EVERSLEY PRIMARY SCHOOL

POLICY FOR THE TEACHING OF MATHEMATICS

INTRODUCTION

This document is a statement of aims, principles and strategies for the teaching and learning of mathematics at Eversley Primary School.

It is linked to the school policies for teaching and learning, behaviour and equal opportunities.

OVERVIEW

The National Curriculum states that:

"Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It 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".

AIMS AND OBJECTIVES

The national curriculum for mathematics aims to ensure that all pupils:

- become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils have **conceptual understanding** and are able to recall and apply their knowledge rapidly and accurately to problems

- **reason** mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can **solve problems** by applying their mathematics to a variety or **routine** and **non-routine** problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions

(National Curriculum 2014)

EVERSLEY MATHS VISION

At Eversley Primary School, we want all children to enjoy maths and have a love of learning maths. We encourage them to understand that a problem is only a problem if they cannot solve it, to persevere, to have self-belief and the determination to succeed in solving the problems in order to be the best mathematicians that they can be.

Our aims in the teaching of mathematics are:

- To promote enjoyment of learning through practical activity, exploration and discussion;
- To promote confidence, enthusiasm and a sense of achievement;
- To promote a high standard in maths and a range of mathematical skills;
- To develop the ability to solve problems through decision making and reasoning in a range of contexts; routine and non-routine problems;
- To develop a practical understanding of the ways in which information is gathered and presented;
- To explore features of shape and space and develop measuring skills in a range of contexts;
- Calculate accurately, both mentally and with pencil and paper, drawing on a range of calculation strategies;
- To understand the importance of mathematics in everyday life.
- Encourage pupil voice to justify and reason in mathematics

In line with the 2014 maths curriculum, we have adopted a 'mastery for all' approach in the teaching and learning of Mathematics here at Eversley. Mastery is something that we want all pupils to acquire. A 'mastery maths curriculum', or 'mastery approaches' to teaching maths, both have the same aim-to help pupils, over time, acquire mastery of the subject which is a deep, long-term, secure and adaptable understanding of the subject.

Mastery of maths, which should build gradually as a child goes through school, is a tool for life, and immeasurably more valuable than the short-term ability to answer questions in tests or exams.

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make **rich connections across mathematical ideas** to develop fluency, mathematical reasoning and competence in solving increasingly **sophisticated problems**. They should also apply their mathematical knowledge to science and other subjects.

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage.

Pupils who grasp concepts rapidly should be **challenged through rich and sophisticated problems before any acceleration through new content**. Those pupils who are not sufficiently fluent with earlier material should **consolidate their understanding, through additional practice, before moving on. (**National Curriculum, 2014)

We use a variety of curriculum resources to support this mastery approach, including White Rose Maths Hub schemes of work, Nrich and NCETM (National Centre for Excellence in the Teaching of Mathematics) resources which ensure continuity and progression in the teaching of mathematics.

THE FOUNDATION STAGE

Work undertaken within the Foundation Stage is guided by the requirements and recommendations set out in the Early Years Foundation Stage document. We provide all of the children with opportunities to develop their problem solving, reasoning and numeracy skills to further develop an understanding of number, measurement, pattern shape and

space through varied activities that allow them to enjoy, explore and talk confidently about mathematics.

In Reception classes a wide range of activities supports the teaching and learning of mathematics including:

- Observation of number and pattern in the environment and daily routines;
- Board games;
- Large and small construction;
- Stories, songs, rhymes and finger games;
- Sand and water;
- Two- and three- dimensional work with a range of materials;
- Imaginative play;
- Cooking and shopping;
- Outdoor play and 'playground' games.

By the summer term we aim for the children to experience maths lessons in preparation for Year One.

THE STRUCTURE FOR THE TEACHING OF MATHEMATICS

The mathematics curriculum is structured around the New Curriculum and its yearly teaching programmes.

This yearly teaching programme is taught through daily mathematics lessons of approximately 45minutes at the start of Key Stage One extending to an hour in Key Stage Two. Teachers are encouraged to deliver maths teaching in an agile teaching approach, where pupils enter the lessons with challenges to tackle straight away. Teachers expose the pupils to the challenge of open-ended tasks where less teacher talk is necessary and more mini plenaries are used to support and extend both teaching and learning.

Our school uses a variety of teaching and learning styles in mathematics lessons in accordance with the school's teaching and learning policy. Our principal aim is that children will:

- Experience a high proportion of whole class, group-direct teaching, and exploration of ideas with mini plenaries to extend learning.
- Be encouraged to ask as well as answer mathematical questions.
- Have the opportunity to use a wide range of resources/manipulatives, such as number lines, number squares,

digit cards, Numicon, Diennes, Place Value Counters and Cuisenaire Rods.
- Use ICT in mathematics lessons to enhance and/or support their learning.
- Wherever possible be encouraged to apply their learning to everyday situations.

It is important that children are allowed to explore maths and present their findings not only in written form but also visually; to that end, the school will adopt the 'CPA approach': concrete, pictorial & abstract. This will allow children to experience the physical aspects of maths before finding a way to present their findings and understandings in a visual form before relying on the abstract numbers. The manipulatives mentioned above are available in each classroom to help facilitate this process.

HOMEWORK

Homework is set in accordance with the school's homework policy to support the teaching of mathematics (see Homework policy). Homework is set via an online tool called: My Maths. This is set on a weekly basis in Year 1-Year 6 by each class teacher and parents are encouraged to be involved in their child's learning.

LEVELS OF CHALLENGE

Differentiation is achieved by emphasising deep knowledge and through individual support and intervention - through enabling the children to access what is being taught. Questioning and scaffolding vary to further support individual progress within lessons. All pupils are given ample opportunities to extend and further apply their learning once they show a solid understanding of the lesson objective. Misconceptions are dealt with immediately.

In all classes, children have a range of mathematical abilities. We recognise this fact and provide suitable learning opportunities for all children by placing them in class or mixed abilities groups for maths lessons. We believe that this approach is of great benefit to all pupils and continues to promote a 'mastery for all' approach.

We achieve this through a range of strategies – in some lessons through three step challenges and in other lessons by organising the children to work in groups, pairs on open-ended problems or games. We use classroom assistants to support some children inside the classroom to ensure that all individual children experience inclusion within mathematics. In the

upper key stage 2 classrooms, we attach an additional highly skilled teacher to teach lower achievers who require additional support to access the curriculum.

RESOURCES

All classrooms have a number line and a wide range of appropriate small apparatus including number lines, number squares, digit cards, Numicon, Diennes, Place Value Counters and Cuisenaire Rods. Calculators are available from the central storage area. The library contains a number of books to support children's individual research. A range of software is available to support work with the computers and interactive whiteboards in each classroom.

TEACHING MATHEMATICS TO PUPILS WITH SPECIAL NEEDS AND MORE ABLE PUPILS

We ensure that all children have access to the New Curriculum. It is part of the school curriculum policy to provide a broad and balanced education for all.

SEN pupils:

- Learning Opportunities are matched to the needs of children with learning difficulties.
- Targets that set for individuals in an Individual Support Programme (ISP) are taken into account in daily planning.
- Pupils with learning difficulties in mathematics may receive extra support from a teaching assistant in order to consolidate and reinforce basic skills.
- Target children are given extra support by teaching assistants, SENCO, Maths subject leader, Class Teachers using the Top Tips intervention programme. Rapid maths and 1 to 1 maths support are also forms of additional support offered to pupils.

More able pupils

- Enrichment activities organised from the local authority are used to support the maths learning that happens at Eversley.
- All lessons involve challenges of non-routine problems to stretch and broaden the understanding of the more able pupils

PLANNING FOR MATHEMATICS TEACHING

Mathematics is a core subject in the National Curriculum and we use the New Curriculum as the basis for implementing the statutory requirements of the programme of study for mathematics.

We carry out the curriculum planning in mathematics in three phases (long term, medium term and short-term planning). The New Curriculum for teaching gives a detailed outline of what we teach in the long term, while our yearly teaching programme identifies the key objectives we teach to in each year.

Our medium term mathematics plans, give details of the main teaching objectives for each term and define what we teach. They ensure an appropriate balance and distribution of work across each term.

The class teacher works closely with their year group partners to complete the weekly plans for the teaching of mathematics. These plans list the specific key learning objectives and other objectives for each lesson and give details of how the lessons are to be taught.

We plan the activities in mathematics so that they build on the children's prior learning. While we give children of all abilities the opportunity to develop their skills, knowledge and understanding, we also plan progression into the scheme of work, so that there is an increasing challenge for the children as they move up through the school.

These plans are reviewed by the subject leader, feedback on planning is given to teachers and targets are set to continuously improve planning.

ASSESSMENT FOR LEARNING

- Formative assessment is used to guide the progress of individual pupils in mathematics. It involves identifying each child's progress against the key objectives determining what they have learnt and what should be the next stage in their learning.
- We assess children's work from three aspects: long-term, medium-term and short term. We make short term assessments which we use to help our daily plans. These short term assessments are closely matched to the teaching objectives.
- Medium term assessments are made to measure progress against the key objectives and to help us plan the next unit of work. Teachers use assessment appropriate to the level of the children which help them identify the specific level the children are at.

They use this information to plan personalised learning targets from the children every term. We use rising stars termly tests to assess pupils understanding.

- Long term assessments are made towards the end of the year using end of year tests and teacher assessments. We use the national test for Year 2 and Year 6 and the optional White Rose assessments for pupils at the end of Year 1, 3, 4 and 5.
- We use the information from the medium – term and long – term assessments to plot onto a tracking sheet (plotted in June, December and March) to assess how much progression is made by each child throughout the year. We pass the information on to the next teacher at the end of the year in order to help them plan for the new academic year.
- Assessing pupil progress through 'I can' statements. Pupils each have a target card in the front of their maths books. Teachers highlight when objectives are met as a means of communicating with their pupils. The pupils can also see their next steps for moving on. This encourages self-assessment. Teachers assess whether pupils are showing developing understanding, secure understanding or extended understanding termly.

FEEDBACK TO PUPILS AND TARGETS

Feedback to pupils about their progress in mathematics is achieved by effective formative assessment which:

- Aims to be encouraging and supportive and move children on;
- Next step marking which is often carried out through discussion between child and teacher during a task;
- May on occasions be carried out by pupils marking their own or each other's work when this is thought to be appropriate or effective;
- Targets are set each term against the key objectives. These are discussed with the individual and are based on both formative and summative assessment. Pupil's targets should be changed regularly when targets have been achieved.

CONTRIBUTION OF MATHS TO OTHER AREAS

Computing

Computing enhances the teaching of mathematics significantly. We believe that using computer software and the Interactive White Board as much as possible and applicable to the task allows for the presentation of information visually, dynamically and interactively, so that children can understand concepts more quickly.

English

Mathematics contributes significantly to the teaching of English in our school by actively promoting the skills of reading, writing, speaking and listening.

Science

Almost every scientific investigation or experiment is likely to require one or more of the mathematical skills of classifying, counting, measuring, calculating, estimating and recording in tables and graphs. In science pupils will for example order numbers, including decimals, calculate simple means and percentages, use negative numbers when taking temperatures, decide whether it is more appropriate to use a line graph or bar chart, and plot, interpret and predict from graphs. There is useful information within the New Curriculum in relation to 'cross-curricular' aspects of mathematics and science.

Art, Design and Technology

Measurements are often needed in art and design and technology. Many patterns and constructions are based on spatial ideas and properties of shapes, including symmetry. Designs may need enlarging or reducing, introducing ideas of multiplication and ratio. When food is prepared a great deal of measurement occurs, including working out times and calculating cost; this may not be straightforward if only part of a packet of ingredients has been used.

History, Geography and Religious Education

In history and geography children will collect data by counting and measuring and make use of measurements of many kinds. The study of maps includes the use of co-ordinates and ideas of angle, direction, position, scale and ratio. The pattern of the days of the week, the calendar and recurring annual festivals all have a mathematical basis. For older children historical ideas require understanding of the passage of time, which can be illustrated on a time line, similar to the number line that they already know.

Physical Education and Music

Athletic activities require measurement of height, distance and time, while ideas of counting, time, symmetry, movement, position and direction are used extensively in music, dance, gymnastics and ball games.

Personal, Social and Health Education (PSHE) and Citizenship

Mathematics contributes to the teaching of personal, social and health education, and citizenship. The work that children do outside their normal lessons encourages independent study and helps them to become increasingly responsible for their own learning. The planned activities that children do within the classroom encourage them to work together and respect each other's views.

REPORTING

Reporting to parents is done three times yearly through consultation evenings and annually through a written report. Reporting in mathematics will focus on each child's:

- Attitude to mathematics
- Competence in basic skills and developing mathematical expertise
- Ability to apply mathematical knowledge to new situations.
- Review and setting of targets

STAFF TRAINING

Whole school in-service training takes place as required and we aim to provide at least one in-service training session each term devoted to whole staff training in the teaching and learning of mathematics. We aim that the training is closely linked to the whole school key priorities.