



Whole School Maths Curriculum Overview: Year 5

#TheSmawthorneExperience



Year 5	Summer Term					
Topic	Shape	Position and Direction	Decimals	Negative Numbers	Converting Units	Volume
The Big Ideas	<p>During this year, pupils increase the range of 2-D and 3-D shapes that they are familiar with. With 3-D shapes they think about the faces as well as the number of vertices and through considering nets think about the 2-D shapes that define the 3-D shapes. Pupils learn about a range of angle facts and use them to describe certain shapes and derive facts about them. Regular shapes have to have all sides and all angles the same. Although non-square rectangles have four equal angles, the fact that they do not have four equal sides means that they are not regular. Some properties of shapes are dependent upon other properties. For example, a rectangle has opposite sides equal because it has four right angles. A rectangle is defined as a quadrilateral with four right angles. It does not have to be defined as a quadrilateral with four right angles and two pairs of equal sides.</p>		<p>Representations that may appear different sometimes have similar underlying ideas. For example 1/4, 0.25 and 25% are used in different contexts but are all connected to the same idea</p>	<p>Large numbers of six digits are named in a pattern of three: hundreds of thousands, tens of thousands, ones of thousands, mirroring hundreds, tens and ones. It is helpful to relate large numbers to real-world contexts, for example the number of people that a local sports arena can hold.</p>	<p>The relationship between area and perimeter is not a simple one. Increasing or decreasing area does not necessarily mean the perimeter increases or decreases respectively, or vice versa. Area is measured in square units. For rectangles, measuring the length and breadth is a shortcut to finding out how many squares would fit into each of these dimensions.</p>	
Key Knowledge and Skills	<p>Step 1 Understand and use degrees Step 2 Classify angles Step 3 Estimate angles Step 4 Measure angles up to 180° Step 5 Draw lines and angles accurately Step 6 Calculate angles around a point Step 7 Calculate angles on a straight line</p>	<p>Step 1 Read and plot coordinates Step 2 Problem solving with coordinates Step 3 Translation Step 4 Translation with coordinates Step 5 Lines of symmetry Step 6 Reflection in horizontal and vertical lines</p>	<p>Step 1 Use known facts to add and subtract decimals within 1 Step 2 Complements to 1 Step 3 Add and subtract decimals across 1 Step 4 Add decimals with the same number of decimal places</p>	<p>Step 1 Understand negative numbers Step 2 Count through zero in 1s Step 3 Count through zero in multiples Step 4 Compare and order negative numbers Step 5 Find the difference</p>	<p>Step 1 Kilograms and kilometres Step 2 Millimetres and millilitres Step 3 Convert units of length Step 4 Convert between metric and imperial units</p>	<p>Step 1 Cubic centimetres Step 2 Compare volume Step 3 Estimate volume Step 4 Estimate capacity</p>

	<p>Step 8 Lengths and angles in shapes</p> <p>Step 9 Regular and irregular polygons</p> <p>Step 10 3-D shapes</p> <ul style="list-style-type: none"> • 		<p>Step 5 Subtract decimals with the same number of decimal places</p> <p>Step 6 Add decimals with different numbers of decimal places</p> <p>Step 7 Subtract decimals with different numbers of decimal places</p> <p>Step 8 Efficient strategies for adding and subtracting decimals</p> <p>Step 9 Decimal sequences</p> <p>Step 10 Multiply by 10, 100 and 1,000</p> <p>Step 11 Divide by 10, 100 and 1,000</p> <p>Step 12 Multiply and divide decimals - missing values</p> <ul style="list-style-type: none"> • 		<p>Step 5 Convert units of time</p> <p>Step 6 Calculate with timetables</p>	
<p>Sentence Stems</p>	<ul style="list-style-type: none"> • 2D Shapes: • A (shape name) has (number) sides. • A (shape name) has (number) vertices. • A (shape name) has (number) lines of symmetry. • A (shape name) is a (regular/irregular) polygon. 	<ul style="list-style-type: none"> • Describing Position: • "The shape is located at coordinates (,)." • "The point is situated in the [first/second/third/fourth] quadrant." • "The object is [above/below/to the left of/to the right of] the reference point." • "The shape is positioned [near/far from] the origin." • Describing Direction: 	<ul style="list-style-type: none"> • Place Value: • "In the number [number], the digit [digit] is in the [place value] place, which is worth [value]." • "The number [number] can be partitioned into [number] ones, [number] tenths, and [number] hundredths." 	<ul style="list-style-type: none"> • Understanding Negative Numbers: • "A negative number is a number that is _____ than zero." • "We use negative numbers to represent values _____ zero." • "The number -5 is _____ than -2 because..." 	<p>General Conversion:</p> <p>"To convert from a larger unit to a smaller unit, you need to multiply."</p> <p>"To convert from a smaller unit to a larger unit, you</p>	<ul style="list-style-type: none"> • Describing Volume: • "The volume of this shape is _____ cubic units." • "This shape has a volume of _____." • "The space

	<ul style="list-style-type: none"> • An (angle type) angle is more than (number) degrees and less than (number) degrees. • A (angle type) angle is exactly (number) degrees. • A (angle type) angle is more than (number) degrees. • 	<ul style="list-style-type: none"> • "To move the shape to its new position, you need to move [number] squares [right/left] and [number] squares [up/down]." • "The shape has been translated [number] units to the [right/left] and [number] units [up/down]." • "The shape has been reflected in the [vertical/horizontal] line." • "The reflection creates a mirror image across the line" • 	<ul style="list-style-type: none"> • "The decimal [decimal] is equivalent to the fraction [fraction]." • "Zero is a placeholder in the [place value] place because [explanation]." 	<ul style="list-style-type: none"> • "A negative number is written with a _____ sign." • "On a number line, negative numbers are located to the _____ of zero." • Ordering Negative Numbers: • "When comparing negative numbers, the number with the _____ value is actually the smaller number." • 	<p>need to divide."</p> <p>"When converting units, it's important to remember that there are (number) (smaller unit) in one (larger unit)."</p>	<p>inside this object is its volume."</p> <ul style="list-style-type: none"> • "To find the volume, I need to count the number of cubes." •
<p>National Curriculum Statements</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • identify 3-D shapes, including cubes and other cuboids, from 2-D representations • know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles • draw given angles, and measure them in degrees • identify: angles at a point and one whole turn (total 360o) angles at a point on a straight line and 1/2 a turn (total 180o) other multiples of 90o • use the properties of rectangles to deduce related facts and find missing lengths and angles • distinguish between regular and irregular polygons based on reasoning about equal sides and angles. 	<p>identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed.</p> <p>identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed.</p>	<p>read and write decimal numbers as fractions [for example, $0.71 = \frac{71}{100}$]</p> <ul style="list-style-type: none"> • recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents • round decimals with two decimal places to the nearest whole number and to one decimal place • read, write, order and compare numbers with up to three decimal places • solve problems involving number 	<p>interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero</p> <ul style="list-style-type: none"> • round any number up to 1 	<ul style="list-style-type: none"> • convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) • understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints • solve problems involving converting between units of time • use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling. <p>estimate volume [for example, using 1 cm³ blocks to build cuboids (including cubes)] and capacity [for example, using water]</p>	

			<p>up to three decimal places</p> <ul style="list-style-type: none"> recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25. 			
<p>Misconceptions</p>	<ul style="list-style-type: none"> Children may confuse the terms clockwise and anticlockwise. Children may find it trickier to identify angles that are not shown in a standard orientation, for example a 3/4 turn from north-east to north-west. Children may find it more challenging to classify angles that are close to 90° or 180°. Children may find angles that are not given in standard orientations more difficult to estimate. Children may want to find exact measurements rather than estimates, and may need support to 	<ul style="list-style-type: none"> Children may confuse the x- and y-values of the coordinates and read or plot them in the wrong order. Children may assume that the intervals on the axes always go up in 1s. Children may confuse the x- and y-axes. Without a grid on which to count squares, children may find it tricky to work out missing values. Children may confuse left and right. When describing a translation, children may look at the gap between shapes rather than how the vertices have been translated. 	<ul style="list-style-type: none"> Children may add digits together irrespective of which place value column they are in, e.g. $0.45 + 0.3 = 0.48$ Children may rely on using formal written methods to add/subtract decimals within 1 instead of using known facts. When finding a complement to 1, children may assume that they need to find the bond to 10 in each place value column, for example $0.365 + 0.745 = 1$ Children may try to use a formal written method to find complements to 1 	<ul style="list-style-type: none"> As children are often shown scales from positive 10 to negative 10, they may count incorrectly across zero, for example 3, 2, 1, 0, -10, -9, -8 etc. Children may only look at the digit and think that, for example, -7 is greater than -2 Children may forget to include zero in a count, for example 3, 2, 1, -1, -2, -3 In counts that include zero, children may forget to include it. Children may just reflect a given sequence rather than counting through zero, for example -8, -5, -2, 2, 5, 8 When counting through 	<ul style="list-style-type: none"> Children may perform the wrong operation, for example multiplying instead of dividing. Children may confuse "kilo-" with "centi-" and use the factor of 100 instead of 1,000 Children may perform the wrong operation, for example multiplying instead of dividing. Children may 	<ul style="list-style-type: none"> Children may only count the visible cubes when working out the volume of a 3-D shape. Children may omit units from their answer. Children may assume that a taller shape always has a greater volume. Children may say that a shape with more cubes in it has a greater volume than one with fewer cubes, without

	realise that different answers are acceptable.		instead of using known number bonds.	zero, children may continue the count from zero, for example 5, 3, 1, 0, -2, -4, -6	confuse the different prefixes "kilo-", "milli-" and "centi-".	considering the sizes of the cubes.
Progression	<p>Year 4: • compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes</p> <ul style="list-style-type: none"> • identify acute and obtuse angles and compare and order angles up to two right angles by size • identify lines of symmetry in 2-D shapes presented in different orientations • complete a simple symmetric figure with respect to a specific line of symmetry. <p>Year 6: • draw 2-D shapes using given dimensions and angles</p> <ul style="list-style-type: none"> • recognise, describe and build simple 3-D shapes, including making nets • compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons • illustrate and name parts of circles, including radius, diameter 	<p>Year 4:</p> <ul style="list-style-type: none"> • describe positions on a 2-D grid as coordinates in the first quadrant • describe movements between positions as translations of a given unit to the left/right and up/down • plot specified points and draw sides to complete a given polygon <p>Year 6:</p> <ul style="list-style-type: none"> • describe positions on the full coordinate grid (all four quadrants) • draw and translate simple shapes on the coordinate plane, and reflect them in the axes. 	<p>Year 4 : • Reason about the location of mixed numbers in the linear number system. • Convert mixed numbers to improper fractions and vice versa</p> <ul style="list-style-type: none"> • Add and subtract improper and mixed fractions with the same denominator, including bridging whole numbers. Y <p>Year 6: • Recognise when fractions can be simplified, and use common factors to simplify fractions. • Express fractions in a common denomination and use this to compare fractions that are similar in value. • Compare fractions with different denominators, including fractions greater than 1, using</p>	<p>Year 4: • Recognise the place value of each digit in four-digit numbers, and compose and decompose four-digit numbers using standard and non-standard partitioning. • Reason about the location of any four-digit number in the linear number system, including identifying the previous and next multiple of 1,000 and 100, and rounding to the nearest of each.</p> <p>Year 6: • Compare and order numbers, including those with up to 2 decimal places. Add and subtract using mental and formal written methods.</p> <ul style="list-style-type: none"> • Compare and order numbers, including those with up to 2 decimal places. Estimate and approximate to the nearest 1 or 0.1. • Read scales on graphs and measuring instruments. 	<p>Year 4:</p> <ul style="list-style-type: none"> • Convert between different units of measure [for example, kilometre to metre; hour to minute] • measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres <p>Year 6:</p> <ul style="list-style-type: none"> • calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm³) and cubic metres (m³), and extending to other units [for example, mm³ and km³]. • solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate • use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places • convert between miles and kilometres 	

	<p>and circumference and know that the diameter is twice the radius • recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.</p>		<p>reasoning, and choose between reasoning and common denomination as a comparison strategy.</p>		
<p>Key Vocabulary</p>	<p>angle, turn whole turn, half turn, quarter turn acute angle, right angle, obtuse angle, refl ex angle degrees (°) 90 degrees 180 degrees, 360 degrees interior angle protractor parallel perpendicular angle, interior angle grid regular, irregular polygon, quadrilateral 2D, 3D viewpoint identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed.</p>	<p>refl ection, translation mirror line coordinate, horizontal coordinate, vertical coordinate horizontal axis, vertical axis</p>	<p>fraction simplify percent, percentage, tenths, hundredths, and thousandths. decimal, decimal place, fraction, place value, digits, and decimal point add, subtract, multiply, divide ones, tenths, hundredths, thousandths difference, group, share, compare, represent column, place value, exchange mass, weight, length, width, cost, height</p>	<p>ones (1s), tens (10s), hundreds (100s), thousands (1000s), place value, Roman numerals, partition, estimate, round up, round down, greater than (>), less than (<)</p>	<p>mass, capacity, length, time, quantity metric units, gram, kilogram, millilitre, litre, millimetre, centimetre, metre, kilometre imperial units, ounce (oz), pound (lb), stone (st), pint (pt), gallon, inch (in), foot (f), yard (yd) second, minute, hour, day, week, month, year convert, equal to, equivalent,</p>