Edna G Olds Academy
A L.E.A.D. Academy

MATHEMATICS AT EDNA G OLDS ACADEMY

INTENT

Mathematics equips pupils with the uniquely powerful set of tools to understand and change the world. These tools include logical reasoning, problem solving skills and the ability to think in abstract ways. At Edna G Olds, we aim to provide all children with the skills and knowledge in mathematics to thrive in the subject as they continue their journey through education.

We believe mathematics is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject. Mathematical understanding influences decision making in all areas of life. With this in mind, we endeavour to ensure that pupils develop a positive and enthusiastic attitude towards mathematics that will stay with them. We aim to nourish pupils with enquiring minds who have developed positive mathematical identities and become powerful mathematical learners.

Our aims agree with those set out in the National Curriculum:

- to become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately
- to reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- to solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

IMPLEMENTATION

In school, we follow 'The National Curriculum programmes of study for Mathematics 2014' and, The EYFS Framework – Number and Numerical Patterns.

All pupils will be taught the breadth of the programmes of study, which will be adapted to meet the needs of each child, ensuring they make the connections across mathematical ideas and the wider curriculum. Teaching with high expectations and challenges, ensures all pupils become confident in their knowledge of the programmes of study and progress to the next stage securely.

Mathematics is taught predominantly through daily lessons, varying in length depending upon their age. There are also mathematical skills taught through the wider curriculum mainly, but not limited to, science, geography, and technology.

All lessons follow the 'REAL' model for teaching and learning:

Reflect -what you already know?
Educate- the learning you are going to be doing today
Apply- application of what you have been taught
Learnt- what have you learnt today?

Throughout the lessons, the children are encouraged to question and explain their mathematical thinking. They are exposed to a variety of questions, which will develop their fluency, reasoning and problem solving skills. Children collaborate with each other and work together striving to support each other's mathematical journey. Teachers use careful questioning to draw out children's reasoning, with all children being offered rich and sophisticated problems and investigative tasks and given the chance to work on 'greater depth' questions and challenges.

Weekly 'Magic maths' sessions are delivered to reinforce and secure the pupils' application of calculation strategies and other key number skills relevant to their year group.

Tasks that require children to make multiple connections within and across the curriculum help them appreciate the interconnectedness of different mathematical ideas and the relationships that exist between mathematics and real life. Children have opportunities to apply mathematics in everyday contexts and they learn about its value to society and its contribution to other areas of knowledge, linking up with their PSHE learning. As a school, we encourage our children to make mistakes and learn from these in order to move our learning forward.

Our approach incorporates the use of concrete objects, pictures, words and numbers to help children explore and demonstrate mathematical ideas, enrich their learning experience and deepen their understanding at all levels.

Concrete – children have the opportunity to use concrete objects and manipulatives to help them understand and explain what they are doing.

Pictorial – children then build on this concrete approach by using pictorial representations, which can then be used to reason and solve problems.

Abstract – With the foundations firmly laid, children can move to an abstract approach using numbers and key concepts with confidence.

Teacher's plan mathematics for the pupils in their year group using a wide variety of resources to ensure the lessons meet the need of all the pupils in their care. Teachers follow the REAL model to deliver lessons that meet the needs of all pupils. Fluent in 5 is used to develop pupils fluency at the start of a session before moving on to the main section of the lesson. In this section, pupils will work on their knowledge and skills with a particular area of maths through variety of different types of activities. These are set at differing levels to allow all pupils to access them and strive towards achieving mastery. The most able children will be encouraged to take their learning further and work towards greater depth. These children will be identified in each lesson though teacher assessment using 'Check in' questions. Throughout this process, teachers will refer to the schools' Calculation Policy to ensure continuity, progression and high expectations for attainment in mathematics.

Numbots, TTRS and Mathletics are used to support children in school and at home to develop their mathematics further.

Mathematics lessons are inclusive to pupils with special educational needs and disabilities. Where required, teachers adapt work to suit the needs of these pupils. Maths focused interventions in school helps children with gaps in their learning and mathematical understanding.

Below are the expectations for each year group in Mathematics set out by 'The National Curriculum programmes of study for Mathematics 2014' and 'The EYFS Framework'

Nursery

- Develop fast recognition of up to 3 objects, without having to count them individually ('subitising').

- Recite numbers past 5.
- Say one number for each item in order: 1,2,3,4,5.
- Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle').
- Show 'finger numbers' up to 5.
- Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5.
- Experiment with their own symbols and marks as well as numerals.
- Solve real world mathematical problems with numbers up to 5.
- Compare quantities using language: 'more than', 'fewer than'
- Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language: 'sides', 'corners'; 'straight', 'flat', 'round'.
- Understand position through words alone – for example, "The bag is under the table," – with no pointing.
- Describe a familiar route.
- Discuss routes and locations, using words like 'in front of' and 'behind'.
- Make comparisons between objects relating to size, length, weight and capacity.
- Select shapes appropriately: flat surfaces for building, a triangular prism for a roof, etc.
- Combine shapes to make new ones – an arch, a bigger triangle, etc.
- Talk about and identify the patterns around them. For example: stripes on clothes, designs on rugs and wallpaper. Use informal language like 'pointy', 'spotty', 'blobs', etc.
- Extend and create ABAB patterns – stick, leaf, stick, leaf.
- Notice and correct an error in a repeating pattern.
- Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then…'

Reception

Number

- Have a deep understanding of number to 10, including the composition of each number;
- Subitise (recognise quantities without counting) up to 5;
- Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.

Numerical Patterns

- Verbally count beyond 20, recognising the pattern of the counting system;
- Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity;
- Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

Year 1

Place Value

- 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 twos, fives and tens
- Given a number, identify one more or 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

Addition and Subtraction

- Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs
- Represent and use number bonds and related subtraction facts within 20
- Add one-digit and two-digit numbers to 20, including 0
- 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

Multiplication and division

- Solve one-step problems involving multiplication, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher
- Solve one-step problems involving division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher

Fractions

- Recognise, find and name a half as one of two equal parts of an object, shape or quantity
- Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity

Geometry – Properties

- Recognise and name a common 2-D shapes [For example, rectangles (Including squares) circles and triangles
- Recognise and name a common 3-D shapes [For example, cuboids (Including cubes) pyramids and spheres
- Geometry – Position and direction
- Describe position, direction and movement, including whole, half, quarter and three-quarter turns

Measure

- Compare, describe and solve practical problems for lengths and heights (Long/short, longer/shorter, tall short, lighter than)
- Compare, describe and solve practical problems for mass/weight (heavy, light, heavier than, lighter than)
- Compare, describe and solve practical problems for capacity and volume (Full empty, more than, less than, half, half full, quarter)
- Compare, describe and solve practical problems for time (Quicker, slower, earlier, later)
- Measure and begin to record lengths and heights
- Measure and begin to record mass/Weight
- Measure and begin to record capacity and volume
- Measure and begin to record time (hours, minutes and seconds)
- Recognise and know the value of different denominations of coins and notes
- Sequence events in chronological order using language (before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening)
- Recognise and use language relating to dates, including days of the week, 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 timesnd subtraction

<u>Year 2</u>

Place Value

- Count in steps of 2, 3 and 5 from 0 and in tens from any number, forward and backward
- Recognise the place value of each digit in a two-digit number (tens, ones)
- Identify, represent and estimate numbers using different representations, including the number line
- Compare and order numbers from 0 up to 100; use < > and = signs
- Read and write number to at least 100 in numerals and in words
- Use place value and number facts to solve problems

Addition and subtraction

- Solve problems with addition and subtraction using concrete objects and pictorial representations, including those involving numbers, quantities and measures
- Solve problems with addition and subtraction applying 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 two-digit numbers and ones, using concrete objects, pictorial representations, and mentally.
- Add and subtract two digit numbers and tens, using concrete objects, pictorial representations, and mentally.
- Add and subtract two two-digit numbers, using concrete objects, pictorial representations, and mentally.
- Add and subtract three one-digit numbers, using concrete objects, pictorial representations, and mentally.
- Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot
- Recognise and use the inverse between addition and subtraction and use this to check calculations and solve missing number problems

Multiplication and division

- 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 x, ÷ and = signs
- Show that the multiplication of two numbers can be done in any order (commutative) and division of any number cannot
- Solve problems involving x and ÷, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in context

Fractions, decimals and percentages

- Recognise, find, name and write fractions 1/3, 1/4 , 2/4 and ¾ of a length, shape and set of objects or quantity
- Write simple fractions, ½ of 6 = 3 and recognise the equivalence of 2/4 and 1/2

Geometry – Properties

- Identify and describe the properties of 2-D shape, 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 shape on the surface of 3-D shapes (Circles on a cylinder and triangle on a pyramid)
- Compare and sort common 2-D and 3-D shapes and everyday objects

Geometry – Position and direction

- 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 knowing rotation as a turn and in terms of angles for quarter, half and three-quarter turns (clockwise and anti-clockwise

Measure

- Choose and use appropriate standard units to estimate length/height (m/cm); mass (g/kg); temperature (˚c); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels.
- Compare and order lengths, mass, volume/capacity and the record using <, > and =
- Recognise and use the symbol for pounds(£) and pence (p) and combine them
- Find different combinations of coins that equal the same value of money
- Solve simple problems, in practical contexts, involving addition and subtraction of money, including giving change
- Compare and sequence interval of time
- Tell and write the time to five minutes, including quarter past,/to the hour and draw the hands on a clock face to show these times
- Know the number of minutes in an hour and the number of hours in a day

Statistics

- Interpret and draw 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 quanity
- Ask and answer questions about totalling and comparing data

<u>Year 3</u>

Place Value

- Count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number
- Recognise the place value of each digit in a three-digit number (hundreds, tens, units)
- Compare and order numbers up to 1000
- Identify, represent and estimate numbers using different representations
- Read and write numbers up to 1000 in numerals and in words
- Solve number and practical problems involving all of these

Addition and subtraction

- Add and subtract a three-digit number and ones mentally
- Add and subtract a three digit number and tens mentally
- Add and subtract a three-digit number and hundreds mentally
- Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction

- Estimate the answer to a calculation and use the inverse to check answers
- Solve problems, including missing numbers, using number facts, and more complex addition and subtraction

Multiplication and division

- Recall and use multiplication and division facts for the 3, 4 and 8 tables
- Write and calculate statements for x and ÷ using the multiplication tables, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods
- Solve problems, including missing numbers, involving x and ÷, including scaling problems and correspondence problems in which n objects are connected to m objects

Fractions, decimals and percentages

- Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10
- Recognise, find and write fractions 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 a whole
- 5/7 + 1/7 = 6/7
- Compare and order fractions with the same denominator
- Solve problems with all the above

Geometry – Properties

- 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 two right angles make a half-turn, three make three quarter turns and four a complete turn; identify whether angles are greater than or less than a right angle
- Identify horizontal and vertical lines and pairs of perpendicular and parallel lines

Measure

- 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 Roman numerals from I to XII, and 12-hour and 24-hour clocks.
- Estimate and read the 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
- Compare durations of events (Calculate the time taken by particular events/tasks)

Statistics

- Interpret and present data using bar charts, pictograms and tables
- Solve one-step and two-step questions (How many more? How many fewer?) using information presented in scaled bar charts and pictograms and tables

<u>Year 4</u>

Place Value

- Count in multiples of 6, 7, 9, 25 and 1000
- Find 1000 more or less than a given number
- Count backwards from zero to include negative numbers
- Recognise the place value of each digit in a four digit number (thousands, hundreds, tens and units)
- Order and compare numbers beyond 1000
- Identify, represent and estimate numbers using different representations
- Round any number to the nearest 10, 100 and 1000
- Solve number and practical problems that involve the above with increasingly larger positive numbers

- Read roman numeral to 100 (I to C) and know that over time, the number system changed to include the concept of zero and place value

Addition and subtraction

- Add and subtract numbers up to 4 digits using the formal written methods of columnar addition and subtraction
- Estimate and use inverse operations to check answers to a calculation
- Solve addition and subtraction two-step problems in context, deciding which operations and methods to use and why

Multiplication and division

- Recall x and ÷ facts for multiplication tables up to 12x12
- Use place value and know derived facts to x and ÷ mentally, including: x by 0 and 1; ÷ by 1; x three numbers
- Recognise and use factor pairs and commutatively in mental calculations
- x two-digit and three-digit numbers by a one-digit using written methods
- Solve problems involving x and +, including using the distributive law to multiply two digit numbers by one digit and scaling problems

Fractions, decimals and percentages

- 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
- Recognise and write decimal equivalents of any number of tenths or hundredths
- Recognise and write decimal equivalence to ¼, ½ and 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 decimal 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 decimal to two decimal places

Geometry – Properties

- 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

Geometry – Position and direction

- Describe positions on a 2-D gird 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

Measure

- Convert between different units of measure (Km to m; hour to minute)
- Measure and calculate the perimeter of rectilinear figure (including squares) in cm and m
- Find the area of 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

Statistics

- 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

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Year 5

Place Value

- 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 zero
- Round any number up to 1,000,000 to the nearest 10, 100, 1000, 10,000 and 100,000
- Solve number problems and practical problems that involve all of the above
- Read Roman numerals to 1000 (M) and recognise years written in Roman numerals

Addition and subtraction

- Add and subtract whole numbers with more than 4 digits, including using formal written methods (Column)
- 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

Multiplication and division

- 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 formal written method, including long multiplication for two-digit numbers
- x and ÷ numbers mentally drawing upon known facts
- ÷ numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders
- multiply and divide whole numbers and those involving decimals by 10, 100 and 1000
- 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 and 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.

Fractions, decimals and percentages

- 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 to the other and write mathematical statements 2/5 + 3/5 + 1/5 = 1 and 1/5
- Add and subtract fraction 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 0.71 = 71/100
- Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalence
- 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 3 decimal places
- Solve problems involving number up to three decimal places
- Recognise the % symbol and understand that per cent relates to 'number of parts per hundred' and write percentages as a fraction with a denominator of 100 and as a decimal
- Solve problems which require knowing percentage and decimal equivalents of 1/2 , 1/4 , 1/5, 2/5, 4/5 and those fractions with a denominator on a multiple of 10 or 2

Geometry – Properties

- 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; Angles at a point on a straight line and ½ turn; 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

Geometry – Position and direction

- 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

Measure

- Convert between different units of metric measures (km and m; cm and m; cm and mm; g and kg ; litre and ml)
- Understand and use equivalences between metric units and common imperial units such as inches, pounds and pints
- Measure and calculate the perimeter of composite rectilinear shapes in cm and m
- Calculate and compare the area of rectangles (Including squares) and including using standard units, square centimetres, and square metres and estimate the area of irregular shapes
- Estimate volume (Using 1cm cubed boxes to build cuboids) and capacity
- Solve problems involving converting between units of time
- Use all four operations to solve problems involving measure (Length, mass, volume and money) using decimal notation and including scaling

Statistics

- Solve comparison, sum and difference problems using information presented in a line graph
- Complete, read and interpret information in tables, including timetables

Year 6

Place Value

- 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 intervals across zero
- Solve number and practical problems that involve all of the above

Addition, subtraction, multiplication and division

- 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 short division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context
- Perform mental calculations, including with mixed operations and large numbers
- Identify common factors, common multiples and prime numbers
- 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, levels of accuracy.

Fractions, decimals and percentages

- 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, $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$]
- Divide proper fractions by whole numbers [for example, $\frac{1}{3} \div 2 = \frac{1}{6}$]
- Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $\frac{3}{8}$]
- 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
- 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

Geometry – Properties

- Draw 2-D shapes using given dimensions and angles
- Recognise, describe and build simple 3-D shapes, including making
- 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 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

Geometry – Position and direction

- 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

Measure

- 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 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].

Statistics

- Interpret and construct pie charts and line graphs and use these to solve problems
- Calculate and interpret the mean as an average.

Algebra

- Use simple formula
- Generate and describe linear number sequences
- Express missing number problems algebraically
- Find pairs of numbers that satisfy an equation with two unknowns
- Enumerate possibilities of combinations of two variables

Ratio and Proportion

- 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 the use of 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.

IMPACT

We want pupils to be confident in making rich connections across mathematical ideas as a result of developing fluency, mathematical reasoning and competence in solving increasingly sophisticated, contextual problems during their time at Edna G Olds Academy. Our pupils will be able to apply their mathematical knowledge across the curriculum and to realise that mathematics has developed over centuries. As our pupils progress further in their education, we intend for them to be able to understand the world, have the ability to reason mathematically and to have a sense of enjoyment and curiosity about the subject. We focus on our pupils achieving outcomes that include conceptual understanding, procedural fluency, strategic competence, and adaptive reasoning;

Through high quality teaching and learning, guidance and effective feedback, children will:

- Clearly explain their reasoning and justify their thought processes
- Quickly recall facts and procedures
- Have the flexibility and fluidity to move between different contexts and representations of mathematics.
- Have the ability to recognise relationships and make connections in mathematics and within the wider curriculum
- Be happy, confident, articulate and autonomous learners with a life-long passion for learning.
- Leave our school at the end of KS2 prepared for the next step in their mathematical education.

Formative assessment takes place on a daily basis and teachers adjust planning accordingly to meet the needs of their class. Teachers use formative assessment to evaluate the learning during a lesson. They may ask questions to check understanding, or scrutinise independent work in order to identify common misconceptions or share thinking. Such assessment allows teachers the flexibility to intervene in a lesson to remind, redirect or reteach pupils as required.

Summative assessments takes place at the end of each term from years 1 - 6 (NFER tests) and pupils's progress and attainment is discussed with senior leaders in pupil progress meetings. At the end of year 4 all pupils complete the Multiplication Check (MTC). The purpose of the MTC is to determine whether pupils can recall their times tables fluently, which is essential for future success in mathematics. To support the children with their multiplication practice we use 'Times Table Rockstars' as an online and fun learning platform which also offer resources to be used in the classroom. At the end of year 2 and 6, the pupils will sit the SATs tests. These are statutory tests provided by the government. In reception, baseline assessments will be completed when the children enter the school in September.