# Maths Year 7

**Subject Vision**

The Mathematical curriculum provides students with a deep knowledge of mathematical concepts. This will enable students to carry out calculations fluently throughout all domains. This should develop students to be inquisitive problem solvers who can apply Maths to the real world.

**End Points**

- **EP1 Have a deep understanding of maths and how it relates to the real world**
- **EP2 Solve Problems and form reasonable and logical conclusions based on rigorous mathematical knowledge**
- **EP3** Reason, interpret and communicate mathematically
- **EP4 Can apply mathematical knowledge fluently across and between domains**

# Maths Year 7

| Subject Domains of Knowledge | Subject Key Concepts |
|---|---|
| • D1 Number<br>• D2 Algebra<br>• D3 Statistics<br>• D4 Ratio proportion and rates of change<br>• D5 Geometry and Measure<br>• D6 Probability | • C1 Mathematical operations<br>• C2 Directed number<br>• C3 FDPR<br>• C4 place value<br>• C5 types of numbers<br>• C6 Algebraic manipulation (simplify /expanding/ changing the subject etc)<br>• C7 Equations<br>• C8 Graphs and sequences<br>• C9 constructions and loci<br>• C10 Measures (perimeter, area, volume etc)<br>• C12 Angles (inc parallel lines and using angles)<br>• C13 Transformations (including vectors)<br>• C14 properties of shapes<br>• C15 Data Handling (including averages, charts and graphs) |

## Medium Term Curriculum Plan

**Year 7: Maths**

| Units | Unit 1: Coordinates and Angles | Unit 2: Calculators | Unit 3: Time |
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# Maths Year 7

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| **Overview** | This is a transition unit looking to develop skills using a protractor, measuring angles and identifying quadrants and coordinates. | This is a transition skills development unit introducing students to the Casio scientific calculator, using all the function buttons which will benefit them through their lessons in Maths. | This is a transition unit making sure all students can tell the time on different sorts of clocks, and work with timetables successfully |
| **Lesson Sequence** | 1. Coodinates in one quadrant<br>2. Coordinate's in four quadrants<br>3. Understand angle facts<br>4. Measuring angles accurate<br>5. Drawing accurate angles | 1. Use key buttons on a calculator<br>2. Use more functions on a calculator<br>3. Use the memory function | 1. Tell the time on analogue clock<br>2. Tell the time on a digital clock<br>3. Converting time<br>4. Using the 24hour clock<br>5. Reading timetables<br>6. Using place value<br>7. Ordering decimals |
| **Key Domains and Concepts taught in this Unit / Term** | D5 Geometry and Measure<br>D1 Number<br>C1 Mathematical operations<br>C10 Measures (perimeter, area, volume etc)<br>C8 Graphs and sequences<br>C10 Measures (perimeter, area, volume etc)<br>C12 Angles (inc parallel lines and using angles) | D1 Number<br>D3 Statistics<br>D2 Algebra<br>C1 Mathematical operations<br>C2 Directed number<br>C5 types of numbers<br>C8 Graphs and sequences | D1 Number<br>C1 Mathematical operations<br>C4 place value<br>C5 types of numbers |
| **KS4 End Points taught in this Unit / Term** | **EP1 Have a deep understanding of maths and how it relates to the real world**<br>**EP2 Solve Problems and form reasonable and logical conclusions based on rigorous mathematical knowledge** | **EP4 Can apply mathematical knowledge fluently across and between domains** | **EP1 Have a deep understanding of maths and how it relates to the real world**<br>**EP2 Solve Problems and form reasonable and logical conclusions based on rigorous mathematical knowledge** |

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| | **EP3** Reason, interpret and communicate mathematically<br>**EP4 Can apply mathematical knowledge fluently across and between domains** | | **EP3 Reason, interpret and communicate mathematically**<br>**EP4 Can apply mathematical knowledge fluently across and between domains** |
| **Declarative Knowledge (Students should know)** | The difference between an acute, obtuse and reflex angle<br>90 degrees is a right angle<br>180 degrees is a straight line<br>The "along the corridor and up the stairs" rule<br>The value of X and Y on a graph | All the buttons on a calculator<br>Be able to convert decimal or fraction answers using the S-D button<br>Programme the calculator for iterations<br>Apply the fraction button into all sums<br>Use the joystick to move on the screen | The use of the different hands on an analogue clock<br>That time is base 60, so adding doesn't work as normal |
| **Procedural Knowledge (Students should be able to do)** | How to draw and measure lines and angles in geometric figures<br>How to use the standard ruler and protractor<br>How to use angle facts and apply them in problem solving questions<br>How to plot a point on a graph<br>How to read a scale from a graph | Use the buttons to find answers to complicated sums<br>How the root or power of a number changes<br>How to substitute values<br>Use of maths terminology such as $x^2$ | Tell the time<br>Add on any given number of minutes to a given time<br>Read a timetable printed in either direction<br>Place decimal numbers in size order using place value correctly |
| **Developing T3 Literacy and Numeracy** | **Angle**: the space (usually measured in degrees) between two intersecting lines or surfaces at or close to the point where they meet.<br>**Obtuse:** (of an angle) more than 90° and less than 180°<br>**Reflex:** (of an angle) exceeding 180°<br>**Acute:** (of an angle) less than 90 | **Calculator**: a machine to help us do different calculations<br>**Function**: A operation/piece of maths the calculator does to the inputted number(s) | **Analogue clock**: a clock using hands to show the time<br>**Digital clock**: a clock using a display to show the time in numbers |

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| | **Equal:** being the same in quantity, size, degree, or value<br>**Coordinate:** coordinates are written as ordered pairs of numbers or letters and numbers.<br>**Quadrant:** each of four parts of a plane, sphere, space, or body divided by two lines or planes at right angles | | |
| **Assessment (Summative and Formative)** | Formative – exit ticket in topic and feedforward with a tick time task<br>Summative – end of term assessment | Formative – exit ticket in topic and feedforward with a tick time task<br>Summative – end of term assessment | Formative – exit ticket in topic and feedforward with a tick time task<br>Summative – end of term assessment |
| **Links to Prior Learning** | KS2 curriculum – they have seen these topics – need to develop understanding | Know some of the functions from KS2 such as square root (not on a calculator) | Basic telling the time and vocabulary such as “o’clock” “half past” “quarter to” etc |
| **Next steps in learning** | Construct shapes/perpendicular lines accurately<br>Use the quadrants from transformations | Use in all areas of maths effectively | Timetable problem solving questions<br>Use of time and timetables in real life |
| **Common Barriers to learning in this unit** | Cannot use a protractor/compass correctly<br>Go the wrong direction a grid | Do not have a calculator and forget how to use the buttons in lessons | Time being in base 60 rather than base 100, so column addition won’t work.<br>Mistake that 0.4 is bigger than 0.23 as 4 is bigger than 2 |

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# Maths Year 7

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# Maths Year 7

| Units | Unit 4: Averages | Unit 5: Estimating and rounding | Unit 6: Order of operation (BIDMAS)/negative numbers |
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| **Overview** | This is a transition unit aimed to develop number skills linking it in with data in real life. They will collect data by measuring, find correlations and display results. | This is a transition unit developing place value and linking it into rounding numbers to decimal places and significant figures. | This is a transitional unit developing all number skills. Looking at the order of operations and using manipulatives to develop understanding on negative numbers. |
| **Lesson Sequence** | 1. Use mode, median and range<br>2. Use the mean<br>3. Collect data and apply it<br>4. Use data in real life | 1. Basic rounding<br>2. Rounding to decimal places<br>3. Rounding to significant figures<br>4. Estimation | 1. Use order of operations<br>2. Add/subtract negative numbers<br>3. Multiply/divide negative numbers |
| **Key Domains and Concepts taught in this Unit / Term** | D1 Number<br>D3 Statistics<br>C1 Mathematical operations<br>C15 Data Handling (including averages) | D1 Number<br>C1 Mathematical operations<br>C5 types of numbers | D1 Number<br>C1 Mathematical operations<br>C2 Directed number<br>C4 place value<br>C5 types of numbers |
| **KS4 End Points taught in this Unit / Term** | **EP1 Have a deep understanding of maths and how it relates to the real world**<br>**EP2 Solve Problems and form reasonable and logical conclusions based on rigorous mathematical knowledge**<br>**EP3** Reason, interpret and communicate mathematically<br>**EP4 Can apply mathematical knowledge fluently across and between domains** | **EP1 Have a deep understanding of maths and how it relates to the real world**<br>**EP2 Solve Problems and form reasonable and logical conclusions based on rigorous mathematical knowledge**<br>**EP3 Reason, interpret and communicate mathematically**<br>**EP4 Can apply mathematical knowledge fluently across and between domains** | **EP2 Solve Problems and form reasonable and logical conclusions based on rigorous mathematical knowledge**<br>**EP3 Reason, interpret and communicate mathematically**<br>**EP4 Can apply mathematical knowledge fluently across and between domains** |

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# Maths Year 7

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| **Declarative Knowledge** | Mean, median, mode and Range – identify the difference<br>Measure and collect personal data<br>Use a frequency chart to collect data<br>Display results using a chart | Place value<br>Decimal places<br>Estimate numbers | Add and subtract numbers<br>Multiply and divide numbers<br>Use indices and brackets on a calculator |
| **Procedural Knowledge (Students should be able to do)** | Use the mean, median and mode to anyalysis data<br>Know the difference between the averages<br>Collect data from a frequency chart and find the average | Round to 1dp/ 2dp /3dp<br>Round to 1sf / 2sf/ 3sf<br>Estimate numbers using significant figures | Use BIDMAS to calculate sums<br>Use manipulatives/number line to add and subtract negative numbers<br>Multiply and divide negative numbers<br>Problem solve complex GCSE questions using BIDMAS |
| **Developing T3 Literacy and Numeracy** | **Mode:** the most common<br>**Mean:** the total of all the scores or amounts<br>**Median:** type of average which is the middle value of an ordered set of data values<br>**Range:** The difference between the lowest and highest values in a set of data | **Decimal:** a number where tenths, hundredths and thousands are written after a decimal point<br>**Significant figures:** rounding to the most significant figure<br>**Integer:** whole number<br>**Round :** approximating a number to one which is easier to work with<br>**Estimate:** roughly calculating the answer or outcome of something | **Brackets:** symbols used to group things together<br>**Indices:** the small number above the base number<br>**Operations:** something you do to one or more numbers<br>**Integer:** a whole number |
| **Assessment (Summative and Formative)** | Formative – exit ticket in topic and feedforward with a tick time task<br>Summative – end of term assessment | Formative – exit ticket in topic and feedforward with a tick time task<br><br>Summative – end of term assessment | Formative – exit ticket in topic and feedforward with a tick time task<br><br>Summative – end of term assessment |
| **Links to Prior Learning** | KS2 in year 6 would have seen averages | KS2 curriculum – decimals and place value and should have seen basic rounding | KS2 curriculum – BIDMAS, adding and subtracting/multiply/divide skills |

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| **Next steps in learning** | Estimated mean<br>Averages from grouped data | Continue to practise skills within most topics in Maths<br>Higher- error intervals and bounds | More practise with negative numbers.<br>Use negative numbers and BIDMAS across all topics in Maths |
| **Common Barriers to learning in this unit** | Get confused with average is which one.<br>Do not order data in ascending order | Not understanding place value | Not being able to add/subtract/multiply/divide<br>Timetables – weak |

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# Maths Year 7

| Units | Unit 7: Collecting add/subtract/substitution | Unit 8: Fractions multiply/dividing | Unit 9: probability |
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| **Overview** | This is an introduction into using algebra. It is a unit focusing on collecting terms when adding and subtracting. In this unit we will look at using letters in substitution too. | This topic is to develop and recall knowledge of multiplying and dividing fractions and developing this skill with mixed numbers and improper fractions. | This unit introduces probability. It looks at the probability scale and the probability of different events happening. This leads to a probability fair happening in term 6. |
| **Lesson Sequence** | 1. Use algebra in words<br>2. Collecting terms when added and subtracted<br>3. Collect terms in complex questions<br>4. Substitute with terms | 1. Converting mixed numbers<br>2. Multiply fractions<br>3. Divide fractions | 1. The probability scale<br>2. Understanding probability<br>3. Listing outcomes<br>4. Mutually exclusive events<br>5. Relative frequency |
| **Key Domains and Concepts taught in this Unit / Term** | D1 Number<br>C1 Mathematical operations<br>C2 Directed number<br>C6 Algebraic manipulation (simplify /expanding/ changing the subject etc)<br>D2 Algebra | C1 Mathematical operations<br>C3 FDPR<br>C5 types of numbers<br>D1 Number<br>D2 Algebra | C1 Mathematical operations<br>D1 Number<br>D6 Probability |
| **KS4 End Points taught in this Unit / Term** | **EP2 Solve Problems and form reasonable and logical conclusions based on rigorous mathematical knowledge**<br>**EP4 Can apply mathematical knowledge fluently across and between domains** | **EP1 Have a deep understanding of maths and how it relates to the real world**<br>**EP3 Reason, interpret and communicate mathematically**<br>**EP4 Can apply mathematical knowledge fluently across and between domains** | **EP1 Have a deep understanding of maths and how it relates to the real world**<br>**EP2 Solve Problems and form reasonable and logical conclusions based on rigorous mathematical knowledge**<br>**EP3 Reason, interpret and communicate mathematically** |

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# Maths Year 7

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| | | | **EP4 Can apply mathematical knowledge fluently across and between domains** |
| **Declarative Knowledge (Students should know)** | Multiply numbers | Equivalent fractions<br>Add/subtract fractions<br>Multiply/divide fractions | Add and multiply fractions |
| **Procedural Knowledge (Students should be able to do)** | Basic algebra – simplify terms – add and subtract them<br>Substitution | Multiply/divide fractions<br>Convert mixed numbers /improper fractions<br>Simplify fractions | Key words of probability<br>Understand the scale of probability<br>Know probability is out of 1<br>Use a sample space |
| **Developing T3 Literacy and Numeracy** | **Like terms:** terms that contain the same letters<br>**Term:** each bit in an expression, separated by plus or minus signs<br>**Expression:** a collection of terms made up of numbers and letters<br>**Equation:** an algebraic statement made up of two expressions separated by an equals sign.<br>**Substitute:** to replace a letter with a number equivalent<br>**Formula:** a rule for working something out, often written using an algebraic expression. | **Numerator:** top number of a fraction<br>**Denominator:** bottom number of a fraction<br>**Reciprocal:** swap the places of the numerator and denominator<br>**Improper:** a fraction where the numerator is greater than the denominator. Also called top heavy fractions<br>**Mixed number:** a fraction which is an integer and a fraction together<br>**Equivalent:** equal | **Event:** a results that matches one or more possible outcomes of a trial<br>**Likely:** more than half a chance of happening<br>**Certain**: 100% probability of happening<br>**Impossible**: 0% probability of happening<br>**Even chance**: 50/50 chance<br>**Unlikely**: less than half a chance of happening<br>**Sample space:** a table showing all the possible outcomes from 2 or more trials<br>**Probability:** how likely it is that something will happen |

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| | | | **Bias:** where something is more likely to in one direction<br>**Fair:** where something is equally likely |
| **Assessment (Summative and Formative)** | Formative – exit ticket in topic and feedforward with a tick time task<br><br>Summative – end of term assessment | Formative – exit ticket in topic and feedforward with a tick time task<br><br>Summative – end of term assessment | Formative – exit ticket in topic and feedforward with a tick time task<br><br>Summative – end of term assessment |
| **Links to Prior Learning** | KS2 curriculum –basic substitution using pictures | KS2 curriculum – what a fraction is/ equivalent fractions / add/subtract/multiply/divide fractions | Not been taught before. Have been taught fractions in KS2. |
| **Next steps in learning** | Collecting terms – multiply and divide<br>Include brackets | Higher –algebraic fractions<br>Using fractions across all domains | Probability in venn diagrams and trees |
| **Common Barriers to learning in this unit** | Letters in algebra<br>Misconception that they do not like algebra from Primary school | Do not understand the concept of what a fraction is | Forget probability is out of 1 |

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# Maths Year 7

| Units | Unit 10: index laws/collecting terms | Unit 11: bar charts/pictograms/pie charts | Unit 12: shapes/ perimeter including circumference |
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| **Overview** | This topic is the next part of introducing collecting terms; looking at multiplying and dividing terms linked in with index laws. | This topic looks at real life data and the different ways to display it, using charts and graps. | This is the first topic recalling all the students knowledge of shapes and developing it by identifying perimeters including circumference of circles. |
| **Lesson Sequence** | 1. Using substitution to write powers<br>2. Use index laws<br>3. Multiply and divide terms<br>4. Using brackets with terms | 1. Bar charts<br>2. Pictograms<br>3. Proportions of a pie chart | 1. 2D shapes and properties<br>2. Symmetry of shapes<br>3. Perimeter of shapes<br>4. circumference |
| **Key Domains and Concepts taught in this Unit / Term** | C1 Mathematical operations<br>C2 Directed number<br>C6 Algebraic manipulation (simplify /expanding/ changing the subject etc)<br>D1 Number<br>D2 Algebra | C1 Mathematical operations<br>C4 place value<br>C12 Angles (inc parallel lines and using angles)<br>C14 properties of shapes<br>C15 Data Handling (including averages, charts and graphs)<br>D3 Statistics<br>D5 Geometry and Measure | C1 Mathematical operations<br>C10 Measures (perimeter, area, volume etc)<br>C14 properties of shapes<br>D1 Number<br>D5 Geometry and Measure |
| **KS4 End Points taught in this Unit / Term** | **EP3 Reason, interpret and communicate mathematically**<br>**EP4 Can apply mathematical knowledge fluently across and between domains** | **EP1 Have a deep understanding of maths and how it relates to the real world**<br>**EP3 Reason, interpret and communicate mathematically**<br>**EP4 Can apply mathematical knowledge fluently across and between domains** | **EP1 Have a deep understanding of maths and how it relates to the real world**<br>**EP2 Solve Problems and form reasonable and logical conclusions based on rigorous mathematical knowledge**<br>**EP3 Reason, interpret and communicate mathematically** |

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| | | | **EP4 Can apply mathematical knowledge fluently across and between domains** |
| **Declarative Knowledge (Students should know)** | Collect terms – multiply and divide<br>Understand algebra | Bar charts – draw and interpret<br>Pictograms – draw and interpret<br>Seen pie charts used | 2d shapes and properties<br>Understand perimeter of a rectangle |
| **Procedural Knowledge (Students should be able to do)** | Use indices to simplify expressions<br>Use the rules of index law | Draw a bar chart without gaps/ dual bar chart and interpret<br>Pictograms – with complicated scales<br>Interpret pie charts | Circumference of a circle<br>Perimeter of all shapes<br>Properties of 2D shapes |
| **Developing T3 Literacy and Numeracy** | **Index notation**: indices rules<br>**Indices**: the little number attached to a base to indicate how many times it is multiplied<br>**Base**: the main number or letter<br>**Power:** indices<br>**Simplify:** make something simpler by collecting terms<br>**Terms:** each of the bits in an expression | **Axis:** line of a graph<br>**Scale:** the numbers on a map or plan that show how actual distances will be represented on a map<br>**Key:** an instruction for reading a diagram or graph<br>**Angles**: a measure of turn<br>**Proportion:** how two numbers relate to each other<br>**Frequency:** how many items are in a category | **Circumference:** perimeter of a circle<br>**Quadrilaterals:** four sided shape<br>**Polygons:** an enclosed shape whose sides are all straight<br>**Perimeter:** outside of a shape<br>**Symmetry:** a shape has symmetry if you can draw on a mirror line where one side of the shape is the exact reflection of the other.<br>**Lines of symmetry:** the line that the picture is reflected in<br>**Parallel lines:** lines that are always the same distance apart and never meet. |

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| | | | **Equal:** sides that are the same length/angles which are the same degrees. |
| **Assessment (Summative and Formative)** | Formative – exit ticket in topic and feedforward with a tick time task<br><br>Summative – end of term assessment | Formative – exit ticket in topic and feedforward with a tick time task<br><br>Summative – end of term assessment | Formative – exit ticket in topic and feedforward with a tick time task<br><br>Summative – end of term assessment |
| **Links to Prior Learning** | Collecting terms for adding and subtract in term 2. Algebra in term 2. Indices in BODMAS term 1. | KS2 curriculum - draw a bar chart, pictogram and seen a pie chart | KS2 – properties of 2D shapes. Understanding or lines of reflection |
| **Next steps in learning** | Applying indices and simplifying with brackets and more complex questions | Construct pie charts<br>Scattergraphs / frequency polygons | Area of all shapes |
| **Common Barriers to learning in this unit** | Get confused with adding and subtract indices. Also when numbers are in front of letters. | Bars next to each other on a bar chart<br>Pictogram- do not read the scale correctly<br>Cannot read a pie chart | Get confused with area and perimeter of a shape |

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# Maths Year 7

| Units | Unit 13: fractions – adding subtracting | Unit 14: solving basic equations | Unit 15: angle facts including triangles |
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| **Overview** | This topic is the next part of consolidating the knowledge of adding and subtracting fractions, including mixed and improper fractions. | This is the first unit introducing inverse operations and the concept of solving an equation. The students will use number machines initially and develop to using algebra. | This unit is equipping students to solve problems within shapes and on parallel lines. They will learn and proof rules which they will develop on in future years. |
| **Lesson Sequence** | 1. use equivalent fractions<br>2. add and subtract with same denominator<br>3. using mixed fractions | 1. Using function machines with one steps<br>2. Using function machines with two steps<br>3. Reverse steps in function machines<br>4. Use basic solving equations | 1. angles<br>2. angles in triangles<br>3. angles in quadrilaterals and pentagons<br>4. problem solving with angles |
| **Key Domains and Concepts taught in this Unit / Term** | C1 Mathematical operations<br>C2 Directed number<br>C3 FDPR<br>C4 place value<br>D1 Number<br>D3 Statistics | C1 Mathematical operations<br>C2 Directed number<br>C6 Algebraic manipulation (simplify /expanding/ changing the subject etc)<br>C7 Equations<br>D1 Number<br>D2 Algebra | C1 Mathematical operations<br>C9 constructions and loci<br>C10 Measures (perimeter, area, volume etc)<br>C12 Angles (inc parallel lines and using angles)<br>C14 properties of shapes<br>D5 Geometry and Measure |
| **KS4 End Points taught in this Unit / Term** | **EP3 Reason, interpret and communicate mathematically**<br>**EP4 Can apply mathematical knowledge fluently across and between domains** | **EP2 Solve Problems and form reasonable and logical conclusions based on rigorous mathematical knowledge**<br>**EP3 Reason, interpret and communicate mathematically** | **EP2 Solve Problems and form reasonable and logical conclusions based on rigorous mathematical knowledge**<br>**EP3 Reason, interpret and communicate mathematically** |

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| | | | **EP4 Can apply mathematical knowledge fluently across and between domains** |
| **Declarative Knowledge (Students should know)** | Multiply and divide fractions<br>simplifying fractions | Find a missing number<br>Inverse functions<br>Have seen Algebra | Properties of shapes<br>Construct an angle<br>Know angle- acute/obtuse/reflex |
| **Procedural Knowledge (Students should be able to do)** | Ordering fractions<br>Equivalent fractions<br>Add/ subtract fractions – including mixed numbers | Use a flow chart to understand how to solve a question<br>Inverse functions to solve | 180 degrees on a straight line<br>180 degrees in a triangle<br>Isosceles has 2 equal angles/sides<br>Equilateral – all angles are 60 degrees |
| **Developing T3 Literacy and Numeracy** | **Numerator:** top number of a fraction<br>**Denominator:** bottom number of a fraction<br>**Reciprocal:** swap the places of the numerator and denominator<br>**Improper:** a fraction where the numerator is greater than the denominator. Also called top heavy fractions<br>**Mixed number:** a fraction which is an integer and a fraction together<br>**Equivalent:** equal | **Inverse:** the opposite operation<br>**Input:** what goes into the equation<br>**Output:** the value that comes out<br>**Solve:** find the missing value | **Sum:** add<br>**Base angles:** angles at the bottom of the triangle<br>**Interior and exterior angles:** inside and outside angles of a shape |

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| **Assessment (Summative and Formative)** | Formative – exit ticket in topic and feedforward with a tick time task<br><br>Summative – end of term assessment | Formative – exit ticket in topic and feedforward with a tick time task<br><br>Summative – end of term assessment | Formative – exit ticket in topic and feedforward with a tick time task<br><br>Summative – end of term assessment |
| **Links to Prior Learning** | KS2 – should have covered add and subtract fractions and ordering fractions | Not seen in KS2. Should have an understanding of algebra an using letters | KS2 – properties of triangles and angles |
| **Next steps in learning** | Consolidate learning of all fractions<br>Higher – algebraic fractions | Solving without a flow chart. 2 step problems | Use this knowledge to solve problems including parallel lines |
| **Common Barriers to learning in this unit** | Forget to find an equivalent fraction to make the denominators the same | Using letters and inverse functions | Identifying isosceles triangles and knowing the properties |

| **Units** | **Unit 16: FDP conversions including ratio** | **Unit 17: inequalities- number lines and listing integers** | **Unit 18: basic transformations** |
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| **Overview** | This unit recalls students knowledge and understanding on fractions and decimals. It introduces percentages and ratio and connects them together in conversion. | This unit introduces inequalities. Students will identify what they mean and how they can be used on a number line. | This unit introduces transformations. Students will look at reflecting, rotating and translating shapes on grids. |

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| **Lesson Sequence** | 1. Ordering fractions<br>2. Fraction of amount<br>3. Percentage of amount<br>4. Use FDP conversions.<br>5. Order fractions, percentage and decimals<br>6. Use ratio in terms of FDP | 1. Recognise inequality signs<br>2. Inequalities on number line<br>3. Use number lines | 1. Describe and draw reflections<br>2. Describe and draw rotations<br>3. Combine reflections and rotations<br>4. Describe and draw translation |
| **Key Domains and Concepts taught in this Unit / Term** | C1 Mathematical operations<br>C2 Directed number<br>C3 FDPR<br>C4 place value<br>C5 types of numbers<br>D1 Number<br>D4 Ratio proportion and rates of change | C1 Mathematical operations<br>C2 Directed number<br>C6 Algebraic manipulation (simplify /expanding/ changing the subject etc)<br>C7 Equations<br>C8 Graphs and sequences<br>D1 Number<br>D2 Algebra | C1 Mathematical operations<br>C8 Graphs and sequences<br>C13 Transformations (including vectors)<br>D1 Number<br>D3 Statistics<br>D5 Geometry and Measure |
| **KS4 End Points taught in this Unit / Term** | **EP1 Have a deep understanding of maths and how it relates to the real world**<br>**EP2 Solve Problems and form reasonable and logical conclusions based on rigorous mathematical knowledge**<br>**EP4 Can apply mathematical knowledge fluently across and between domains** | **EP2 Solve Problems and form reasonable and logical conclusions based on rigorous mathematical knowledge**<br>**EP3 Reason, interpret and communicate mathematically** | **EP2 Solve Problems and form reasonable and logical conclusions based on rigorous mathematical knowledge**<br>**EP3 Reason, interpret and communicate mathematically** |
| **Declarative Knowledge (Students should know)** | Fraction of amount<br>Decimals<br>Percentage is out of 100 | What an integer is<br>Place value applied on a number line<br>Rounding to the nearest integer and to decimal places | Use coordinates to plot on a grid<br>Understand what a line of reflection is |

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| **Procedural Knowledge (Students should be able to do)** | Convert fraction to decimal to percentage<br>Link with ratio<br>Understand the connection between percentage / decimals / fractions | Understand how to use inequalities<br><br>Use inequalities to find bounds of a number<br><br>Use a number line to describe all the numbers greater than, less than or equal to | Be able to reflect shapes in a given mirror line on a grid<br>Be able to rotate shapes about a given centre on a grid<br>Describe translation in words<br>Be able to translate shapes in positive directions, from words or vectors |
| **Developing T3 Literacy and Numeracy** | **Fraction:** a part of a whole, written as one number on top of another<br>**Decimal:** a number where tenths, hundredths and thousandths are written after a decimal point<br>**Percentage:** out of 100<br>**Ratio:** the amount of one thing compared to another<br>**Proportion:** how two numbers relate to each other<br>**Equivalent:** the same<br>**Simplify:** make something simpler by collecting terms | **Integer:** whole number<br>**Inequality:** > greater than / less than = equal to<br>**Integers:** whole numbers | **Transformation:** Changing a shape's position or size<br>**Object:** The original shape, before a transformation<br>**Image:** The new shape, after a transformation<br>**Reflection:** An image or shape as it would be seen in a mirror line<br>**Mirror line:** The line of symmetry between an object and its reflected image<br>**Rotation:** To turn a shape, by a given angle<br>**Centre of rotation:** The point around which an object is rotated<br>**Translation:** To move an object, without rotation or reflection<br>**Vector**: A way of writing a translation, without words |

SOUTH DOWNS
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# Maths Year 7

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| **Assessment (Summative and Formative)** | Formative – exit ticket in topic and feedforward with a tick time task<br><br>Summative – end of term assessment | Formative – exit ticket in topic and feedforward with a tick time task<br><br>Summative – end of term assessment | Formative – exit ticket in topic and feedforward with a tick time task<br><br>Summative – end of term assessment |
| **Links to Prior Learning** | KS2 – being able to use decimals and fractions | Rounding numbers and how to place numbers on a number line - KS2 | September in year 7 – coordinates and looking at a 4 quadrant grid<br>Symmetry in shapes – line of reflection |
| **Next steps in learning** | Percentage of amount – percentage increase and decrease | Error intervals and truncation | Reflection over named straight lines on coordinate axes<br>Rotation about a coordinate point on a coordinate axes<br>Negative Translations<br>Enlargement – just scale factors |
| **Common Barriers to learning in this unit** | Dividing or multiplying by 100 in the wrong way. Not remembering percentage is out of 100. Cant simplify fractions. | Which way around the inequalities go<br>On the number line when to use a filled in dot or open dot | Miscount squares in reflection<br>Mistake clockwise/anticlockwise<br>Can't use tracing paper for rotations |

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# Maths Year 7

| Units | Unit 19: sequences term to term and nth term | Unit 20: probability fair | Unit 21: ratio- simplifying ratio/equivalent /recipes |
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| **Overview** | This unit introduces sequences using algebra. The students will develop their skills of finding patterns and connect it to the nth term. | This unit the students use their knowledge from probability in term 2 and create in groups a probability game. It is then used to compete in a probability fair. | This unit develops on previous ratio lesson knowledge and relates it to real life scenarios including recipes. |
| **Lesson Sequence** | 1. Sequences from patterns<br>2. Find a term to term rules<br>3. Find an nth term<br>4. Find terms from nth term rule | 1. Use probability to make an effective game<br>2. Use the game in the probability fair | 1. Simplify ratio questions<br>2. Use equivalent ratio<br>3. Use ratio in recipe questions |
| **Key Domains and Concepts taught in this Unit / Term** | C1 Mathematical operations<br>C2 Directed number<br>C5 types of numbers<br>C6 Algebraic manipulation (simplify /expanding/ changing the subject etc)<br>C8 Graphs and sequences<br>D1 Number<br>D2 Algebra<br>D3 Statistics<br>D4 Ratio proportion and rates of change | C1 Mathematical operations<br>C15 Data Handling (including averages, charts and graphs)<br>D1 Number<br>D6 Probability | C1 Mathematical operations<br>C3 FDPR<br>C6 Algebraic manipulation (simplify /expanding/ changing the subject etc)<br>D1 Number<br>D4 Ratio proportion and rates of change |

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| | D5 Geometry and Measure<br>D6 Probability | | |
| **KS4 End Points taught in this Unit / Term** | **EP1 Have a deep understanding of maths and how it relates to the real world**<br>**EP2 Solve Problems and form reasonable and logical conclusions based on rigorous mathematical knowledge**<br>**EP4 Can apply mathematical knowledge fluently across and between domains** | **EP1 Have a deep understanding of maths and how it relates to the real world**<br>**EP2 Solve Problems and form reasonable and logical conclusions based on rigorous mathematical knowledge**<br>**EP4 Can apply mathematical knowledge fluently across and between domains** | **EP1 Have a deep understanding of maths and how it relates to the real world**<br>**EP2 Solve Problems and form reasonable and logical conclusions based on rigorous mathematical knowledge**<br>**EP3 Reason, interpret and communicate mathematically**<br>**EP4 Can apply mathematical knowledge fluently across and between domains** |
| **Declarative Knowledge (Students should know)** | Find patterns in sequences<br>Look for rules and connections in sequences | Know probability is out of 1<br>Know how to find the probability of mutually exclusive events<br>Relative frequency | Connect ratio with fractions<br>Understand how to simplify fractions |
| **Procedural Knowledge (Students** | Find the next term in the sequence<br>Find the nth term of a sequence<br>Find a term in the sequence | Design a game planned with probability. Use probability to make a game which looks good to play but has a higher chance of | Be able to simplify ratio<br>Find equivalent ratios<br>Use ratio in basic recipes to find new values |

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| **should be able to do)** | | students loosing so able to make money in the fair. | |
| **Developing T3 Literacy and Numeracy** | **Nth term:** a rule for a list of numbers in a sequence<br>**Sequence:** a pattern of numbers or shapes that follow a certain rule<br>**Linear:** straight line graph, nth term sequence<br>**Arithmetic:** straight line graph, nth term sequence<br>**Term:** each of the bits in a an expression | **Relative frequency:** the probability of an event happening many times<br>**Probability:** how likely it is that something will happen | **Equivalent:** the same<br>**Ratio:** the amount of one thing compared to another<br>**Simplify:** make something simpler by collecting terms<br>**Fractions:** a part of a whole, written as one number on top of another |
| **Assessment (Summative and Formative)** | Formative – exit ticket in topic and feedforward with a tick time task<br><br>Summative – end of term assessment | Formative – exit ticket in topic and feedforward with a tick time task<br><br>Summative – end of term assessment | Formative – exit ticket in topic and feedforward with a tick time task<br><br>Summative – end of term assessment |
| **Links to Prior Learning** | Finding patterns in picture sequences – KS2 | KS3 term 2 – theory of probability | KS2 – simplify fractions – find equivalent fractions |
| **Next steps in learning** | Practise finding the nth term<br>Look at special sequences<br>Understand the difference between geometric, Fibonacci and others | Probability using two way tables, frequency tables and venn diagrams | Sharing in a ratio, ratio problem solving |
| **Common Barriers to learning in this unit** | Confusion with finding the nth term and substituting to find any number in the sequence. | Make a game without effective probability planned in, so do not win many games. Or leave it to chance. | Do not add the parts together in a ratio |

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| | Describing if a number is in the sequence clearly | | Forget to multiply/divide both sides in an equivalent ratio |

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# Maths Year 7

| Units | Unit 22: construction/loci |
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| **Overview** | This unit introduces the use of a pair of compasses. Students will learn how to draw and bisect lines and angles accurately. |
| **Lesson Sequence** | 1. Practice drawing angles<br>2. Construct SAS and ASA triangles<br>3. Construct SSS triangles<br>4. Construct angle sectors<br>5. Construct perpendicular lines<br>6. Use construction in loci problems |
| **Key Domains and Concepts taught in this Unit / Term** | C1 Mathematical operations<br>C9 constructions and loci<br>C10 Measures (perimeter, area, volume etc)<br>C12 Angles (inc parallel lines and using angles)<br>C14 properties of shapes<br>D5 Geometry and Measure |
| **KS4 End Points taught in this Unit / Term** | **EP1 Have a deep understanding of maths and how it relates to the real world**<br>**EP2 Solve Problems and form reasonable and logical conclusions based on rigorous mathematical knowledge** |

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| | **EP3 Reason, interpret and communicate mathematically**<br>**EP4 Can apply mathematical knowledge fluently across and between domains** |
| **Declarative Knowledge (Students should know)** | Use a protractor – be able to draw angles<br>Know what different angles look like<br>Properties of different triangles |
| **Procedural Knowledge (Students should be able to do)** | Use a compass to construct with<br>Know what the words bisect and perpendicular mean<br>Be able to construct different triangles and angles |
| **Developing T3 Literacy and Numeracy** | **Bisect:** to cut an angle exactly in half<br>**Perpendicular:** two lines that cross as 90 degrees<br>**Construct:** use a compass to actually draw<br>**Equidistant:** equal distance<br>**Locus/ loci:** a set of points which satisfy a particular condition |
| **Assessment (Summative and Formative)** | Formative – exit ticket in topic and feedforward with a tick time task<br><br>Summative – end of term assessment |

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| **Links to Prior Learning** | Year 7 term 1 – use a protractor and draw angles<br>Term 4 – properties of triangles |
| **Next steps in learning** | Loci and problem solving – using construction skills |
| **Common Barriers to learning in this unit** | Can not use a compass correctly – bad tools<br>Forget to construct a triangle which is SSS. |