

Area of study

Your child will ... (Knowledge)

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

## Autumn Term

Properties of number

- Revisit the vocabulary of factors, multiples, product reciprocal etc
- Apply knowledge of how to find highest common factor and lowest common multiple to larger numbers and look at alternative methods for calculating.
- Investigate that any number can be written as a unique product of prime factors
- Use the product of prime factors
- Advance understanding of indices, starting with squares and cubes and progressing to look at higher powers and their associated roots
- Relate knowledge of indices to help learn index rules relating to multiplying and dividing
- Recognising equivalence in indices

- Calculate the highest common factor and lowest common multiple of a number using the product of prime factors where appropriate
- Apply the laws of indices to numbers with the same base
- Start to investigate problems involving more than 2 numbers and how to identify the highest common factor and lowest common multiple

Properties of shape

- Be aware of the different types of triangles, including their names and properties
- Know what key terms like horizontal, vertical, parallel, perpendicular and congruent mean
- Know the total of the angles in triangles and quadrilaterals, and use this to find missing angles
- Know the names of a variety of different types of quadrilaterals and other polygons
- recognise properties of shape that provide reflective and rotational symmetry

- Learn to use properties of parallel and intersecting lines to find missing angles (angles about a point, angles on a straight line, vertically opposite angles)
- Work with polygons to calculate the total of their interior angles
- Begin to understand interior and exterior angles in regular polygons

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### Autumn Term

Fractions, Decimals and percentages

- Recognise when a fraction has been simplified fully by cancelling
- Convert mixed numbers and improper fractions
- Correctly order decimal values by magnitude
- Multiply fractions by both integers and proper fractions
- Define percentage as a number of parts per hundred

- Learn to put fractions in order from largest to smallest
- Calculate a fraction of an integer
- Be able to find a percentage of a total amount including with percentages

Probability

- Express one quantity as a percentage of another
- Know that probabilities are ordered from 0 to 1
- Use the language of probability, using terms including randomness, fairness, equally and unequally likely and assigning these approximate values
- Know the probability of a single, simple event, as a fraction
- Start to discuss the concept of bias and how this can affect results

- Greater than 100% probabilities for all outcomes add to 1 to find missing probabilities
- List all outcomes of two independent events, and use this to find the probability of a particular pair of events occurring including the use of sample space diagrams

### Spring Term

Algebra

- Revisit simplifying expressions
- Explore calculations with letters and numbers to including multiplying and dividing and how these can be written algebraically
- Introduce the use of brackets and that these represent multiplication
- Look at the differences between two sets of linear expressions being added and a quadratic expression
- Investigate factorising as the inverse of expanding. Linking to the term factor as we are finding common factors within terms
- Recognise that numerical values can be substituted into equations and formulae to find

- Expand single brackets
- Events are mutually exclusive
- Expand double brackets
- Factorise linear expressions
- Substitute values into equations and formula including key formula used in other subjects such as science

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## Spring Term

Place value and calculations

- Use understanding of place value to multiply and divide integers and decimals by 10, 100, 1000
- Recall of work on negative numbers and the ordering of negative values to include decimals
- Use place value to make approximations
- Use understanding of place value to multiply integers and decimals by 0.1, 0.01, 0.001 and explain the effect
- Revisit rules of rounding with nearest 100, 10, integer
- Understand the vocabulary of significant figures and identifying which numbers

- Round decimal numbers to the nearest decimal place
- Round integers to one significant figure

Graphs

- Revisit the plotting of linear graphs and extend with the use of plotting on a calculator
- Substitute values into linear and quadratic expressions.
- Understand that gradient represents the steepness of the graph and can be calculated by determining the difference in y values for an increase of one in x
- Use a table of values to construct quadratic graphs
- Plot more than one graph on the same set of axes and investigate the relationship between the points of intersection
- Start to recognise graphs of different functions such as exponential and reciprocal

- Plot linear graphs of the form  $y=mx+c$
- Recognise and calculate the y intercept within linear graphs
- Recognise and calculate the gradient of linear graphs
- Recognise and sketch quadratic graphs including starting to identify key values including roots and points of intersection
- Start to use graphs to estimate solutions to simultaneous equations

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## Spring Term

Sequences

- How to continue sequences and fill in gaps in sequences - including arithmetic, geometric and Fibonacci like sequences
- Identify patterns in sequences that can be used to determine whether large values are in them
- Generate sequences from term to term rules
- Be familiar with the use of  $n$  as a variable to denote the position of a term in a sequence

- Find the  $n$ th term of a linear sequence
- Use the  $n$ th term to find a specific term later in the sequence
- Recognise that  $n$  must be an integer. Begin to use this to determine whether a particular value is a term in a sequence
- Continue quadratic sequences

## Summer Term

Ratio and proportion

- Convert worded expressions to ratios using  $:$  notation
- Simplify ratios, and know whether a ratio is fully simplified
- Share amounts into a ratio
- Convert a ratio to the form  $1:n$
- Understand what proportional means
- Recognise whether something is directly proportional

- Start to solve problems with ratios, including
- Finding totals from one part of the ratio
- Finding totals from differences between parts of a ratio
- Use unitary method to solve direct proportion questions
- Solve problems that relate ratio to other areas of maths
- Determine the best value between different prices and amounts of

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Summer Term

Averages

- Know how to calculate the mean, median and mode of data
- Have some knowledge of the advantages and disadvantages of each type of average
- Knows how to calculate the range
- Understand that the range is a measure of spread, not an average
- Can calculate all averages from a frequency table
- Some understanding of how to compare two data sets using averages and the range
- Recognise that not all data will follow general trends and describe outliers

- Can estimate the mean from a grouped frequency table
- Can find missing values from lists of data given averages and the range
- Can begin to calculate averages of decimals, fractions and algebraic terms
- Can draw a cumulative frequency graph
- Knows how to find quartiles from

Collecting and representing data

- Able to effectively read tables of data
- Construct simple graphs, such as pictograms and bar charts
- Organise data using tally charts
- Organise data by putting it into frequency tables, including when appropriate to use data in grouped tables
- Recognise the difference between discrete and continuous data

- Can use Venn diagrams to organise data and solve problems
- Can construct line graphs
- Can draw a scatter graph
- Can calculate angles for pie charts