

Area of study

Your child will ... (Knowledge)

Your child will be able to... (Skills)

Autumn Term

Properties of number

- Revisit how to find the lowest common multiple and highest common multiple of two or more numbers using the product of prime factors
- Investigate problems involving highest common factor and lowest common multiple included worded scenarios and those where working in reverse to find the original values is required
- Revisit laws of indices involving multiplying and dividing and then build to look at laws involving brackets and where the base number needs manipulation to apply the laws
- Learn to write large and small numbers in standard form
- Revisit roots and learn how these can be written exactly using surds or as a decimal

- Apply the laws of indices to be able to calculate values and to simplify expressions
- Complete calculations in standard form for both large and small numbers and with both multiplying and dividing
- Start to apply knowledge of reciprocals and roots to negative and fractional indices

Perimeter, area and volume

- ^{approximation} Revisit how to find the perimeter of shapes and that this is a measurement of length
- calculate the circumference of circles and learn the relationship between circle and pi
- Learn the formula to calculate the area of a trapezium and that this can be calculated by partitioning the shape into rectangles and triangles.
- Learn how to calculate the area of a circle
- Discover that volume measures the capacity of a 3 dimensional shape and that prisms will have a cross sectional area that can be calculated using previously acquired skills
- Use nets of 3 dimensional shapes to visualise the faces to assist in the calculation of surface area

- Apply mathematical formulae to calculate the area of more complex shapes including a trapezium and circles.
- Start to problem solve by finding missing lengths when given area and some of the lengths of shapes including a trapezium
- Use required formula to calculate the surface area of prisms including cylinders
- Calculate the volume of prisms

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Autumn Term

Fractions, decimals and percentages

- Revisit converting between improper fractions and mixed numbers
- Carry out calculations with fractions including adding and subtracting.
- Revisit multiplying fractions by both integers and fractions
- learn that dividing by a fraction is the same as multiplying by the reciprocal
- Convert between percentages, decimals and fractions
- Calculate percentage increase and decrease
- Apply terminology to the language of percentages including interest, profit and depreciation

- Be able to add, subtract, multiply and divide fractions involving both proper fractions and with mixed numbers
- Make comparisons between fractions, decimals and percentages
- Convert between fractions, decimals and percentages
- Calculate percentages of amounts using multipliers including

Properties of shape

- Extend use of angles in parallel lines with multi step problems including those involving straight lines and triangles including corresponding and alternate angles
- Recognise the properties of regular polygons
- Find the sum of interior angles in triangles, quadrilaterals and extend to an N sided polygon
- Learn the relationship between side lengths in a right angled triangle by applying Pythagoras's theorem to calculate the length of the hypotenuse and then other sides
- Apply terminology of triangles including hypotenuse, adjacent and opposite and how to label triangles based on the information provided

- questions in a financial context
- Calculate interior and exterior angles of both regular and irregular polygons
- Understand and apply mathematical similarity
- Apply Pythagoras' theorem to right angled triangles
- Use trigonometry to find missing lengths in right angled triangles

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Spring Term

<p>Algebra</p>	<ul style="list-style-type: none"> • Recognise that when an expression is equal to a value it is an equation and can be solved • Consider and apply inverse operations to solve equations to find unknown values in questions of increasing difficulty, starting with one step including add, subtract, multiply and divide • Taking worded problems and writing algebraically to form an equation that can be solved • Identifying other subjects where solving equations may be used eg science • Introduce the use of inequalities, how they can be solved and represented on a number line or graphically 	<ul style="list-style-type: none"> • Form and solve linear equations • Solve equations with unknown values on both sides including brackets • Factorise quadratic expressions • Change the subject of a formula by rearranging
<p>Place value and calculations</p>	<ul style="list-style-type: none"> • Revisit the process of rounding numbers to a suitable degree of accuracy • Use calculators to find exact answers to solutions and see that by using approximate values we can achieve sensible estimates to solve problems • Continue to apply the hierarchy of operations to more complex calculations • Apply use of place value to multiplying and dividing by 10,100, 1000 to calculations involving decimals • Discover how to write numbers using standard form and how this can assist when calculating with large and small values 	<ul style="list-style-type: none"> • Estimate calculations by rounding numbers to one significant figure • Apply approximations to solve problems • Multiply decimal numbers • Carry out calculations in standard form • Express bounds of a number in the form of an error interval using inequalities
<p>Collecting Data</p>	<ul style="list-style-type: none"> • Recognise the concept of bounds and how numbers rounded to a degree of accuracy have a lower and higher limit • know when to use appropriate graphs and justify choice or representations • recognise sources of bias and know how to minimise them • design a question to solve a problem and plan how to answer it • group data into equal class intervals (grouped frequency tables) 	<ul style="list-style-type: none"> • Extract and interpret information from a variety of lists, tables and other sources of data • Design and use appropriate data collection sheets for both discrete and continuous data

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Spring Term

Representing data

- construct time series graphs
- use Venn and Carroll diagrams to sort/classify their data
- interpret graphs, diagrams and pie charts
- recognise and read data from a scatter graph
- Start to learn how to construct a frequency polygon
- Understand why different graphs are plotted using different calculations from the same data and what each of these graphs represents

- Construct scatter graphs
- Draw and interpret lines of best fit on a scatter graph
- Calculate the gradient of a line of best fit and start to interpret what this represents

Summer Term

Ratio and proportion

- Revisit writing ratios in the form 1:n and n:1
- Solve multi stage ratio problems which involve more than 2 parts using lowest common multiple
- Recognise that equivalent ratios can be written as fractions
- Use different strategies to calculate values that are in direct proportion
- Recognise relationships that are inversely proportional

- Use relevant direct proportion methods to solve “Best Buy” problems
- Solve multi stage ratio problems which involve more than 2 parts using lowest common multiple
- Start to recognise and write direct and inversely proportional relationships using algebra
- Start to recognise graphs

Probability

- understand and use the term mutually exclusive
- use and understand relative frequency
- find probabilities from two-way tables
- Represent probabilities using tree diagrams and venn diagrams

- know when to add and multiply probabilities representing proportional relationships
- use tree diagrams to find probabilities – independent events
- start to calculate probabilities from Venn Diagrams

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SummerTerm

Angles and constructions

- Measure and draw angles including acute, obtuse and reflex angles to the nearest degree using a protractor
- Use eight compass point directions
- Recognise angles as a measure of a turn
- Construct a SAS, SSS and ASA triangles accurate to 1mm and 2 degrees
- Understand the language of construction including terms such as bisect, perpendicular, loci
- Use a pair of compasses to construct a perpendicular bisector and to bisect an angle

- Apply previous knowledge of angles in parallel lines to multi stage problems
- Construct the perpendicular from a point on a line
- Find the sum of interior angles using $180(n-2)$
- Understand and use congruence and mathematical similarity

Compound measures

- Identify relationships with compound units including speed and density
- Revist converting between units for time, length, area, volume
- Make connections with work in science

- Solve problems involving speed
- Solve problems involving density