Year 8 Mathematics Overview

Autumn Term 1		Autumn Term 2	
The Structure of the Number System	Sequences and Graphs	Operating on Number	Assessments

| Crystal Maze | Place Value, Estimation and Rounding | Sequences | Graphical Representations | Solving Linear Equations | |

Spring Term 1	Spring Term 2	
Multiplicative Reasoning	Statistics and Probability	Assessments

| Understanding Multiplicative Relationships | Statistical Representations and Measures | Statistical Analysis | |

Summer Term 1	Summer Term 2	
Geometry		Assessments

| Perimeter, Area and Volume | Geometrical Properties | |

Legend:
- Number & Place Value
- Calculation
- Geometry
- Statistics
- Algebra
- F.D.P
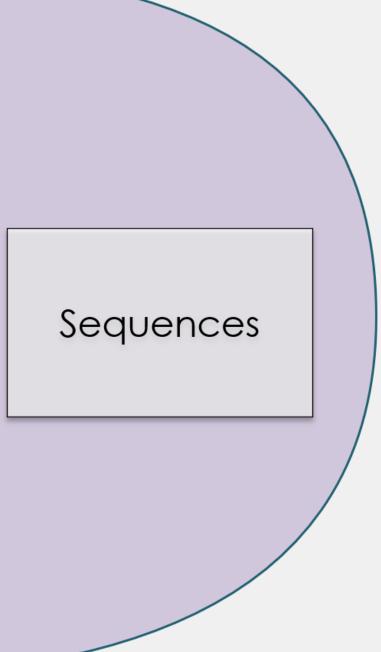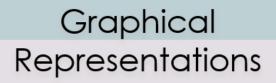- Others

Crystal Maze

Year 8 Mathematics Overview

Place Value, Estimation and Rounding

- Round numbers to up to three decimal places
- Round numbers to any number of decimal places
- Understand the concept of significant figures
- Round integers to a required number of significant figures
- Understand what is meant by a sensible degree of accuracy
- Estimate numerical calculations
- Estimate and check if solutions to problems are of the correct magnitude
- Determine whether calculations using rounding will give an underestimate or overestimate
- Understand the impact of rounding errors when using a calculator, and the way that these can be compounded to result in large inaccuracies
- Calculate possible errors expressed using inequality notation $a < x \leq b$

Year 8 Mathematics Overview

Sequences

Know that a sequence is a succession of terms formed according to a rule

Understand that a sequence can be generated and described using term-to-term approaches

Understand that a sequence can be generated and described by a position-to-term rule

Understand the features of an arithmetic sequence and be able to recognise one

Understand that any term in an arithmetic sequence can be expressed in terms of its position in the sequence

Understand that the nth term allows for the calculation of any term

Determine whether a number is a term of a given arithmetic sequence

Year 8 Mathematics Overview

Graphical Representations

Know that a set of coordinates, constructed according to a mathematical rule, can be represented algebraically and graphically

Understand that a graphical representation shows all of the points that satisfy a relationship

Recognise that linear relationships have particular algebraic and graphical features as a result of the constant rate of change
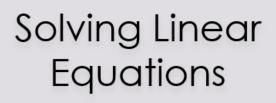
Understand that there are two key elements to any linear relationship: rate of change and intercept point

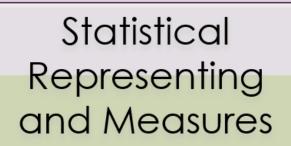That writing linear equations in the form $y = mx + c$ helps to reveal the structure

Solve a range of problems involving graphical and algebraic aspects of linear relationships

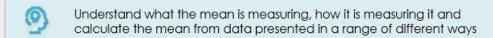# Year 8 Mathematics Overview

Solving Linear Equations

- Recognise that there are many different types of equations of which linear is one type

- Understand that in an equation the two sides of the 'equals' sign balance

- Understand that a solution is a value that makes the two sides of an equation balance

- Understand that a family of linear equations can all have the same solution

- Solve a linear equation requiring a single additive step

- Solve a linear equation requiring a single multiplicative step

- Understand that an equation needs to be in a format to be 'ready' to be solved, through collecting like terms on each side of the equation

- Know that when an additive step and a multiplicative step are required, the order of operations will not affect the solution

- Recognise that equations with unknowns on both sides of the equation can be manipulated so that the unknowns are on one side

- Solve complex linear equations, including those involving reciprocals

- Appreciate the significance of the bracket in an equation

- Recognise that there is more than one way to remove a bracket when solving an equation

- Solve equations involving brackets where simplification is necessary first

Year 8 Mathematics Overview

Multiplicative Change

- Use a graph to represent a multiplicative relationship and connect to other known representations
- Use a scaling diagram to represent a multiplicative relationship and connect to other known representations
- Describe one number as a percentage of another
- Find a percentage of a quantity using a multiplier
- Calculate percentage changes
- Calculate the original value, given the final value after a stated percentage increase or decrease
- Find the percentage increase or decrease, given start and finish quantities
- Understand the connection between multiplicative relationships and direct proportion
- Recognise direct proportion and use in a range of contexts including compound measures
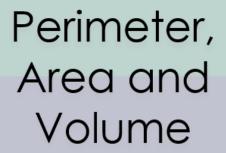- Recognise and use inverse proportionality in a range of contexts

Year 8 Mathematics Overview

Statistical Representing and Measures

Understand what the mean is measuring, how it is measuring it and calculate the mean from data presented in a range of different ways

Understand what the median is measuring, how it is measuring it and find the median from data presented in a range of different ways

Understand what the mode is measuring, how it is measuring it and identify the mode from data presented in a range of different way

Understand what the mode is measuring, how it is measuring it and identify the mode from data presented in a range of different way

Construct bar charts from data presented in a number of different ways

Construct pie charts from data presented in a number of different ways

Construct pictograms from data presented in a number of different ways

Construct scatter graphs from data presented in a number of different ways

Statistical Analysis

- Understand that the different measures of central tendency offer a summary of a set of data

- Understand how certain statistical measures may change as a result in changes of data

- Understand range as a measure of spread, including a consideration of outliers

- Understand that the different statistical representations offer different insights into a set of data

- Use the different measures of central tendency and spread to compare two sets of data

- Use the different statistical representations to compare two sets of data

- Recognise relationships between bivariate data represented on a scatter graph

- Given a statistical problem, choose what data needs to be analysed to explore that problem

- Given a statistical problem, choose appropriate statistical measures to explore that problem

- Given a statistical problem, choose appropriate representations to explore that problem

- Given a statistical problem, choose appropriate measures and representations to effectively summarise and communicate conclusions

Perimeter, Area and Volume

Recognise that there is constant multiplicative relationship (π) between the diameter and circumference of a circle

Use the relationship C = πd to calculate unknown lengths in contexts involving the circumference of circles

Understand the derivation of, and use the formula for, the area of a circle

Solve area problems of composite shapes involving whole and/or part circles, including finding the radius or diameter given the area

Understand the concept of surface area and find the surface area of 3D shapes in an efficient way

Be aware that all prisms have two congruent polygonal parallel faces (bases) with parallelogram faces joining the corresponding vertices of the bases

Use the constant cross-sectional area property of prisms and cylinders to determine their volume

Year 8 Mathematics Overview

Geometrical Properties

Understand that a pair of parallel lines traversed by a straight line produces sets of equal and supplementary angles

Know and understand proofs that in a triangle, the sum of interior angles is 180 degrees

Know and understand proofs for finding the interior and exterior angle of any regular polygon

Solve problems that require use of a combination of angle facts to identify values of missing angles, providing explanations of reasoning and logic used