Maths at Shilbottle Primary

At Shilbottle Primary 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 September 2016. There are several elements which have influenced improvements in attainment and progress in mathematics for our children. Mathematics is led by Mr M. Skirving (MaST) who is undertaking the Mastery Specialist Teacher this year. This document sets out our approach and the reasons why maths at Shilbottle 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

- **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. We use the White Rose Hub small steps planning and, after evaluating the findings of the National Textbook Project, 'Maths No Problem' textbooks to support progression and variation. We follow the same steps in KS1 using Plan bee with White rose supporting the small step approach. 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 using the Planbee and Math no problem schemes of work (collaboratively in staff meetings and where possible supported by Mr Skirving) 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 or unit this exploration is referred to as the '**cold 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 and Planbee materials 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 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.
- **Recording the *learning*** – not just pages of similar calculations – Maths books are used across the school. In books you will see a range of activities including those requiring written explanations of the children's understanding.
- **Practising** – not drill and practice but practice characterised by variation – years 1 and 2 use Planbee small step planning. Year 3 to Year 6 use the Maths No Problem textbooks to 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 – 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. Ideally this would happen on the same day but this is not always possible so it may be the following morning but will be before new learning is introduced.
- **Marking** – the marking policy has been amended following the guidance of the NCETM. Current marking policy is that learning is ticked or crossed. Marking is often completed by the learners to ensure their development into becoming autonomous learners is guided and nurtured. Comments are made if/when a teacher feels this is necessary to move learning forward. Gap tasks or challenges may appear for individual children in their books, but usually **gaps are addressed through same day or early morning 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 EYFS 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. EYFS 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).