



SUBJECT YEAR PLAN 20/21 Subject: Maths Year Group: 7

| | Week 1 | Week 2 | Week 3 | Week 4 | Week 5 | Week 6 | Week 7 | Week 8 |
|----------------------|--|---|---|---|---|--|--|--|
| Autumn Term 1 | Shortened week Baselining and resettling into new groups. Across the board assessments to ensure correct grouping. | Whole Number and decimals: Introduction. Place value. Ordering Whole numbers. Place value and decimals. | Whole Number and decimals: Introduction. Decimals and money. Adding decimals. Temperature. Rounding and estimating. Order of operations. | Measures, perimeter and area: Introduction. Measuring lines. Reading scales. Time. Shapes. | Measures, perimeter and area: Introduction. Perimeter. Area. Metric. | Expressions and formulae: Introduction. Using letters 1 Using letters 2. Adding with symbols. | Expressions and formulae: Introduction. Simplifying expressions. Substitution. Creating a formula. | Fractions, decimals and percentages: Introduction. Writing fractions. Equivalent fractions. Improper fractions. Key task assessment. |
| Autumn Term 2 | Fractions, decimals and percentages: Introduction. Fractions of an amount of 1. Fractions of an amount of 2. Percentages. | Fractions, decimals and percentages: Introduction. Finding percentages. Fraction, decimals and percentages. | Angles and 2D shapes: Introduction. Angles. Adding angles. Measuring angles. Finding angles at a point. | Angles and 2D shapes: Introduction. Calculating angles. Properties of triangles. Angles in a triangle. Compass turns. | Graphs: Introduction. Coordinates. Coordinates with negative numbers. | Graphs: Introduction. Reading graphs. Line graphs 1. Line graphs 2. | Adding and subtracting: Introduction. Mental methods of addition. Mental methods of subtraction. Key task assessment. | |
| Spring Term 1 | Adding and subtracting: Introduction Written addition and subtraction 1. | Statistics: Introduction. Planning and collecting data. Organising data. | Statistics: Introduction. Reading and drawing pictograms. | Statistics: Introduction. Reading diagrams. Averages – the mode. | Statistics: Introduction. Reading pie charts. Reading diagrams. Averages – the mode. | Statistics: Introduction. Averages – the median. | | |



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| | Written addition and subtraction 2. | Reading lists and tables. | Reading and drawing bar charts. Reading pie charts. | Averages – the median. Comparing data – range and average. | | Comparing data – range and average. Key task assessment. | | |
| Spring Term 2 | Transformation and symmetry: Introduction. Line of symmetry. Reflection. | Transformation and symmetry: Introduction. Translation. Rotation. Tessellations. | Equations Introductions. Operations. Inverse operations. Using letters 3. | Equations Introductions. Equations 1. Equations 2. | Factors and Multiples: Introduction. Operations. Inverse operations. Using letters 3. | Factors and Multiples: Introduction. Equations 1 Equations 2. Key task assessment. | | |
| Summer Term 1 | Constructions and 3D shapes: Introduction. 3D shapes. Nets of cubes. Nets of others 3D shapes. 2D representations of 3D shapes. | Constructions and 3D shapes: Introduction. Measuring and drawing angles. Drawing a triangle. Introducing circles. | Sequences: Introduction. Sequences. Describing sequences. | Sequences: Introduction. Using rules. Sequences with negative numbers. | Multiplying and dividing: Introduction. Multiplication. Multiplying by 10 and 100. Mental methods of multiplication. Written methods of multiplication. Key task assessments. | | | |
| Summer Term 2 | Multiplying and dividing: Introduction. Mental methods of division. Division problems. | Ratio and proportion: Introduction. ratio and proportion. | Ratio and proportion: Introduction. Solving arithmetic problems. | Probability: Introduction. Introducing probability. The probability scale 1. | Probability: Introduction. The probability scale 2 Sorting with Venn diagrams. | Everyday Maths: Introduction. The swimming gala. The diving pool and tickets sales. | Everyday Maths: Introduction. The diving competition and the café. The invitation event. Key task assessment. | |



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| | Written methods of division. Calculator skills. | Ration and proportion problems. | Scale drawings. | | | Getting ready for the gala. | | |
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| Unit Name: Whole Number and decimals: | | Recommended Teaching Time: |
| Overview and Aims | | |
| <p>How do you write nothing? With a zero of course, but the idea of using zero as a number didn't always exist. Indian mathematics in the 9th Century were the first to use zero both as a number and a placeholder. From India the idea travelled to Arabic and Chinese mathematicians, finally reaching Europe. Nowadays, we use zero everywhere, for example the Prime Meridian in geography which allows the Eastern and Western hemispheres to be defined.</p> <p>To use a zero as a placeholder allows you to write any number, however large or small, using just the digits 0 to 9.</p> | | |
| I can statements (star the "essentials") | Critical Content, Key Words and Additional Notes. | |
| <p>✓</p> <p>Each student will be able to:</p> <p>I can round a number to the nearest 10, 100 or 1000.</p> <p>I can understand place value for whole numbers.</p> <p>I can compare and order whole numbers.</p> <p>I can use place value and decimal notation in different contexts, including money.</p> <p>I can add decimals using mental and written methods.</p> <p>I can understand and order negative numbers in the context of temperature.</p> <p>I can use an estimate to check a result.</p> <p>I can use the order of operations.</p> | <p>Keywords</p> <p>Digit: A single Figure within a number</p> <p>Place Value: The value of a digit within a number</p> <p>Decimal point: The dot separating units from tenths</p> <p>Integer: A whole number</p> <p>Negative Number: A number smaller than zero</p> <p>Brackets: These tell you to do this part of the calculation first.</p> | |
| Assessment details | | |



SUBJECT YEAR PLAN 20/21 Subject: Maths Year Group: 7

Students will use both written and verbal explanations of method, Students will also apply concepts to problem solve both practically and written forms

| Unit Name: Measures, perimeter and area: | Recommended Teaching Time: |
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| Overview and Aims What is the area of the United Kingdom? It is not a very regular shape, in fact when it comes to working out its area its quite a pointy country, yet surveyors have worked out it's an area of 244820km ² . They do this by dividing the country into smaller regular shapes such as triangles and trapeziums and then working out the area of each of these pieces. Being able to work out the area of a country gives you an idea how big it is. | |
| I can statements (star the "essentials") ✓ Each student will be able to: I can measure lengths in centimetres and millimetres. I can read and interpret scales in different contexts, including time. I can classify 2D shapes by their properties. I can calculate the perimeter of simple shapes. I can calculate or estimate the area of a shape by counting squares. I can calculate and use standard metric units of measure. I can calculate the area of triangles and parallelograms | Critical Content, Key Words and Additional Notes. <u>Keywords</u> Perimeter: The distance round a shape. Area: The area of a 2D shape is the amount of surface it covers. Metric System: In the metric system, units of measurement are related by powers of 10. |
| Assessment details Students will use both written and verbal explanations of method, Students will also apply concepts to problem solve both practically and written forms | |



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| Unit Name: Expressions and formulae: | | Recommended Teaching Time: |
| Overview and Aims You use algebra most days without thinking about it. When you are changing your holiday money from pounds into euros, calculating the cost of using a mobile phone or converting a recipe from ounces to grams, you are using algebraic formulae. A formula gives you a quick and easy way to work out unknown amounts – just by applying a simple rule. | | |
| I can statements (star the “essentials”) | Critical Content, Key Words and Additional Notes. | |
| ✓ Each student will be able to: I can use letters to represent unknown numbers. I can simplify algebraic expressions by collecting like terms. I can substitute whole numbers into expressions and formulae I can derive a simple formula. | <u>Keywords</u> Expression: A collection of numbers, letters and operations, but with no equals sign Terms: Part of an expression, separated from other terms by + or signs. Like Terms: Like terms are made from the same letters. Formula: A rule that links two or more quantities. Subject: The single letter on the left-hand side of the equals sign. The formula tells you how to find the value of the subject. | |
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|---|--|-----------------------------------|
| Unit Name: Fractions, decimals and percentages | | Recommended Teaching Time: |
| Overview and Aims The very first fractions can be traced back to the Egyptians. They wrote all their fractions as unit fractions such as $1/3$ or $1/5$ and they didn't allow fractions such as $3/4$, various other civilisations invented their own systems for fractions but it was not until the 17 th century in Europe that fractions existed as we know them today. A world without fractions would find it difficult to describe parts of whole numbers, or to share out quantities. | | |
| I can statements (star the "essentials") | Critical Content, Key Words and Additional Notes. | |
| ✓ Each student will be able to: I can use fractions to describe parts of a whole, including improper fractions. I can identify equivalent fractions. I can find fractions of a quantity. I can calculate simple percentages, including problems involving money. I can express proportion as a fraction, a decimal or a percentage. | Keywords: Numerator: The top number in a fraction; it gives the number of parts you have. Denominator: The bottom number in a fraction; it gives the total number of parts in the whole. Equivalent: Different ways of writing the same value. Integer: A whole number. Percentage: A number of parts out of 100. Decimal: The standard number system, based on powers of 10. | |
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| Unit Name: Angles and 2D Shapes | | Recommended Teaching Time: |
| Overview and Aims | | |
| <p>The Leaning Tower of Pisa is a very famous building in Italy. It was built in three stages over a timescale of 300 years. As it was being built it began to tilt and later the engineers tried to compensate by building rooms with one side bigger than the other. Modern restoration work has taken nearly 40 years to stabilise the tower and it now stand safely at an angle of about 4" from the vertical.</p> <p>Accurate measurement of angles allows surveyors and engineers to construct buildings which are vertical and therefore stable otherwise they would fall down.</p> | | |
| I can statements (star the "essentials") | | Critical Content, Key Words and Additional Notes. |
| <p>✓</p> <p>Each student will be able to:</p> <p>I can estimate angles and use a protractor to measure them.</p> <p>I can distinguish between acute obtuse and reflex angles.</p> <p>I can use the sum of angles at a point, on a straight line and in a triangle.</p> <p>I can classify triangles by their properties.</p> <p>I can find missing angles in a triangle.</p> <p>I can understand and use the points of a compass.</p> | | <p><u>Keywords:</u></p> <p>Acute, Obtuse, Reflex angles: Describes the size of an angle Acute from 0° to 90° Obtuse from 90° to 180° Reflex from 180° to 360°</p> <p>Equilateral, Isosceles, Scalene: Describes how many sides and angles are equal in a triangle: Equilateral all, Isosceles two, Scalene none.</p> <p>Parallel, perpendicular: Two lines in a plane are: Parallel if they never cross. Perpendicular if they cross at right-angles.</p> <p>Quadrilateral: A quadrilateral is a shape with four straight sides.</p> |
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| Unit Name: Graphs | | Recommended Teaching Time: |
| Overview and Aims When you use the satellite navigation system in a car or search on your phone for the nearest branch of a shop your electronic devices are using GPS coordinates. The GPS system uses coordinates which are expressed in terms of latitude and longitude, and are fixed by determining the exact distance from a number of satellites in orbit above the earth. Coordinates allow you to specify the exact position of any point on the Earth using just a pair of numbers. | | |
| I can statements (star the “essentials”) | Critical Content, Key Words and Additional Notes. | |
| ✓ Each student will be able to: I can identify and plot coordinates in all four quadrants. I can construct and interpret line graphs in context. I can plot points from a table of values I can draw a graph and use it to estimate an unknown value | Keywords: Coordinates: A pair of numbers that, together, give the position of a point. Formula: A rule connecting different quantities. You can write a formula in words or symbols. Table of values: Two rows of values that can be plotted as coordinates. | |
| Assessment details | | |
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| Unit Name: Whole number calculations | | Recommended Teaching Time: |
| Overview and Aims Whether you are checking your change in a shop or working out the cost of downloading five times, calculations skills are an important part of your life. The same skills are equally important for adults in all walks of life. A good grasp of arithmetic is a vital skill for everyday life. People with poor calculation skills often struggles to success with money. | | |
| I can statements (star the “essentials”) | Critical Content, Key Words and Additional Notes. | |
| ✓ Each student will be able to: I can strengthen and extend mental methods of addition and subtraction. I can use efficient written methods to add and subtract whole numbers. I can do multiplication and division calculations using mental calculations I can use the order of operations. I can do short and long division using a standard written method I can use a calculator to work out more complex expressions | <u>Keywords:</u> Estimate: Simplify the numbers in a calculation to make it easy to find an approximate answer Partitioning: Split one number into two simpler numbers. Compensation: Round up one number to make a calculation easier and then subtract the correction. Short Division: A written method, suitable for dividing by a one-digit number. Long Division: A written method, suitable for dividing by a two-digit number. Long Multiplication: A written method, suitable for multiplying two-digit or three-digit numbers. | |



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Assessment details

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Unit Name: Statistics

Recommended Teaching Time:

Overview and Aims

Designer clothes are big business. Shops have to decide how many items to stock in each size – too few and the customers complain, too many and they have lots of unsold items on the shelves. Clothes shops conduct surveys to find out the ‘distribution’ of sizes of their customers so they can work out the correct number of items to stock in each size. Market research allows businesses to find out information about their customers’ needs. If they do not have this awareness, they will most likely go out of business.

I can statements (star the “essentials”)

✓
Each student will be able to:

- I can understand and draw different types of bar chart
- I can plan how to collect and organise small sets of data from surveys and experiments.
- I can solve problems by interpreting data in lists and tables.
- I can construct and interpret statistical diagrams e.g pie charts and line graphs.
- I can calculate statistics for small sets of data including the mode, median and range.

Critical Content, Key Words and Additional Notes.

Keywords:

- Bar Chart: A graph using the heights of bars to represent frequencies. The bars should be equal width and have gaps between them.
- Grouped data: Data that is organised into class intervals.
- Line Graphs: A graph that shows plotted points joined by straight lines.
- Average: A value that represents the typical values in a data set.
- Mode: An average defined as the data value that occurs most often.
- Median: An average defined as the middle value when the data are listed in numerical order.
- Mean: An average defined as the sum of a “ of the data values divided by the number of data values.
- Range: A measure of the spread of data. It is defined as the largest value minus the smallest value.

Assessment details



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| Unit Name: Transformations and symmetry | Recommended Teaching Time: |
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| <p>Overview and Aims</p> <p>Dance is an art form in which people move their body rhythmically to music. It features in most cultures for many different purposes. Each dance contains a series of steps which are performed in various combinations to form a routine.</p> <p>Transformations move points and shapes from one place to another. The steps of a dance routine can be described by mathematical transformations – slides (translations) flips (reflections) and spins (rotations).</p> | |
| I can statements (star the “essentials”) | Critical Content, Key Words and Additional Notes. |
| <p>✓</p> <p>Each student will be able to:</p> <p>I can identify lines of symmetry in a 2d shape. I can transform a shape by reflection in a mirror line. I can transform a shape by translation and describe a translation. I can transform a shape by rotation about a point. I can recognise and describe translations I can create tessellations using reflections, rotations and translations.</p> | <p>Keywords:</p> <p>Congruent: Two Figures are congruent if they have exactly the same shape and size. Transformation: A change in the position or size of a shape that follows set rules.</p> <p>Object Image: The object is the shape before a transformation and the image is the shape after the transformation.</p> <p>Vertex: A corner of a two-dimensional shape.</p> <p>Tessellation: A tiling pattern that doesn't have any gaps or overlaps.</p> <p>Symmetry: A 2D shape can show reflection symmetry or rotation symmetry. These are transformations that leave the shape unchanged</p> |
| Assessment details | |



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Unit Name: Equations

Recommended Teaching Time:

Overview and Aims

The word algebra comes from the title of a book “Hidab al-jabr wal-muqubala” written in 825 AD by the Arab mathematician Abu Abdulla Mohammed 1bn Musa al Khawarizmi. The title of his book loosely translates as “the science of reunion opposition” it describes the steps that are used to solve equations. Even to his day algebra allows lots of real life problems to be solved by using maths.

I can statements (star the “essentials”)

✓
Each student will be able to:

I can multiply and divide numbers and letters in algebra
I can understand and use inverse operations.
I can use letters to represent unknown numbers.
I can solve an equation by multiplying or dividing on both sides
I can solve two step equations.

Critical Content, Key Words and Additional Notes.

Keywords:

Expression: Made from numbers, letters and operations but not including an equals sign.

Term: Part of an expression between plus or minus signs.

Equation: An expression equal to a number or another expression.

Solve: To find the value of the unknown in an equation that makes it true.

Inverse: An operation that reverses the effect of a given operation.

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| Unit Name: Factors and multiples | Recommended Teaching Time: |
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| <p>Overview and Aims</p> <p>If you want to listen to music and surf the internet at the same time without your computer slowing down you need plenty of RAM (Random Access Memory), which is measured in gigabytes (GB). The speeds and memories of computers are becoming so fast and so big that mathematics have to use increasing multiples of 1000 to describe them.</p> <p>1000 Megabytes = 1 Gigabyte 1000 Gigabyte = 1 Terabyte 1000 Terabytes = 1 Petabyte 1000 Petabytes = 1 Exabyte</p> <p>Being able to appreciate very large numbers as multiples of familiar numbers allows you to understand the technical specifications of your computer.</p> | |
| <p>I can statements (star the “essentials”)</p> <p>✓</p> <p>Each student will be able to:</p> <p>I can recognise and list factors and multiples. I can use simple tests of divisibility. I can recognise the squares of numbers up to 10×10. I can use the order of operations. I can find the LCM and the JCF of a pair of numbers</p> | <p>Critical Content, Key Words and Additional Notes.</p> <p><u>Keywords:</u></p> <p>Factor: A whole number that divides into a given number without any remainder. Multiple: Those numbers that appear in a given number's times table. Prime number: A number with two factors, itself and 1. Square number: A number that equals a whole number multiplied by itself. Triangle Numbers: Numbers which occur in the pattern:</p>  <p>Square Root: The number which, when squared, is equal to the given number. Highest Common Factor (HCF): For a pair of numbers, this is the largest number that is a factor of both numbers.</p> |



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| | Lowest Common Multiple (LCM): For a pair of numbers, this is the smallest number that is a multiple of both numbers. |
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| Unit Name: Constructions and 3D Shapes | Recommended Teaching Time: |
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| Overview and Aims |
| How do you make a football? When you look at a football, it is made of regular mathematical shapes joined together to make a sphere. The manufacturer first makes out a 2D plan, or net, of the material from which the football is made. The net is fastened or sewn together to make the 3D football. An understanding of 2D shapes allows us designers to combine them to make many of the 3D shapes which you see every day. |

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| I can statements (star the “essentials”) | Critical Content, Key Words and Additional Notes. |
| <p>✓</p> <p>Each student will be able to:</p> <p>I can recognise and name common 3D shapes I can construct simple nets of 3D shapes I can use 2D representations to visualise 3D shapes I can Use a protractor to measure and draw angles I can use a ruler and a protractor to construct a triangle I know the parts of a circle.</p> <p>2019/20 (prior years) – Strengths and Weaknesses</p> | <p>Keywords</p> <p>Vertex: The point on a 3D shape at which two or more edges meet (commonly known as the corner). The plural is vertices.</p> <p>Net: The 2D shape that makes a 3D shape when it is folded</p> <p>Construct: To draw a line, angle or shape accurately.</p> <p>Radius : The distance from the centre to the edge of a circle.</p> <p>Diameter: The distance across a circle through the centre. The diameter is twice the radius.</p> |



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Circumference: The distance around the edge of a circle.:

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Unit Name: Sequences

Recommended Teaching Time:

Overview and Aims

Humans are good at spotting patterns. You can see patterns all around you in the natural world – there are symmetrical patterns in snowflakes and starfish, complex spirals in shells and pineapples, and fractal-like patterns in the clouds and coastlines. There are patterns in the way rivers meander, patterns in the sand as the tides ebb and flow, patterns in crystals, patterns in birdsong, and patterns in the markings of animals like zebras and leopards. By following the patterns that occur in nature, we can understand natural phenomena and predict possible changes.

I can statements (star the “essentials”)

Critical Content, Key Words and Additional Notes.



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Core Questions

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| <p>✓</p> <p>Each student will be able to:</p> <p>I can find patterns in sequences of numbers I can describe a sequence using a rule to find the next term. I can generate terms in a sequence using a rule. I can use negative numbers in a sequence.</p> | <p><u>Keywords</u></p> <p>Sequence – A set of numbers that follow a rule, for example 1,3,5,7,9, Rule – An operation to describe the link between two numbers that are next to each other in sequence. Term – A number in a sequence. (The word ‘term’ is also used to mean part of an expression in algebra).</p> |
| <p>Assessment details</p> | |
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| <p>Unit Name: Multiplying and dividing</p> | <p>Recommended Teaching Time:</p> |
| <p>Overview and Aims Scott Flansburg is known as the ‘human calculator’. He is in the Guinness Book of World Records for adding the same number to itself more times in 15 seconds than a person can do using a calculator. Scott uses lots of different strategies to do his calculations so quickly rather than relying on just one method. Having a range of mental strategies might not turn you into the next ‘human calculator’ but it will help make important decisions about your money quickly and accurately.</p> | |
| <p>I can statements (star the “essentials”)</p> | <p>Critical Content, Key Words and Additional Notes.</p> |



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| <p>✓</p> <p>Each student will be able to:</p> <p>I can consolidate multiplication facts up to 12 x 12. I can multiply by 10 and 100. I can multiply whole numbers using mental and written methods. I can divide whole numbers using mental and efficient written methods. I can use a calculator and interpret the display in different contexts, including money.</p> | <p><u>Language and meaning</u></p> <p>Multiplication – The act of repeated addition. Division – The act of sharing and grouping. Partitioning – Splitting a number into smaller parts. It is a method usually used to make calculations simpler. Doubling and halving – A method for multiplying two numbers Remainder – The amount left over when one number is divided by another (often denoted by r or rem).</p> |
| <p>Assessment details</p> | |
| <p>Students will use both written and verbal explanations of method, Students will also apply concepts to problem solve both practically and written forms</p> | |

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| <p>Unit Name: Ratio and proportion</p> | <p>Recommended Teaching Time:</p> |
| <p>Overview and Aims</p> <p>When you ride a bike, the seat, handlebars and pedals are positioned so that you can reach all of them at the same time. The designers make sure that the different parts of a child's bike are in proportion to the size of the 'average' child. This process of fitting technology to the human body is called ergonomics. If designers didn't understand proportion, people wouldn't be able to ride bikes or drive cars – they wouldn't be able to reach the pedals!</p> | |



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| I can statements (star the “essentials”) | Critical Content, Key Words and Additional Notes. |
| <p>✓</p> <p>Each student will be able to:</p> <p>I can write and use ratios and proportions. I can solve simple problems involving ratio and proportion. I can solve arithmetic problems in context. I can construct and interpret scale drawings.</p> | <p><u>Language and Meaning</u></p> <p>Ratio – A comparison between one part or quantity and another part or quantity. Proportion – A comparison between one part and the whole. Scale – The ratio between the size of an object and its portrayal on a diagram.</p> |
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| Unit Name: Probability: | Recommended Teaching Time: |
| <p>Overview and Aims</p> <p>Human beings seem fascinated with games. As soon as babies interact with their parents they start to play peek-a-boo, and as toddlers taking their first tumbling steps they begin to play hide and seek. The love affair with games continues into sports, board and card games and in modern times ubiquitous computer games. Games have such a strong appeal because they not only entertain and amuse but also help you develop strategic thinking. Most games are based upon a mixture of skill and chance. Understanding probability helps make better decisions in games that involve chance.</p> | |
| I can statements (star the “essentials”) | Critical Content, Key Words and Additional Notes. |



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| <p>✓</p> <p>Each student will be able to:</p> <p>I can use the vocabulary and ideas of probability, drawing on experience. I can understand and use the probability scale from 0 to 1. I can sort objects using a Venn diagram.</p> | <p><u>Language and Meaning</u></p> <p>Probability – A measure of how likely an outcome is to occur. It is described using words (certain, very likely, unlikely,) or numbers (50%, 0.85 etc) Even chance - The probability for an event which is as likely to happen as not happen. Event – An activity. Outcome – A result of an activity. Venn Diagram – A diagram that sorts objects into sets.</p> |
| Assessment details | |
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