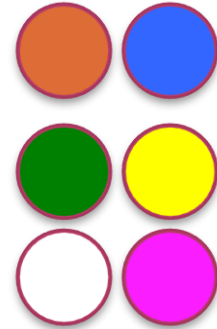


Maths Workshop

Wednesday 29th March



On a scale of one to ten, how much do you honestly enjoy mathematics?



I can do this!
I'm ready to try something new.

www.tpet.co.uk

I'm getting there.
I need a bit of help.
I'm a bit unsure.
I might need to practise.

www.tpet.co.uk

I need help!
I don't understand this.
I'm not ready to move on yet.

www.tpet.co.uk

National Curriculum aims for children

To become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.

To reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.

To solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

At St Anthony's, we want our children



- to be an active participant in their own learning
- to be confident and numerate
- to be fluent in their maths
- to be able to reason about their learning using the correct mathematical vocabulary
- to be able to apply their skills and knowledge as they progress, through sustainable learning
- *to develop an appreciation that maths is a key skill that equips them for life*
- to not feel anxious and enjoy maths!



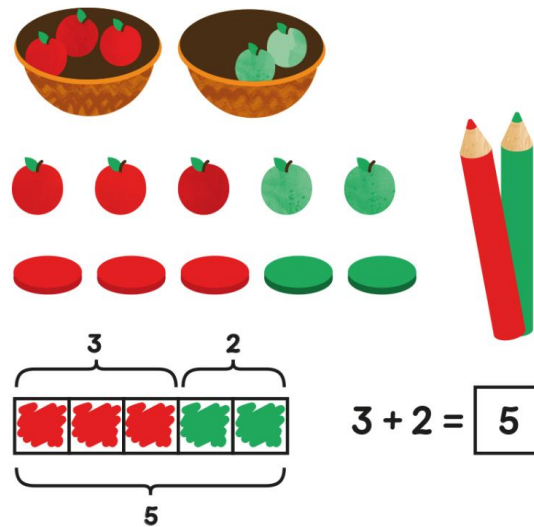


Resources can be powerful tools to support mathematical thinking and reasoning skills.

They help our children to be able to engage practically with new learning and to support their ability to visualise new concepts and knowledge.

At St Anthony's, we apply a CPA approach to maths learning which embeds the importance of using physical, concrete resources to support learning opportunities.

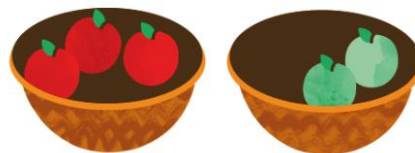
The use of visual images and concrete resources are crucial to the conceptual understanding of mathematics.



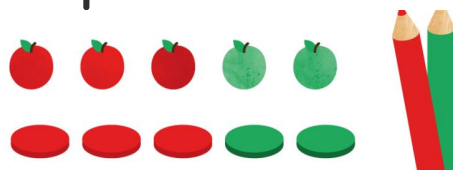
The Concrete, Pictorial, Abstract approach (CPA) is a highly effective approach that develops a deep and sustainable understanding of maths.

It is an essential technique within the teaching of maths for mastery.

Children (and adults!) can find maths difficult because it is abstract. The CPA approach builds on children's existing knowledge by introducing abstract concepts in a concrete and tangible way. It involves moving from concrete materials,



to pictorial representations,



to abstract symbols and problems.

A diagram showing a row of five squares. The first three are red and the last two are green. Brackets above the red squares are labeled '3' and above the green squares are labeled '2'. A bracket below all five squares is labeled '5'. To the right of this is the equation $3 + 2 = \boxed{5}$.



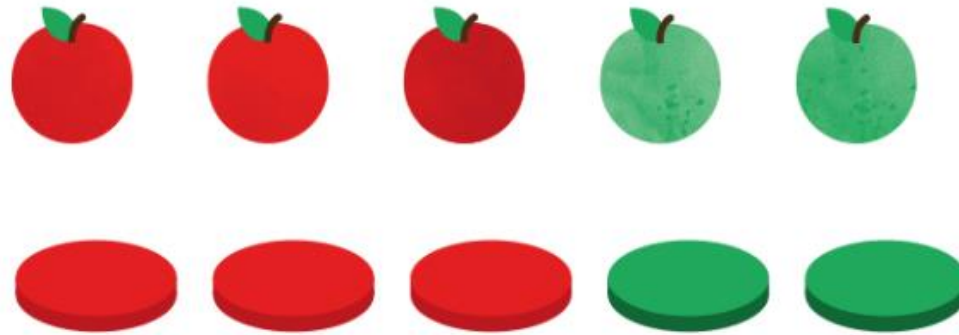
Concrete step of CPA

Concrete is the “doing” stage.

During this stage, students use concrete objects to model problems.

It allows children to experience and handle physical (concrete) objects.

With the CPA framework, every abstract concept is first introduced using physical, interactive and concrete materials/resources.



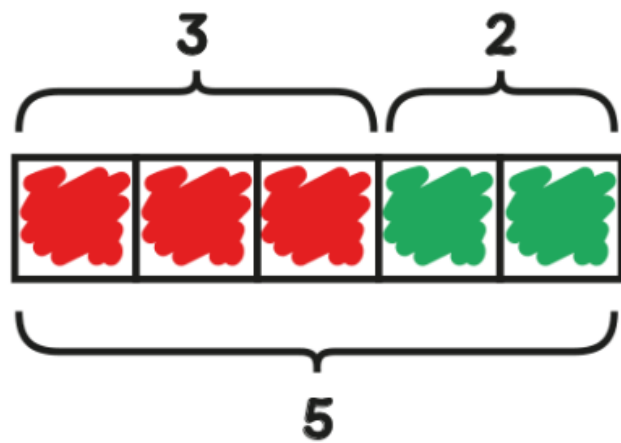
Pictorial step of CPA

Pictorial is the "seeing" stage.

Here, visual representations of concrete objects are used to model problems.

This stage encourages children to make a mental connection between the physical, concrete object and the abstract pictures, diagrams or models.

This makes it easier for children to visualise and grasp difficult abstract concepts (for example, fractions).

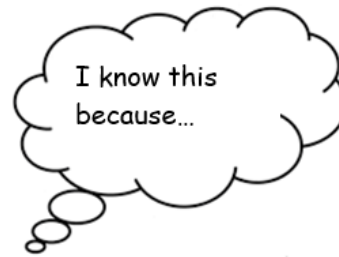


$$3 + 2 = \boxed{5}$$

Abstract step of CPA

Abstract is the "symbolic" stage, where children use abstract symbols to model problems.

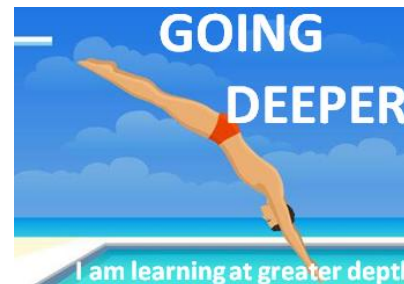
Children are introduced to the concept at a symbolic level, using only numbers, notation, and mathematical symbols (for example, +, -, x, /) to indicate addition, subtraction, multiplication or division.



It is also crucial that children can explain their thinking using the appropriate vocabulary. This not only embeds their own learning but supports the learning of others through hearing quality explanations.

Describing	Simply tells what they did
Explaining	Offers some reasons for what they did (may or may not be correct)
Convincing	Confident that their chain for reasoning is right (inductive reasoning)
Justifying	A correct logical argument that has a complete chain of reasoning
Proving	A watertight argument that is mathematically sound (deductive reasoning)

'By giving our students practice in talking with others, we give them frames for thinking on their own.'



Vygotsky, L. (1978)

Calculation Policy

Our calculation policy is in line with the programmes of study taken from the National Curriculum for Mathematics.

It is designed to be challenging, focussing on essential core subject knowledge and skills. This document guides you through the **appropriate calculation methods within each year group** and the **progression of skills throughout the school**.

The content of this document is set out in year group blocks under the following headings: **addition, subtraction, multiplication and division**.

What does Maths look like in EYFS?



Mathematics

Number

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

Numerical Patterns

- Verbally count beyond 20, recognising the pattern of the counting 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.



- Learning through play.
- Outdoor activities.
- Counting, counting and more counting!
- Pattern spotting.
- Number recognition and ordering to 10.
- Learning number bonds up to 10.
- Shape recognition, 2D and 3D.
- Addition and subtraction using single digit numbers.

What does Maths look like in Year 1?

Year 1 Addition

Addition in Year 1 includes:

- reading, writing and interpreting mathematical statements involving addition (+) and equals (=) signs
- represent and use number bonds within 20
- adding one-digit and two-digit numbers to 20, including zero
- solve one-step addition problems using concrete objects and pictorial representations, and missing number problems.

What does Maths look like in Year 1?

Year 1 Subtraction

Subtraction in Year 1 includes:

- reading, writing and interpreting mathematical statements involving subtraction (-) and equals (=) signs
- represent and use number bonds and related subtraction facts within 20
- subtracting one-digit and two-digit numbers to 20, including zero
- solve one-step subtraction problems using concrete objects and pictorial representations, and missing number problems.

What does Maths look like in Year 2?

Year 2 Addition

Addition in Year 2 includes:

- solving addition problems:
 - using concrete objects and pictorial representations, including those involving numbers, quantities and measures
 - applying increased knowledge of mental and written methods
- recalling and using addition facts to 20 fluently, and derive and use related facts up to 100
- adding numbers using concrete objects, pictorial representations, and mentally, including:
 - a two-digit number and ones
 - a two-digit number and tens
 - two two-digit numbers
 - adding three one-digit numbers
- showing that addition of two numbers can be done in any order (commutative)
- recognising and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.

What does Maths look like in Year 2?

Year 2 Subtraction

Subtraction in Year 2 includes:

- solving subtraction problems:
 - using concrete objects and pictorial representations, including those involving numbers, quantities and measures
 - applying their increasing knowledge of mental and written methods
- recall and use subtraction facts to 20 fluently, and derive and use related facts up to 100
- subtract numbers using concrete objects, pictorial representations, and mentally, including:
 - a two-digit number and ones
 - a two-digit number and tens
 - two two-digit numbers
- show that subtraction of one number from another cannot be done in any order.
- recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.

What does Maths look like in Year 3?

Year 3 Addition

Addition in Year 3 includes:

- adding numbers mentally, including:
 - a three-digit number and ones
 - a three-digit number and tens
 - a three-digit number and hundreds
- adding numbers with up to three digits, using formal written methods of columnar addition
- estimate the answer to a calculation and use inverse operations to check answers
- solving problems, including missing number problems, using number facts, place value, and more complex addition.

What does Maths look like in Year 3?

Year 3 Subtraction

Subtraction in Year 3 includes:

- subtracting numbers mentally, including:
 - a three-digit number and ones
 - a three-digit number and tens
 - a three-digit number and hundreds
- subtracting numbers with up to three digits, using formal written methods of columnar subtraction
- estimate the answer to a calculation and use inverse operations to check answers
- solving problems, including missing number problems, using number facts, place value, and more complex subtraction

What does Maths look like in Year 4?

Year 4 Addition

Addition in Year 4 includes:

- adding numbers with up to 4 digits using the formal written methods of columnar addition where appropriate. The pupils progress from the expanded method, where they make links with place value to the compact method, where they rename and regroup where necessary.
- estimating and using inverse operations to check answers to a calculation.
- solving addition and subtraction two-step problems in context, deciding which operations and methods to use and why.

What does Maths look like in Year 4?

Year 4 Subtraction

Subtraction in Year 4 includes:

- subtracting numbers with up to 4 digits using the formal written method of columnar subtraction where appropriate. The pupils make links with place value, and rename and regroup where necessary.
- estimating and using inverse operations to check answers to a calculation
- solving addition and subtraction two-step problems in context, deciding which operations and methods to use and why.

What does Maths look like in Year 5/6?

Year 5 and 6 Addition

Addition in Years 5 and 6 includes:

- adding whole and decimal numbers with more than 4 digits, including using formal written (columnar) methods.
- adding numbers mentally with increasingly large numbers
- using rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
- solving multi-step problems in context, deciding which operations and methods to use and why.
- performing mental calculations with mixed operations and large numbers where they use their knowledge of the order of operations to carry out calculations involving the four operations (Year 6)
- estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy (Year 6)

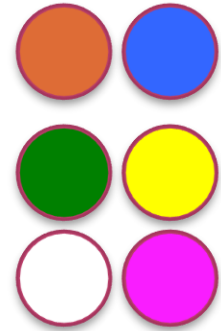
What does Maths look like in Year 5/6?

Year 5 and 6 Subtraction

Subtraction in Years 5 and 6 includes:

- subtracting whole and decimal numbers with more than 4 digits, including using formal written (columnar) methods.
- subtracting numbers mentally with increasingly large numbers
- using rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
- solving multi-step problems in context, deciding which operations and methods to use and why.
- performing mental calculations with mixed operations and large numbers where they use their knowledge of the order of operations to carry out calculations involving the four operations (Year 6)
- estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy (Year 6)

Activities



How can you help your child with Maths at home?

- Take away their fear. Maths is fun!
- Reassure and praise whenever possible.
- Let them see you using Maths in your everyday routines - portioning meals between the family, chopping vegetables into halves and quarters etc.
- Play with numbers and shapes through games.
- Seeing mistakes as an opportunity to learn and using them as a discussion point.
- Recognising the **importance** and value of maths in our everyday lives e.g. managing money and telling the time.

Alternatives to maths resources

Counters



or you could use...

Smarties



3D shapes



or you could use...

groceries



Counting Bears



or you could use...

anything you have a lot of!



You can use anything you have...

Cards for number
recognition and counting



Pasta for counting



Toys to put in size order



Magnetic numbers for
number recognition

Don't Forget Outside!



Websites to support children's Maths skills

- [BBC Bitesize](#) - lots of information alongside short videos help to make the learning enjoyable and accessible for all children.
- [CBeebies](#) have lots of fun and interactive games and activities to help our younger children to get excited about Maths.
- [I See Maths](#) - a useful site with a plethora of ideas for fun games for all the family.
- [Hit the Button](#) - children love this game as it helps to increase confidence through practising times tables and number bonds.

Thank you for coming

Any questions?



[Maths No Problem for parents](#)