



Individually Strong, Collectively Stronger

Mathematics Policy



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MATHEMATICS POLICY

1. INTRODUCTION

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.

Mathematics is important in everyday life. It is integral to all aspects of life and with this in mind we endeavour to ensure that children develop a healthy and enthusiastic attitude towards mathematics that will stay with them.

The National Curriculum for mathematics describes what must be taught in each key stage. Allen Edwards Primary School follows the Revised Primary Numeracy Framework (implemented during academic year 2007 – 2008), which provides detailed guidance for the implementation of the National Curriculum for mathematics. This ensures continuity and progression in the teaching of mathematics. In early years the curriculum is guided by the planning principles for Foundation Stage in the Primary Framework, and the EYFS document. This policy follows a whole school format and rationale.

2. RATIONALE

All school policies form a corporate, public and accountable statement of intent. As a primary school it is very important to create an agreed whole school approach of which staff, children, parents, governors and other agencies have a clear understanding. This policy is the formal statement of intent for mathematics. It reflects the essential part that mathematics plays in the education of our pupils. It is important that a positive attitude towards mathematics is encouraged amongst all our pupils in order to foster self-confidence and a sense of achievement. The policy also facilitates how we, as a school, meet the legal requirements of recent Education Acts and National Curriculum Requirements.

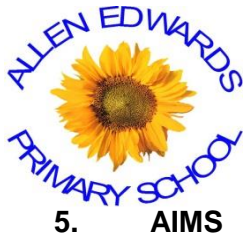
3. SCOPE

This statement of policy relates to all pupils, staff, parents and governors of Allen Edwards Primary School. The age range of pupils from Nursery must be acknowledged in the creation of policy and the development of the mathematics curriculum.

4. PRINCIPLES

The principles of Allen Edwards Primary School in mathematics are:

- policy and provision are evaluated and reviewed regularly
- resources of time, people and equipment are planned, budgeted for and detailed when appropriate in the SIP.
- the governing body of Allen Edwards Primary School discharge their statutory responsibility with regard to mathematics
- cross curricular links will be highlighted where appropriate
- planning of mathematics ensures continuity and progression across all year groups and key stages



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5. AIMS

5.1 General

Although relating specifically to mathematics our aims for the subject are also in line with the school's general aims.

We aim to provide the pupils with a mathematics curriculum which will produce individuals who are literate, creative, independent, inquisitive, enquiring and confident. We also aim to provide a stimulating environment and adequate resources so that pupils can develop their mathematical skills to their full potential.

5.2 Specific

Our pupils should

- have a sense of the size of a number and where it fits into the number system
- know by heart number facts such as number bonds, multiplication tables, doubles and halves
- use what they know by heart to figure out numbers mentally
- calculate accurately and efficiently, both mentally and in writing and paper, drawing on a range of calculation strategies
- recognise when it is appropriate to use a calculator and be able to do so effectively
- make sense of number problems, including non-routine problems, and recognise the operations needed to solve them
- explain their methods and reasoning using correct mathematical terms
- judge whether their answers are reasonable and have strategies for checking them where necessary
- suggest suitable units for measuring and make sensible estimates of measurements
- explain and make predictions from the numbers in graphs, diagrams, charts and tables
- develop spatial awareness and an understanding of the properties of 2D and 3D shapes

6. PROVISION

Pupils are provided with a variety of opportunities to develop and extend their mathematical skills in and across each phase of education.

Lessons follow the suggested Primary Framework format with a starter focussing on mental/ oral work, a main teaching activity and an evaluation/ plenary session. The teaching of mathematics at Allen Edwards Primary School provides opportunities for:

- group work
- paired work
- whole class teaching
- individual work

Pupils engage in:

- the development of mental strategies
- written methods (see appendix 1)
- practical work
- investigational work
- problem solving
- mathematical discussion
- consolidation of basic skills and number facts



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At Allen Edwards Primary School we recognise the importance of establishing a secure foundation in mental calculation and recall of number facts before standard written methods are introduced. We refer to each unit's vocabulary when planning to help determine the appropriate terminology to use in our teaching and children are expected to use it in their verbal and written explanations. Key Vocabulary should also be displayed in the classroom, and changed weekly to reflect the strand of Numeracy being taught.

Mathematics contributes to many subjects and it is important the children are given opportunities to apply and use Mathematics in real contexts.

'It is important that time is found in other subjects for pupils to develop their Numeracy Skills, eg. there should be regular, carefully planned opportunities for measuring in science and technology, for the consideration of properties of shape and geometric patterns in technology and art, and for the collection and presentation of data in history and geography' (NNS 1999).

With the increase in emphasis on Speaking & Listening, children are encouraged to use formalised talk partners on a regular basis in order to practice mathematical terminology in context.

We endeavour at all times to set work that is challenging, motivating and encourages the pupils to talk about what they have been doing.

6.1 Early Years

All children in the Nursery will participate in mathematical activities, including counting rhymes, matching and number recognition. This will be developed in Reception when children will begin to be taught in a more formal way, so aiding a smooth transition to Key Stage 1 work.

6.2 Key Stage 1 and 2

KS1 teachers use the revised Primary Framework to plan and deliver an hour's numeracy lesson each day. KS2 classes also have a separate 'mental maths' lesson each week (Y5 and Y6 have 2 of these sessions). Years 3 and 4 undertake the ICT delivered ILS programme 3 times per week where they consolidate work done in class. This programme is managed by the ICT coordinator.

7. ASSESSMENT

Assessment is regarded as an integral part of teaching and learning and is a continuous process. It is the responsibility of the class teacher to assess all pupils in their class.

In our school we are continually assessing our pupils and recording their progress. We see assessment as an integral part of the teaching process and strive to make our assessment purposeful, allowing us to match the correct level of work to the needs of the pupils, thus benefiting the pupils and ensuring progress. Thus the teacher works with a guided group daily and records progress against expectation.

Information for assessment will be gathered by analysing end of year assessments. Each year from Year 1 upwards now has formalised either statutory or non-statutory tests in mathematics which can be used to track the attainment of all children with particular attention to Portuguese children and children of Caribbean extract, as well as any other ethnicities where underachievement may be a concern. The numeracy coordinator will then use this information to



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set targets as well as to give whole school INSET to sure up areas of less confidence. Target setting (see appendix 3) takes place each term and is taken from the most challenging area of the previous half term. There will also be termly assessment against the yearly Key Objectives from using Progress Over Time grids for Year 1 – Year 6, which is passed on through the year groups as an ongoing record of attainment.

At half term intervals (October, February, May) we will be using a system of Teacher Assessment to record the level of the children in classes. At the end of Autumn, Spring and Summer terms, there will be more summative testing, in the form of 'rising stars' tests, or optional SATs papers in order to assess progress. This data is entered into a tracking system, which is monitored by the numeracy coordinator and the leadership team.

8. ROLE OF MATHS LEADERS

The mathematics leader is responsible for co-ordinating mathematics through the school. This includes:

- ensuring continuity and progression from year group to year group
- providing all members of staff (including teaching assistants) with guidelines and training to show how aims are to be achieved and how the variety of all aspects of mathematics is to be taught – each class teacher will be given a copy of this and updated policies (including appendices) at the beginning of each academic year.
- assisting and advising colleagues on creation of IEPs for children with specific needs in mathematics
- moderating and advising on weekly Numeracy planning
- half termly moderation of pupils' books and folders, and teachers' running records, to ensure adherence to PF yearly key objectives and weekly planning.
- advising on in-service training to staff where appropriate. This will be in line with the needs identified in the Development Plan and within the confines of the school budget
- advising and supporting colleagues in the implementation and assessment of mathematics throughout the school
- assisting with requisition and maintenance of resources required for the teaching of mathematics. Again this will be within the confines of the school budget

9. ROLE OF CLASS TEACHER

- to ensure progression in the acquisition of mathematical skills with due regard to the Primary Framework and consequently the National Curriculum for mathematics
- to develop and update skills, knowledge and understanding of mathematics
- to identify inset needs in mathematics and take advantage of training opportunities
- to keep appropriate on-going records
- to plan effectively for mathematics with year group partners, liaising with manager when necessary. The previous week's annotated planning is to be handed in each Monday morning before 9am. Planning will be moderated and fed back on when necessary.
- to inform parents of pupils' progress, achievements and attainment
- to assess Numeracy every half term through the Rising Stars tests, along with their own assessment and to keep tracking records up to date.

10. PERFORMANCE INDICATORS



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Performance Indicators, which are the criteria for success of the school's mathematics policy at Allen Edwards Primary School are:

- At KS2 - successful completion of all, or identified, key objectives for each year group, leading to a high level of confidence in Numeracy at the end of the Key Stage and year on year improvement in KS2 SATs.
- At KS1 - a sound understanding of number and the number system; confidence in carrying out mental calculations (+ & -).
- children enjoy mathematics
- children talk confidently about what they are doing in mathematics
- children use mathematical vocabulary and terminology confidently

11. CLASSROOM ENVIRONMENT

Class teachers should provide a stimulating and interactive Numeracy area in the classroom which is age appropriate. To help with continuity, we require the following in each classroom.

- demonstration number square/demonstration number line
- demonstration multiplication square/fraction wall (KS2)
- weekly vocabulary
- place value chart
- evidence of children's work
- washing line (accessible to children)
-

The full class resource list can be found in Appendix 2.

12. EQUAL OPPORTUNITIES

We incorporate mathematics into a wide range of cross-curricular subjects and seek to take advantage of multicultural aspects of mathematics e.g. Islamic patterns in RE.

All children have equal access to the curriculum regardless of their gender, race, ethnic or religious background. This is monitored by analysing pupil performance throughout the school to ensure that there is no disparity between groups.

Children with special educational needs, at all ability levels are catered for, through differentiation and specific work pertaining to IEPs.

Allen Edwards uses the 'Springboard' Wave 3 intervention programme from Years 3-6 to provide additional support for those children who are below expectation for their year group in the strand of AT2 – Number.

Children with a particular flair for mathematics will be identified and placed on the Gifted & Talented register. As the Gifted and Talented area develops, there will be provision made for those who are mathematically able within the school through more investigative work and greater differentiation in planning. Further, there will be the opportunity every Spring Term for Year 5 able children to join Saturday morning Lambeth classes for more able children.



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We also aim to involve children who arrive at Allen Edwards speaking little or no English. Therefore, included in Appendix 4 is the “Tips for creating a better learning environment for children with EAL”, which is circulated to all teachers at the beginning of each academic year. Further, children with EAL are helped by the use of talk partners, targeted TA support to explain vocabulary and mathematical big books to stimulate talk.

13. PARENTAL INVOLVEMENT

At Allen Edwards School we encourage parents to be involved by:

- inviting them into school twice yearly to discuss the progress of their child
- termly target sheets for each pupil showing areas that child is currently working towards
- inviting parents into school in the summer term to discuss the yearly report
- inviting parents to curriculum evenings or circulating information via half termly newsletters when significant changes have been/are made to the mathematics curriculum
- inviting parents of Year 6 and Year 2 pupils to a meeting in January on supporting their children with SATs
- holding workshops for parents during maths week focusing on areas of mathematics, particularly number, in order that parents may become more familiar with the methods used in school.
- Termly target sheets are discussed at parents’ evenings which indicate what the children are learning and gives parents ideas on ways to help their children.

This policy will need to be reviewed yearly in order to take account of new initiatives or any changes to the curriculum.

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Reviewed: October 2018

Review Date of Policy: October 2019



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APPENDIX 3:

Setting $\frac{1}{2}$ termly targets

APPENDIX 4:

Tips for creating a better learning environment for children with EAL.

APPENDIX 1

ALLEN EDWARDS PRIMARY SCHOOL

Progression towards a standard written method of calculation

INTRODUCTION

The National Numeracy Strategy provides a structured and systematic approach to teaching number. There is a considerable emphasis on teaching mental calculation strategies. Up to the age of 9 (Year 4) informal written recording should take place regularly and is an important part of learning and understanding. **More formal written methods should follow only when the child is able to use a wide range of mental calculation strategies.**

REASONS FOR USING WRITTEN METHODS

- To aid mental calculation by writing down some of the numbers and answers involved
- To make clear a mental procedure for the pupil
- To help communicate methods and solutions
- To provide a record of work to be done
- To aid calculation when the problem is too difficult to be done mentally
- To develop and refine a set of rules for calculations

WHEN ARE CHILDREN READY FOR WRITTEN CALCULATIONS?

Addition and subtraction

- Do they know addition and subtraction facts to 20?
- Do they understand place value and can they partition numbers?
- Can they add three single digit numbers mentally?
- Can they add and subtract any pair of two digit numbers mentally?
- Can they explain their mental strategies orally and record them using informal jottings?

Multiplication and division

- Do they know the 2, 3, 4, 5 and 10 time table
- Do they know the result of multiplying by 0 and 1?
- Do they understand 0 as a place holder?
- Can they multiply two and three digit numbers by 10 and 100?
- Can they double and halve two digit numbers mentally?
- Can they use multiplication facts they know to derive mentally other multiplication facts that they do not know?
- Can they explain their mental strategies orally and record them using informal jottings?

The above lists are not exhaustive but are a guide for the teacher to judge when a child is ready to move from informal to formal methods of calculation.



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Allen Edwards Primary School - Whole School Approach

We have developed a consistent approach to the teaching of written calculation methods. This will establish continuity and progression throughout the school.

ESTABLISH MENTAL METHODS, BASED ON A GOOD UNDERSTANDING OF PLACE VALUE IN NUMBERS

Place value will be taught mentally first from Reception class where number tracks are used progressing to number lines (to 10 or 20 as appropriate) in Years 1 and 2.

The empty number line will then be introduced to aid calculations.

Subtraction will be taught both forwards and backwards depending on the numbers.

34 - 16 - count on forwards

256 - 32 count back

Numbers such as 10, 100, 1000 will be called Landmark Numbers.

- In all cases make sure that the children always look out for special cases that can still be done entirely mentally eg. $11 + 9$, $15 + 5$ (number bonds to 20).
- Learn to estimate/approximate first eg. $29 + 30$ (round up to nearest 10, the answer will be near to 60).

STAGES IN ADDITION

1. Mental method, using partitioning:

$$47 + 76 = (40 + 70) + (7 + 6)$$

or

$$47 + 76 = (47 + 70) + 6$$

2. Vertical layout, expanded working, moving to adding the least significant digit first:

$$\begin{array}{r} 47 \\ + 76 \\ \hline 110 \\ 13 \\ \hline 123 \end{array}$$

$$\begin{array}{r} 47 \\ +76 \\ \hline 13 \\ 110 \\ \hline 123 \end{array}$$

$$\begin{array}{r} 368 \\ +493 \\ \hline 700 \\ 150 \\ 11 \\ \hline 861 \end{array}$$

$$\begin{array}{r} 368 \\ +493 \\ \hline 11 \\ 150 \\ 700 \\ \hline 861 \end{array}$$



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3. Vertical layout, contracting the working to a compact efficient form:

47	47	368	368
+76	+76	+493	+493
<hr style="width: 100%;"/>	<hr style="width: 100%;"/>	<hr style="width: 100%;"/>	<hr style="width: 100%;"/>
13	123	11	861
<hr style="width: 100%;"/>	<hr style="width: 100%;"/>	<hr style="width: 100%;"/>	<hr style="width: 100%;"/>
110	11	150	11
<hr style="width: 100%;"/>		<hr style="width: 100%;"/>	
123		700	
		<hr style="width: 100%;"/>	
		861	

4. Bigger numbers and decimals

Stages in Subtraction

1. 563 - 241

-	500	60	3	leading to	563
	200	40	1		<u>-241</u>
	300	20	2		322

2. 563 - 278

-	400	150	13		
	<u>200</u>	<u>70</u>	<u>8</u>		
	200	80	5	=	285

Children should be able to understand that in the 2nd example, an extra '100' was borrowed from the '500', to make '50' into '150'. This was necessary since it is not possible to subtract '70' from '50'. This is where, using the older version, we would have 'borrowed 1' from the hundreds column. This terminology is no longer used because it is not leading the pupil to treat each component as a whole number, as demonstrated by partitioning.