Power Maths
Parent/Carer Workshop

Wednesday 14th October 2020

Kindness   Service   Truthfulness   Forgiveness   Courage   Perseverance

Aims of this session

▶ Understand the pedagogy behind Power Maths

▶ Explore a typical week of Power Maths in Reception

▶ Understand the impact for Year 1 and beyond

What is Power Maths?

It is a whole class mastery approach, that is based upon the concrete, pictorial and abstract approach.

Non-linear stages

Concrete

Replacing the traditional approach of a teacher working through a problem in front of the class, the concrete stage introduces real objects that children can use to 'do' the maths – any familiar object that a child can manipulate and move to help bring the maths to life. It is important to appreciate, however, that children must always understand the link between models and the objects they represent. For example, children need to first understand that three cakes could be represented by three pretend cakes, and then by three counters or bricks. Frequent practice helps consolidate this essential insight. Although they can be used at any time, good concrete models are an essential first step in understanding.

Pictorial

This stage uses pictorial representations of objects to let children 'see' what particular maths problems look like. It helps them make connections between the concrete and pictorial representations and the abstract maths concept. Children can also create or view a pictorial representation together, enabling discussion and comparisons. The *Power Maths* teaching tools are fantastic for this learning stage, and bar modelling is invaluable for problem solving throughout the primary curriculum.

Abstract

Our ultimate goal is for children to understand abstract mathematical concepts, signs and notation and, of course, some children will reach this stage far more quickly than others. To work with abstract concepts, a child needs to be comfortable with the meaning of, and relationships between, concrete, pictorial and abstract models and representations. The C-P-A approach is not linear, and children may need different types of models at different times. However, when a child demonstrates with concrete models and pictorial representations that they have grasped a concept, we can be confident that they are ready to explore or model it with abstract signs such as numbers and notation.

Use at any time and with any age to support understanding.

Alder Grove
Church of England Primary School

What is Power Maths?

Every lesson is divided into sections that involve and encourage discovery, sharing, collaboration, practice and reflection. Children are encouraged to solve problems each day through the use of concrete resources, pictorial representations and abstract thinking.
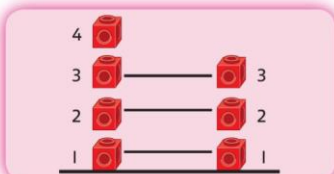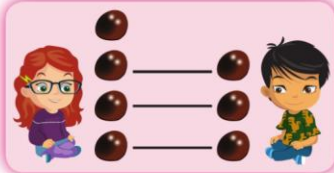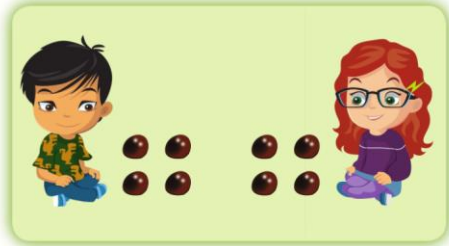
What is Power Maths?

At the heart of this programme is the principle that all children can achieve and be successful mathematicians with the right growth mindset. It promotes five child friendly characters, each with their own positive skillset, to inspire and motivate children. These characters are:

Ash
Ash is curious and inquistive. He loves to explore new concepts.

Astrid
Astrid is brave and confident. She is not afraid to make mistakes.

Dexter
Dexter is determined. When he makes a mistake, he learns from it and tries again.

Flo
Flo is flexible and creative. She often comes up with new methods.

Sparks
Sparks is helpful and supportive. He will remind you of things that may help you.

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What is Power Maths?

To develop mastery in maths, children need to be enabled to acquire a deep understanding of maths concepts, structures and procedures, step by step. Complex mathematical concepts are built on simpler conceptual components and when children understand every step in the learning sequence, maths becomes transparent and makes logical sense. Interactive lessons establish deep understanding in small steps, as well as fluency in key facts such as tables and number bonds. The whole class works on the same content and no child is left behind.

Power Maths:

▶ Builds every concept in small, progressive steps.

▶ Is built with interactive, whole-class teaching in mind.

▶ Provides the tools you need to develop growth mindsets.

▶ Helps your child's teacher check understanding and ensure that every child is keeping up.

▶ Establishes core elements such as practice and reflection.

What does Power Maths look like in Reception class?

Unit 2 – Sorting
Monday - Check

What does Power Maths look like in Reception class?

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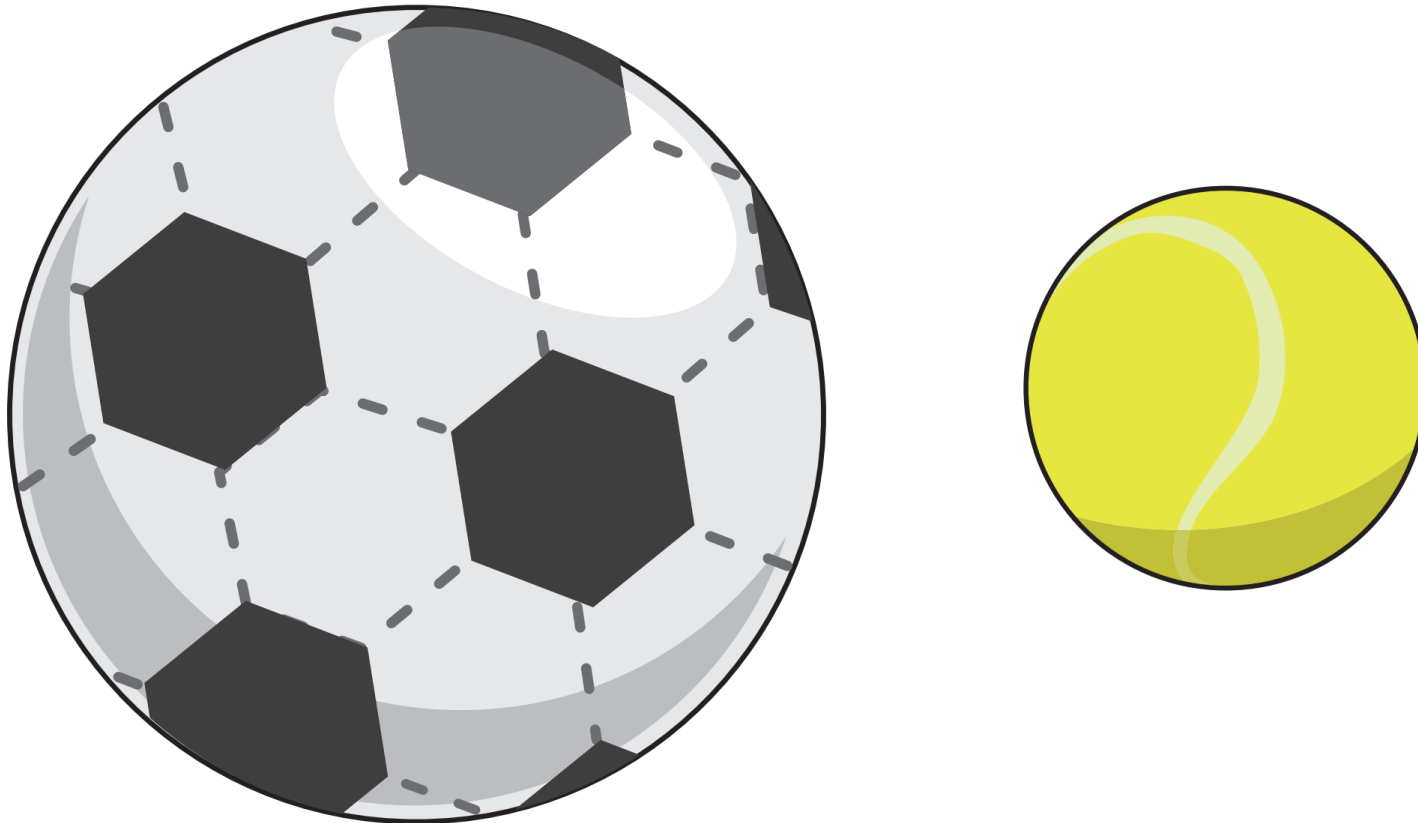
STIMULUS Picture to prompt discussion
The picture of two different balls is intended to spark discussion about similarities and differences.

WAYS OF WORKING Whole class or in pairs
Encourage children to describe the physical characteristics of the football and the tennis ball and compare them in terms of what is the same and what is different. Prompt children to think about size, shape and colour.

IN FOCUS The focus is on practising the language of description and observing the properties of an object, using these observations to describe the similarities and differences between objects. This is an important foundation for being able to accurately sort a set of objects into groups.

ASK

• What is the same about these two objects?
• What is different about these two objects?
  What else is different about these two objects?

GET ACTIVE Ask children to find an interesting object in the classroom to share with a partner. Encourage children to describe what is the same and what is different about their objects. Encourage them to describe the shape, colour, pattern or size. Ask: *Are there any other similarities or differences?* Ask pairs of children to describe to the class what is the same and what is different about their two objects. Ask: *Who else has an object the same as X's? How is it the same? How is it different?* Children may struggle to notice that two very different objects can be 'the same' by virtue of their colour, shape or size. If appropriate, continue with identifying pairs of objects that have something the same and something different about them (large and yellow, small and yellow; used for art or one white, one red).

Tuesday – Discover & Share

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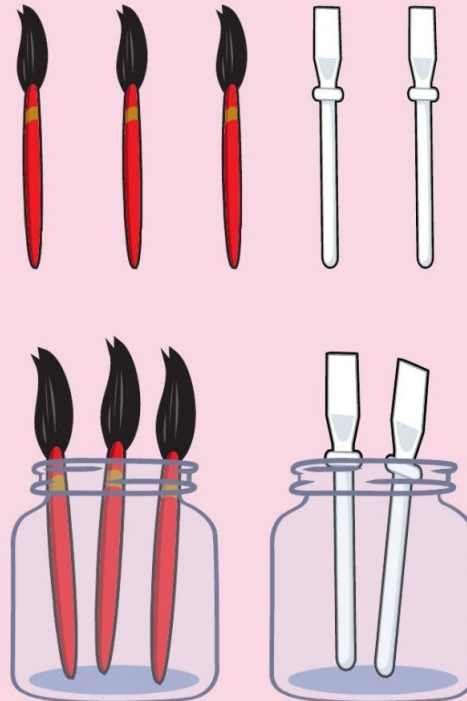
Wednesday – Think Together

Thursday – Challenge

Friday – Practical Activities

Learning focus

Sorting collections of objects

Practical activities

WAYS OF WORKING Whole class at start, then in pairs

IN FOCUS The focus of the activity is to give children confidence in sorting groups by asking them to collect their own group of objects (up to 5 objects in total) and then use the skills of description they have developed and practised in this unit to sort their objects.

GET ACTIVE Sorting collections

If possible, use the outside area to give children access to a variety of objects from nature that they can choose from to form their own 'collections'. Ask children to make a collection of 5 natural objects, such as leaves, stones, petals, shells. Working with a partner, can they sort their collections into two groups? Discussion is vital here: how have they sorted, why did they choose to sort their collections that way, is there a different way to sort their collections?

If children need a starting point, prompt them to look at the colour, pattern, shape and size of their objects. Give lots of positive feedback as they sort and then encourage one pair of children to share how they have sorted their collection with another pair of children. To finish off, move children inside and ask them to record how they have sorted their collections by drawing them in their groups.
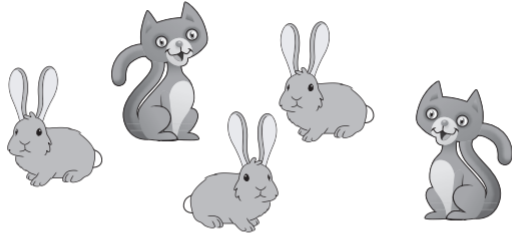
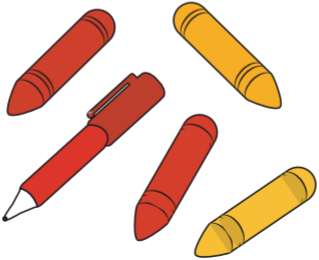# What does Power Maths look like in Reception class?

Throughout Week
Journal – Independent Work

Power Maths Overview

Autumn term

Strand	Unit		Week	Weekly title	Early Learning Goal 2020
Number – number and place value	Unit 1	Numbers to 5	1	Counting to 1, 2 and 3	Have a deep understanding of number to 10, including the composition of each number. Recognise the pattern of the counting system.
			2	Counting to 4	
			3	Counting to 5	
Number – addition and subtraction	Unit 2	Sorting	4	Sorting into 2 groups	Compare quantities up to 10 in different context
Number – number and place value	Unit 3	Comparing groups within 5	5	Comparing quantities of identical objects	Compare quantities up to 10 in different context Subitise (recognise quantities without counting) up to 5.
			6	Comparing quantities of non- identical objects	

Strand	Unit		Week	Weekly title	Early Learning Goal 2020
Number – addition and subtraction	Unit 4	Change within 5	7	One more	Have a deep understanding of number to 10, including the composition of each number. Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.
			8	One less	
	Unit 5	Time	9	My day	

Power Maths Overview

Spring term

Strand	Unit		Week	Weekly title	Early Learning Goal 2020
	Unit 6	Number bonds within 5	1	Introducing the part-whole model	Have a deep understanding of number to 10, including the composition of each number. Automatically recall number bonds up to 5.
	Unit 7	Numbers to 10	2	Counting to 6, 7 and 8	Have a deep understanding of number to 10, including the composition of each number. Subitise (recognise quantities without counting) up to 5. Verbally count, recognising the pattern of the counting system.
			3	Counting to 9 and 10	
	Unit 8	Comparing numbers within 10	4	Comparing groups up to 10	Have a deep understanding of number to 10, including the composition of each number. Subitise (recognise quantities without counting) up to 5.

Strand	Unit		Week	Weekly title	Early Learning Goal 2020
					Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.
	Unit 9	Addition to 10	5	Combining two groups to find the whole	Have a deep understanding of number to 10, including the composition of each number. Subitise (recognise quantities without counting) up to 5. Automatically recall numbers bonds up to 5 and some number bonds to 10, including double facts. Compare different contexts, recognising when one quantity is greater than, less than or the same as the other quantity quantities up to 10 in.

Power Maths Overview

Strand	Unit		Week	Weekly title	Early Learning Goal 2020
					Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.
	Unit 10	Number bonds to 10	6	Using a ten frame	Have a deep understanding of number to 10, including the composition of each number.

Subitise (recognise quantities without counting) up to 5.

Automatically recall number bonds up to 5 and some number bonds to 10, including double facts. |
			7	The part-whole model to 10	
	Unit 11	Shape and space	8	Spatial awareness	
			9	3D shapes	
			10	2D shapes	

Power Maths Overview

Summer term

Strand	Unit		Week	Weekly title	Early Learning Goal 2020
	Unit 12	Exploring patterns	1	Making simple patterns	
			2	Exploring more complex patterns	
	Unit 13	Counting on and back	3	Add by counting on	Have a deep understanding of number to 10, including the composition of each number. Verbally count, recognising the pattern of the counting system.
			4	Taking away by counting back	
	Unit 14	Numbers to 20	5	Counting to 20	Verbally count beyond 20, recognising the pattern of the counting system.
	Unit 15	Numerical patterns	6	Doubling	Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.
			7	Halving and sharing	
			8	Odds and evens	
	Unit 16	Measure	9	Length, height and distance	
			10	Weight	
			11	Volume and capacity	

Power Maths across the school

Discover | Share | Think together | CHALLENGE

Thank you!

Any questions?