EARLY SKILLS IN MATHEMATICS

AT SHALFLEET AND YARMOUTH CHURCH OF ENGLAND PRIMARY SCHOOLS

The Federation of the Church Schools of Shalfleet and Yarmouth - Curriculum for Learning Overview

What are we trying to achieve?

Lifelong Achievement and Wellbeing

Our purpose is to educate children in an atmosphere of Christian love where all achieve the very best they can, now and throughout their lives

Conscious Community, Community Map, Cultural Capital

Curriculum Values

- **Relationships** – We have strong partnerships and positive relationships
- **Determination** – We are determined to do our very best to achieve
- **Respect** – We show respect to others and the environment

Design principles to inspire & challenge

- Coherent learning links and pathways
- Strong working partnerships
- High quality outcomes, deep learning
- Valuing all children, learning is accessible to all
- Challenging, engaging and motivating
- Opportunities for memorable experiences
- Promotes independence and curiosity
- Broad, relevant and balanced – Local, Mainland, Global

How do we implement ?

The curriculum as the entire planned learning experience

Components

Lessons | Topics | Events/Trips | Environment | Enrichment/Inspire | Partnerships

Teaching for Learning

Clear understanding of cognition and learning – Good subject knowledge – Skilful instruction, coaching and facilitating – Flexible and responsive teaching strategies – Stimulating and well organised learning environments – Effective use of assessment - High expectations and productive interactions

Approaches

Sequences of learning that link key ideas in subject domains - rich connected learning journeys – clear progression of learning – flexible inclusion strategies to tackle educational disadvantage - social, moral, spiritual, cultural education

EYFS/National Curriculum

CLL | PSED | PD | Literacy | Maths | UW | EAD

Eng | Ma | Sci | Comp | D&T | Hist | Geo | A&D | Music | PE | MFL | PSHE | RE

What is the impact?

Successful Learning

- Positive relationships and interactions
- Appropriate learning opportunities understood by pupils
- Children understand how to be successful
- Oral and written feedback that has impact
- Dialogic talk and rich questioning
- Developing meta-cognition
- Moderation underpins standards
- Effective use of assessment driving tailored learning
- Target setting and review

Systematic monitoring, action and review : Do design principles translate into an inspiring and challenging curriculum for all?

Evidenced by…

Our curriculum impact can be measured by…

- High achievement and outcomes for all across the curriculum
- Good behaviour, positive attitudes and high attendance
- Teaching that is engaging and consistently good for all
- Motivated teams & positive learning culture
- Confident, kind, respectful, determined learners

OUR INTENT

The reception year is a fundamental stage in a child's life and one in which we aim to welcome and settle our children and their families into our school community. We aim to provide children with the opportunities to develop a love of learning through positive relationships, memorable experiences and by giving them an active role in their learning by tailoring learning to the children's interests . But, we also know the importance of the reception year to equip children with the fundamental skills as they prepare for the National Curriculum in Year 1.

We aim to equip children with a strong foundation of Early Mathematic Skills on which their learning can continue to build as they move through their school years. We understand how early number sense is critical to supporting children in acquiring the building blocks of number and the importance of embedding number teaching and number experiences into real life opportunities so that children understand the role and importance of numbers in everyday life.

Through a range of play based and adult led approaches, we work to ensure children secure a strong foundation of number, pattern, shape, space and measure. However, we also understand the importance of adult led teaching for developing children's mathematical understanding. We use White Rose Maths planning alongside child led themes and opportunities to teach maths in Early Years.

We work to support our families too, to enhance their understanding of the key role they play in their child's learning journey.

THE NEW EARLY YEARS CURRICULUM

Mathematics:

Number

- Have a deep understanding of number to 10, including the composition of each number.
- Subitise (recognise quantities without counting) up to 10.
- Automatically recall (without reference to rhymes, counting or other aids), number bonds up to 5 (including subtraction facts) and some number bonds up to 10, including double facts.

Numerical Patterns

- Verbally count beyond 20, recognising the pattern of the number system.
- Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.
- Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

- We must remember that the Early Learning Goals themselves do not constitute a curriculum and therefore, even though Shape, Space and Measure is not formally mentioned in the goals, we must endeavor to continue to teach children about these fundamental mathematical concepts.

Further reading:
Prime and Specific Areas 7 Feature of Effective Practice. Characteristics of Effective Learning

THE IMPORTANCE OF EARLY YEARS IN THE TEACHING OF MATHS

> "Children are born ready, able and eager to learn. They actively reach out to interact with other people, and in the world around them. Development is not an automatic process, however. It depends on each unique child having opportunities to interact in positive relationships and enabling environments."[i]

The first few years of a child's life are especially important for mathematics development. Research shows that early mathematical knowledge predicts later reading ability and general education and social progress[ii]. Conversely, children who start behind in mathematics tend to stay behind throughout their whole educational journey[iii].

(i) Development Matters, 2012

(ii) Duncan et al, 2007

(iii) Aubrey, Godfrey, Dahl, 2006

The role of an Early Years Practitioner is to ensure that all children develop firm mathematical foundations in a way that is engaging and appropriate to their age.

NCETM

NCETM

There are six key areas of early mathematics learning, which collectively provide a platform for everything children will encounter as they progress through their maths learning at primary school, and beyond.

The materials below were first published by the NCETM in 2018 and updated in 2019.

SIX KEY AREAS OF EARLY MATHEMATICS LEARNING

Cardinality and Counting

Understanding that the cardinal value of a number refers to the quantity, or 'howmanyness' of things it represents

Comparison

Understanding that comparing numbers involves knowing which numbers are worth more or less than each other

Composition

Understanding that one number can be made up from (composed from) two or more smaller numbers

Pattern

Looking for and finding patterns helps children notice and understand mathematical relationships

Shape and Space

Understanding what happens when shapes move, or combine with other shapes, helps develop wider mathematical thinking

Measures

Comparing different aspects such as length, weight and volume, as a preliminary to using units to compare later

RESEARCH

Education Endowment Foundation

The EEF isn't just a grant-funder, nor just a research organisation. What we are is a charity with a moral imperative – to support teachers and senior leaders to raise attainment and close the disadvantage gap – which roots its response to this educational challenge in the best available evidence.

1

Develop practitioners'understanding of how children learn mathematics

- Professional development should be used to raise the quality of practitioner' knowledge of mathematics, of children's mathematical development and of effective mathematical pedagogy.
- Developmental progressions show us how children typically learn mathematical concepts and can inform teaching.
- Practitioners should be aware that developing a secure grasp of early mathematical ideas takes time, and specific skills may emerge in different orders.
- The development of self-regulation and metacognitive skills are linked to successful learning in early mathematics.

2

Dedicate time for children to learn mathematics and integrate mathematics throughout the day

- Dedicate time to focus on mathematics each day.
- Explore mathematics through different contexts, including storybooks, puzzles, songs, rhymes, puppet play, and games.
- Make the most of moments throughout the day to highlight and use mathematics, for example, in daily routines, play activities, and other curriculum areas.
- Seize chances to reinforce mathematical vocabulary.
- Create opportunities for extended discussion of mathematical ideas with children.

3

Use manipulatives and representations to develop understanding

- Manipulatives and representations can be powerful tools for supporting young children to engage with mathematical ideas.
- Ensure that children understand the links between the manipulatives and the mathematical ideas they represent.
- Ensure that there is a clear rationale for using a particular manipulative or representation to teach a specific mathematical concept.
- Encourage children to represent problems in their own way, for example with drawings and marks.
- Use manipulatives and representations to encourage discussion about mathematics.
- Encourage children to use their fingers—an important manipulative for children.

4

Ensure that teaching builds on what children already know

- It is important to assess what children do, and do not, know in order to extend learning for all children.
- A variety of methods should be used to assess children's mathematical understanding, and practitioners should check what children know in a variety of contexts
- Carefully listen to children's responses and consider the right questions to ask to reveal understanding.
- Information collected should be used to inform next steps for teaching. Developmental progressions can be useful in informing decisions around what a child should learn next.

5

Use high quality targeted support to help all children learn mathematics

- High quality targeted support can provide effective extra support for children.
- Small-group support is more likely to be effective when:
- children with the greatest needs are supported by the most experienced staff;
- training, support and resources are provided for staff using targeted activities;
- sessions are brief and regular; and
- explicit connections are made between targeted support and everyday activities or teaching.
- Using an approach or programme that is evidence-based and has been independently evaluated is a good starting point.

24th January 2020

MATHS MASTERY

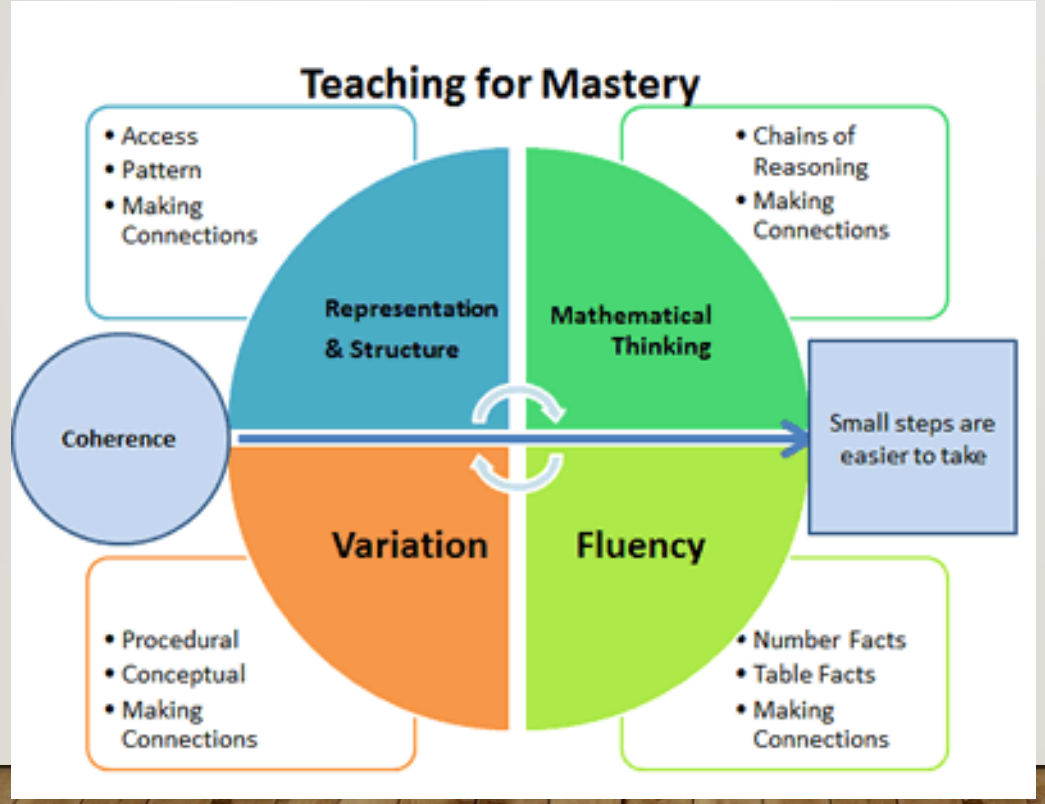
Mastering maths means pupils acquiring a deep, long-term, secure and adaptable understanding of the subject.

The phrase 'teaching for mastery' describes the elements of classroom practice and school organisation that combine to give pupils the best chances of mastering maths.

Achieving mastery means acquiring a solid enough understanding of the maths that's been taught to enable pupils to move on to more advanced material.

Coherence: Lessons are broken down into small chunks, gradually unfolding a concept.

Representation and Structure: Mathematical representations explore the structure/ concepts being taught with the larger aim that students can eventually do the maths without the visual cues.



Mathematical Thinking: Ideas are to be understood deeply by pupils – thought about, reasoned about and discussed with others.

Fluency: Quick and efficient recall of facts and flexibility to move between contexts and representations.

Variation: How teachers may represent a concept in more than one way and how they sequence activities – looking at what is kept the same and what is different.

WHAT WERE IDENTIFIED AS PRIORITIES FOR THE DEVELOPMENT OF MATHEMATICAL SKILLS IN EARLY YEARS 2021/22?

Mathematical Fluency – putting additional daily sessions into the timetable to increase children's mathematical fluency. This includes:

- Daily counting – e.g. at registration reception classes use class number lines e.g. the numicon number line to count the day of the week and use the picture cue to locate the corresponding picture card. This allows modelling of language too, "'16' so we are looking for a full 10s frame and 6 more."

Rekenrek Time

Daily singing – linking to counting songs and finger manipulation to represent number facts / sequences in the songs.

'Opportunities to cooperate in singing games, action songs and movement to music are the early childhood active learning precurors to thinking, problem solving and memory. Music helps children and adults stay alert. Music is the essential element for children that touches all ways young children learn.'
Elizabeth Carlton, 2012

Why song and rhyme?
Develops listening skills.
Stengthens aural discrimination.
Helps children engage in mathematical vocabulary in number and spatial awareness.
Music helps children remember.
Helps children engage in mathematical thinking.
Using rhyme gesture reinforces concepts.
Helps children reason for a purpose.
Begins and then continues the journey of using representations.
Develops motor skills for supporting counting.
Supports all 7 areas of learning.
Helps children to cooperate, think and problem solve.
Its FUN!!

White Rose Maths Webinar Tea Party November 2021

PRIORITIES CONTINUED

More work to engage parents in understanding the depth of mathematical understanding:

Videos shared on dojo until COVID regulations allow face to face presentations.

Audit of resources to ensure classrooms have access to high quality resources (with sufficient training to ensure high quality use).

'Manipulatives and representations can be powerful tools for supporting pupils to engage with mathematical ideas. However, manipulatives and representations are just tools, how they are used is important. They need to be used purposefull and appropriately in order to have an impact.'
Education Endowment Foundation: Improving Mathematics.

Time to talk about our maths – skilled questioning by practitioners to build children's competence and confidence to explain their mathematical thinking and reasoning – both through increased opportunities for playing alongside children and extending their thinking and whole class / small group adult directed time. Including upskilling practitioners through training.

'From keeping track of the monkeys on the bed with fingers to the joy of pretending to jump on the bed and fall off, children can model the one-less pattern of counting down. And you can extend their learning by asking all kinds of questions that touch on the rules of counting.
What if 2 more monkeys came over to play? What if 2 monkeys fell off at once?'
Erikson, Early Math Collaborative, 2017.

Increased use of stories to promote mathematical thinking and making links between maths and literacy – joining skills across these 2 important areas of the curriculum.

'Where story and mathematics connect, there is scope to think mathematically through the story context.'
McGrath, 2021

OUR IMPLEMENTATION - ASSESSMENT

Class teachers use assessment to track the achievements of all pupils at key milestones throughout the year across all areas of the Early Year Curriculum. We begin initially with the baseline assessment and information provided through our robust transition from pre schools. This data will influence starting points and next steps for pupils and the level of support needed.

As skilled practioners we use our understanding of child development and the Early Years Framework to understand the vital link between mathematics and other areas of the curriculum when assessing progress. e.g. the importance of securing those positive relationships, developing children's self regulation, their confidence to try new things and step out of their comfort zone, the power and importance of mistakes. Likewise, we understand the role and vital importance of children being supported to develop their speaking and listening skills so that they can adequately express their mathematical ideas, use new mathematical vocabulary and ask and answer questions to deepen their understanding.

With the new curriculum, whilst the progress of all pupils is essential, early identification of those children who are in danger of falling behind is identified as critical. Early identification allows practioners to quickly identify the needs of children and implement measures and interventions to close gaps in learning. Assessment findings link to the class provision map, identifying those steps being taken to support children in danger of falling behind.

MONITORING AND EVALUATING

Impact of the implementation of the teaching of Early Literacy Skills is measured in a variety of ways.

These include:

- Talking to children and families about their experiences
- Time spent in the learning environments
- Assessment data
- Looking at samples of children’s work