

Mathematics at Slade Primary School

At Slade Primary School we aim to equip all pupils with the skills and confidence **to solve a range of problems through fluency with numbers and mathematical reasoning**. Children are encouraged to see the mathematics that surround them every day and enjoy **developing vital life skills** in this subject.

We started our journey to improve the teaching and learning of mathematics for every child in April 2016. There are several elements which have influenced improvements in attainment and progress in mathematics for our children. Mathematics is led by Clare Williams (MaST, NCETM PD Led, Mastery Specialist Teacher); supported by the maths team who include the deputy head teacher and a class teacher. This document sets out our approach and the reasons why maths at Slade may look a little different to other schools, or the way lessons/books looked a few years ago.

The three aims of the NC should be addressed every day (not just in the maths lesson) –
Fluency – Reasoning – Problem Solving.

Mathematics Planning

In Years 1-6 we have introduced the split lesson approach. This was introduced in September 2016. Maths is taught in 3, 30 minute sessions split throughout the day. The content of each session is discussed later in this document.

- **Whole class together** – we teach mathematics to whole classes and do not label children. Lessons are planned based on formative assessment of what students already know and we include all children in learning mathematical concepts. At the planning stage, teachers consider the **scaffolding** that may be required for children struggling to grasp concepts in the lesson and **suitable challenge questions** for those who may grasp the concepts rapidly. ***In line with NCETM advice, one form of depth frequently used, during the first part of the lesson, is variation theory (conceptual and procedural). Variation is one of the five 'big ideas' at the heart of Teaching for Mastery. For example, a child who can produce a quick correct answer may be asked to solve the question using more than one other procedure, to represent the question in more than one way (such as the bar model or part whole).***
- **Longer but deeper** – in order to ensure children have a secure and deep understanding of the content taught, our plans have been adjusted to allow longer on topics and we move more slowly through the curriculum. After evaluating the findings of the National Textbook Project, we broadly follow the 'Maths No Problem' textbook progression. Teachers adapt each lesson to meet the needs of their children and add extra questioning / tasks which will allow children to learn the content more

deeply. The learning will focus on one key conceptual idea and connections are made across mathematical topics. To outsiders it may appear that the pace of the lesson is slower, but progress and understanding is enhanced.

- **Key learning points** are identified during planning (collaboratively in year groups and supported by a member of the maths team) and a clear journey through the maths should be shown on flipcharts (also reflected on working walls). Learning points may appear to be very small but this is deliberate. For example, a whole lesson may be spent on adding the ones to a 3 digit number. The expectation is that every child will master the concept and some children will work more deeply on the same concept using variation theory and challenge tasks.
- **Questions** will probe pupil understanding throughout, taking some children's learning deeper. Responses are expected in full sentences, using precise **mathematical vocabulary**.
- **Fluency** – there is a whole school focus on developing an instant recall of key facts, such as number bonds, times tables, division facts, addition and subtraction facts.

Lesson Structure

- **Exploration** – instead of 'Let me teach you...' or giving a learning objective as a starting point, children are encouraged to explore a problem themselves to see what they already know. At the beginning of each lesson this exploration is referred to as the '**anchor task**'. During this time, the teacher and teaching assistant will spend time observing and questioning the children. The understanding of children who provide a quick correct answer will be probed further using **questions based around variation theory**. The Maths No Problem textbooks are used during this part of the lesson to enhance the learning experience, providing a high quality resource for children and teachers.
- Develop **reasoning and deep understanding** (contexts and representations of mathematics) – problems are often set in real life contexts – carefully chosen practical resources and pictorial representations are used to explore concepts. These pictorial representations will appear in books as children show their understanding, rather than answers to a series of calculations. The use of practical resources, pictorial representations and recording takes place in every lesson (the CPA approach).
- **Structuring** – the teacher will organise the findings of the exploration, compare/contrast strategies and guide toward the most efficient strategy (or the one being learnt that day).
- **Step by step approach** – journey through the mathematics (these steps may appear small, especially at the beginning of a lesson, there are points when suddenly a jump appears to have been made, or an extra challenge appears – this is normal).

- **Questions** to challenge thinking – teachers use questioning throughout every lesson to check understanding – a variety of questions are used, but you will hear the same ones being repeated: How do you know? Can you prove it? Are you sure? Can you represent it another way? What's the value? What's the same/different about? Can you explain that? What does your partner think? Can you imagine? Listen out for more common questions you hear.

NB: Due to the episodic style of the lessons with frequent questioning, lessons may appear to move slower than in the past. There will be more talking and less recording in books. We do not want children to attempt independent recording until we believe they are secure with the concept. We do not want them to practise errors.

- **Discussion and feedback** – pupils have opportunities to talk to their partners and explain/clarify their thinking.
- **Journal** – recording the *learning* – not just pages of similar calculations – years 1-6 maths journals are used. In year 6 you will also see maths folders where additional test practise is recorded and a variety of workbooks for intervention groups are used. Fluency work is often practical and based on games, where it is recorded you will see it in the back of the journals.
- **Practising** – not drill and practice but practice characterised by variation – years 1-6 use the Maths No Problem workbooks, these workbooks provide children with carefully chosen questions and are essential in assessing how the children have understood the concept taught. You will also see another level of differentiation within these books as some children rapidly grasp the concepts and therefore complete the pages quickly and move onto questions or activities where their understanding can be developed to a greater depth. Some children will work very hard in the lesson to complete the pages independently, some children will need additional support to complete the pages and some children will sometimes be provided with different tasks and questions appropriate to their understanding of a concept.
- **Rapid intervention (same day catch up) – in mathematics** new learning is built upon previous understanding, so in order for learning to progress and to keep the class together pupils need to be supported to keep up and areas of difficulty must be dealt with as and when they occur. We do this through same day interventions which is called 'Keep Up'. They are 30 minute lessons in the afternoon. While identifies are in the Keep Up lesson with their teacher, the other children will be developing their fluency in number and exploring mathematical ideas through a range of activities to promote problem solving and reasoning skills. In addition, we still run intervention sessions outside of the maths lesson for some targeted children and through our SEND support programmes.
- **Marking** – the marking policy has been amended following the guidance of the NCETM. Current marking policy is that learning is ticked or highlighted pink (incorrect) or green (correct). A comment is made if/when a teacher feels this is necessary to move learning forward. Gap tasks may appear for individual children in

their books, but usually **gaps are addressed through same day catch up** and therefore will not always be recorded in books. The most valuable feedback is given during a lesson. Very often the children's next steps are addressed in the subsequent lessons and therefore will not appear as questions for some children to answer after a lesson has taken place.

- **SEND pupils** – may be supported by additional adults, different resources, differentiated activities. They will also complete additional activities outside of the mathematics lesson.
- Children in reception and nursery explore mathematical concepts through active exploration and their everyday play based learning . Children are taught key concepts and application of number using a hands on practical approach. Nursery practitioners provide opportunities for children to manipulate a variety of objects which supports their understanding of quantity and number.

The CPA approach is used when teaching children key mathematical skills. Practitioners allow children time for exploration and the use of concrete objects helps to support children's mathematical understanding. Maths in the early years provides children with a solid foundation that will enable them to develop skills as they progress through their schooling and ensures children are ready for the Nation Curriculum.

NB: We do not label our children. We have high expectations of all children and strongly believe that all children are equally able in mathematics. Some may take longer to grasp concepts and may need careful scaffolding or extra time/support (guided groups, same day catch-up, additional homework, pre-teaching, intervention group, specific parental support).