Mathematics Policy – Pimperne Primary School

Mathematics is a tool for everyday life. It teaches children how to make sense of the world around them through developing their ability to calculate, reason and solve problems. It enables children to understand relationships and patterns in both number and space in their everyday lives. To function in society, we all need to be able to communicate mathematically and we aim to ensure that the children in our care leave our school with high standards of numeracy as well as literacy.

Aims

In addition to the general school aims, our aims in teaching mathematics are:

- **To foster positive attitudes and an awareness of the fascination of mathematics**
- **To promote an enjoyment of learning through practical activity, exploration and discussion**
- **To give pupils opportunities to use mathematics in everyday situations**
- **To enable pupils to be proficient, competent and confident with numbers and mathematical knowledge, concepts and skills**
- **To enable children to express themselves fluently and confidently using correct mathematical language and vocabulary**
- **To enable automaticity in key learning facts**
- **To explore features of shape and space and develop measuring skills in a range of contexts**
- **To develop the ability to solve problems through decision making and reasoning in a range of contexts**

Teaching and Learning Styles

The school uses a variety of teaching and learning styles in mathematics. Our main aim is to develop children's knowledge, skill and understanding. We encourage the children to ask, as well as answer, mathematical questions. They have the opportunity to use a wide range of resources and apparatus to support their learning. Interactive TV screens are used for modelling ideas and methods and laptops / iPads used for individualised learning tasks. Wherever possible, we encourage the children to apply their learning to everyday situations. We use the CPA method of learning: using actual objects for children to add, subtract, multiply or divide before moving onto using pictorial representations of the object and, ultimately, abstract symbols.

Planning and Delivery

Year groups follow the 2014 Maths Curriculum to ensure that all parts of the National Curriculum Programmes of Study are being met. Curriculum planning is carried out in three stages, long-term, medium-term and short-term. The 2014 Curriculum identifies

the key objectives to be taught within the year for the long-term and medium-term planning to ensure a balance and distribution of work across each term.

We use the White Rose overview of learning and its materials to support planning and teaching and ensure full coverage of the National Curriculum, tailoring this to meet the needs to each specific class. Maths is taught in all year groups every day in order for teaching to be done in the depth needed for children to become fluent and confident mathematicians who can apply their knowledge to reasoning and problem solving. Teachers are aware of what learning comes before and after their year group so they are able to build on prior learning and lay the foundation for the next steps, focusing on the retention of key learning facts for each year group.

Maths homework is sent home weekly from Years 2 to 6 as per homework policy.

<u>Prior Knowledge and Small Steps in Learning</u>

Our maths curriculum has been planned to ensure sequential, layered knowledge acquisition so that children are continuously embedding the key maths knowledge and learning the skills required to become fluent mathematicians who can apply their knowledge to problem solving. As part of this, continuously retrieving prior knowledge is understood by staff as essential for effective teaching in all subjects, but particularly in mathematics, where the development of a secure maths schema is necessary to learn new things in maths, as maths topics connect with one another. To support the embedding of essential prior knowledge, Early Morning Maths (EMM) is a vital tool for revisiting concepts throughout the year from not just their year group objectives. Tools used for EMM include: Flashback 4, Twinkl mats for fluency, reasoning and problem solving, Mathsbot, Corbett Maths 5-a-day and teachers' own questions.

Teachers use the small steps from the White Rose planning (or their own personalised small steps) in all areas of maths so they know what the next step in their learning of that topic is. When starting a new unit of work, teachers revisit prior learning at the beginning of the lesson, going back more than one year if necessary – and tailoring it to the needs of their class. This allows for children's prior knowledge to be retrieved and brought to the front of the children's thinking so that all children are ready to access their year group objectives. This includes differentiating component steps where needed so that all children can access the learning and aims to not over-load the working memory of children so that the new learning develops prior learning, without overwhelming children.

<u>Automaticity and Fluency</u>

Fluency in maths is the ability to flexibly apply strategies in an efficient and accurate way. Automaticity in math, is being able to provide an automatic response.

Achieving automaticity in a task happens when we don't need to consciously think about each step of the process, as we are completing it. The task becomes effortless and

somethings we can even be thinking about something else at the same time. The time it takes to perform the task or skill is reduced. Automaticity in a task is developed when children have practised their skill, their performance is improved, and a high level of accuracy is reached. We are in the process of refining key automaticity in each year group.

Automaticity is attained through learning, repetition, and practice. In maths, children have attained when they can easily retrieve basic facts from their long-term memory in all four operations (+, −, ×, ÷) without conscious effort or attention. The skill that must be automatic is remembering maths facts. We aim for children to be able to recall the answer to single digit facts like 9 + 7 while simultaneously doing more complex problems. We aim for children to be able to recall those facts without losing their place in what they are computing, just like playing a musical instrument. We use various methods to obtain automaticity in different key components of maths such as number bonds, times tables and division facts, fraction, decimal and percentage equivalents etc. including oral / mental sessions and the use of computer programs (Times Tables Rockstars / Sumdog).

The National Curriculum states that pupils should become fluent in the fundamentals of mathematics through varied and frequent practice. Fluency differs from automaticity as it is predominantly about developing number sense and being able to the most appropriate method for the task at hand and to be able to apply a skill to multiple contexts.

<u>Reasoning and Problem Solving</u>

Children are encouraged to be independent and to explain their mathematical thinking rather than just provide answers. They work both individually and in groups to investigate and solve problems in a range of situations. White Rose actively promotes problem solving by embedding different strategies in a range of mathematical contexts and incorporating problem solving and reasoning throughout its scheme of work.

We use stem sentences in a range of topics to provide clarity or to generalise concepts. In maths, stem sentences include accurate mathematical vocabulary in a highly structured sentence that provides pupils with a way to communicate their ideas with mathematical precision as well as clarity / the explanation of a concept or problem using accurate vocabulary. These can be used to state a fact, explain a thought process or give an answer to a problem.

<u>EYFS</u>

In Reception we give all children the opportunity to develop their understanding of number, measurement, pattern, shape and space through varied activities that allow them to enjoy, explore, practise and talk confidently about mathematics. Mathematical activities are often taught through practical learning in play, investigation and exploration.

Resources

Resources, or manipulatives, are stored both centrally and in classrooms allowing access at all times, encouraging children to make their own decisions. A range of computing programs is available (eg Mathletics, Sumdog and BBC Bitesize) to aid learning.

Cross Curricular Links

When appropriate, the cross curricular links will be developed in order to draw mathematical experiences out of a wide range of activities. This will allow children to begin to use and apply mathematics in real contexts. These links are detailed in creative curriculum planning and are monitored by the maths subject leader. Staff share ideas and progress with each other at staff meetings.

In particular, computing enhances the teaching of mathematics significantly because it offers individualised learning providing both accessibility and challenge. Teachers also use computing and interactive TV screens to present information visually, dynamically and interactively so that children can understand concepts more quickly. In return, children can use computing to aid learning, to practise and reinforce concepts and skills, make rapid mental calculation, practise times tables and produce graphs and tables amongst other things.

Inclusion

Each class contains a wide range of mathematical ability. As in other subjects, we match the activity to the child and use a range of strategies to challenge each individual and accommodate their learning styles. Teaching assistants are used to challenge and support individuals and groups. We believe that good teaching for pupils with SEND is good teaching for all. Our strongest pedagogy matters most for pupils whose learning is most vulnerable and there are likely to be many more children with gaps in learning. By honing our teaching skills to best support our pupils with SEND, we can also build secure learning for others. Intervention plans are set up where necessary to include specific mathematics targets.

Scaffolding support is provided to children whilst they are in the process of learning something new. It builds on something they can do independently and allows them to move progressively to deeper learning. Through scaffolding, each pupil in the room is exposed to the same learning but their journey to complete set tasks may be supported in different ways.

Within the daily mathematics lesson, teachers not only provide activities to support children who find mathematics difficult but also activities that provide appropriate challenges for children who are high achievers in mathematics. The most able children in upper Key Stage 2 are given the opportunity to attend annual Mathematics Challenges in local schools. Revision sessions are held after school for all Y6 in preparation for SATs.

Assessment for Learning (AfL)

For assessment purposes, the children are assessed against age related expectations, as outlined in the 2014 curriculum and this information is used to decide whether the child is emerging, working towards, ARE or greater depth.

AfL lies at the heart of promoting learning and in raising standards of attainment. Short-term assessments are an informal part of every lesson to inform our daily planning and teaching. Medium-term assessments of children's progress relate to the key objectives and help to identify particular strengths or weaknesses and to plan the next unit of work. Long-term assessment measures progress at the end of a school year or Key Stage and these are carried out by a combination of teacher assessment and standardised tests (across years 1 to 6). This information can then be used to set targets, address specific issues for the next school year and make a summary of each child's progress.

Tracking a child's progress is an ongoing process and interventions and procedures are put into place for those children not meeting expectations.

Children are part of their own assessment for learning and demonstrate their understanding through various methods including thumbs up and traffic lights. Online platforms (such Sumdog, Times Tables Rock Stars and maths.co.uk) are useful tools for class and individual assessment, enabling teachers to make informed judgements and decisions about individual and group attainments drawing on the full context of pupils' work. These judgements help to level children's progress and to inform planning, grouping and next steps.

Monitoring and Review

The subject leader oversees monitoring of the standards of children's work and the quality of teaching. The role also includes supporting colleagues in their teaching, being informed about current developments in the subject and providing a strategic lead and direction for mathematics in the school. Issues for development are discussed with the head teacher and included either on the School Development Plan (SDP) or addressed in staff meetings. A Governors' 'Maths Monitoring Focus Group' has met with the Maths Subject Lead (as per SDP) to monitor maths development throughout the school.

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Tracey Jones