Topic
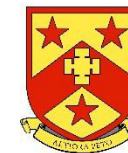
Autumn Term 1 (8 weeks)

Basic number (1 week)
- Order positive and negative integers
- Use the symbols =, ≠, <, >, ≤, ≥
- Apply the four operations, including formal written methods, to integers – both positive and negative
- Understand and use place value
- Recognise and use relationships between operations including inverse operations
- Estimate answers
- Check calculations using approximation and estimation, including answers obtained using technology

Factors and multiples (1 week)
- Use the concepts and vocabulary of prime numbers, factors (divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisation, including using product notation, and the unique factorisation theorem
- Apply systematic listing strategies and the use of the product rule for counting

Angles (1 week)
- Use conventional terms and notations:
  - points, lines, vertices, edges, planes, parallel lines, perpendicular lines, right angles, polygons, regular polygons and polygons with reflection and/or rotation symmetries
- Use the standard conventions for labelling and referring to the sides and angles of triangles
- Draw diagrams from written descriptions
- Apply the properties of:

Autumn Term 2 (7 weeks)

Basic decimals (1 week)
- Order positive and negative decimals
- Apply the four operations, including formal written methods, to decimals – both positive and negative
- Understand and use place value
- Work interchangeably with terminating decimals and their corresponding fractions
- Change recurring decimals into their corresponding fractions and vice versa

Coordinates and linear graphs (1 week)
- Work with co-ordinates in all four quadrants
- Solve geometrical problems on co-ordinate axes
- Plot graphs of equations that correspond to straight line graphs in the co-ordinate plane
- Use the form $y = mx + c$ to identify parallel lines and perpendicular lines
- Find the equation of the line through two given points, or through one point with a given gradient
- Identify and interpret gradients and intercepts of linear functions graphically and algebraically

Rounding (1 week)
- Round numbers and measures to an appropriate degree of accuracy (e.g. to a specified number of decimal places or significant figures)
- Use inequality notation to specify simple error intervals due to truncation or rounding
- Apply and interpret limits of accuracy including upper and lower bounds

SUBJECT: Mathematics Year 9H 2019 2010

Assessment	**Progress Check 1 on the following topics:** Basic number Factors and multiples **Approximate Date of Assessment Week Beginning: 23/09/19** **MILESTONE 1 on the following topics:** Basic number Factors and multiples Angles Scale diagrams and bearings Basic algebra review **Approximate Date of Assessment Week Beginning: 14/10/19**	**Progress Check 2 on the following topics:** Basic fractions Basic decimals **Approximate Date of Assessment Week Beginning: 11/11/19** **MILESTONE 2 on the following topics:** Basic fractions Basic decimals Coordinates and linear graphs Rounding **Approximate Date of Assessment Week Beginning: 02/12/19**

Topic

Spring Term 1 (6 weeks)

Sequences (1 week)
- Generate terms of a sequence from either a term-to-term or a position-to-term rule

Recognise and use:
- sequences of triangular, square and cube numbers
- simple arithmetic progression
- Fibonacci type sequences
- quadratic sequences
- and simple geometric progressions (`r^n` where `n` is an integer and `r` is a rational number > 0)
- other sequences
- Deduce expressions to calculate the nth term of linear and **quadratic** sequences

Basic percentages (1 week)
- Define percentage as 'number of parts per hundred'
- Interpret percentages and percentage changes as a fraction or decimal and interpret these multiplicatively
- Express one quantity as a percentage of another
- Compare two quantities using percentages
- Work with percentages greater than 100%
- Interpret fractions and percentages as operators

Perimeter and area (2 weeks)
- Identify properties of the faces, surfaces, edges and vertices of: cubes, cuboids, prisms, cylinders, pyramids, cones and spheres
- Calculate the perimeter of a 2D shapes and composite shapes
- Find the surface area of pyramids composite shapes
- Know and apply formulae to calculate area of:
  - triangles

Spring Term 2 (6 weeks)

Circumference and area (2 weeks)
- Identify and apply circle definitions and properties, including: centre, radius, chord, diameter, circumference, tangent, arc, sector and segment
- Know and use the formulae:
  - Circumference of a circle
  - Area of a circle
- Calculate the perimeters of 2D shapes including circles and composite shapes
- Calculate areas of circles and composite shapes
- Calculate surface area of spheres, cones and composite solids

Calculate arc lengths, angles and areas of sectors of circles

Ratio and proportion (1½ weeks)
- Identify and work with fractions in ratio problems
- Express one quantity as a fraction of another, where the fraction is less than 1 or greater than 1
- Use ratio notation, including reduction to simplest form
- Divide a given quantity into two parts in a given part:part or part:whole ratio
- Express the division of a quantity into two parts as a ratio
- Apply ratio to real contexts and problems (such as those involving conversion, comparison, scaling, mixing and concentrations)
- Express a multiplicative relationship between two quantities as a ratio or fraction
- Understand and use proportion as equality of ratios
- Relate ratios to fractions and to linear functions

Equations (1½ weeks)
- Substitute numerical values into formulae and expressions,

Assessment	**Progress Check 3 on the following topics:** Collecting and representing data Sequences Basic percentages Perimeter and area **Approximate Date of Assessment Week Beginning: 03/02/20**	**MILESTONE 3 on the following topics:** Collecting and representing data Sequences Basic percentages Perimeter and area Real life graphs Circumference and area Ratio and proportion **Approximate Date of Assessment Week Beginning: 16/03/20**

Topic

Summer Term 1 (5 weeks)

Basic probability (1 weeks)
- Record, describe and analyse the frequency of outcomes of probability experiments using tables and frequency trees
- Apply the property that the probabilities of an exhaustive set of outcomes sum to 1
- Apply the property that the probabilities of an exhaustive set of mutually exclusive events sum to 1
- Construct theoretical possibility spaces for single and combined experiments with equally likely outcomes and use these to calculate theoretical probabilities

Scatter graphs (1 week)
- Use and interpret scatter graphs of bivariate data
- Recognise correlation and know that it does not indicate causation
- Draw estimated lines of best fit
- Make predictions
- Interpolate and extrapolate apparent trends whilst knowing the dangers of doing so

Standard form (1½ weeks)
- Understand and use place value (e.g. when working with very large or very small numbers)
- Calculate with and interpret standard form

Transformations (1 week of 2 weeks)

Summer Term 2 (6 (+1) weeks)

Transformations (2nd week of 2 weeks)
- Identify, describe and construct congruent and similar shapes, including on co-ordinate axes, by considering rotation, reflection, translation and enlargement (including fractional and negative scale factors)
- Describe translations as 2D vectors
- Describe the changes and invariance achieved by combinations of rotations, reflections and translations

Constructions and loci (2 weeks)
- Use the standard ruler and compass constructions:
- perpendicular bisector of a line segment
- constructing a perpendicular to a given line from / at a given point
- bisecting a given angle
- Know that the perpendicular distance from a point to a line is the shortest distance to the line
- Use these to construct given figures and solve loci problems

2D representations of 3D shapes (1 week)
- Construct and interpret plans and elevations of 3D shapes

Asses	Progress Check 4 on the following topics: Equations Basic probability **Approximate Date of Assessment Week Beginning: 27/04/20**	**End of Year Trial Exams** **Approximate Date of Assessment Week Beginning:** 22/06/20

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	Topic	Assessment
Autumn Term 1	Basic Number Factors and Multiples Angles Scale diagrams and bearings Basic algebra review Basic fractions	**Progress Check 1 w/c 23/09/19** ***MILESTONE 1 w/c 14/10/19**
Autumn Term 2	Basic decimals Coordinates and linear graphs Rounding Sequences	**Progress Check 2 w/c 11/11/19** ***MILESTONE 2 w/c 02/12/19**
Spring Term 1	Collecting and representing data Basic percentages Perimeter and area Real life graphs Circumference and area Ratio and proportion	**Progress Check 3 w/c 03/02/20**
Spring Term 2	Equations Basic probability	***MILESTONE 3 w/c 16/03/20**
Summer Term 1	Scatter graphs Standard form Transformations	**Progress Check 4 w/c 27/04/20**
Summer Term 2	Transformations Constructions and Loci 2D representations of 3D shapes	**Trial Exam w/c 22/06/20**

*Please note that milestones include topics from the previous progress check.