Unit 1 – Number 1

Multiples and Factors

- Use the concepts and vocabulary of divisor, highest common factor, least (lowest) common multiple and prime factor decomposition ***(M2)***
- Find the LCM and HCF of numbers written as the product of their prime factors ***(M3)***

Indices, Powers and Roots

- Use index notation and index laws for positive, whole number powers ***(M2)***

Accuracy and Bounds

- Round to a specified or appropriate number of significant figures ***(M2)***
- Calculate the upper and lower bounds in calculations involving addition and multiplication of numbers expressed to a given degree of accuracy ***(M3)***
- Calculate the upper and lower bounds in calculations involving subtraction and division of numbers expressed to a given degree of accuracy ***(M4)***

Growth and Decay

- Use percentage and repeated proportional change ***(M2)***
- Find the original quantity, given the result of a proportional change ***(M3)***

Unit 2 – Algebra 2

The Language of Algebra

- Know the difference between an equation and an identity ***(M3)***

Expressions

- Simplify and manipulate algebraic expressions by multiplying a single term over a bracket ***(M2)***
- Manipulate algebraic expressions by taking out common factors that are terms ***(M2)***
- Multiply two linear expressions ***(M3)***
- Factorise quadratic expressions of the form x2+bx+c ***(M3)***
- Factorise using the difference of two squares ***(M3)***
- Factorise quadratic expressions of the form ax2+bx+c ***(M4)***

Equations

- Set up and solve linear equations in one unknown, including those with the unknown on both sides of the equation and equations of the form x/4 +3 = 7 ***(M2)***
- Set up and solve linear equations of the form 4a+3/10 + 6a-5/5 = 13/2 ***(M3)***
- Set up and solve quadratic equations using factors ***(M3)***
- Set up and solve equations such as 2/x+2 + 3/2x-1 = 1 ***(M4)***
- set up and solve quadratic equations using factors and the formula, where the coefficient of x2 ≠ 1 and more complex equations ***(M4)***

Algebracic Fractions

- Add or subtract algebraic fractions, for example simplify 4a+3/10 + 6a-5/5 ***(M3)***
- Simplify, multiply and divide algebraic fractions with linear or quadratic numerators and denominators ***(M3)***
- Add or subtract algebraic fractions with linear denominators, for example simplify 2/x+2 + 3/2x-1 ***(M4)***

Unit 3 - Geometry and Measures 1

Perimeter

- Calculate perimeters of kite, parallelogram, rhombus and trapezium ***(M2)***
- Calculate perimeters of composite shapes ***(M2)***

Area

- Calculate areas of kite, parallelogram, rhombus and trapezium ***(M2)***
- Calculate areas of composite shapes ***(M2)***

Volume

- Calculate volumes of right prisms ***(M2)***

Pythagoras and Trigonometry

- Use Pythagoras' theorem in 2D problems ***(M2)***
- Understand and use the trigonometric ratios of sine, cosine and tangent to solve 2D problems, including those involving angles of elevation and depression ***(M3)***

Unit 4 – Number 2

Working With Money

- Calculate with money and solve problems in a financial context for example compound interest, insurance, taxation, mortgages and investments ***(M2)***

Working With Fractions

- Add, subtract, multiply and divide fractions, including mixed number ***(M2)***

Working With Decimals

- Add, subtract, multiply and divide decimals of any size ***(M2)***

Fractions and Decimals

- Recognise that recurring decimals are exact fractions and that some exact fractions are recurring decimals ***(M2)***

Unit 5 – Geometry and Measures 2

Shape Properties

- Identify and apply circle definitions and properties, including tangent, arc, sector and segment. ***(M3)***

Angle Properties, Circle Theorems

- Understand and use circle theorems ***(M4)***

Unit 6 – Handlng Data 1

Mean, Mode, Median and Range

- Estimate mean from a grouped frequency distribution ***(M2)***
- Identify the modal class and the median class from a grouped frequency distribution ***(M2)***
- Calculate quartiles and inter-quartile range from ungrouped data and understand their uses ***(M3)***
- Estimate the median, quartiles and interquartile range ***(M3)***

Sampling

- Infer properties of populations or distributions from a sample and know the limitations of doing so ***(M3)***
- Understand and use stratified sampling techniques ***(M4)***

Scatter Graphs

- Draw and/or use lines of best fit by eye, understanding what these lines represent ***(M2)***
- Draw conclusion from scatter diagrams ***(M2)***
- Use terms such as positive correlation, negative correlation and little or no correlation ***(M3)***
- Interpolate and extrapolate from data and know the dangers of doing so ***(M3)***
- Identify outliers ***(M3)***
- Appreciate that correlation does not imply causality ***(M3)***

Using Statistical Diagrams

- Use 3 circle Venn diagrams to sort data ***(M2)***

Unit 7 – Algebra 2

Co-Ordinate Geometry

- Find the midpoint and length of a line in 2D co-ordinates ***(M2)***
- Find the equation of a line through two given points or through one point with a given gradient ***(M3)***
- Understand and use the gradients of parallel lines ***(M3)***
- Understand the use the gradients of perpendicular lines ***(M4)***

Graphs and Gradients

- Find and interpret gradients and intercepts of linear graphs, for example plot and interpret the graph of hiring a car at £40 per day plus a cost of 20p per mile ***(M2)***
- Understand that the form y = mx +c represents a straight line and that m is the gradient of the line and c is the value of the y intercept ***(M3)***

Unit 8 – Handling Data 2

Box Plots

- Calculate quartiles and inter-quartile range from ungrouped data and understand their uses ***(M3)***
- Display information using box plots ***(M3)***

Cumulative Frequency Graphs

- Construct and interpret cumulative frequency tables and the cumulative frequency curve ***(M3)***
- Estimate the median, quartiles and interquartile range ***(M3)***

Histograms

- Construct and interpret histograms for grouped continuous data with unequal class intervals ***(M4)***

Unit 9 – Geometry and Measures 3

Mensuration Problems

- Solve mensuration problems that involve arc length and area of a sector and surface area and volume of a cylinder, cone or sphere ***(M3)***
- Solve more complex mensuration problems, for example frustums ***(M4)***

Compound Mesures and Units

- Use compound measures and units such as density and kg/m3 ***(M2)***
- Use compound measures and units such as pressure and N/m2 ***(M3)***