Topic: Unit 1 – Understanding Ratio		**Duration: 10 lessons**	**Composite:**
Key vocabulary:	**Powerful knowledge components**	**Core knowledge Components**	**Links to previous and future topics**
Ratio Fraction Compare Simplify Share Divide Pi Gradient Notation	**I know that:** - ratio is a way of comparing one quantity with another **I know how:** - to represent ratio using pictures and diagrams e.g. bar models - to use ratio notation e.g. 2:3 -to simplify ratios by finding common factors -to find fractions from ratios and vice versa -to solve simple problems involving ratio, independently	**I know that:** -pi is ratio **I know how:** -to use the language of ratio e.g. for every blue square there are 4 red squares. -to use algebra to show ratios -to write ratios of positions on number lines -to solve simple real-life problems involving ratio -to using scaling to find a missing quantity in a ratio - to share in a given ratio -to solve ration problems involving averages -to solve ratio problems involving algebra -to use ration to work out side-lengths of triangles -to solve more complex ratio problems in the form 1:n (Higher) -to investigate pi as a ratio -investigate gradient as a ratio (Higher)	Previous: Simplifying ratios Sharing in a ratio Future: More complex problems involving ratio

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Cultural capital – Mathematician of the week, link problem solving to local business and the local area e.g. School population size compared to Telford population size

Topic: Unit 2 – Multiplicative Change		**Duration: 8 lessons**	**Composite:**
Key vocabulary:	**Powerful knowledge components**	**Core knowledge Components**	**Links to previous and future topics**
Direct proportion Multiplicative Conversion Scale factor Ratio gradient	**I know that:** - direct proportion is when 1 quantity changes by the same multiplicative amount as another. **I know how:** **-** to calculate different recipe amounts using multiplicative relationships -to use multiplication and division to scale up and down in a variety of problem-solving contexts -plot points on a conversion/direct proportion graph -	**I know that:** **-**a direct proportion graph will continue on the same gradient -scale factors are examples of multiplicative representations **I know how:** -to use and draw conversion graphs -to convert currencies -to recognise and interpret a direct proportion graph (Higher) - to investigate relationships in shapes, including using ratio to compare measurement -to use scale factors in a variety of problem-solving situations -to draw and interpret scale diagrams -to interpret maps using scale factors and ratios	Previous: Recipes Conversion graphs Future: Inverse proportion

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Topic: Unit 3 – Multiplying and Dividing Fractions		**Duration: 10 lessons**	**Composite:**
Key vocabulary:	**Powerful knowledge components**	**Core knowledge Components**	**Links to previous and future topics**
Fraction Integer Numerator Denominator Reciprocal Multiply Divide	**I know that:** - an integer will get smaller when multiplied by a fraction -a fraction with the same numerator and denominator is equal to 1 whole **I know how:** **-** to represent multiplication of fractions with shapes, number lines, bar models etc -to multiply unit and non-unit fractions and simplify the product -to divide an integer by a unit fraction e.g. How many thirds are in 2? -	**I know that:** **-**the reciprocal fraction is when the numerator and denominator swap positions **I know how:** -to multiply a fraction by an integer -to draw diagrams to represent multiplying a fraction by an integer -to solve problems involving multiplying a fraction by an integer -to find the product of two unit fractions and complete diagrams to represent the multiplication - to find the product of any pair of fractions and complete diagrams to represent the multiplication - to divide an integer by a fraction - to use algebra to generalise with division of fractions -to divide a fraction by a unit fraction and complete diagrams to represent the division -to use the reciprocal to divide fractions	Previous: Multiplying fractions Dividing fractions Simplifying fractions Future: Solving more complex problems multiplying and dividing fractions

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Topic: Unit 4 – Working in the Cartesian Plane		**Duration: 12 lessons**	**Composite:**
Key vocabulary:	**Powerful knowledge components**	**Core knowledge Components**	**Links to previous and future topics**
Co-ordinate Points Axis/axes Sequence Gradient Intercept Positive Negative Linear Parallel Substitute Equation	**I know that:** - there are 4 quadrants -*x* and *y* are the horizontal and vertical axes on a coordinate grid -the *x* co-ordinate is described first and then the *y* -the gradient is the steepness of a line **I know how:** -to describe co-ordinates of points on a grid -to plot co-ordinates on a grid -to recognise the rules of a linear sequence and find missing terms -to draw a right-angled triangle between points to calculate the gradient of a line -to divide the change in the *y* coordinate by the change in the *x* coordinate to find the gradient of a line -to substitute into an equation to generate co-ordinates for a lin -to draw and describe the equation of a line parallel to the *x* or *y* axis	**I know that:** -parallel lines will always have the same distance between them and will never meet -lines graphs can positive or negative and this changes the direction on the line **I know how:** -to find missing co-ordinates for a shape on a co-ordinate grid -to identify, draw and describe lines that are parallel lines -to understand, recognise and use the line $y = x$ -recognise and use lines in the form $y = kx$ where k is an integer or fractional value -to link $y = kx$ to direct proportion -to explore gradient of a straight line (Higher) -to solve problems and explain reasons, when working with co-ordinates and straight lines -to recognise and use lines in the form $y = x + a$ -recognise the *y* intercept -to explore graphs with negative gradient (y = −kx, y = a − x, x + y = a) -to plot co-ordinates that have been generated by a sequence -to plot graphs in the form $y = mx + c$ -to explore non-linear graphs (Higher) -to find the midpoint of a line segment	Previous: Sequences Plot and describe co-ordinates Parallel lines Future: Equation of straight lines Solve problems with straight line graphs

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Topic: Unit 5 -Representing Data		**Duration: 10 lessons**	**Composite:**
Key vocabulary:	**Powerful knowledge components**	**Core knowledge Components**	**Links to previous and future topics**
Data Discrete Continuous Grouped Ungrouped Graph Two-way table Correlation Linear	**I know that:** - there are different types of data e.g. discrete/continuous -data can be ungrouped or grouped **I know how:** -to draw and label a graph -to plot points to create a scatter graph -to recognise trends on a scatter graph -to interpret and complete tables and charts -to recognise which interval class a piece of data belongs in -to fill in missing data in a two-way table -to describe my reasoning when solving a problem	**I know that:** -**discrete** data only takes certain values e.g. eye colour, standard shoe sizes (finite) -**continuous** data is a measurement and has an infinite number of values e.g. height, mass -**ungrouped** data shows every value in the sample -**grouped** data is grouped into equal classes and several values are in each class **I know how:** -to interpret and describe trends/relationships on a scatter graph -to understand and describe correlation -to draw and use the line of best fit -to describe relationships in non-linear graphs e.g. temperatures in the UK over a year -to complete and interpret **ungrouped** data in frequency tables -to complete and interpret **grouped** data in frequency tables -to represent grouped **discrete** data in tables -to represent **continuous** data, grouped into equal classes -to construct and interpret two-way tables -to solve problems and explain reasoning	Previous: bar charts line graphs collecting and interpreting data Future: Find averages from data tables and graphs

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Topic: Unit 6 – Tables and Probability		**Duration: 5 lessons**		**Composite:**
Key vocabulary:	**Powerful knowledge components**	**Core knowledge Components**		**Links to previous and future topics**
Sample space Two-way table Venn diagram Probability Outcomes Ratio Product rule Fraction	**I know that:** -a sample space diagram displays all possible outcomes for an event e.g. all possible scores when throwing two dice -probability is the likelihood of an outcome happening **I know how:** -to list outcomes for an event - to complete a sample space diagram -to complete a two-way table -express probabilities as a fraction of the whole sample -to draw and complete a Venn diagram	**I know that:** -a Venn diagram shows the relationships in sets of data, using overlapping circles **I know how:** -to list possible outcomes for an event -to construct a sample space diagram for one or more events -to find probabilities from a sample space diagram -to solve problems and explain reasoning for sample space diagrams -to find probabilities from two-way table -to use ratio in two-way table problems -to find probabilities from Venn diagrams -to interpret Venn diagram notation -to use written information to construct a Venn diagram -to use the product rule for calculating all possible outcomes in an event		Previous: Venn diagrams Probability Simple Sample Space Future: More complex probabilities from tables and diagrams
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