Mathematics Curriculum

At Sacred Heart, our intent for Mathematics is to teach a rich, balanced and progressive curriculum using maths to reason, problem solve and develop fluent conceptual understanding in each area. Our curriculum allows children to better make sense of the world around them by making connections between mathematics and everyday life. The structure of the Mathematics curriculum across school shows clear progression in line with age related expectations. Teaching curriculum content in blocks allows children to explore skills and knowledge in depth and gain a secure understanding of particular subject matter. Key knowledge and skills are also revisited regularly allowing repetition to embed learning. A concrete, pictorial, abstract approach provides children with a clear structure in which they can develop their depth of understanding of mathematical concepts. We aim to ensure that Mathematics is a high profile subject which children view positively and with a 'Can do' attitude.

Year group	Autumn	Spring	Summer
Year 1	• Number- Place value within 10 • Addition and Subtraction within 10 • Geometry- shape • Consolidation and revision	• Number- Place value within 20 • Addition and Subtraction within 20 • Measurement- Length and height • Number- Place value within 50 • Measurement- mass and volume	• Number- Multiplication and division • Number- Fractions • Number- Place value within 100 • Geometry- Position and direction • Measurement- Money • Measurement- Time • Consolidation

Key Mathematics objectives (Pupils must know and remember these facts / Improve, hone & apply these skill

Place Value	Addition and Subtraction	Multiplication and Division	Fractions
• count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number • count, read and write numbers to 100 in numerals; count in multiples of 2s, 5s and 10s • given a number, identify 1 more and 1 less • identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least • read and write numbers from 1 to 20 in numerals and words.	• read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs • represent and use number bonds and related subtraction facts within 20 • add and subtract one-digit and two-digit numbers to 20, including 0 • solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ? - 9.	• recall and use multiplication and division facts for the 2 and 10 multiplication tables, including recognising odd and even numbers • solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.	• recognise, find and name a half as 1 of 2 equal parts of an object, shape or quantity • recognise, find and name a quarter as 1 of 4 equal parts of an object, shape or quantity.
Measurement		**Properties of shapes**	**Position and Direction**

• compare, describe and solve practical problems for: - lengths and heights [for example, long/short, longer/shorter, tall/short, double/half] - mass / weight - capacity and volume - time • measure and begin to record the following: - lengths and heights - mass/weight - capacity and volume - time (hours, minutes, seconds)	• recognise and know the value of different denominations of coins and notes • sequence events in chronological order using language • recognise and use language relating to dates, including days of the week, weeks, months and years • tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.	• recognise and name common 2-D and 3-D shapes, including: - 2-D shapes - 3-D shapes	• describe position, direction and movement, including whole, half, quarter and three quarter turns.

Year group	Autumn	Spring	Summer

Year 2	• Number- Place value • Number- Addition and Subtraction • Geometry- Shape	• Measurement- Money • Number- Multiplication and division • Measurement- Length and height	• Measurement- mass, capacity and temperature • Number fractions • Measurement- Time • Statistics • Geometry- Position and direction • Consolidation

Key Mathematics objectives (Pupils must know and remember these facts / Improve, hone & apply these skill

Place Value	Addition and Subtraction	Multiplication and Division	Fractions
• count in steps of 2, 3, and 5 from 0, and in 10s from any number, forward and backward • recognise the place value of each digit in a two-digit number (10s, 1s) • identify, represent and estimate numbers using different representations, including the number line • compare and order numbers from 0 up to 100; use <, > and = signs	• solve problems with addition and subtraction: • using concrete objects and pictorial representations, including those involving numbers, quantities and measures • applying their increasing knowledge of mental and written methods • recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 • add and subtract numbers using concrete objects, pictorial representations, and mentally, including: • a two-digit number and 1s • a two-digit number and 10s • 2 two-digit numbers	• recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers • calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs • show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot	• recognise, find, name and write fractions 1/3, 1/4, 2/4 and 3/4 of a length, shape, set of objects or quantity • write simple fractions, for example 1/2 of 6 = 3 and recognise the equivalence of 2/4 and 1/2.

• read and write numbers to at least 100 in numerals and in words • use place value and number facts to solve problems.	• adding 3 one-digit numbers • show that addition of 2 numbers can be done in any order (commutative) and subtraction of one number from another cannot • recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.	• solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.	
Measurement	Position and Direction	Properties of shapes	Statistics
• choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels • choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels	• order and arrange combinations of mathematical objects in patterns and sequences • use mathematical vocabulary to describe position, direction and movement including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise).	• identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line • identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces • identify 2-D shapes on the surface of 3-D shapes • compare and sort common 2-D and 3-D shapes and everyday objects.	• interpret and construct simple pictograms, tally charts, block diagrams and tables • ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity • ask and answer questions about totalling and comparing categorical data.

Year group	Autumn	Spring	Summer
Year 3	• Number- Place value • Number- Addition and subtraction • Number- Multiplication and division A	• Number- Multiplication and division B • Measurement- Length and perimeter • Number- Fractions A • Measurement- Mass and capacity	• Number- Fractions B • Measurement- Money • Measurement- Time • Geometry- Shape • Statistics

Key Mathematics objectives (Pupils must know and remember these facts / Improve, hone & apply these skill

Place Value	Addition and Subtraction	Multiplication and Division	Fractions
• Count from 0 in multiples of 4,8,50,100 • 10, 100 more or less than a number • compare and order numbers to 1000 • use different representations for numbers • read and write numbers in numerals and words up to 1000 • solve problems with all of the above	• add and subtract numbers mentally (3 digits and 1s, 10s,100s) • 3 digit column addition and subtraction • Estimate and use the inverse for the above • Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.	• Recall multiplication and related division facts for 3,4,8 multiplication tables. • Write mathematical statements for the tables I know. • 2 digit by 1 digit multiplication • Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.	• Count backwards and forwards in tenths from any given point. • Know that a tenth is dividing 1 into ten equal pieces. • Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators. • recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators • recognise and show, using diagrams, equivalent fractions with small denominators • add and subtract fractions with the same denominator within one whole

			• compare and order unit fractions, and fractions with the same denominators • Solve problems with all of the above.
Measurement		**Properties of shapes**	**Statistics**
• measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) • measure the perimeter of simple 2-D shapes • add and subtract amounts of money to give change, using both £ and p in practical contexts • tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks	• estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, am/pm, morning, afternoon, noon and midnight • know the number of seconds in a minute and the number of days in each month, year and leap year	• Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them • Recognise angles as a property of shape or a description of a turn • Identify right angles, recognise that 2 right angles make a half-turn, 3 make three quarters of a turn and 4 a complete turn; identify whether angles are greater than or less than a right angle	• interpret and present data using bar charts, pictograms and tables • solve one-step and two-step questions using information presented in scaled bar charts and pictograms and tables

• compare durations of events	• Identify horizontal and vertical lines and pairs of perpendicular and parallel lines.	

Year group	Autumn	Spring	Summer
Year 4	• Number- Place value • Number- Addition and subtraction • Measurement- Area • Number- Multiplication and division A • Consolidation	• Number- Multiplication and division B • Measurement- Length and perimeter • Number- Fractions	• Number- Decimals • Measurement- Money • Measurement- Time • Geometry- Shape • Statistics • Geometry- Position and direction

Key Mathematics objectives (Pupils must know and remember these facts / Improve, hone & apply these skills			
Place Value	**Addition and Subtraction**	**Multiplication and Division**	**Fractions**
• Count in multiples of 6, 7, 9, 25 and 1000 • Find 1000 more or less than a given number • Count backwards through zero to include negative numbers • Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) • Order and compare numbers beyond 1000 • Identify, represent and estimate numbers using different representations • Round any number to the nearest 10, 100 or 1000 • Solve number and practical problems that involve all of the above and with	• Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate • Estimate and use inverse operations to check answers to a calculation • Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.	• Recall multiplication and division facts for multiplication tables up to 12 × 12 • Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers • Recognise and use factor pairs and commutativity in mental calculations • Multiply two-digit and three-digit numbers by a one-digit number using formal written layout • Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.	• Recognise and show, using diagrams, families of common equivalent fractions • Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten. • Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number • Add and subtract fractions with the same denominator

increasingly large positive numbers • Read Roman numerals to 100 (i to c) and know that over time, the numeral system changed to include the concept of zero and place value.			• Recognise and write decimal equivalents of any number of tenths or hundredths • Recognise and write decimal equivalents to ¼, ½, ¾ • Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths • Round decimals with one decimal place to the nearest whole number • Compare numbers with the same number of decimal places up to two decimal places • Solve simple measure and money problems involving fractions and decimals to two decimal places.

Position and direction	Measurement	Properties of shapes	Statistics

• 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.	• 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 • Find the area of rectilinear shapes by counting squares • Estimate, compare and calculate different measures, including money in pounds and pence • Read, write and convert time between analogue and digital 12- and 24-hour clocks • Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.	• Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes • 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.	• Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. • Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.

Year group	Autumn	Spring	Summer
Year 5	• Number- Place Value • Number- Addition and subtraction • Number Multiplication and division A • Number- Fractions A	• Number- Multiplication and Division B • Number- Fractions B • Number- Decimals and percentages • Measurement- Perimeter and area • Statistics	• Geometry- Shape • Geometry- Position and direction • Number- Decimals • Number- Negative numbers • Measurement- Converting Units • Measurement- Volume

Key Mathematics objectives (Pupils must know and remember these facts / Improve, hone & apply these skills			
Place Value	**Addition and Subtraction**	**Multiplication and Division**	**Fractions**
• read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit • count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000 • interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through 0 • round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000 • solve number problems and practical problems	• Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) • Add and subtract numbers mentally with increasingly large numbers • Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy • Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.	• Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers. • Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers • Establish whether a number up to 100 is prime and recall prime numbers up to 19 • Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers • Multiply and divide numbers mentally drawing upon known facts • Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret	• Compare and order fractions whose denominators are all multiples of the same number • Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths • Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number • Add and subtract fractions with the same denominator and denominators that are multiples of the same number • Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams • Read and write decimal numbers as fractions • Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents

that involve all of the above • read Roman numerals to 1,000 (M) and recognise years written in Roman numerals.		remainders appropriately for the context • Multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000 • Recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3) • Solve problems involving multiplication and division, including using their knowledge of factors and multiples, squares and cubes • Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign • Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.	• Round decimals with 2 decimal places to the nearest whole number and to 1 decimal place • Read, write, order and compare numbers with up to 3 decimal places • Solve problems involving number up to 3 decimal places • Recognise the per cent symbol (%) and understand that per cent relates to "number of parts per 100", and write percentages as a fraction with denominator 100, and as a decimal fraction • Solve problems which require knowing percentage and decimal equivalents of 1/2, 1/4, 1/5, 2/5, 4/5 and fractions with a denominator of a multiple of 10 or 25.

Position and direction	Measurement	Properties of shapes	Statistics

• 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. (Without mirrors or tracing paper)	• Convert between different units of metric measure • Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints • Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres • Calculate and compare the area of rectangles (including squares) including using standard units, square centimetres (cm2) and square metres (m2) and estimate the area of irregular shapes • Estimate volume and capacity • Solve problems involving converting between units of time • Use all four operations to solve problems involving measure using decimal notation including scaling.	• 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 (o) • Identify: - angles at a point and 1 whole turn (total 360 degrees) - angles at a point on a straight line and half a turn (total 180 degrees) - other multiples of 90 degrees • 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.	• Solve comparison, sum and difference problems using information presented in a line graph • Complete, read and interpret information in tables, including timetables.

Year group	Autumn	Spring	Summer

Year 6	• Number- Place value • Number- Addition, subtraction, multiplication and division • Number- Fractions A and B • Measurement- Converting units	• Ratio • Number - Algebra • Number - Decimals • Number- Fractions, decimals and percentages • Measurement- Area, perimeter and volume • Statistics	• Geometry- Shape • Geometry- Position and direction • Themed projects and consolidation (Post SATs)

Key Mathematics objectives (Pupils must know and remember these facts / Improve, hone & apply these skills

Place Value	Addition and Subtraction	Multiplication and Division	Algebra	Fractions, Decimals, Percentages
• Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit • Round any whole number to a required degree of accuracy • Use negative numbers in context, and calculate	• Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication • Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context • Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context • Perform mental calculations, including with mixed operations and large numbers • Identify common factors, common multiples and prime numbers		• Use simple formulae • Generate and describe linear number sequences • Express missing number problems algebraically • Find pairs of numbers that satisfy number sentences involving two unknowns • Enumerate possibilities of combinations of two variables.	• Use common factors to simplify fractions; use common multiples to express fractions in the same denomination • Compare and order fractions, including fractions >1 • Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions • Multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, ¼ × ½ = 1/8]

intervals across zero • Solve number problems and practical problems that involve all of the above.	• Use their knowledge of the order of operations to carry out calculations involving the four operations • Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why • Solve problems involving addition, subtraction, multiplication and division • Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.		• Divide proper fractions by whole numbers [for example, 1/3 ÷ 2 = 1/6] • Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, 3/8] • Identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places • Multiply one-digit numbers with up to two decimal places by whole numbers • Use written division methods in cases where the answer has up to two decimal places. • Solve problems which require answers to be rounded to specified degrees of accuracy • Recall and use equivalences between simple fractions, decimals and percentages including in different contexts.

Position and direction	Measurement	Properties of shapes	Ratio and proportion	Statistics

• 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.	• 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 • Recognise that shapes with the same areas can have different perimeters and vice versa • Recognise when it is possible to use the formulae for area and volume of shapes • Calculate the area of parallelograms and triangles • Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units [for example, mm^3 and km^3	• Draw 2-d shapes using given dimensions and angles • 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 circle, including radius, diameter 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.	• Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts • Solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and use percentages for comparison • Solve problems involving similar shapes where the scale factor is known or can be found • Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.	• Interpret and construct pie charts and line graphs and use these to solve problems • Calculate and interpret the mean as an average