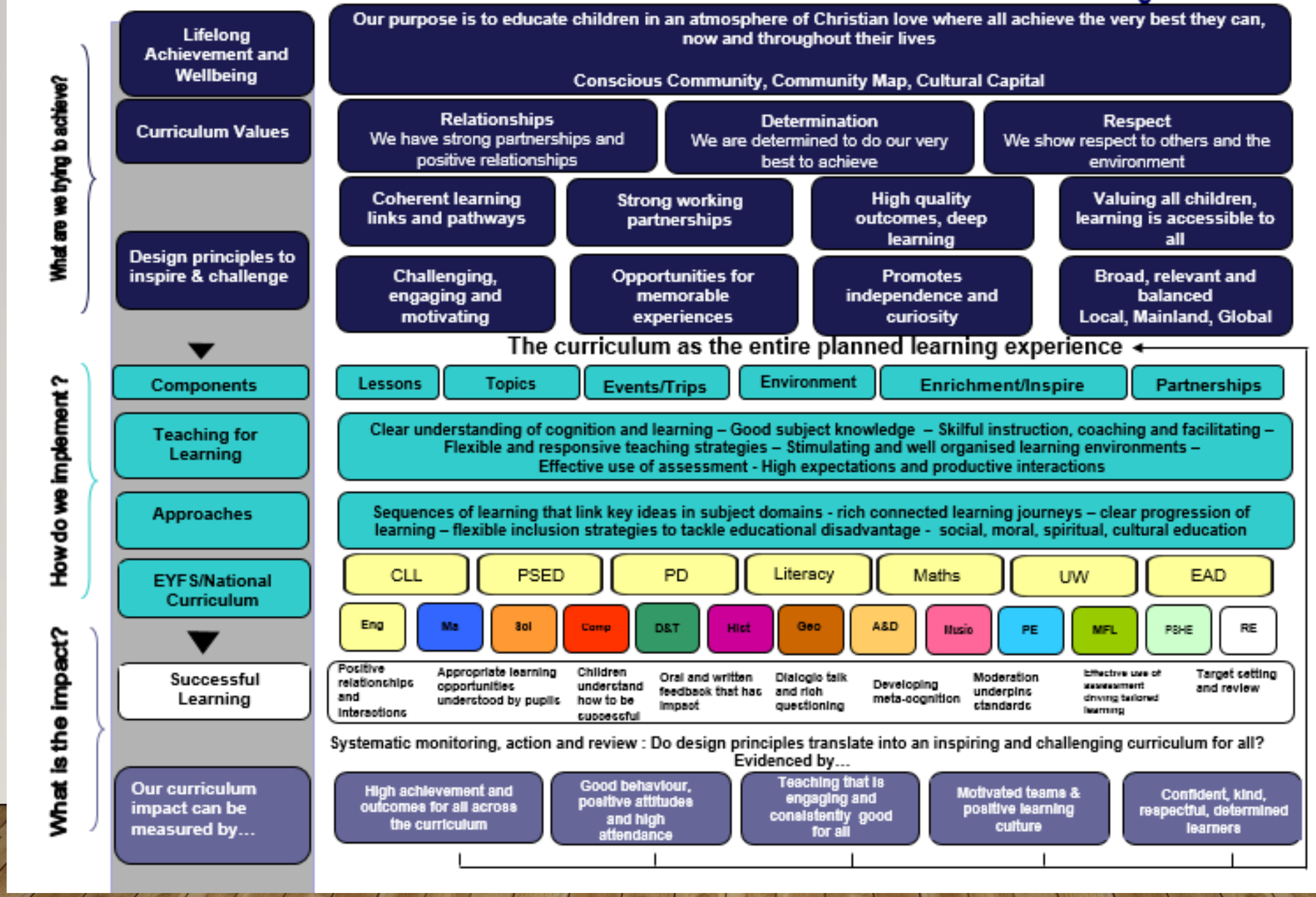
EARLY SKILLS IN MATHEMATICS

AT SHALFLEET AND YARMOUTH CHURCH OF ENGLAND PRIMARY SCHOOLS

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



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

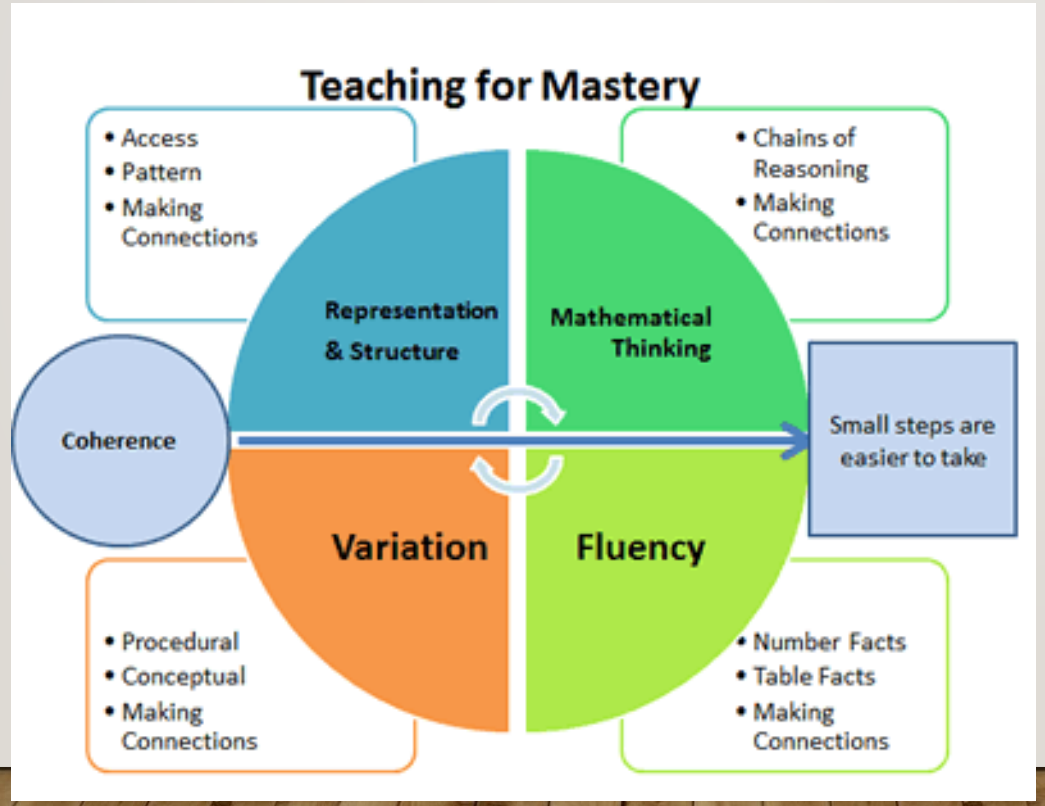
Mastering maths means pupils acquiring a deep, long-term, secure and adaptable understanding of the subject.

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 and Number Sense Time.

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

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

'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

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.

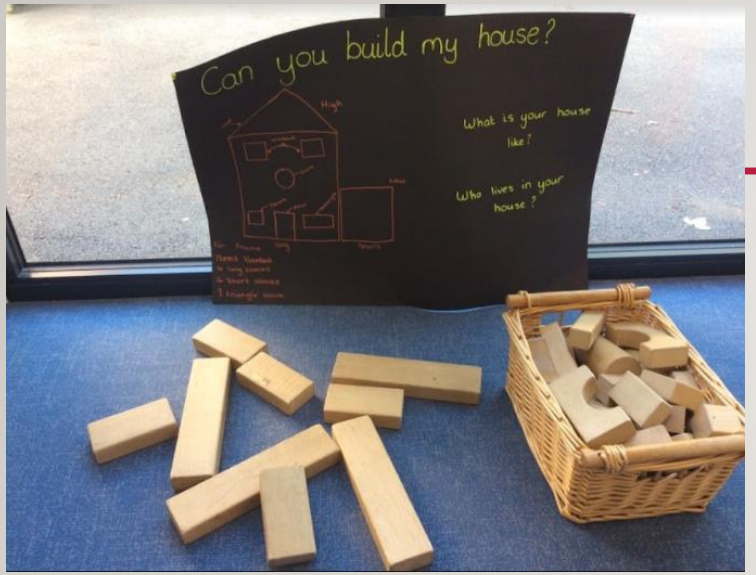
'From keeping track of the monkeys on the bed with fingers to the joy of pretending to jump on the bed and fall off, children can model the one-less pattern of counting down. And you can extend their learning by asking all kinds of questions that touch on the rules of counting.
What if 2 more monkeys 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

AUTUMN TERM - MATHEMATICS

PRE SCHOOL, LITTLE EXPLORERS, SHALFLEET.



Fun number games – children matching digits to build monsters.

Challenges linked to interests and stories – practioners on hand to extend children's thinking and encourage them to explain their reasoning. Here children were sorting longer and shorter bricks.

Maths equipment and challenge cards to develop understanding of pattern.

Numbers displayed as digits at eye level for the children. Baskets of manipulatives to encourage children to count out that amount. Extending understanding of cardinality.

LITTLE EXPLORERS, PRE SCHOOL SHALFLEET.

Maths is all around us – encounters with mathematical puzzles and number representations throughout the environment.

Shape manipulatives open discussions through child led play and provide open ended exploration, discovery and problem solving.

PRE SCHOOL LITTLE STARS PRESCHOOL, YARMOUTH.

Role play shop with practitioner on hand to model language and mathematical concept of number value – counting out amounts with children.

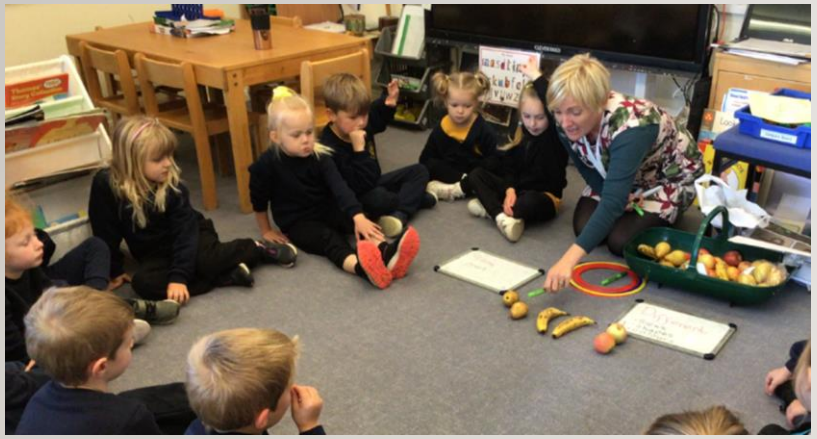
Using natural resources giving the important message that maths is all around us and embedded within everyday life. Exploring biggest/ bigger, smaller / smallest. Comparison of size and weight.

Exploring patterns and comparing quantities.

Child led construction play offers opportunities for children to explore and use the language related to shape and measure and developing valuable skill of comparison and explaining our ideas.

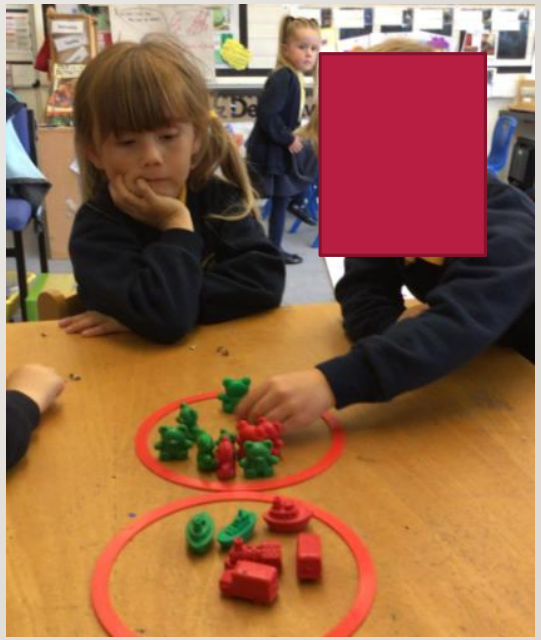
BEACH CLASS, RECEPTION – YARMOUTH

ADULT DIRECTED TASKS



Same and Different – Whole Class Input

Opportunities for children to continue to explore the concept of groups, explaining similarities and differences through Child Led Learning.



Small group adult led challenges to extend thinking.

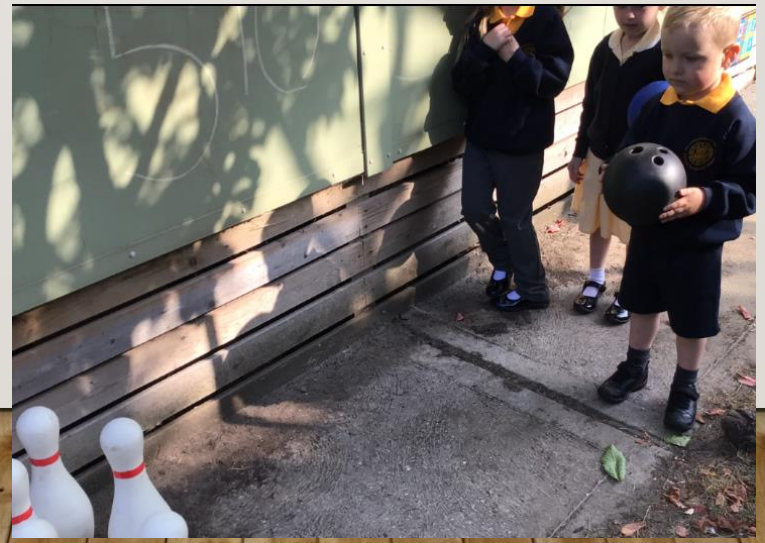
MATHS THROUGH **CHILD LED LEARNING** BEACH CLASS

These children made links to our Jack and the Beanstalk story time, recreating stalks and using mathematical language in their play, 'We need to make it taller.' It's too short.'

Leighton and Jack were enjoying rolling the dice – great for subitising. The adult extended their subitising by challenging them to write the corresponding digit on the IWB.

Through conversations with the practitioners, William was able to explain his reasoning of why he was cutting different lengths, applying the language of longer and shorter that we had visited in directed learning.

In these 2 pictures, children were encouraged to extend their child led learning to keep scores and compare amounts in their games – representing numbers as digits. Adults would use rhyme prompts and modelling to develop accurate number formation.



Skylar used the abacus to represent numbers 1-10 and 10-1 during her child led learning.

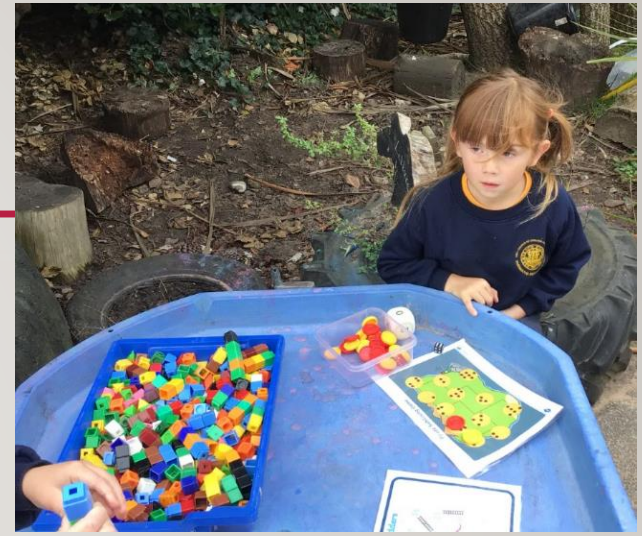
Here children played a memory puzzle to find matching pairs.

BEACH CLASS YARMOUTH – **CHILD LED**

We invest time playing maths games with children like this build a superhero game which develops digit recognition, subitising as well as social interactions / turn taking.

This child was playing a game and after an adult modelled how to draw her own fives frame (which had been introduced during an adult directed input), Skylar was able to represent amounts and compare. She spent a prolonged time drawing her frames, rolling a dice and representing the amount in her frames to compare. Practitioner questioning supported Skylar's problem solving when she rolled, '6' which was too large for one fives frame.

Subitising pirate game.

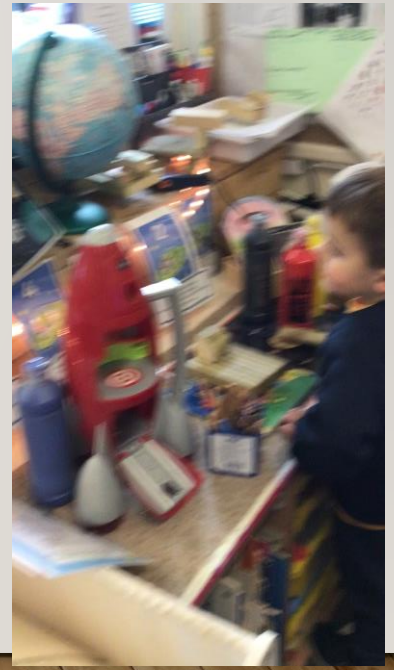


Bonnie using a ruler to measure the piece of wood she wanted to cut for her model.

Maths through story links and linked closely to child led interests: Jack and the Beanstalk.
Whole class investigation to compare the size of items to the length of the giant's footprint. Key terminology of 'longer than' and 'shorter than' were introduced to children, with them encouraged to tell a practitioner about their discoveries. This activity also introduced the children to accuracy of measuring (lining up the end of the footprint to our object).

Our class made advent calendar. Children worked together to number each envelope that they made and place them in order. Each day, children were challenged to locate the number that was needed.

A child accessing the rhyme table, using props and a familiar song to count down from 5.



A SAMPLE OF BEACH CLASS WORKING WALLS

Numicon number line to 31, used for daily counting when setting the date with children each morning. Children are challenged to find the corresponding numicon card to place on the calendar. Opportunities to discuss and model language e.g. it is one full tens frame and one more (11). We also start from different numbers when counting, not always from 0.

Our maths wall linking to current theme of investigation – celebrating work, showcasing stem sentences for adults to use during their child interactions.

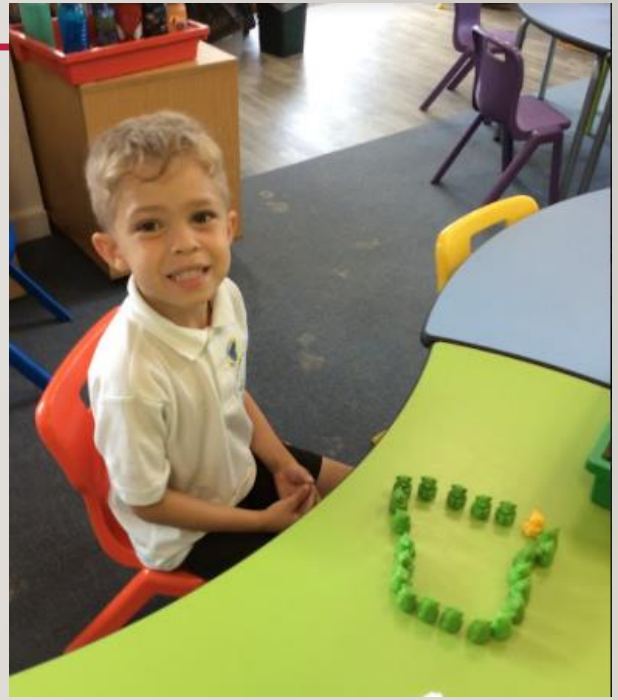
Child height maths investigation resource for them to use and interact with.

RAINBOW CLASS RECEPTION, SHALFLEET.

Number representatives in the environment for children to access through child led learning.

Exploring shape through open ended manipulatives.

Finding ways to display 'odd one out' with further discussions to group items, identifying characteristics for 'same and different.'

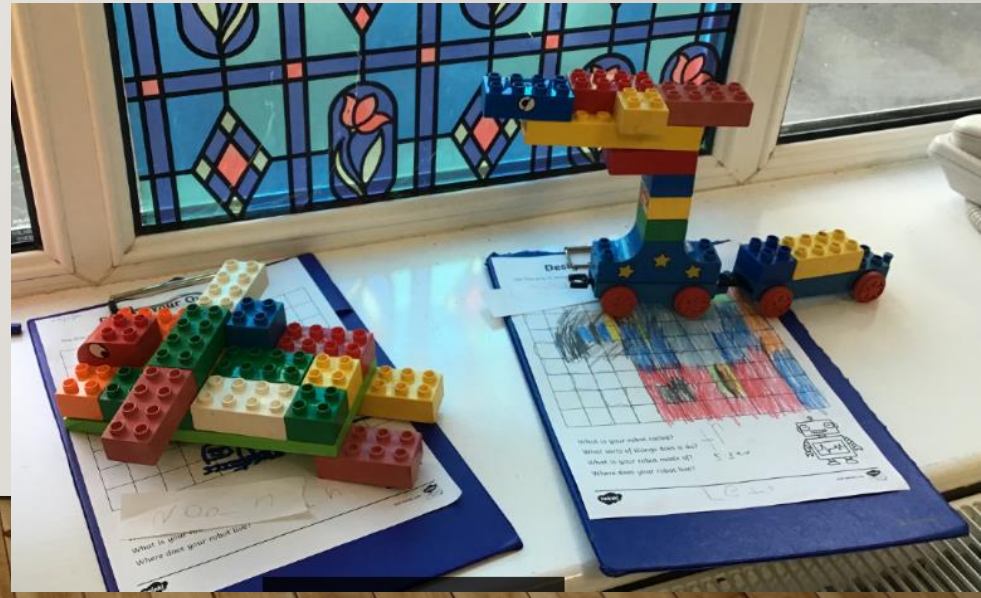


Powerful messages that maths is all around us – using natural resources within the outdoor provision to provide endless opportunities for maths exploration, representation and reasoning.

RAINBOW CLASS, RECEPTION CLASS SHALFLEET.

Table top investigations. Sometimes this is linked with our focus number of the day but at other times linked to the child led theme at the time e.g. these shape animals and vehicles.

Interactive games to allow children to develop and apply maths learning.



SPRING TERM - MATHEMATICS

LITTLE EXPLORERS PRESCHOOL - SHALFLEET

Drawing shapes and naming them. Using key adults around to talk about features of the shapes.

Making and exploring features of shapes.

Shape floor puzzle with key adult.

Exploring shape and height.

Sorting and balancing.

Following patterns and building our own patterns.

Clock building / number sorting and time.

In the moment maths – counting my fruit at snack time.

Number puzzles.

LITTLE STARS – PRESCHOOL - YARMOUTH

An interest in maps allowed hunts for numbers on coordinates and an introduction to words associated with position, size and direction.

Exploring capacity and making predictions of number of scoops / cups.

Child led interest in under the sea – art and junk modelling activity gave an opportunity to compare legs on sea animals, incorporating counting and an opportunity to develop 1:1 correspondence.

Exploring measure and weight through cooking.

Parachute games incorporating counting songs.

Using 'worms' to talk about length and to compare lengths.

BEACH CLASS – ADULT DIRECTED LEARNING

Exploring composition of number 5 through the 5's frame. How many different ways can we show 5 with 2 colours of counters?
Subitising warm up activity on IWB.

Mathematical links to 'same but different' in PSHE and literacy tasks.

Using small world and practical game to explore groups within 5. Stem sentence e.g,' I have ___ dinosaurs altogether. _____ are in the water and _____ are under the trees.'

Introducing children to part/part/whole models to explore the composition of number. Children used a stem sentence to explain what their model showed….'_____ is my whole, ___ is my part and ___ is my part.

BEACH CLASS – **CHILD LED** LEARNING

Our rhyme table inspiring children to count backwards and apply the concept of 'one less' through song and rhyme.

Children used their learning of the part/part/whole model to share 5 flags into different parts.

Children using their knowledge of the 5's frame for counting in their own play. Children were extended to play a game of how many are missing? Children have to work out how many objects are missing by looking at the 5's frame. They then hunt the objects and replace in the frame to fill it.

Tough spot number matching challenge. One child realised the numbers stoppedat 10 and she could make more numbers. The adult challenged her to continue the number line and build the new numbers.

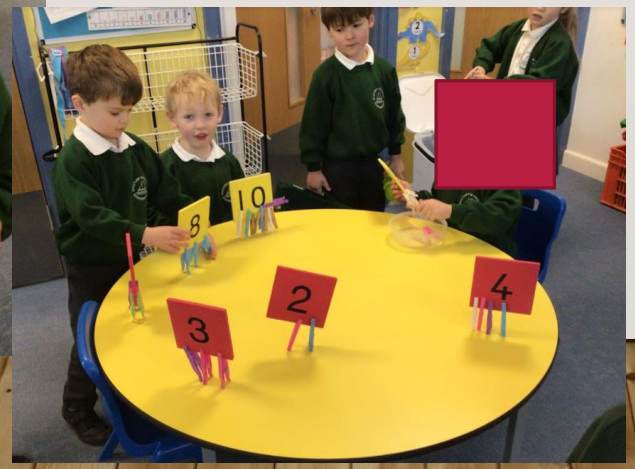
Hands on cardinality – spontaneous through a cooking activity. Children exploring 1:1 correspondence and the '4 ness of 4.'

Our class shop gave children the opportunity to explore coins in English currency, number value, number order and find totals of an amount with simple additions.

RAINBOW CLASS

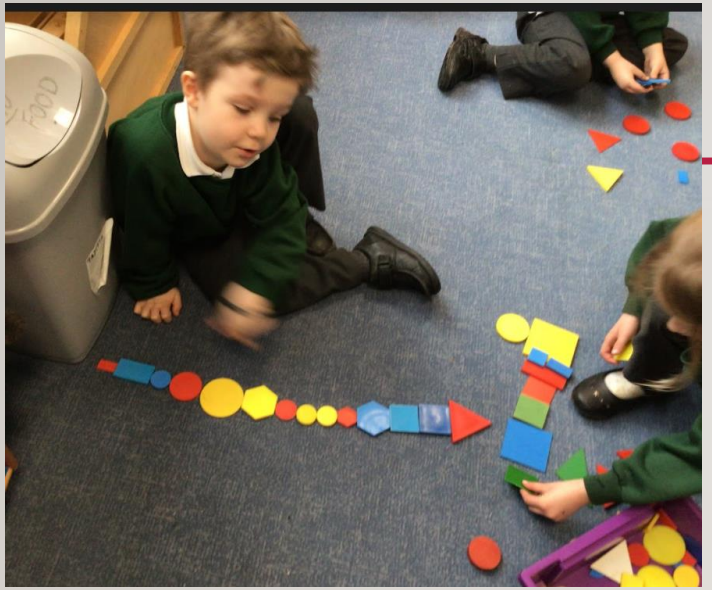
Table top challenges and concrete apparatus to allow children to recognise numbers and their value. Matching numbers.

Taking inspiration from The Numberblocks to find different ways of making / displaying the character 6.



Making pairs.

RAINBOW CLASS, SHALFLEET.



Making shape rockets, linking to child theme of space and literacy theme 'Whatever Next.'

SUMMER TERM MATHEMATICS

PRE SCHOOL, LITTLE EXPLORERS, SHALFLEET.

Providing endless opportunities for children to explore and apply mathematical concepts through play in pre-school. Introducing children to shape, space and number.

PRE SCHOOL, LITTLE STARS, YARMOUTH

Providing endless opportunities for children to explore and apply mathematical concepts through play in pre-school. Introducing children to shape, space, pattern and number.

LITTLE STARS PRE SCHOOL CONTINUED

Counting and subitizing.

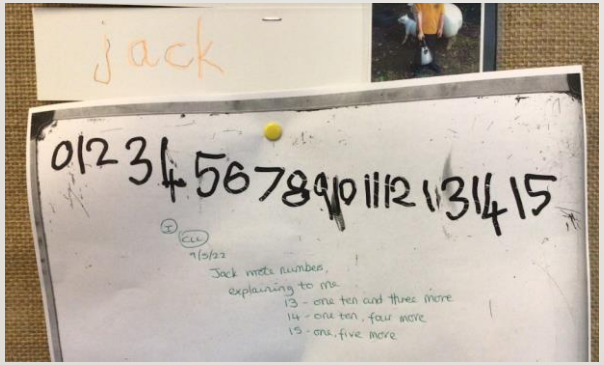
Exploring patterns and shapes linked to stories shared.

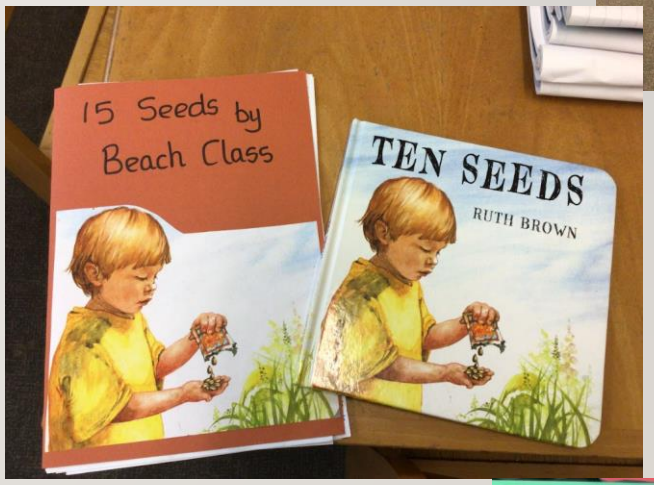
Using opportunities in play to talk about size and shape – introducing and modelling vocabulary for children to explain their ideas.

BEACH CLASS YARMOUTH

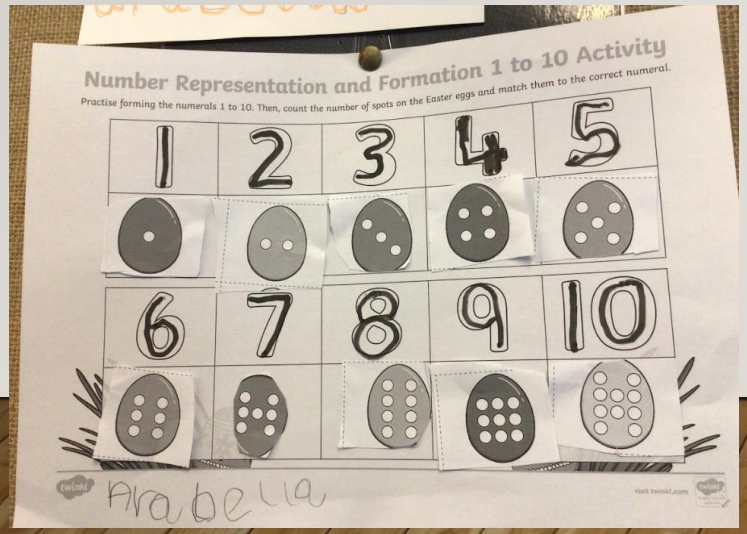
Whole class investigation of doubles and expanding our understanding of this concept at fruit time.

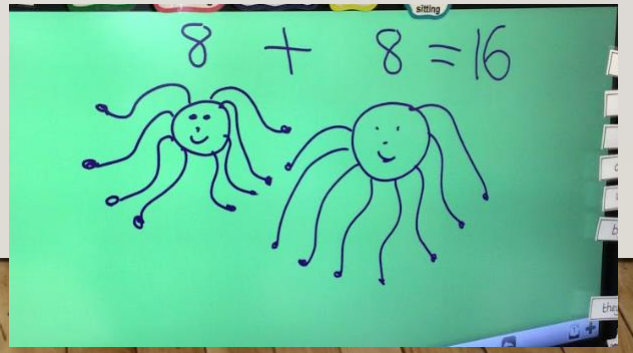
Exploring numbers beyond 10 with stem sentences and equipment, 'one full tens frame and one more' (11)

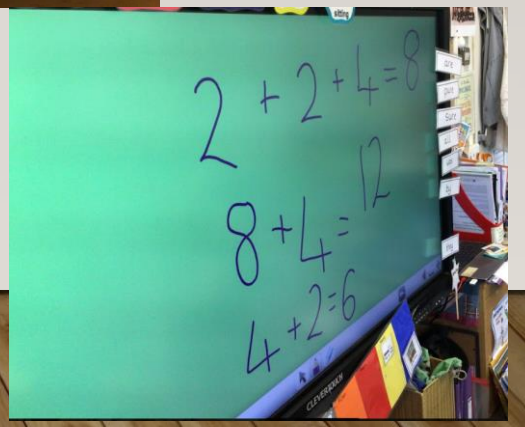




Using stories to explore maths e.g. how many legs?

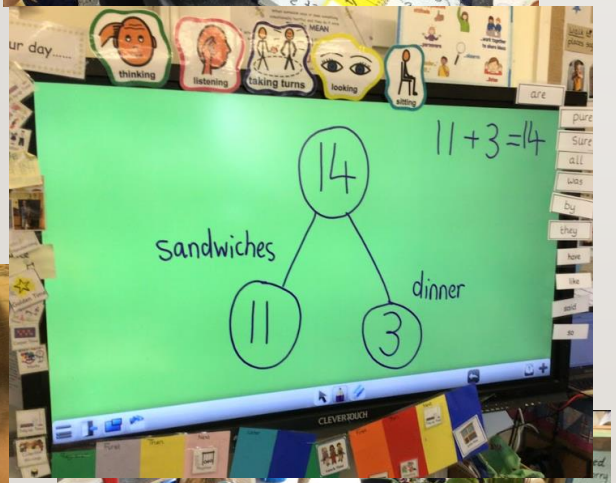


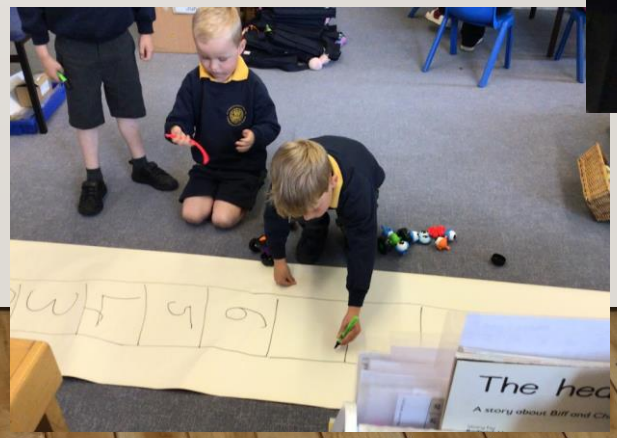




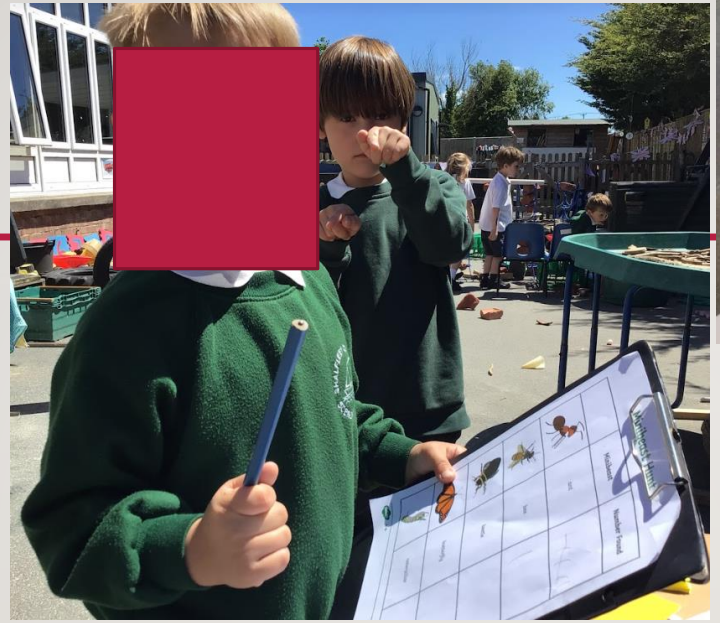
BEACH CLASS CONTINUED

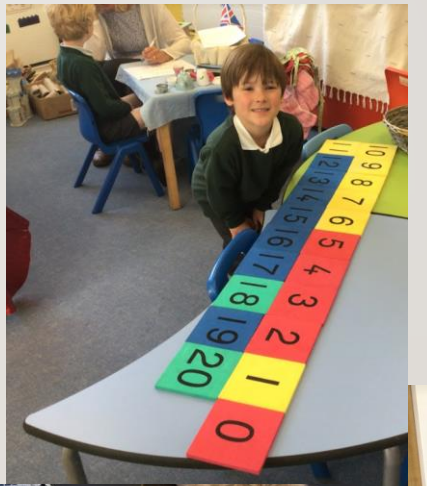
Providing endless opportunities to children to apply new maths skills through their child led and adult led learning.



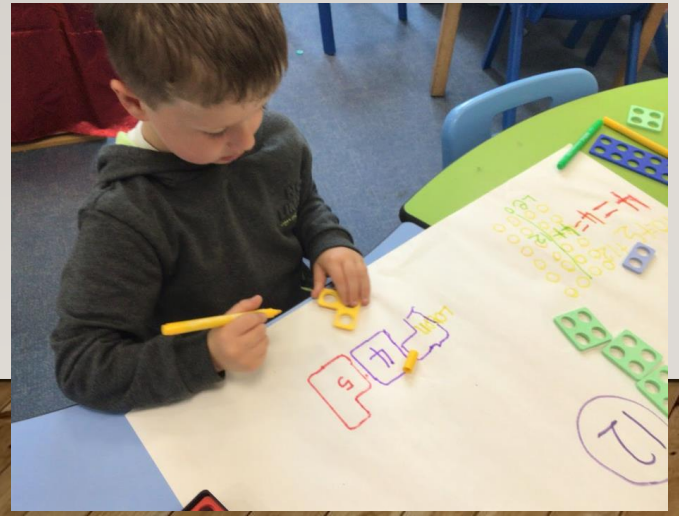


RAINBOW CLASS, SHALFLEET.





Providing endless opportunities to children to apply new maths skills through their child led and adult led learning.



MAKING LINKS TO THE ONWARD JOURNEY TO THE NATIONAL CURRICULUM

- Onward links to the National Curriculum portfolios.docx

School Maths Statement:

School Maths Policy:

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

SUBJECT LEADER ACTION PLAN

2022/2023 One Page Subject Action Plan

Subject – EYFS maths

Subject Lead – Emma Haisell

FDP Link -

ACTION	WHY?	HOW? *Success Criteria*	WHO?	COST/RESOURCES?	OBJECTIVE ACHIEVED?	EVALULATION *What has been the impact?*	NEXT STEPS
To enrol reception class teachers on EYFS mastery training NCETM and implement approach in class.	To update our approach to teaching number to ensure mastery approach is consistent across Federation in all year groups.	-Follow steps from Debbie Lewis to enrol on NCETM programme. -Ensure reception teachers attend all training sessions and when this can't be together, meet to discuss training. -Keep Debbie Lewis up to date with maths approach in Reception in light of new scheme. - Ensure time allocated on EYFS timetables to allow daily session of discrete maths teaching for NCETM. -Reception teachers print and begin NCETM daily planning sessions in class.	EH with CH.				
To conduct maths audit of resources with reception classes.	To ensure that there is sufficient and correct equipment available to ensure application of NCETM mastery approach.	-Attend training sessions from NCETM and in collaboration with CH, place a request for missing resources.	EH with CH.	Varied depending on how many resources are required to complete NCETM approach in class effectively.			
To visit both pre-schools to allow time to explore maths approach, provision and resources.	To ensure consistent approach across the Federation – to share new mastery approach to number in Reception to ensure continuity for children between pre-schools and Reception class. To support nurseries in needs they identify or visit identifies e.g. through sourcing more equipment etc.	- Plan a time to allow a visit to each pre-school site. - Meet with both nursery managers to discuss their maths approach and needs going forward.	EH	Time to cover EH in class to allow visits to pre-school settings.			

OUR IMPACT

SUBJECT LEADER REPORT