Pierrepont Gamston Primary School

Mathematics Policy

Introduction

At Pierrepont Gamston, mathematics 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. Children develop the mathematical skills that are essential for everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment.

Values

Our school curriculum is underpinned by the values that we hold dear. In our school, everyone is equally valued and treated with respect. We believe that everyone is made in the image of God, which means that everyone has an equal opportunity to achieve and will be challenged and supported to ensure that they continue to grow and learn within all areas of the curriculum.

Intent (incorporating the Aims of the National Curriculum)

- Children 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.
- Children can reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.
- Children can 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.
- Develop a range of calculation strategies for each of the four main operations as described by the Pierrepont Gamston Calculation Policy. These strategies develop skills based on prior learning and equip the children to select the most efficient or effective method for solving a particular written or mental calculation. The calculation policy uses the concrete, pictorial, abstract approach in order to underpin and deepen children's understanding using multiple representations of calculations.
- Teaching will follow the White Rose schemes of learning in order to ensure full coverage of the curriculum. This will be supported by other resources purchased by the school, including: Maths on Target, Classroom Secrets, Maths Shed, Timestables Rockstars, Hamilton Trust and Twinkl.
- Children will use mathematical vocabulary appropriate to their year group (appendix 2) to further develop and demonstrate their understanding.

Implementation (incorporating the National Curriculum key stage overviews)

- In foundation stage mathematics skills are introduced through the specific areas of Number and Numerical Patterns. Children are encouraged to develop reliable counting skills and a deep understanding of numbers. This learning is delivered through adult lead carpet sessions and also during continuous provision, where children develop their own lines of enquiry.
- In key stage 1 pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources. Pupils also develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.
- In lower key stage 2 (years 3 and 4) pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. Pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers. Pupils should also develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching ensures that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. They develop the skills to use measuring instruments with accuracy and make connections between measure and number.
- In upper key stage 2 (years 5 and 6) pupils extend their understanding of the number system and place value to include larger integers, developing the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio. Pupils develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. Pupils are also introduced to the language of algebra as a means for solving a variety of problems. Pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.

Children with Special Educational Needs and Disabilities

We make appropriate provision to overcome all barriers to learning and ensure pupils with SEND needs have full access to the Nation Curriculum, as stated in our SEN policy. We provide additional resources or support for children with special needs as required. This may be in the form of adaptions, differentiation by outcome, intervention, adult support or a personalised curriculum.

Subject leader role

The role of a subject leader is to:

- Provide strategic lead and direction for a specific subject
- Support and offer advice to colleagues on issues related to the subject
- Monitor pupil progress in that subject area
- Provide efficient resources management for the subject

It is the role of each subject leader to keep up to date with developments in their subject, at both national and local level. They review the way the subject is taught in school and plan for improvement. This development planning links to whole school objectives. Each subject leader reviews the curriculum plans for their subject, ensures that there is full coverage of the National Curriculum and that progression is planned into programmes of study.

Assessment

Formative assessment in mathematics is a regular part of everyday teaching which is then used to inform future planning and teaching. Termly summative assessments are carried out using Cornerstone assessment materials with data submitted and analysed using OTrack. This data is discussed with the senior leadership team at termly pupil progress meetings which then informs provision going forward. In the reception class, children are assessed using teacher knowledge and evidence of independent work when appropriate.

Monitoring and Review

- Class teachers are responsible for the day to day planning, organisation and delivery of the curriculum subject.
- Subject leaders monitor the way their subject is taught throughout school and feedback to SLT and whole school where appropriate.
- The allocated Governor is responsible for liaising with subject leaders to closely monitor the way the school teaches each subject.
- Impact reports are prepared annually to review impact of panned activities on children's learning.

Date: Spring 2022
Review date: Autumn 2023

Appendix 1

Mathematics programmes of study: key stages 1 and 2 (National Curriculum in England)

Available at:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/335158/PRIMARY_national_curriculum_-_Mathematics_220714.pdf

Pierrepont Gamston Calculation Policy

Available at:

http://www.pgps.org.uk/mathematics-policies/

Appendix 2 – Vocabulary Progression

	Number and place value	Addition and subtraction	Multiplication and division	Measure	Geometry (position and direction)	Geometry (properties of shape)	Fractions	Data and Stats	Problem Solving

EYFs								
	zero numbers to twenty and beyond, count, count (up) to, count on (from, to), count back (from, to) count in ones, twos, fives, tens, is the same as more, less, odd, even, few, pattern pair, ones, tens, digit, the same number as, as many, as more, larger, bigger, greater, fewer, smaller, less, fewest, smallest, least, most, biggest, largest, greatest, one more, ten more, one less, ten less, compare, order, size, first, second, third… twentieth last, last but one, before, after, next, between, guess, how many, estimate, nearly, close to, about the same as, just over, just under too many, too few enough, not enough.	add, more, make, sum, total, altogether double, one more, two more … ten more, how many more to make …? how many more is … than …? how much more is …? take away, how many are left/left over? how many have gone? one less, two less, ten less … how many fewer is … than …? how much less is …? difference between.	Sharing, doubling, halving, number patterns.	Measure, compare, guess, estimate enough, not enough, too much, too little too many, too few nearly, close to, about the same, as just over, just under metre length, height, width, depth long, short, tall high, low, wide, narrow, thick, thin, longer, shorter, taller, higher, longest, shortest, tallest, highest, far, near, close, weigh, balances heavy, light, full, empty, half full, holds, container, time days of the week, birthday, holiday, morning, afternoon, evening, quick, slow, old, new, money, coin, penny, pence, pound, price, cost buy, sell spend, spent, pay.	Over, under above, below top, bottom, side on, in outside, inside around in front, behind, front, back, beside, next to, opposite, apart, between, middle, edge, corner, direction, left, right, up, down forwards, backwards, sideways, across, next to, close, near, far along, through, to, from, towards, away from, movement, slide, roll, turn, stretch, bend, whole turn, half turn.	shape, pattern, flat, curved, straight, round, hollow, solid sort, make, build, draw, size, bigger, larger, smaller symmetrical, pattern, repeating pattern, match corner, side, rectangle, (including square) circle, triangle.	parts of a whole, half quarter.	count, sort group, set list.	Puzzle, what could we try next? how did you work it out? Recognise, describe, draw, compare, sort.

	Number / Place Value	Addition & Subtraction	Multiplication & Division	Measurement / Time	Position & Direction	Shape	Fractions	Data	Problem Solving
1	Ten more/less, digit, numeral, figure(s), compare, (in) order/a different order, size, value, between, halfway between, above, below, tens, ones	inverse, double, near double, equals, is the same as (including equals sign),	Once, twice, three, five times, multiple of times. Multiply, multiply by, repeated addition, array, row, column, double, halve, share, share equally, group in pairs, threes, etc., equal groups of, divide, divided by, left over	Seasons, today, yesterday, tomorrow, takes longer, takes less time, hour, o'clock, half past, clock, watch, hands, how long ago?, How long will it be to … ?, How long will it take to … ?, How often?, always, never, often, sometimes, usually, once, twice, first, second, third, etc., estimate, close to, about the same as, just over, just under, too many, too few, not enough, enough	Before, after, besides, next to, opposite, apart, between, middle, edge, centre, corner, direction, journey.	Corner (point, pointed), face, side, edge, make, build, draw	Whole, equal parts, four equal parts, one half, two halves, a quarter, two quarters		Tell me, describe.
2	Numbers to one hundred, hundreds, partition, recombine, more/less			Quarter past/to, metres, kilometres, grams, kilograms, millimetres, litres, temperature, degrees	Rotation, clockwise, anticlockwise, straight line, ninety degree turn, right angle	Symmetrical, line of symmetry, fold, match, mirror line, reflection,	Three quarters, one third, a third, equivalence, equivalent	Represent, set, list, table, label, title, most popular, most common, least popular, least common	Predict, describe the pattern, describe the rule, find, find all, find different, investigate
3	Numbers to one thousand	Column addition and subtraction	Product, multiples of four, eight, fifty and one hundred, scale up	Leap year, twelve-hour/twenty-four-hour clock, Roman numerals I to XIII	Greater/less than ninety degrees, orientation, acute, obtuse.	Horizontal, perpendicular and parallel lines	Numerator, denominator, unit fraction, non-unit fraction, compare and order, tenths	Chart, bar chart, frequency table, Carroll diagram, Venn diagram, axis, axe	
4	Tenths, hundredths, decimal (places), round (to nearest), thousand more/less than, negative integers, count through zero, Roman numerals I to C		Multiplication facts (up to 12x12), division facts, inverse, derive	Convert	Co-ordinate, translate, quadrant, X-axis, Y-axis, perimeter, area	Quadrilaterals, triangles, right, acute and obtuse angles	Equivalent decimals and fractions	Continuous data, line graph	

5	Powers of 10	Efficient written method	Factor pairs, composite numbers, prime number, prime factors, square number, cubed number, formal written method	Volume, imperial units, metric units	Reflex angle, dimensions	Regular and irregular polygons	Proper fractions, improper fractions, mixed numbers, percentage, half, quarter, fifth, two fifths, four fifths, ratio, proportion		
6	Numbers to ten million.	Order of operations, indices.	Common factors and common multiples.		Four quadrants (for co-ordinates)	Vertically opposite (angles), circumference, radius, diameter.	Degree of accuracy, simplify.	Mean, pie chart, construct.	**Algebra:** Linear number sequence, substitute, variables, symbol, known values