

Maths Teaching In Goodrich C.E. Primary School

At Goodrich C.E. Primary School we have adopted a flexible mastery approach to teaching mathematics as recommended by the National Centre of Excellence in the Teaching of Mathematics. This approach expose all of the children to the same curriculum content at the same pace, allowing them all full access to the curriculum by focusing on developing deep understanding and secure fluency with facts and procedures, and providing differentiation by offering rapid support and intervention to address each individual pupil's needs. An approach based on mastery principles:

- makes use of mathematical representations that expose the underlying structure of the mathematics;
- helps children to make sense of concepts and achieve fluency through carefully structured questions, exercises and problems that use conceptual and procedural variation to provide 'intelligent practice', which develops conceptual understanding and procedural fluency in parallel;
- blends whole class discussion and precise questioning with intelligent practice and, where necessary, individual support.
- encourages children to make links in their learning.

Goodrich CE Primary mastery approach

A mastery approach to teaching and learning in maths was introduced in 2016-17. This approach is in its infancy and this year we are beginning to embed it into our curriculum. Staff training and the purchase of mastery resources which aid teachers in the planning of their lessons were purchased in September 2017 to establish the mastery approach throughout the school.

Our ultimate aim is to ensure that children are given a visual/concrete representation of the maths being taught and set in a real life context to make it meaningful to the children. We are developing a mastery approach by:

- Teachers reinforcing an expectation that all pupils are capable of achieving high standards in mathematics.
- The large majority of pupils progressing through the curriculum content at the same pace. Differentiation is achieved by emphasising deep knowledge and through individual support and intervention.
- Pupils who grasp concepts rapidly being 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, including through additional practice, before moving on.

- Teaching is underpinned by methodical curriculum design and supported by carefully crafted lessons and resources to foster deep conceptual and procedural knowledge.
- Practice and consolidation playing a central role. Carefully designed variation within this builds fluency and understanding of underlying mathematical concepts in tandem.
- Teachers using precise questioning in class to test conceptual and procedural knowledge, and assess pupils regularly to identify those requiring intervention so that all pupils keep up.
- Developing a rich use of mathematical vocabulary with teacher modelling and children verbalising their understanding using the correct vocabulary. This is being developed through oral discussion within lessons, using stem sentences to scaffold reasoning vocabulary and Maths Magpie books (from Y2 – Y6) to use as a reminder of their previous learning.

Throughout the school all classes are mixed age. The mastery approach is taught with the lesson objective chosen from each year group which closely match and are a continuation of each other being developed throughout the lesson or series of lessons. Where lesson objectives for differing year groups cannot be closely match, objectives are taught to the whole class ensuring that support and/or depth of learning opportunities are provided. On occasion, where necessary and appropriate, children are taught in smaller groups for precision teaching.

A flexible approach is adopted to the grouping of children based on their needs relating to the particular objective(s) being taught. Where appropriate children are given the opportunity to choose the level of their challenge based on their need as thus providing opportunities for them to develop as independent learners.

Differentiation

Differentiation is achieved in a range of ways:

- Through carefully planned questioning. Precise questioning during lessons ensures that pupils develop fluent technical proficiency and think deeply about the underpinning mathematical concepts. The questioning and scaffolding that individual pupils receive in class as they work through problems will differ, with higher attainers challenged through more demanding problems which deepen their knowledge of the same content.
- Through procedural variation which either seeks to support learners through small steps or extend them by making links requiring larger steps in their learning.

- By exposing children to a range of activities to develop fluency, reasoning and problem solving.
- By exposing children to a range of problem solving activities which require a varying depth of learning.

Intervention

Pupils' difficulties and misconceptions are identified through immediate formative assessment and addressed with rapid intervention on a daily basis. Blue (teacher intervention) or green (TA intervention) tabs are placed in books to create interventions group which take place before the next lesson, either later that day or at the beginning of the next lesson.

Children with specific learning difficulties receive tailored interventions as identified in their Closing the Gap Plans.

Funkey Maths Mentors

A group of eight Year 5 and 6 children have received training to enable them to nurture and support younger members of the school while also learning vital life skills of their own.

Funkey Maths has two aims:

1. To have fun with maths
2. To practise and develop key concepts.

Each Funkey Maths Mentors is partnered with a younger child who needs a little more practise at key skills and spends time each week playing fun games to develop mathematical confidence and competence.

Cross-curricular Maths

Mathematical concept taught are rooted in a real life context to allow the children to develop a sense of purpose. Wherever possible, skills taught in mathematics lessons are reinforced in a real world setting through a range of cross curricular links.

Key Skills

Within the skills coverage there are four key skills which need to be taught well in order for children to become confident and competent in using and applying their mathematical knowledge. Children need a secure knowledge of:

- Place value
- A bank of memorised number facts (number bonds, times table multiplication/division facts, square numbers, 'nearly numbers' e.g. 39 is nearly 40, etc)
- Doubling and halving facts e.g. 1000000 divided by 8 can be halved, halved and halved again; 13 divided by 5 can be solved by doubling both sides, calculating the answer then halving.
- A range of clear images and models. Children should be given clear images and models of concepts being taught to enable them to visualise and comprehend the skills/concepts being taught (using bead strings, numicon, pictures, counters, Shanghai bar etc).

Daily Maths Skills

In addition to daily maths lessons, each class completes a 15 minute number skill session to support fluency underpinned by reasoning.

To aid and assess children's quick recall of mathematical facts, Minute Maths or Froggy Maths should be completed on a regular basis.

Marking

In order to be an effective tool for assessment for learning, Maths marking should include:

- A colour coded assessment dot will be placed in the books by the teacher/pupils/peers to show the extent to which the lesson objective was understood and to indicate what the next step is. The colour coded dots refer to one of the following categories – 'Push it', 'Grow it' or 'Build it'. The children respond to this marking by completing the task require before the next lesson is taught. 'Build it' will be identified children who require quick intervention working with adult support. 'Grow it' will be children who need to purple polish their work. 'Push it' will be children who have achieved the objective and are ready to work on an additional challenge.
- Where written comments are used, comments should relate to objectives/targets/next steps.
- Evidence that children have responded to marking in purple pen.
- If work is completed with adult support the work will be stamped

Displays

Each class will have a maths display which reflects the current topic being taught. The display will provide vocabulary, images and models to support learning.

Maths Magpie Book

A class magpie book will be kept as a record to remind the children of the methods of calculation. It will also serve as a source to refer back to in order to support learning and make links.

Assessment and Tracking

Children are assessed within lessons on a daily basis. Hot and cold tasks are completed from Y1 – Y6 to assess progress through units of work.

Progress through objectives are recorded on School Pupil Tracker at 30 day intervals. Analysis of this data is completed shortly after each data point with in depth analysis carried out at 60, 120 and 180 days.

Evidence for assessment could also include:

- Children's work
- Marking codes and annotations
- Teacher/TA observation notes
- Photographs with annotations
- Audio recordings

Children of concern are identified and actions/interventions put in place to support their learning. Class/school trends are identified and action points are created where necessary which form the basis of SLT monitoring.

Homework

Teachers set homework which is appropriately matched to the children's ability and needs. It should be explained clearly and pitched at a level that the child can do independently.

Key Instant Recall Fact (KIRF) sheets should be sent home at the beginning of each term to inform parents of the mental recall facts which will be focused on in school. KIRF sheet contain ideas which the parents can use to support their child's learning.