>1.3 HCF and LCM</b> Multiply prime factors together. List the factors of a number.</p> <p><b>1.4 Calculating with powers (indices)</b> Work out simple powers. Apply the four operations.</p> <p><b>1.5 Zero, negative and fractional indices</b> Convert between fractions and decimals. Use the laws of indices for positive indices.</p> <p><b>1.6 Powers of 10 and standard form</b> Multiply by powers of 10 when the number is written as an ordinary number and not an index. Review different ways to divide by 10. Use negative indices.</p> <p><b>1.7 Surds</b> Review the meaning of the dot in the recurring notation. Identify the missing multiple which practices the skills of searching for a perfect square factor.</p> <p><b>2.1 Algebraic indices</b> Recognise that squaring and taking the square roots, and cubing and taking the cube root, are inverse operations. Calculate with powers.</p> <p><b>2.2 Expanding and factorising</b> Simplify algebraic terms, including using index notation. Multiply a single term over a bracket. Find highest common factors.</p> <p><b>2.3 Equations</b> Solve a simple equation expressed in words. Solve simple algebraic equations. Find lowest common multiples.</p> <p><b>2.4 Formulae</b> Substitute values into a one-step formula. Write numbers in standard form.</p>

<p>2.4 Formulae Calculate with negative numbers and terms. Recall square numbers. Substitute into and evaluate expressions. Write simple expressions.</p> <p>2.5 Expanding brackets Multiply negative and positive terms. Simplify algebraic expressions. Write simple formulae.</p> <p>2.6 Factorising Find HCFs of number pairs. Multiply a single term over brackets.</p> <p>2.7 Using expressions and formulae Write simple expressions. Substitute into and evaluate expressions.</p>	<p>2.5 Linear sequences Find the next term of a given arithmetic sequence. Substitute values in a simple linear expression. Write terms in a sequence given the nth term. Use a function machine to find outputs.</p> <p>2.6 Non-linear sequences Find the next term of given sequences. Identify arithmetic and geometric sequences. Find the term-to-term rule for a sequence.</p> <p>2.7 More expanding and factorising Recalling a square root. Finding the factor pairs of small integers.</p>
<b>Term 2</b>	
<p>3.1 Frequency tables Addition of numbers. Counting tally symbols and drawing tally charts. Interpret a frequency table, including calculating the total population.</p> <p>3.2 Two-way tables Convert between 12 and 24 hour clock times. Calculate with time. Understand use of fractions.</p> <p>3.3 Representing data Determine what features are missing from a graph. Interpret bar charts.</p> <p>3.4 Time series Write decimal numbers of millions. Plot a line graph.</p> <p>3.5 Stem and leaf diagrams Place numbers in order of size.</p> <p>3.6 Pie charts Express a part of a circle as a fraction or percentage of the whole. Know the number of degrees in a circle. Draw a circle. Draw a given angle.</p> <p>3.7 Scatter graphs Understand depreciation of value as things age, as well as an understanding of exceptions (e.g. classic cars). Plot coordinates in the first quadrant.</p> <p>3.8 Line of best fit</p>	<p>3.1 Statistical diagrams 1 Work out mode, median and range from a list of numbers.</p> <p>3.2 Time series Identify trends by noticing whether sequences of numbers increase, decrease or oscillate.</p> <p>3.3 Scatter graphs Recognise when a line has a positive, negative or zero gradient. Plot points on a coordinate grid, and identify points that do not lie on a straight line.</p> <p>3.4 Line of best fit Understand and be able to define the meaning of correlation. Read values from graphs.</p> <p>3.5 Averages and range Find the range of a list of numbers. Find the midpoint of two numbers.</p> <p>3.6 Statistical diagrams 2 Use subtraction to find missing values. Draw a bar chart.</p> <p>4.1 Fractions Identify unit fractions, improper fractions and mixed numbers. Multiply a whole number by a fraction. Know the priority of operations.</p> <p>4.2 Ratios</p>

Recall definitions of positive, negative and no correlation. Read values from a graph.

#### 4.1 Working with fractions

Identify equivalence in fractions. Identify the denominator of a fraction. Identify the numerator of a fraction. Find the LCM. Write fractions in their simplest form.

#### 4.2 Operations with fractions

Convert between units of length. Add and subtract fractions. Convert between mixed numbers and improper fractions.

#### 4.3 Multiplying fractions

Find a fraction of a quantity. Know that 1000 g = 1 kg. Know the commutative rule  $a \times b = b \times a$ . Write 1 million pounds as a figure.

#### 4.4 Dividing fractions

Divide larger numbers by smaller numbers. Convert between mixed numbers and improper fractions. Multiply a whole number or a fraction by a fraction.

#### 4.5 Fractions and decimals

Identify the (place) value of a digit in a decimal number. Convert between common fractions and decimals. Write one value as a fraction of another.

#### 4.6 Fractions and percentages

Write common fractions and decimals as percentages.

#### 4.7 Calculating percentages 1

Find percentages of quantities. Convert a fraction to a decimal. Convert a percentage to a fraction.

#### 4.8 Calculating percentages 2

Calculate with percentages. Convert a percentage to a decimal. Find a percentage of a quantity.

#### 5.1 Solving equations 1

Understand the meaning of the term 'inverse operation'. Find the output of a function machine when given the input.

#### 5.2 Solving equations 2

Multiply a fraction by its reciprocal for a product of 1. Simplify ratios. Write ratios in the form  $n : 1$ .

#### 4.3 Ratio and proportion

Write one number as a proportion of the total. Identify equivalent ratios.

#### 4.4 Percentages

Find a percentage of a given amount. Work out percentage multipliers.

#### 4.5 Fractions, decimals and percentages

Convert between fractions, decimals and percentages. Solve simple equations.

#### 5.1 Angle properties of triangles and quadrilaterals

Recognise special types of triangle and quadrilateral. Recall basic angle facts.

#### 5.2 Interior angles of a polygon

Name polygons and understand the meaning of 'regular polygon'. Substitute numbers into an expression. Find missing angles in triangles, quadrilaterals and at a point.

#### 5.3 Exterior angles of a polygon

Find missing angles on a straight line. Calculate the sum of interior angles of a polygon.

#### 5.4 Pythagoras' theorem 1

Recall square numbers and square roots. Find the area of a square.

#### 5.4 Pythagoras' theorem 1

Find square roots. Recognise perfect squares. Use Pythagoras' theorem to find the length of the hypotenuse.

#### 5.6 Trigonometry 1

Convert fractions to decimals. Identify the hypotenuse. Use the angle sum of a triangle to work out missing angles.

#### 5.7 Trigonometry 2

Identify the opposite and adjacent sides of a given angle in right-angled triangles. Use the trigonometric ratios to find lengths in right-angled triangles.

Use all four operations to solve simple, single one-step equations. Work out the outputs of a function machine. Simplify expressions.

5.3 Solving equations with brackets

Expand a single bracket, involving positive and negative numbers. Solve two-step equations.

5.4 Introducing inequalities

Identify numbers that satisfy an inequality. Use the inequality signs between numbers.

5.5 More inequalities

List integer values that satisfy an inequality.

5.6 More formulae

Identify the inverse of all four operations. Substitute into and evaluate expressions.

5.7 Generating sequences

Find the missing numbers in simple arithmetic sequences. Write down missing terms in sequences. Find the term-to-term rule.

5.8 Using the nth term of a sequence

Substitute into a simple expression. Solve simple equations.

**Term 3**

6.1 Properties of shapes

Identify lines of symmetry and rotational symmetry in 2D shapes. Draw angles. Know that the angles in a quadrilateral sum to  $360^\circ$ .

6.2 Angles in parallel lines

Identify parallel and perpendicular lines. Identify acute and obtuse angles.

6.3 Angles in triangles

Identify different types of triangles. Know that the angles in a triangle sum to  $180^\circ$ .

6.4 Exterior and interior angles

Recall the number of sides of different polygons. Know the properties of special triangles and quadrilaterals.

6.1 Linear graphs

Identify positive and negative gradients and intercepts from graphs. Rearrange equations.

6.2 More linear graphs

Identify lines with the same gradient or y-intercept from their equations. Write the equation of a line from a graph.

6.3 Graphing rates of change

Find speed from given distance and time. Find the area of triangles and rectangles.

6.4 Real-life graphs

Write the equation of a line from a sketch graph. Plot a graph using values given in a table.

6.5 More exterior and interior angles

Recall the number of interior angles in different polygons. Identify exterior and interior angles.

6.6 Geometrical patterns

Using angle facts to find missing angles. Write an equation to solve a problem

7.1 Mean and range

Understand that sharing equally involves dividing a total. Identify the mode.

7.2 Mode, median and range

Identify the mode, median and range. Identify an incorrect value. Draw a stem and leaf diagram. Understand inequality notation.

7.3 Types of average

Find the mode, median and mean.

7.4 Estimating the mean

Calculate the value halfway between pairs of numbers. Calculate the mean. Read data from a frequency table.

7.5 Sampling

Understand the use of random numbers in a real-life situation.

8.1 Rectangles, parallelograms and triangles

Understand the meaning of 'perpendicular'. Work out the perimeter and area of triangles and rectangles.

8.2 Trapezia and changing units

Multiplying and dividing by powers of 10, converting between Millimetres, centimetres and metres.

8.3 Area of compound shapes

Know that 1 km = 1000m. Multiply and divide by powers of 10. Convert between metric measures of area.

8.4 Surface area of 3D solids

Describe shapes using correct vocabulary, including face, edge and vertex. Sketch the net of a cuboid. Work out the area of rectangles, triangles and trapezia.

8.5 Volume of prisms

6.5 Line segments

Identify parallel and perpendicular lines. Know properties of gradients of parallel lines. Identify the gradient and intercept from an equation in the form  $y = mx + c$ .

6.6 Quadratic graphs

Identify quadratic expressions. Write the equation of a line from a graph.

6.7 Cubic and reciprocal graphs

Know the shape of linear and quadratic graphs.

6.8 More graphs

Match the shape of a container to the graph of depth of water against time. Read values from graphs.

7.1 Perimeter and area

Recognising units of length (perimeter) and area. Work out the area and perimeter of rectangles, triangles and parallelograms.

7.2 Units and accuracy

Recall the formulae for the area of quadrilaterals and triangles. Identify the possible integer values of  $x$  from an inequality. Round numbers to a specified degree of accuracy. Work out percentages of quantities.

7.3 Prisms

Calculate the volume and surface area of a cuboid. Calculate the volume of a shape made from cuboids.

7.4 Circles

Understand 'radius' and 'diameter'. Solve and rearrange simple equations.

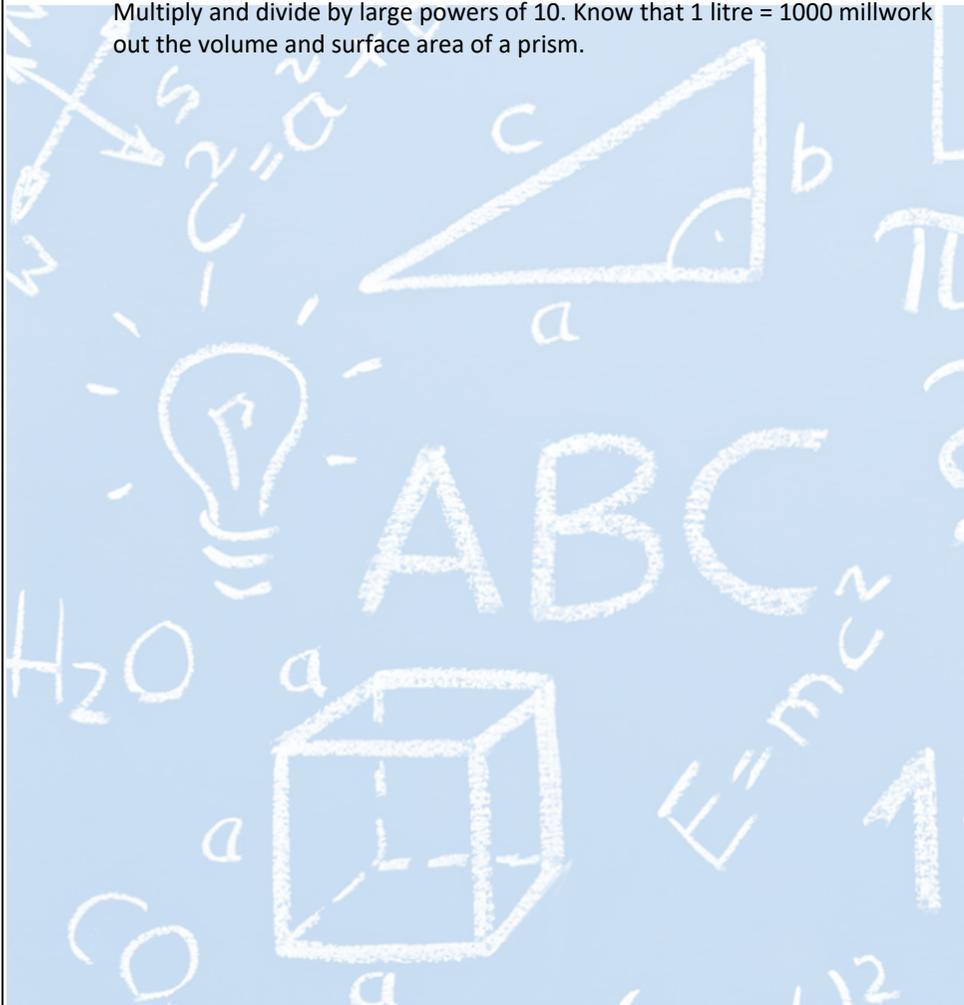
7.5 Sectors of circles

Work out fractions of a circle given the angle of a sector. Simplify equations.

7.6 Cylinders and spheres

Find the area and circumference of a circle in terms of  $\pi$ . Sketch a net of a cylinder. Solve simple equations.

7.7 Pyramids and cones

	<p>Identify cross sections of prisms. Decide whether a 3D solid is a prism.</p> <p>8.6 More volume and surface area. Multiply and divide by large powers of 10. Know that 1 litre = 1000 millwork out the volume and surface area of a prism.</p> 	<p>Find the volume of a cube. Find the side length of a cube given its volume. Calculate the area of a triangle. Use Pythagoras' theorem to work out the length of the hypotenuse.</p> <p>8.1 3D solids Draw 3D shapes on an isometric grid. Recognise dimensions of a cuboid.</p> <p>8.2 Reflection and rotation Draw simple straight lines on a coordinate grid. Know whether the image is congruent to the original following a reflection or a rotation.</p> <p>8.3 Enlargement Enlarge shapes on a coordinate grid in one quadrant.</p> <p>8.4 Transformations and combinations of transformations Describe translations.</p> <p>8.5 Bearings and scale drawings Convert metric measures and apply to scales. Accurate drawing of right-angled triangle.</p> <p>8.6 Constructions 1 Accurate drawings of triangles given SSS and ASA. Know the meaning of the terms perpendicular, bisect, arc.</p> <p>8.7 Constructions 2 Draw angles with a protractor. Construct triangles and deduce information from them.</p> <p>8.8 Loci</p>
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Year 10	Foundation	Higher
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	Term 1	
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	<p>1.1 Calculations</p> <p>Order positive and negative integers and decimals. Use the symbols =, &lt;, &gt; Find a fraction of a number. Recall square numbers. Understand the commutative property of multiplication.</p>	<p>1.1 Number problems and reasoning</p> <p>Multiply numbers in a similar format to questions later in the section. List possible outcomes from two events.</p> <p>1.2 Place value and estimating</p> <p>Estimate the value of a square root.</p>
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<p>1.2 Decimal numbers Identify place value. Convert between metric measures.</p> <p>1.3 Place value Round to the nearest 100, 10 and whole number. Multiply and divide by powers of 10.</p> <p>1.4 Factors and multiples Understand the meaning of the words prime, factor, multiple and product. List the multiples of a given number.</p> <p>1.5 Squares, cubes and roots Understand the meaning of the words prime, factor, multiple and product. Round numbers to a specified degree of accuracy.</p> <p>1.7 Index notation Use simple powers of 10. Convert between metric units. Evaluate numeric expressions with powers.</p> <p>1.8 Prime factors List the factors of numbers; identify which factors are prime. Evaluate numeric expressions with powers.</p> <p>2.1 Algebraic expressions Simplify simple algebraic expressions.</p> <p>2.2 Simplifying expressions Multiply and divide simple terms. Calculate with positive and negative integers. Use index notation.</p> <p>2.3 Substitution Recognise equivalent expressions. Calculate with positive and negative integers. Apply the four operations.</p> <p>2.4 Formulae Calculate with negative numbers and terms.</p>	<p>Round numbers to a specified degree of accuracy. Apply the four operations.</p> <p>1.3 HCF and LCM Multiply prime factors together. List the factors of a number.</p> <p>1.3 Calculating with powers (indices) Work out simple powers. Apply the four operations.</p> <p>1.4 Zero, negative and fractional indices Convert between fractions and decimals. Use the laws of indices for positive indices.</p> <p>1.5 Powers of 10 and standard form Multiply by powers of 10 when the number is written as an ordinary number and not an index. Review different ways to divide by 10. Use negative indices.</p> <p>1.6 Surds Review the meaning of the dot in the recurring notation. Identify the missing multiple which practices the skills of searching for a perfect square factor.</p> <p>2.1 Algebraic indices Recognise that squaring and taking the square roots, and cubing and taking the cube root, are inverse operations. Calculate with powers.</p> <p>2.2 Expanding and factorising Simplify algebraic terms, including using index notation. Multiply a single term over a bracket. Find highest common factors.</p> <p>2.3 Equations Solve a simple equation expressed in words. Solve simple algebraic equations Find lowest common multiples.</p> <p>2.4 Formulae Substitute values into a one-step formula. Write numbers in standard form.</p>
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Recall square numbers.  
Substitute into and evaluate expressions.  
Write simple expressions.

#### 2.5 Expanding brackets

Multiply negative and positive terms.  
Simplify algebraic expressions.  
Write simple formulae.

#### 2.6 Factorising

Find HCFs of number pairs.  
Multiply a single term over brackets.

#### 2.7 Using expressions and formulae

Write simple expressions.  
Substitute into and evaluate expressions.

#### 3.1 Frequency tables

Addition of numbers.  
Counting tally symbols and drawing tally charts.  
Interpret a frequency table, including calculating the total population.

#### 3.2 Two-way tables

Convert between 12 and 24 hour clock times.  
Calculate with time.  
Understand use of fractions.

#### 3.3 Representing data

Determine what features are missing from a graph.  
Interpret bar charts.

#### 3.4 Time series

Write decimal numbers of millions.  
Plot a line graph.

#### 3.5 Stem and leaf diagrams

Place numbers in order of size.

#### 3.6 Pie charts

Express a part of a circle as a fraction or percentage of the whole.  
Know the number of degrees in a circle.  
Draw a circle.  
Draw a given angle.

#### 2.5 Linear sequences

Find the next term of a given arithmetic sequence.  
Substitute values in a simple linear expression.  
Write terms in a sequence given the nth term.  
Use a function machine to find outputs.

#### 2.6 Non-linear sequences

Find the next term of given sequences.  
Identify arithmetic and geometric sequences.  
Find the term-to-term rule for a sequence.

#### 2.7 More expanding and factorising

Recalling a square root.  
Finding the factor pairs of small integers.

#### 3.1 Statistical diagrams 1

Work out mode, median and range from a list of numbers.

#### 3.2 Time series

Identify trends by noticing whether sequences of numbers increase, decrease or oscillate.

#### 3.3 Scatter graphs

Recognise when a line has a positive, negative or zero gradient.  
Plot points on a coordinate grid, and identify points that do not lie on a straight line.

#### 3.4 Line of best fit

Understand and be able to define the meaning of correlation.  
Read values from graphs.

#### 3.5 Averages and range

Find the range of a list of numbers, Find the midpoint of two numbers.

#### 3.6 Statistical diagrams 2

Use subtraction to find missing values, Draw a bar chart, Draw a pie chart,

#### 4.1 Fractions

Identify unit fractions, improper fractions and mixed numbers.  
Multiply a whole number by a fraction, Know the priority of operations.

#### 4.2 Ratios

<p>3.7 Scatter graphs Understand depreciation of value as things age, as well as an understanding of exceptions (e.g. classic cars) Plot coordinates in the first quadrant.</p> <p>3.8 Line of best fit Recall definitions of positive, negative and no correlation. Read values from a graph.</p> <p>5.1 Solving equations 1 Understand the meaning of the term 'inverse operation'. Find the output of a function machine when given the input.</p> <p>5.2 Solving equations 2 Use all four operations to solve simple, single one-step equations. Work out the outputs of a function machine. Simplify expressions.</p> <p>5.3 Solving equations with brackets Expand a single bracket, involving positive and negative numbers. Solve two-step equations.</p> <p>5.4 Introducing inequalities Identify numbers that satisfy an inequality. Use the inequality signs between numbers.</p> <p>5.5 More inequalities List integer values that satisfy an inequality.</p> <p>5.6 More formulae Identify the inverse of all four operations. Substitute into and evaluate expressions.</p> <p>5.7 Generating sequences Find the missing numbers in simple arithmetic sequences. Write down missing terms in sequences, Find the term-to-term rule.</p> <p>5.8 Using the nth term of a sequence Substitute into a simple expression, Solve simple equations.</p>	<p>Multiply a fraction by its reciprocal for a product of 1, Simplify ratios. Write ratios in the form <math>n : 1</math>.</p> <p>4.3 Ratio and proportion Write one number as a proportion of the total, Identify equivalent ratios.</p> <p>4.4 Percentages Find a percentage of a given amount, Work out percentage multipliers.</p> <p>4.5 Fractions, decimals and percentages Convert between fractions, decimals and percentages, Solve simple equations.</p> <p>5.1 Angle properties of triangles and quadrilaterals Recognise special types of triangle and quadrilateral, Recall basic angle facts.</p> <p>5.2 Interior angles of a polygon Name polygons and understand the meaning of 'regular polygon'. Substitute numbers into an expression. Find missing angles in triangles, quadrilaterals and at a point.</p> <p>5.3 Exterior angles of a polygon Find missing angles on a straight line, Calculate the sum of interior angles of a polygon.</p> <p>5.4 Pythagoras' theorem 1 Recall square numbers and square roots, Find the area of a square.</p> <p>5.4 Pythagoras' theorem 1 Find square roots. Recognise perfect squares, Use Pythagoras' theorem to find the length of the hypotenuse.</p> <p>5.6 Trigonometry 1 Convert fractions to decimals, Identify the hypotenuse. Use the angle sum of a triangle to work out missing angles.</p> <p>5.7 Trigonometry 2 Identify the opposite and adjacent sides of a given angle in right-angled triangles. Use the trigonometric ratios to find lengths in right-angled triangles.</p>
<b>Term 2</b>	
<p>6.1 Properties of shapes Identify lines of symmetry and rotational symmetry in 2D shapes.</p>	<p>6.1 Linear graphs Identify positive and negative gradients and intercepts from graphs.</p>

<p>Draw angles. Know that the angles in a quadrilateral sum to <math>360^\circ</math>.</p>	<p>Rearrange equations.</p>
<p>6.2 Angles in parallel lines Identify parallel and perpendicular lines. Identify acute and obtuse angles.</p>	<p>6.2 More linear graphs Identify lines with the same gradient or y-intercept from their equations. Write the equation of a line from a graph.</p>
<p>6.3 Angles in triangles Identify different types of triangles. Know that the angles in a triangle sum to <math>180^\circ</math>.</p>	<p>6.3 Graphing rates of change Find speed from given distance and time. Find the area of triangles and rectangles.</p>
<p>6.4 Exterior and interior angles Recall the number of sides of different polygons. Know the properties of special triangles and quadrilaterals.</p>	<p>6.4 Real-life graphs Write the equation of a line from a sketch graph. Plot a graph using values given in a table.</p>
<p>6.5 More exterior and interior angles Recall the number of interior angles in different polygons. Identify exterior and interior angles.</p>	<p>6.5 Line segments Identify parallel and perpendicular lines Know properties of gradients of parallel lines. Identify the gradient and intercept from an equation in the form <math>y = mx + c</math>.</p>
<p>6.6 Geometrical patterns Using angle facts to find missing angles. Write an equation to solve a problem.</p>	<p>6.6 Quadratic graphs Identify quadratic expressions. Write the equation of a line from a graph.</p>
<p>7.1 Mean and range Understand that sharing equally involves dividing a total. Identify the mode.</p>	<p>6.7 Cubic and reciprocal graphs Know the shape of linear and quadratic graphs.</p>
<p>7.2 Mode, median and range Identify the mode, median and range. Identify an incorrect value. Draw a stem and leaf diagram. Understand inequality notation.</p>	<p>6.8 More graphs Match the shape of a container to the graph of depth of water against time. Read values from graphs.</p>
<p>7.3 Types of average Find the mode, median and mean.</p>	<p>7.1 Perimeter and area Recognising units of length (perimeter) and area. Work out the area and perimeter of rectangles, triangles and parallelograms.</p>
<p>7.4 Estimating the mean Calculate the value halfway between pairs of numbers. Calculate the mean. Read data from a frequency table.</p>	<p>7.2 Units and accuracy Recall the formulae for the area of quadrilaterals and triangles. Identify the possible integer values of <math>x</math> from an inequality. Round numbers to a specified degree of accuracy. Work out percentages of quantities.</p>
<p>7.5 Sampling Understand the use of random numbers in a real-life situation.</p>	<p>7.3 Prisms Calculate the volume and surface area of a cuboid.</p>

<p>8.1 Rectangles, parallelograms and triangles Understand the meaning of 'perpendicular'. Work out the perimeter and area of triangles and rectangles.</p> <p>8.2 Trapezia and changing units Multiplying and dividing by powers of 10, converting between millimetres, centimetres and metres.</p> <p>8.3 Area of compound shapes Know that 1 km = 1000 m Multiply and divide by powers of 10. Convert between metric measures of area.</p> <p>8.4 Surface area of 3D solids Describe shapes using correct vocabulary, including face, edge and vertex. Sketch the net of a cuboid. Work out the area of rectangles, triangles and trapezia.</p> <p>8.5 Volume of prisms Identify cross sections of prisms, Decide whether a 3D solid is a prism.</p> <p>8.6 More volume and surface area Multiply and divide by large powers of 10. Know that 1 litre = 1000 ml. Work out the volume and surface area of a prism.</p> <p>9.1 Coordinates Halve a number. Substitute into an equation, and solve for an unknown.</p> <p>9.2 Linear graphs Use a function machine, Read scales</p> <p>9.3 Gradient Understand that parallel lines will never meet. Identify which line is steepest.</p> <p>9.4 <math>y = mx + c</math> Understand that in a linear equation, the coefficient of x is the gradient. Understand that parallel lines have the same gradient. Draw a line with a given gradient.</p>	<p>Calculate the volume of a shape made from cuboids.</p> <p>7.4 Circles Understand 'radius' and 'diameter'. Solve and rearrange simple equations.</p> <p>7.5 Sectors of circles Work out fractions of a circle given the angle of a sector. Simplify equations.</p> <p>7.6 Cylinders and spheres Find the area and circumference of a circle in terms of <math>\pi</math>. Sketch a net of a cylinder. Solve simple equations.</p> <p>7.7 Pyramids and cones Find the volume of a cube. Find the side length of a cube given its volume. Calculate the area of a triangle. Use Pythagoras' theorem to work out the length of the hypotenuse.</p> <p>8.1 3D solids Draw 3D shapes on an isometric grid, Recognise dimensions of a cuboid.</p> <p>8.2 Reflection and rotation Draw simple straight lines on a coordinate grid. Know whether the image is congruent to the original following a reflection or a rotation.</p> <p>8.3 Enlargement Enlarge shapes on a coordinate grid in one quadrant.</p> <p>8.4 Transformations and combinations of transformations Describe translations.</p> <p>8.5 Bearings and scale drawings Convert metric measures and apply to scales. Accurate drawing of right-angled triangle.</p> <p>8.6 Constructions 1 Accurate drawings of triangles given SSS and ASA. Know the meaning of the terms perpendicular, bisect, arc.</p> <p>8.7 Constructions 2</p>
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<p>9.5 Real-life graphs Interpret scales. "Draw a graph of an equation in the form <math>y = mx + c</math>."</p> <p>9.6 Distance-time graphs Understand and use the relationship between distance, average speed and time.</p> <p>9.7 More real-life graphs Interpret a distance–time graph. Recall the definitions of positive, negative and no correlation. Find the equation of a line.</p> <p>10.1 Translation Use the words left and right List the four types of transformations Describe translations using left/right and up/down.</p> <p>10.2 Reflection Define the word perpendicular Reflect a shape in a mirror line.</p> <p>10.3 Rotation Know the number of degrees in fractions of a turn. Use the words clockwise and anticlockwise.</p> <p>10.4 Enlargement Find scale factor from object to image and from image to object.</p> <p>10.5 Describing enlargements Recognise the properties of enlargements. Simplify fractions.</p> <p>10.6 Combining transformations State key information for describing transformations. Identify the type of transformation used.</p>	<p>Draw angles with a protractor, Construct triangles and deduce information from them.</p> <p>8.8 Loci</p> <p>9.1 Solving quadratic equations 1 Know that a square has two possible roots, Find the factors of a given number. Factorise expressions, Solve simple equations containing a squared term.</p> <p>9.2 Solving quadratic equations 2 Understand the term quadratic, Find positive and negative square roots. Solve quadratic equations by factorising, Expand two pairs of brackets. Simplify surds.</p> <p>9.3 Completing the square Expand and simplify a square bracket. Simplify surds. Solve simple equations, giving the answer in surd form.</p> <p>9.4 Solving simple simultaneous equations Substitute into simple algebraic expressions, Rearrange equations.</p> <p>9.5 More simultaneous equations Recall the equation of a straight line, Solve simple simultaneous equations.</p> <p>9.6 Solving linear and quadratic simultaneous equations Identify different types of equations, Solve quadratic equations.</p> <p>9.7 Solving linear inequalities Understand inequality signs, Construct correct inequalities from given information</p> <p>10.1 Combined events List all outcomes for a single event systematically. List all outcomes for two events systematically.</p> <p>10.2 Mutually exclusive events Add decimals. Subtract decimals and fractions from 1. Understand the relationship between ratios and fractions.</p> <p>10.3 Experimental probability Simplify fractions, Multiply whole numbers by decimals.</p> <p>10.4 Independent events and tree diagrams Add and multiply fractions and decimals.</p> <p>10.5 Conditional probability Know that the probability of something not happening is 1 minus the probability of the event happening, Draw and use probability tree diagrams.</p>
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		<p>10.6 Venn diagrams and set notation Interpret inequalities, Use Venn diagrams.</p>
<b>Term 3</b>		
	<p>11.1 Writing ratios Multiply and divide whole numbers. Interpret bar charts.</p> <p>11.2 Using ratios 1 Know and use metric conversions. Find the HCF of a pair of numbers.</p> <p>11.3 Ratios and measures Convert units of weight, length, capacity and time. Use index notation. Work out areas of rectangles and volumes of cubes.</p> <p>11.4 Using ratios 2 Write ratios using correct notation. Round to a specified degree of accuracy. Write a ratio in its simplest form.</p> <p>11.5 Comparing using ratios Interpret ratios. Write a ratio in its simplest form.</p> <p>11.6 Using proportion Understand and use place value to order decimals. Write a ratio in the form 1: n.</p> <p>11.7 Proportion and graphs Understand and use <math>y = mx + c</math>. Use conversion graphs. Plot a line graph from a table of values.</p> <p>11.8 Proportion problems Relate common sense to real life problems.</p> <p>12.1 Pythagoras' theorem 1 Calculate of simple squares and square roots. Substitute into and evaluate expressions. Round answers to a specified degree of accuracy.</p>	<p>11.1 Growth and decay Understand the use of indices. Work out the decimal multiplier for a percentage increase/decrease.</p> <p>11.2 Compound measures Calculate simple rates. Substitute numbers into equations, and solve for the unknown. Use speed = distance/time to solve problems.</p> <p>11.3 More compound measures Convert between metric units. Recall the formulae for the area of a circle and volume of a prism.</p> <p>11.4 Ratio and proportion Rearrange formulae. Recognise graphs of <math>y = x</math> and <math>y = 1/x</math>. Find the gradient of a line given its equation. Decide whether quantities are in direct proportion.</p> <p>12.1 Congruence Know the angle sum of interior angles of a triangle. Recognise congruent shapes. Recall basic angle facts. Find missing lengths using Pythagoras' theorem.</p> <p>12.2 Geometric proof and congruence Know the conditions of congruence and use correct mathematical notation for equal angles and sides. Recall the properties of special triangles and quadrilaterals.</p> <p>12.3 Similarity Use geometric properties to find similarities and differences between given polygons. Calculate scale factors.</p> <p>12.4 More similarity Find area scale factor, given length scale factor.</p>
		<p>12.5 Similarity in 3D solids Work out the volume and surface area of a cube.</p>

<p>12.2 Pythagoras' theorem 2 Understand the meaning of <math>\neq</math>. Interpret a surd expression shown on the calculator display. Identify the hypotenuse, and calculate its length.</p> <p>12.3 Trigonometry: the sine ratio 1 Simplify fractions. Convert fractions to decimals using a calculator.</p> <p>12.4 Trigonometry: the sine ratio 2 Calculate the sine of an angle in a right-angled triangle. Use the sin key on a calculator.</p> <p>12.5 Trigonometry: the cosine ratio Identify the hypotenuse and adjacent side in a right-angled triangle.</p> <p>12.6 Trigonometry: the tangent ratio Identify the opposite and adjacent sides in right-angled triangles.</p> <p>12.7 Finding lengths and angles using trigonometry Identify the sine, cosine and tangent ratios.</p> <p>13.1 Calculating probability Write probability as a fraction, a decimal and a percentage. Add and subtract fractions.</p> <p>13.2 Two events List outcomes. Simplify fractions.</p> <p>13.3 Experimental probability Convert fractions, decimals and percentages. Compare fractions. Understand theoretical probability (single event). Use two-way tables.</p> <p>13.4 Venn diagrams Add and subtracting equivalent fractions. List primes and multiples. Calculate probabilities.</p> <p>13.5 Tree diagrams Calculate with fractions. List the possible outcomes for two events. Work out the probability of something not happening.</p>	<p>Convert between metric units. Work out cubes and cube roots.</p> <p>13.1 Accuracy Find upper and lower bounds of a given measurement.</p> <p>13.2 Graph of the sine function Know the exact values of <math>\sin \theta</math> for <math>\theta = 30^\circ, 45^\circ, 60^\circ</math> and <math>90^\circ</math> Use Pythagoras' theorem. Find angles using the sin function.</p> <p>13.3 Graph of the cosine function Know the exact values of <math>\cos \theta</math> for <math>\theta = 30^\circ, 45^\circ, 60^\circ</math> and <math>90^\circ</math> Use Pythagoras' theorem. Find angles using the cos function.</p> <p>13.4 The tangent function Know the exact values of <math>\tan \theta</math> for <math>\theta = 30^\circ, 45^\circ, 60^\circ</math> Use Pythagoras' theorem. Find angles using the tan function.</p> <p>13.5 Calculating areas and the sine rule Calculate the area of a triangle using <math>(1/2)b \times h</math> Know the formula for calculating the area of a circle. Use trigonometry</p> <p>13.6 The cosine rule and 2D trigonometric problems Use bearings Calculate the area of a triangle. Solve calculations.</p> <p>13.7 Solving problems in 3D Use the sine and cosine rule.</p> <p>13.8 Transforming trigonometric graphs 1 Reflect and rotate a coordinate point. Know the exact values of <math>\sin \theta</math> and <math>\cos \theta</math> for <math>\theta = 0^\circ, 30^\circ, 45^\circ, 60^\circ</math> and <math>90^\circ</math>; know the exact value of <math>\tan \theta</math> for <math>\theta = 0^\circ, 30^\circ, 45^\circ</math> and <math>60^\circ</math> Sketch <math>y = \sin x</math>, <math>y = \cos x</math> and <math>y = \tan x</math> for <math>x</math> from <math>0^\circ</math> to <math>360^\circ</math></p>
	<p>13.9 Transforming trigonometric graphs 2 Translate coordinate points by column vectors.</p>

Calculate probabilities.

### 13.6 More tree diagrams

Calculate with and simplify fractions.  
Work out probabilities using tree diagrams.

### 14.1 Percentages Convert percentages to decimals.

Express one number as a percentage of another.  
Work out percentage increases and decreases.

### 14.2 Growth and decay

Write powers of numbers in index form.  
Relate percentages to decimals.

### 14.3 Compound measures Understand 'rate' as a mathematical concept.

Substitute into and solve equations.  
Rearrange equations.  
Convert between metric units of volume.  
Calculate the area of a trapezium.  
Calculate the volume of a prism.

### 14.4 Distance, speed and time

Find speed in km/h, given distance travelled in minutes.  
Convert between metric units of length.

### 14.5 Direct and inverse proportion

Identify graphs showing direct proportion.  
Write a ratio as a unit ratio.

### 15.1 3D solids

Recall names of common 2D shapes.

### 15.2 Plans and elevations

Identify names of 2D shapes from faces of 3D solids.  
Recall names of common 3D shapes.  
Know the properties of special triangles and quadrilaterals.

### 15.3 Accurate drawings 1

Understand of the meaning of 'congruence'.  
Draw lines, angles and circles accurately

### 15.4 Scale drawings and maps

Work out scale factor of an enlargement.  
Write a ratio in the form 1:m, and write equivalent ratios.  
Convert between metric measurements of length.

### 15.5 Accurate drawings 2

Knowledge of scale factors of enlargement, Identify a solid from its net.

### 15.6 Constructions

Identify parallel and perpendicular lines, Draw lines accurately.

### 15.7 Loci and regions

Convert distances from map scale to real life distance and vice versa.

Understand negative translations.

### 14.1 Sampling

Use fractions and percentages to work out data from a table.

### 14.2 Cumulative frequency

Find the median of a data set.

### 14.3 Box plots

Find the median and range from a stem-and-leaf diagram.

### 14.4 Drawing histograms

Division calculations  
Draw a frequency diagram.  
Write the modal class  
Estimate the mean mass.

### 14.5 Interpreting histograms

Write the modal class  
Estimate the mean mass.

### 14.6 Comparing and describing populations

Work out the mean, median and mode of data sets.  
Work out the mean and range from a table.

### 15.1 Solving simultaneous equations graphically

Know and draw graphs of circles.

### 15.2 Representing inequalities graphically

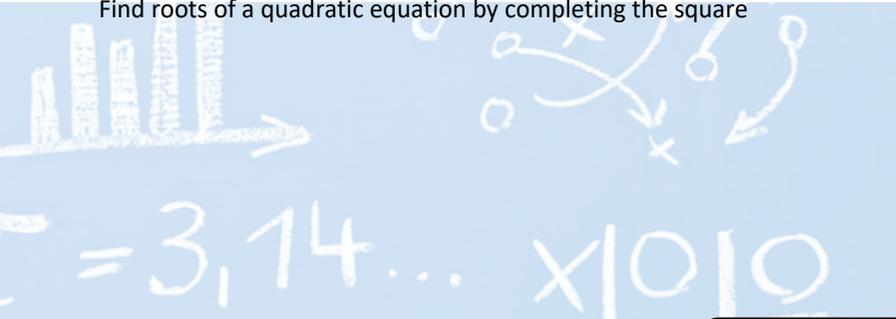
Know which integers satisfy an inequality  
Solve inequalities with one variable and show solution using set notation.

### 15.3 Graphs of quadratic functions

Solve quadratic equations by factorising.  
Sketch simple quadratic graphs  
Find coordinates of maximum point.

### 15.4 Solving quadratic equations graphically

Understand maximum and minimum points.  
Find roots of an equation by completing the square and using the quadratic formula.

	<p>Construct the perpendicular bisector.</p> <p>15.8 Bearings</p> <p>Working out the complement to 180 or 360 (addition and subtraction).</p> <p>Recall the properties of angles at a point, angles on a straight line, alternate and corresponding angles.</p> 	<p>15.5 Graphs of cubic functions</p> <p>Know where a graph will cross the x-axis</p> <p>Expand and simplify double brackets</p> <p>Find roots of a quadratic equation by completing the square</p> 
<b>Year 11</b>	<b>Term 1/Term 2</b>	
	<p><b>Foundation</b></p> <p>16.1 Expanding double brackets</p> <p>Be able to work out area of a shape using algebraic terms.</p> <p>Simplify algebraic expressions.</p> <p>Multiply a single term over brackets.</p> <p>16.2 Plotting quadratic graphs</p> <p>Be able to square terms.</p> <p>Identify the equation of the mirror line.</p> <p>Copy and complete a table of values and plot a straight line graph.</p> <p>16.3 Using quadratic graphs</p> <p>Define the origin and x-axis on a graph.</p> <p>Copy and complete a table of values and plot a quadratic graph.</p> <p>16.4 Factorising quadratic expressions</p> <p>Work out factor pairs of negative numbers</p> <p>Multiply double brackets.</p> <p>16.5 Solving quadratic equations algebraically</p> <p>Know that taking the square root of a number will result in both a positive and a negative answer.</p> <p>Factorise quadratic expressions.</p> <p>17.1 Circumference of a circle 1</p> <p>Round accurately to a given number of significant figures or decimal place.</p> <p>Rearrange equations.</p>	<p><b>Higher</b></p> <p>16.1 Radii and chords</p> <p>Recall the properties of an isosceles triangle and the language of a circle.</p> <p>Use the basic congruence criteria for triangles (SSS, SAS, ASA, RHS).</p> <p>16.2 Tangents</p> <p>Recall that the line drawn from the centre of a circle to the midpoint of a chord is at right angles to the chord.</p> <p>Know that the sum of the angles in a triangle must be 180°</p> <p>Recall the correct maths language for parts of a circle</p> <p>16.3 Angles in circles 1</p> <p>Recall simple maths facts.</p> <p>Recall the correct maths language for parts of a circle.</p> <p>16.4 Angles in circles 2</p> <p>Recall sum of angles of a triangle and a quadrilateral.</p> <p>Recall correct maths language for parts of a circle.</p> <p>16.5 Applying circle theorems</p> <p>Understand that <math>x^2 + y^2 = r^2</math> is the equation of a circle with centre at the origin.</p> <p>Find the gradient of a line from its equation and know the gradient of a line perpendicular to it.</p> <p>Find the equation of the straight line, given a gradient and a coordinate.</p> <p>Recall circle theorems</p> <p>17.1 Rearranging formulae</p>

**Home**

<p>17.2 Circumference of a circle 2 Round to nearest metre. Solve equations. Understand inequality notation. Rearrange equations.</p> <p>17.3 Area of a circle Evaluate squares and square roots. Substitute into formulae and solve for the unknown.</p> <p>17.4 Semicircles and sectors Know number of degrees in a full turn, half turn or quarter turn. Simplify fractions. Find the area and circumference of a circle.</p> <p>17.5 Composite 2D shapes and cylinders Know and use the formula for the volume of a prism. Sketch the net of a cylinder. Work out the area and perimeter of rectangles, semicircles and quarter circles. Give answers in terms of <math>\pi</math>.</p> <p>17.6 Pyramids and cones Understand and use maths language for 3-D shapes. Work out the area of 2D shapes. Give answers in terms of <math>\pi</math>.</p> <p>17.7 Spheres and composite solids Know volume and surface area formulae. Work out the length of the hypotenuse using Pythagoras' theorem.</p> <p>18.1 Multiplying and dividing fractions Convert between fractions, mixed numbers and improper fractions. Work out reciprocals of whole numbers, fractions, and decimals. Four operations with fractions.</p> <p>18.2 The laws of indices Evaluate simple powers. Recall the index laws for multiplying and dividing positive integer powers.</p> <p>18.3 Writing large numbers in standard form Evaluate powers of 10. Write 1 million and 1 billion in figures.</p>	<p>Substitute into linear equations. Change the subject of a formula. Factorise linear expressions.</p> <p>17.2 Algebraic fractions Simplify numeric fractions and fractions containing simple algebraic terms. Add and multiply numeric fractions.</p> <p>17.3 Simplifying algebraic fractions Factorise expressions by identifying the common factor between two terms. Simplify fractions containing simple algebraic terms. Factorise quadratic expressions of the form <math>x^2 + bx + c</math></p> <p>17.4 More algebraic fractions Simplify algebraic fractions by cancelling common factors. Add, subtract, divide and multiply fractions containing simple algebraic terms.</p> <p>17.5 Surds Decide whether each number is rational or irrational.</p> <p>17.6 Solving algebraic fraction equations Find the lowest common multiple of two algebraic fractions. Solve quadratic equations by factorising. Manipulate expressions containing simple algebraic fractions.</p> <p>17.7 Functions Calculate the output from a function machine for three different inputs. Solve simple equations Write expressions using function machines</p> <p>17.8 Proof Identify an odd number and an even number written algebraically. Recall the definitions of equations and identities.</p> <p>18.1 Vectors and vector notation Use vectors to describe translations. Recall and use Pythagoras' Theorem. Simplify surds.</p>
	<p>18.2 Vector arithmetic Understand the components of a vector and use vectors to describe translations. Recall properties of triangles and quadrilaterals.</p>

18.4 Writing small numbers in standard form  
Divide integers and decimals by powers of ten.

18.5 Calculating with standard form  
Use correct priority of operations.  
Write numbers in standard form.

19.1 Similarity and enlargement  
Understand the scale factor of an enlargement.  
Equivalent fractions.

19.2 More similarity  
Calculating fractions of whole numbers.  
Using similarity of triangles to identify equal angles and lengths of corresponding sides.  
Identify similar shapes.

19.3 Using similarity  
Understand squares and cubes of whole numbers and decimals.  
Use similarity to find unknown lengths.

19.4 Congruence 1  
Know that the sum of the angles in a triangle must be  $180^\circ$ .  
Identify congruent shapes.

19.5 Congruence 2  
Recognise corresponding and alternate angles.  
Find angles using corresponding and alternate angles.  
Draw triangles accurately.

19.6 Vectors 1  
Add and subtract with negative numbers.  
Use column vectors.

19.7 Vectors 2  
Calculate with negative numbers.  
Find the resultant of two vectors.

20.1 Graphs of cubic and reciprocal functions  
Recognise the shape of linear and quadratic graphs.  
Find reciprocals of fractions and integers.

18.3 More vector arithmetic  
Use properties of a parallelogram to identify equal and parallel lines.  
Add two column vectors.

18.4 Parallel vectors and collinear points  
Identify parallel column vectors.  
Add and subtract column vectors.

18.5 Solving geometric problems  
Understand the relationship between ratio and fractional parts  
Identify parallel vectors

19.1 Direct proportion  
Recognise direct proportion  
Write equations for quantities in direct proportion.

19.2 More direct proportion  
Use direct proportion.  
Find the constant of proportionality.

19.3 Inverse proportion  
Using inverse proportion to solve simple problems.  
Write equations for quantities in direct proportion.

19.4 Exponential functions  
Evaluate indices

19.5 Non-linear graphs  
Work out the area of a trapezium  
Recall and use the formula  $\text{speed} = \text{distance} \div \text{time}$ .  
Find the gradient of a line between two given points.

19.6 Translating graphs of functions  
Translating coordinates  
Function notation

19.7 Reflecting and stretching graphs of functions  
Transformation of functions

## 20.2 Non-linear graphs

Recognise statements and equations describing direct and indirect proportion.

Recognise the graphs of  $y = x$  and  $y = 1/x$ .

## 20.3 Solving simultaneous equations graphically

Write algebraic expressions.

## 20.4 Solving simultaneous equations algebraically

Add and subtract positive and negative terms, substitute integer and decimal values into a simple expression.

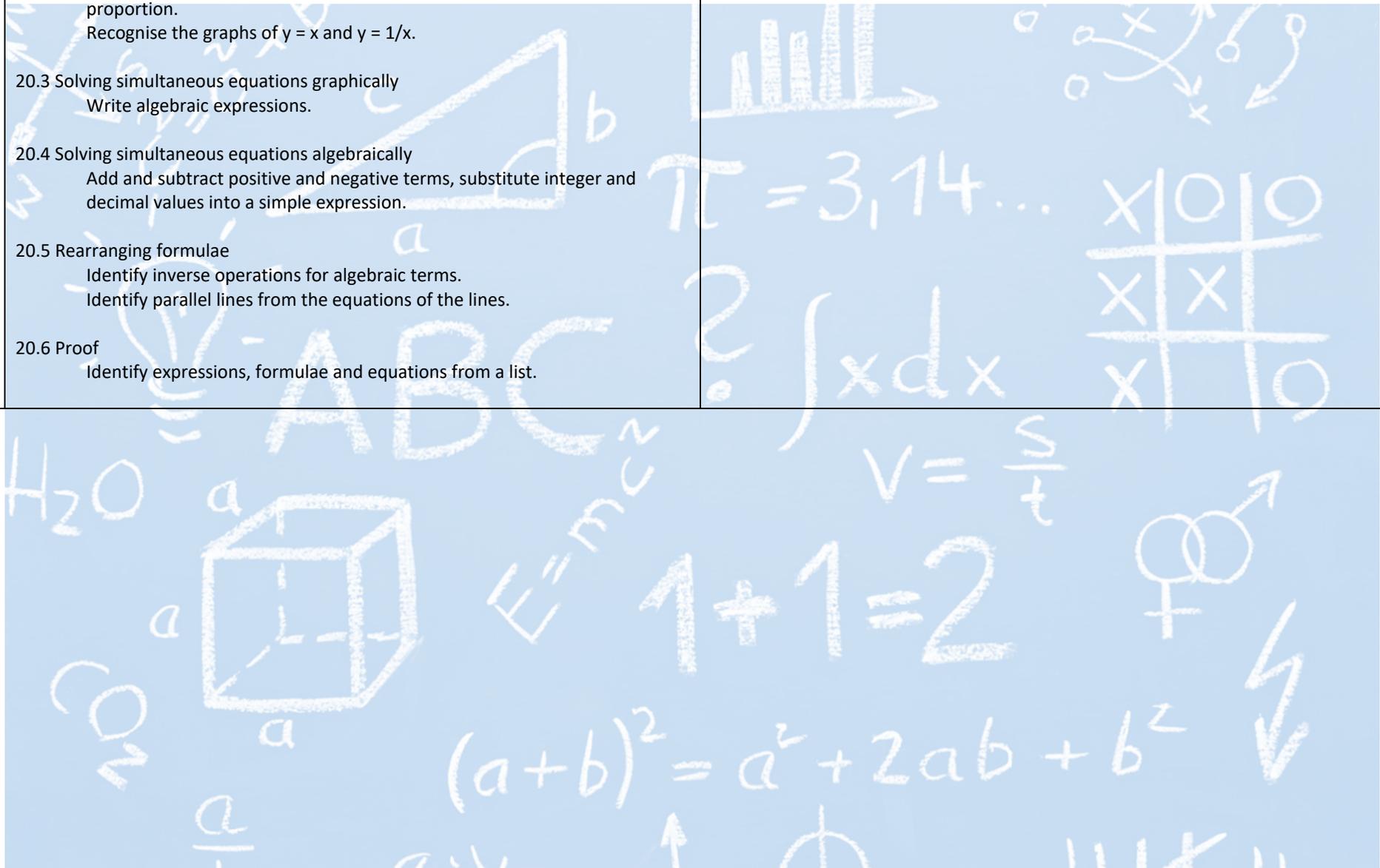
## 20.5 Rearranging formulae

Identify inverse operations for algebraic terms.

Identify parallel lines from the equations of the lines.

## 20.6 Proof

Identify expressions, formulae and equations from a list.



## Useful Links

Home

**Mathswatch:** Ideal for videos and interactive questions.

<https://vle.mathswatch.co.uk/vle/>

**CorbettMaths:** Ideal for worksheets, videos and practice questions

<https://corbettmaths.com/>

**Maths Genie:** Ideal for exam practice with worked solutions and for revision

<https://www.mathsgenie.co.uk/>

Subject Content

- Number
- Algebra
- Ratio, Proportion, Rates of Change
- Geometry and Measures
- Probability and Statistics

Grades that will be examined:

Higher	1	2	3	4	5	6	7	8	9
Foundation	1	2	3	4	5				

You will find some formulas and information in this insert. It will be very helpful to learn it all, off-by-heart for your exam.

Area of a circle =  $\pi r^2$   
Circumference of a circle =  $2\pi r$



Grade 1

- Place Value ..... 1
- Ordering Integers ..... 2
- Ordering Decimals ..... 3
- Reading Scales ..... 4
- Simple Mathematical Notation ..... 5
- Interpreting Real-Life Tables ..... 6
- Introduction to Algebraic Conventions ..... 7
- Coordinates ..... 8
- Simple Geometric Definitions ..... 9
- Polygons ..... 10
- Symmetries ..... 11
- Tessellations and Congruent Shapes ..... 12
- Names of Angles ..... 13
- The Probability Scale ..... 14
- Tally Charts and Bar Charts ..... 15
- Pictograms ..... 16

**Addition/Subtraction**

(+) becomes + eg.  $5 - (-3) = 5 + 3$

(-) becomes + eg.  $5 + (-3) = 5 - 3$

(-) becomes - eg.  $5 + (-3) = 5 - 3$

(-) becomes - eg.  $(-5) \times (-3) = 15$

(-) becomes - eg.  $(-5) \times 3 = -15$

**Multiplication/Division**

(+) x (+) becomes + eg.  $(-5) \times (-3) = 15$

(-) x (-) becomes + eg.  $(-5) \times (-3) = 15$

(+) x (-) becomes - eg.  $(-5) \times 3 = -15$

(-) x (+) becomes - eg.  $(-5) \times 3 = -15$

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**Prime Numbers**

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, ..

Each prime number has exactly two factors.

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Area of a triangle =  $\frac{1}{2} \times b \times h$

Area of trapezium =  $\frac{1}{2}(a+b)h$

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**The Laws of Indices**

$x^a \times x^b = x^{a+b}$

$x^a \div x^b = x^{a-b}$

$(x^a)^b = x^{a \times b}$

$x^1 = x$

**Pythagoras**

$a^2 + b^2 = c^2$

**Trigonometry**

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**Fractional Indices**

$x^a \times x^b = (x^a)^b = x^{a \times b}$

$x^a \div x^b = (x^a)^{\frac{1}{b}} = x^{\frac{a}{b}}$

$(x^a)^b = x^{a \times b}$

**Surds**

$\sqrt{a} \times \sqrt{b} = \sqrt{a \times b}$

$\frac{\sqrt{a}}{\sqrt{b}} = \sqrt{\frac{a}{b}}$

$\sqrt{a} \times \sqrt{a} = a$

**Quadratic Formula**

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

**Sine Rule**

$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

**Cosine Rule**

$a^2 = b^2 + c^2 - 2bc \cos A$

**Histograms**

frequency density =  $\frac{\text{frequency}}{\text{class width}}$

MATHSWATCH COVERS EVERY TOPIC ON THE 2015 SYLLABUS

Grades that will be examined:      Grades that can be obtained:

Higher	2	3	4	5	6	7	8	9	Higher	4	5	6	7	8	9
Foundation	2	3	4	5					Foundation	1	2	3	4	5	

The Maths Grade 1 to 9 syllabus is split into 5 areas and 240 videos.

- Number - 65 videos
- Algebra - 64 videos
- Ratio and Proportion - 17 videos
- Geometry and Measures - 66 videos
- Probability and Statistics - 28 videos

How long will it take to revise?

The timings of our videos are:

0 to 5 mins	10 videos
5 to 10 mins	110 videos
10 to 15 mins	220 videos
15 to 20 mins	4 videos
20 to 25 mins	1 video