

*Learn with
us workshop*

*Maths in Year 3 at
Harborne Primary School*



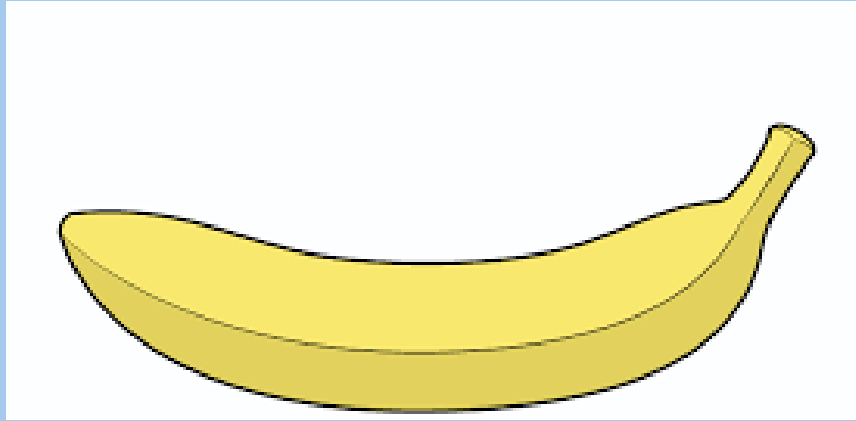
Year 3 Maths at HPS

We didn't do it like that when I was at school!

What is the CPA approach and why do we use it?



Concrete

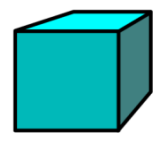


Pictorial

Banana

Abstract

What is the CPA approach and why do we use it?



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1. Concrete

- **What it is:** use physical, tangible objects to represent and manipulate mathematical concepts.
- **Example:** children may physically share objects

2. Pictorial

- **What it is:** Students move to visual representations, such as drawings, diagrams, or number lines.
- **Example:** Instead of using counters, the child would draw dots in a circle to show the objects

3. Abstract

What it is: Students use symbols, numbers, and equations to solve problems without the need for objects or pictures.

Example: At this stage, the child would use the division symbol to write and solve the calculation $8 \div 4 = 2$.

Ready to progress – what does that look like for your child?

Ready to progress statements are unique to each year group.

Year 2 conceptual prerequisite	Year 3 ready-to-progress criteria	Future applications
<p>Know that 10 ones are equivalent to 1 ten, and that 40 (for example) can be composed from 40 ones or 4 tens.</p> <p>Know how many tens there are in multiples of 10 up to 100.</p>	<p>3NPV-1 Know that 10 tens are equivalent to 1 hundred, and that 100 is 10 times the size of 10; apply this to identify and work out how many 10s there are in other three-digit multiples of 10.</p>	<p>Solve multiplication problems that involve a scaling structure, such as 'ten times as long'.</p>
<p>Recognise the place value of each digit in two-digit numbers, and compose and decompose two-digit numbers using standard and non-standard partitioning.</p>	<p>3NPV-2 Recognise the place value of each digit in three-digit numbers, and compose and decompose three-digit numbers using standard and non-standard partitioning.</p>	<p>Compare and order numbers.</p> <p>Add and subtract using mental and formal written methods.</p>
<p>Reason about the location of any two-digit number in the linear number system, including identifying the previous and next multiple of 10.</p>	<p>3NPV-3 Reason about the location of any three-digit number in the linear number system, including identifying the previous and next multiple of 100 and 10.</p>	<p>Compare and order numbers.</p> <p>Estimate and approximate to the nearest multiple of 1,000, 100 or 10.</p>
<p>Count in multiples of 2, 5 and 10.</p>	<p>3NPV-4 Divide 100 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 100 with 2, 4, 5 and 10 equal parts.</p>	<p>Read scales on graphs and measuring instruments.</p>

Year 2 conceptual prerequisite	Year 3 ready-to-progress criteria	Future applications
<p>Add and subtract across 10, for example: $8 + 5 = 13$ $13 - 5 = 8$</p>	<p>3NF-1 Secure fluency in addition and subtraction facts that bridge 10, through continued practice.</p>	<p>Add and subtract mentally where digits sum to more than 10, for example: $26 + 37 = 63$</p> <p>Add and subtract across other powers of 10, without written methods, for example: $1.3 - 0.4 = 0.9$</p> <p>Add within a column during columnar addition when the column sums to more than 10 (regrouping), for example, for: $126 + 148$</p> <p>Subtract within a column during columnar subtraction when the minuend of the column is smaller than the subtrahend (exchanging), for example, for: $453 - 124$</p>
<p>Calculate products within the 2, 5 and 10 multiplication tables.</p>	<p>3NF-2 Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number.</p>	<p>Use multiplication facts during application of formal written layout.</p> <p>Use division facts during short division and long division.</p>
<p>Automatically recall addition and subtraction facts within 10, and across 10.</p> <p>Unite in tens: understand that 10 can be thought of as a single unit of 1 ten.</p>	<p>3NF-3 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10), for example: $80 + 60 = 140$ $140 - 60 = 80$ $30 \times 4 = 120$ $120 \div 4 = 30$</p>	<p>Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 100), for example: $8 + 6 = 14$ and $14 - 6 = 8$ so $800 + 600 = 1,400$ $1,400 - 600 = 800$</p> <p>$3 \times 4 = 12$ and $12 \div 4 = 3$ so $300 \times 4 = 1,200$ $1,200 \div 4 = 300$</p>

Ready to progress – what does that look like for your child?

Ready to progress statements are unique to each year group.

Year 2 conceptual prerequisite	Year 3 ready-to-progress criteria	Future applications
Automatically recall number bonds to 9 and to 10. Know that 10 ones are equivalent to 1 ten, and 10 tens are equivalent to 1 hundred.	3AS-1 Calculate complements to 100, for example: $46 + ? = 100$	Calculate complements to other numbers, particularly powers of 10. Calculate how much change is due when paying for an item.
Automatically recall addition and subtraction facts within 10 and across 10. Recognise the place value of each digit in two- and three-digit numbers. Know that 10 ones are equivalent to 1 ten, and 10 tens are equivalent to 1 hundred.	3AS-2 Add and subtract up to three-digit numbers using columnar methods.	Add and subtract other numbers, including four-digits and above, and decimals, using columnar methods.
Have experience with the commutative property of addition, for example, have recognised that $3 + 2$ and $2 + 3$ have the same sum. Be able to write an equation in different ways, for example, $2 + 3 = 5$ and $5 = 2 + 3$ Write equations to represent addition and subtraction contexts.	3AS-3 Manipulate the additive relationship: Understand the inverse relationship between addition and subtraction, and how both relate to the part-part-whole structure. Understand and use the commutative property of addition, and understand the related property for subtraction.	All future additive reasoning.
Recognise repeated addition contexts and represent them with multiplication equations. Relate grouping problems where the number of groups is unknown to multiplication equations with a missing factor, and to division equations (quotitive division).	3MD-1 Apply known multiplication and division facts to solve contextual problems with different structures, including quotitive and partitive division.	

Year 2 conceptual prerequisite	Year 3 ready-to-progress criteria	Future applications
	3F-1 Interpret and write proper fractions to represent 1 or several parts of a whole that is divided into equal parts.	Use unit fractions as the basis to understand non-unit fractions, improper fractions and mixed numbers, for example: $\frac{2}{5}$ is 2 one-fifths $\frac{6}{5}$ is 6 one-fifths, so $\frac{6}{5} = 1\frac{1}{5}$
	3F-2 Find unit fractions of quantities using known division facts (multiplication tables fluency).	Apply knowledge of unit fractions to non-unit fractions.
Reason about the location of whole numbers in the linear number system.	3F-3 Reason about the location of any fraction within 1 in the linear number system.	Compare and order fractions.
Automatically recall addition and subtraction facts within 10. Unite in tens: understand that 10 can be thought of as a single unit of 1 ten, and that these units can be added and subtracted.	3F-4 Add and subtract fractions with the same denominator, within 1.	Add and subtract improper and mixed fractions with the same denominator, including bridging whole numbers.
Recognise standard and non-standard examples of 2D shapes presented in different orientations. Identify similar shapes.	3G-1 Recognise right angles as a property of shape or a description of a turn, and identify right angles in 2D shapes presented in different orientations.	Compare angles. Estimate and measure angles in degrees.
Compose 2D shapes from smaller shapes to match an exemplar, rotating and turning over shapes to place them in specific orientations.	3G-2 Draw polygons by joining marked points, and identify parallel and perpendicular sides.	Find the area or volume of a compound shape by decomposing into constituent shapes. Find the perimeter of regular and irregular polygons.

What are the key aspects of maths for my child?

- **Number and Place Value (NPV)** – deepen the understanding of the relationship between digits in a number, rationalising that as we move to the left or right, the value of a digit becomes ten times bigger or smaller. Using knowledge of 2,4,5 and 10 to split 100s into these size groups or divisions
- **Number Fluency (NF)** – increase fluency with addition and subtraction by repeating these skills within and across ten. Beginning to apply knowledge of 2, 4, 5, 8 and 10 to associate known multiplication facts
- **Addition and Subtraction (AS)** – adding and subtracting beginning to use column methods – then using knowledge of the ‘inverse’ to relate this information and check it
- **Multiplication and division (MD)** - apply known multiplication and division facts (as above NF) into problem solving context
- **Fractions** – familiarise themselves with numbers smaller than 1 using fractions and apply this to finding unit fractions of amounts
- **Geometry (G)**– recognise technical aspects of 2D shapes, including right angles and numbers of turns within shapes. Also, create polygons using parallel and perpendicular lines.

New learning
area in year
3

What does work look like in your child's year group?

✓/LO= Subtract 2 numbers across

10.05

I $\begin{array}{r} 725 \\ -341 \\ \hline 384 \end{array}$ 8. $\begin{array}{r} 200 \\ -341 \\ \hline 159 \end{array}$

$\begin{array}{r} 51 \\ -252 \\ \hline 279 \end{array}$ ✓

$\begin{array}{r} 50 \\ -284 \\ \hline 466 \end{array}$ ✓

6.

In the ones column, we have the calculation $4 - 6$. There are not enough ones, so we need to take 1 ten and exchange it for 10 ones. Therefore, 70 becomes 60 and 4 becomes 14.

Now we can calculate $14 - 6 = 8$. There are 6 tens (60) remaining so we need to calculate $60 - 30 = 30$.

Finally, we can calculate $500 - 100 = 400$. Therefore, $574 - 136 = 438$.

a) $\begin{array}{r} 651 \\ -428 \\ \hline 223 \end{array}$ ✓ b) $\begin{array}{r} 715 \\ -109 \\ \hline 615 \end{array}$ ✓ c) $\begin{array}{r} 818 \\ -873 \\ \hline 45 \end{array}$ ✓

3AS-2



3AS-2

Hundreds	Tens	Ones

H	T	O
2	8	1
+	4	3
<hr/>		
7	1	7
✓		

3AS-3

$\begin{array}{r} 680 \\ -526 \\ \hline 154 \end{array}$ ✓ ✓ ✓

$\begin{array}{r} 726 \\ -419 \\ \hline 307 \end{array}$ ✓ ✓ ✓

Superb!

$\begin{array}{r} 453 \\ -218 \\ \hline 235 \end{array}$

Tom works out $453 - 218$

What mistake has Tom made?

Ribbon A is 262 cm long. A

Ribbon B is 129 cm long. B

What is the difference in length between the two ribbons?

Can you see how your child's teacher has used the CPA approach?

Statutory assessments

- *Although there are no Y3 statutory assessments, we start practising and embedding times tables for fluency in maths*
- *In year 4, children will take the Multiplication Tables Check – a presentation for this will be held for the parents in the Autumn term next year*

How can I help my child at home?



- Times Table Rockstar – a programme for developing times table fluency bond fluency
- PurpleMash homework
- Both of these logins can be found in your child's reading diary – please alert your child's class teacher if they are not in there



- Apply any of the games or strategies learnt here today
- Make maths fun – include children in practical activities i.e. cooking, measuring, telling the time
- Intentionally use mathematical vocabulary
- Consolidation of adding and subtracting - 1digit an 1 digit - 2 digit and 1 digit

