# Year 2

# Maths Curriculum

KNOW IT!

TEACH IT!

APPLY IT!

JAMES COOK
LEARNING TRUST

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# KNOW IT

## YEAR 2

### PLACE VALUE

- Count in steps of 2, 3 and 5 from 0 and in 10s from any number forwards and backwards.
- Count in multiples of 2, 5 and 10.
- Know the value of each digit in 2-digit numbers.
- Find 10 more or 10 less from any given number.
- Begin to recognise place value in numbers beyond 20.
- Know the signs >, < and =.
- Know the language of equal to, more than, less than, fewer, most and least.

### CALCULATIONS

- Recall number bonds within and to 20 fluently.
- Know number bonds within and to 20.
- Know 2, 5 and 10 times tables.
- Know division facts for 2, 5 & 10 times tables.
- Know doubles and halves to 20.
- Know doubles and halves to 10.

### FRACTIONS

- $\frac{2}{4}$ = one half
- Recognise $\frac{3}{4}$ and $\frac{1}{3}$
- Recognise $\frac{1}{2}$ as 2 equal parts.
- Recognise $\frac{1}{4}$ as 4 equal parts.

### MEASURES

- 100 cm = 1 metre
- 100 pence = 1 pound
- 60 minutes = 1 hour
- 24 hours = 1 day
- 7 days = 1 week
- 12 months = 1 year
- cm is used to measure length and height.

### GEOMETRY

- Right angle = quarter turn.
- Know whole $\frac{1}{2}$, $\frac{1}{4}$, and $\frac{3}{4}$ turns.
- Know the direction of clockwise and anticlockwise.
- Identify quadrilaterals and the polygons pentagon, hexagon and octagon.
- Identify prisms and cones.
- Identify cuboids, cubes, pyramids and spheres.

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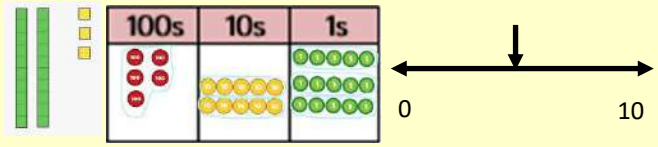
# TEACH IT: NUMBER & PLACE VALUE

# YEAR 2

## KEY OBJECTIVES

- Count in steps of 2,3 and 5 from 0 and in 10s from any number forwards and backwards.
- Count to and across 100 forwards and backwards beginning with 0 or 1 or from any given number.
- Count in multiples of twos, fives and tens.
- Given a number, identify one more and one less.
- Recognise the place value of each digit in a two-digit number (10s and 1s).
- Count, read and write numbers to 100 in numerals.
- Compare and order numbers from 0 up to 100 using >, < and = signs.
- Use the language of equal to, more than, less than, most and least.
- Read and write numbers to at least 100 in numerals and words.
- Read and write numbers from 1 to 20 in numerals and words.
- Identify, represent and estimate numbers using different representations, including the number line.

Dienes | Place Value Counters | Estimate




- Identify and represent numbers using objects and pictorial representations, including the number line.

## POSSIBLE TEACHING SEQUENCE

**Count in steps of 2, 3 and 5 from 0...**

⇒ Count forwards to 100 in 1s.
⇒ Count back from 100 in 1s.
⇒ Count in steps of 2, 5 and 10 from 0.
⇒ Count in steps of 10 from any number.
⇒ Count in steps of 3 using concrete and pictorial representations.
⇒ Count forwards and backwards in steps of 3.

**Recognise the place value of each digit...**

⇒ Read numbers to 100.
⇒ Partition 2-digit numbers using concrete representations into 10s and 1s.
⇒ Partition 2-digit numbers using pictorial representations into 10s and 1s (part-whole models and place value charts).

**Compare and order numbers from 0 up to 100 using...**

⇒ Use the language of greater than, less than, equal to, smallest and greatest.
⇒ Know signs >, < and =.
⇒ Use signs to compare two sets of concrete materials.
⇒ Use signs to compare two pictorial representations.
⇒ Use signs to compare two numbers.
⇒ Order objects from smallest to greatest and vice-versa.
⇒ Order numbers from smallest to greatest and vice-versa.

**Identify, represent and estimate numbers using different representations...**

⇒ Count objects to 100.
⇒ Represent numbers to 100 using a range of concrete materials.
⇒ Represent numbers to 100 using images.
⇒ Represent numbers to 100 using numerals and words.

## STEM SENTENCES

- 'There are ten ones in a ten.'
- 'There are one hundred ones in a hundred.'
- 'There are ten tens in a hundred.'
- '98 is 98 ones.'
- '98 is 9 tens and 8 ones.'
- 'Zero is the digit 0, which stands for no amount.'
- 'The widest part of the < and > sign always points to the larger number.'

## VOCABULARY

- **Represent**
- **Representation**
- **Value**
- **Sequence**
- **Identify**
- **Estimate/Approximate**
- **Compare**
- **Order**
- **Sign**
- **Smallest**
- **Greatest**
- **Forwards**
- **Backwards**

## COMMON MISCONCEPTIONS

- Not knowing to use 0 as a place holder when a column is empty.
- Knowing which of the signs < , > means greater than and which less than.
- Not knowing the value of a digit e.g. ' 7 in 78 is worth 7.' instead of '7 in 79 is worth 70'.
- Thinking that numbers ending in 3 are multiples of 3.
- Inaccurate counting when crossing 10s boundaries e.g. 72, 71, 70, 79...

## KEY DEFINITIONS

⇒ **Digit** - written numeral from 0-9 that forms part of a number.
⇒ **Partition** - to split or break a number into 2 or more parts.
⇒ **Multiple** - product of one number multiplied by another number.
⇒ **>** means 'greater than' and **<** means 'less than' and **=** means 'equal to'
⇒ **Numeral** - a symbol or a group of symbols you use to show a number.

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# TEACH IT: ADDITION & SUBTRACTION

# YEAR 2

## KEY OBJECTIVES

- Recall and use addition and subtraction facts to 20 fluently and derive and use related facts to 100.
- Represent and use number bonds and related subtraction facts within 20.
- Add and subtract numbers using concrete objects, pictorial representation and mentally including:
  - ⇒ 2 digits and ones;
  - ⇒ 2 digits and tens;
  - ⇒ two, 2-digit numbers;
  - ⇒ three, 1-digit numbers.
- Add and subtract one-digit and two-digit numbers to 20, including zero.
- Show that the addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot.
- Recognise and use the inverse relationship between addition and subtraction and use this to check calculations.
- Use concrete objects and pictorial representations to solve missing number problems e.g.

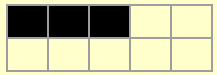
  7 = □ - 9.

## POSSIBLE TEACHING SEQUENCE

**Recall and use addition and subtraction facts…**

⇒ Rapid recall of number bonds to 20.

⇒ Make links between practical calculations where the ones can be used to represent the tens e.g.



100 = 30 + 70.

⇒ Make links between written calculations where the ones can be used to represent tens e.g. 5 + 4 = 9; 50 + 40 = 90 and 8—6 = 2; 80—60 = 20.

**Add and subtract numbers using concrete…**

***a 2-digit number and ones***

⇒ add and subtract ones without bridging 10.

⇒ add and subtract ones with bridging (use a number line to count on in ones from the larger number).

⇒ use number bonds to add and subtract more efficiently when bridging through tens e.g.

17 + 5 = 17 + 3 + 2 and 22 - 7 = 22 - 2 - 5.

***a 2-digit number and tens***

⇒ add and subtract 10 using concrete materials.

⇒ add and subtract 10 using 100 square, recognising how the tens digit changes.

⇒ add and subtract multiples of ten using concrete, then pictorial and then abstract methods.

***two, 2-digit numbers***

⇒ add two 2-digit numbers using concrete materials in a place value chart without and then with an exchange.

⇒ add two, 2-digit numbers using numerals (in columns and number sentences).

⇒ follow the above steps for subtracting two, 2-digit numbers.

⇒ use number bonds when adding three, 1-digit numbers e.g.

3 + 5 + 7 = 3 + 7 + 5.

## STEM SENTENCES

- 'I know that 5 + 4 = 9 so I now that 5 tens + 4 tens = 9 tens so I know that 50 + 40 = 90.'
- 'I know that 8 - 6 = 2 so I know that 8 tens —6 tens = 2 tens so I know that 80 - 60 = 20.'
- 'If the total of the ones column is equal to 10 or more then I must exchange.'
- 'Addition can be done in any order.'
- 'Subtraction cannot be done in any order.'
- 'When adding or subtracting tens, the ones digit remains the same.'

## VOCABULARY

- **Mental**
- **Calculate**
- **Calculation**
- **Add**
- **Addition**
- **Sum**
- **Total**
- **Plus**
- **Altogether**
- **Subtract**
- **Subtraction**
- **Difference**
- **Fewer**
- **Less**
- **More**
- **Greater**
- **Takeaway**
- **Minus**
- **Number bond**

## COMMON MISCONCEPTIONS

- Re-ordering a subtraction statement so you always take away from the greater digit instead of exchanging e.g.

  3 5 5 - 8 becomes 8 - 5.
  - 1 8
- Lining up columns incorrectly especially in terms of 2 digit - 1 digit etc.
- Knowledge of what 46-12 actually means e.g. 4 - 1 is actually 40 - 10.

## KEY DEFINITIONS

⇒ **Efficient** -the quickest way to solve a calculation.

⇒ **Partition** - to split or break a number into 2 or more parts.

⇒ **Column** - an arrangement of objects or numbers in a vertical line, side by side.

⇒ **Row** - an arrangement of objects or numbers in a horizontal line, side by side.

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# TEACH IT: MULTIPLICATION & DIVISION

# YEAR 2

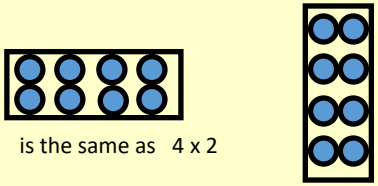
## KEY OBJECTIVES

- Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers.
- Make connections between arrays, number patterns and counting in 2s, 5s and 10s.
- Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (x), division (÷) and equals (=) signs.
- Calculate the answer to multiplication and division sums using concrete objects, pictorial representations and arrays with the support of the teacher.
- Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot.

## POSSIBLE TEACHING SEQUENCE

⇒ Use sets of equal groups of objects for repeated addition.

⇒ Demonstrate commutativity e.g. through use of arrays.



2 x 4 is the same as 4 x 2

⇒ Make links between repeated addition and multiplication through introduction of x sign to represent 'lots of' and 'multiplied by'.

⇒ Use concrete, pictorial and abstract representations to find totals when counting in 2s, then in 5s and then in 10s.

⇒ Know that the ÷ sign means 'divided by'.

⇒ Use concrete or pictorial representations to share and group when dividing by 2.

⇒ Understand that odd numbers cannot be shared/grouped equally when dividing by 2.

⇒ Use concrete or pictorial representations to share and group when dividing by 5.

⇒ Use concrete or pictorial representations to share and group when dividing by 10.

## STEM SENTENCES

- 'The groups are equal because there are the same number of objects in each group.'
- 'The groups are unequal because there are a different number of objects in each group.'
- 'There are 2 + 2 + 2 so we can write this as 2 x 3.'
- 'Factor times factor is equal to product.'

## VOCABULARY

- **Multiplication**
- **Division**
- **Multiply**
- **Divide**
- **Calculate**
- **Mental**
- **Recall**
- **Double**
- **Half**
- **Efficient**
- **Array**
- **Groups of**
- **Lots of**
- **Times**
- **Repeated**
- **Left**
- **Odd**
- **Even**

## COMMON MISCONCEPTIONS

- Writing/saying division statement in the wrong order e.g.

  5 ÷ 45 instead of 45 ÷ 5.
- Not realising that multiplication is commutative e.g.

  Not recognising that 6 x 5 is the same as 5 x 6.

## PATTERNS

<u>2 times tables</u>
- All even;
- Doubling.

<u>5 times tables</u>
- Ends in 0 or 5;
- Half the 10 times table;
- Even multiples of 5 are also multiples of 10.

<u>10 times tables</u>
- Double the 5 times table;
- Always ends in 0;
- Always a multiple of 5.

## KEY DEFINITIONS

⇒ **Factor** - a whole number that divides exactly into another number.

⇒ **Product** - the result when two numbers are multiplied together.

⇒ **Equal** - the same amount.

⇒ **Unequal** - different amounts.

⇒ **Multiple** - the product of one number multiplied by another.

⇒ **Divide** - to share or group a number into equals parts.

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# TEACH IT: FRACTIONS

## YEAR 2

### KEY OBJECTIVES

- Recognise, find, name and write fractions ⅓, ¼, $^{2}/_{4}$ and ¾ of a length, shape, set of objects or quantity.
- Recognise, find and name ½ as one of two equal parts of an object, shape or quantity.
- Recognise find and name ¼ as one of four equal parts of an object, shape or quantity.
- Write simple fractions e.g. ½ of 6 = 3 and recognise the equivalent of $^{2}/_{4}$ = ½.

### POSSIBLE TEACHING SEQUENCE

⇒ Make equal parts by splitting sets of objects and pictorial representations.

⇒ Recognise ½ in different contexts and find ½ of a set of objects or quantity.

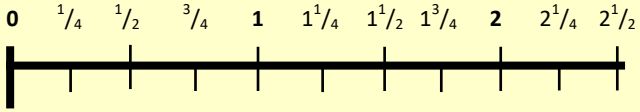
⇒ Find quarters in different contexts.

⇒ Explore equivalence of $^{2}/_{4}$ and ½ practically.

⇒ Find ¾ by splitting quantities into 4 equal groups and then combining 3 of the groups.

⇒ Find ⅓ by splitting quantities into 3 equal groups.

⇒ Use a number line to count in fractions (¼, ½ and ⅓) and know that fractions can add up to more than one whole.




### STEM SENTENCES

- '$^{2}/_{4}$ is the same as ½.'
- 'A part is smaller than the whole.'
- 'The whole has been divided into __ equal parts.'
- 'Halving is the same as dividing by 2.'
- 'A quarter is half of a half.'

### VOCABULARY

- **Part**
- **Equal**
- **Unequal**
- **Whole**
- **Same**
- **Different**
- **Half/Halves**
- **Quarter**
- **Divide**

### COMMON MISCONCEPTIONS

- Equal parts have to look the same (but they do not) e.g.

- Assuming that 3 parts is always thirds (even when they are not equal parts) e.g.

- ¼ is bigger than ⅓ and ½ because the denominator is larger.

### KEY DEFINITIONS

⇒ **Fraction** - an equal part of something.

⇒ **Third** - one of three equal parts.

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# TEACH IT: MEASURE

## YEAR 2

## Key Objectives

- Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (l/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels.
- Measure and begin to record the following: lengths and heights; mass and weight; capacity and volume and time-hours, minutes and seconds.
- Compare and order lengths, mass, volume/capacity and record the results using <, >, or =.
- Compare, describe and solve practical problems for length and heights; mass and weight; capacity and volume and time.
- Recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value.
- Find different combinations of coins that equal the same amounts of money.
- Recognise and know the value of different denominations of coins and notes.
- Compare and sequence intervals of time.
- Sequence events in chronological order using language.
- Recognise and use the language relating to dates, including days of the week, weeks, months and years.
- Tell and write the time to five minutes including quarter past/to the hour and draw the hands on a clock face to show these times.
- Know the number of minutes in an hour and the number of hours in a day.
- Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.

## Possible Teaching Sequence

**Length & Height**

⇒ Measure a variety of objects using a ruler, tape measure or metre stick-practically then reading scales on images.

⇒ Compare the length of 2 objects and order more than 2 lengths.

**Mass & Weight**

⇒ Compare mass of different objects using balance scales.

⇒ Use gram/kilogram weights to measure the mass of objects on a balance scale.

⇒ Weigh objects on standard weighing scales and record mass of objects represented pictorially.

**Volume & Capacity**

⇒ Practically investigate volume and capacity using a variety of containers.

⇒ Explore a variety of cylinders and jugs to measure in ml and l.

⇒ Compare volume and capacity of different containers-move from concrete to visual representations.

**Temperature**

⇒ Use thermometers to measure temperatures at different times and places around school.

⇒ Compare temperatures practically and those represented visually.

**Money**

⇒ Know the value of coins and find the totals of sets of coins-all the same and then different combinations.

⇒ Know the value of notes £5, £10 and £20 and find totals of notes-all the same and then different combinations.

⇒ Find the totals of notes and coins.

⇒ Select coins to make an amount (practically, pictorially and abstract).

⇒ Explore different ways of making the same amount and compare 2 different values of coins and/or notes.

⇒ Add amounts of money and find the difference between two amounts.

⇒ Find the change from given amounts.

**Time**

⇒ Read and write times to the hour and half past.

⇒ Read and draw times 'quarter to' and 'quarter past'.

⇒ Read and show time to 5 minute intervals.

⇒ Convert a time in minutes, to hours and minutes e.g. 68 minutes = 1 hour and 8 minutes.

⇒ Calculate the duration of an event when given the start and end times.

⇒ Compare and order times and durations.

## Stem Sentences

- 'There are 24 hours in 1 day.'
- 'There are 60 minutes in 1 hour.'
- 'Cent means 100; there are 100 cm in 1 metre.'
- 'There are 100p in £1.'
- 'Capacity is the amount a container or object can hold.'
- 'Volume is the amount of space occupied by an object.'

## Vocabulary

- **Half**
- **Quarter**
- **Three quarters**
- **Less**
- **More**
- **Most**
- **Least**
- **Amount**
- **Change**
- **Difference**
- **Measure**
- **Measurement**
- **Length**
- **Height**
- **Temperature**
- **Thermometer**
- **Compare**
- **Order**
- **Longer/est**
- **Shorter/est**
- **Taller/est**
- **Heaviest**
- **Lightest**
- **Hour**
- **Minute**
- **Clock**
- **Seconds**
- **Hands**
- **Past**
- **To**

## Common Misconceptions

- Not knowing that after half past, we start to read time 'to' the next hour; instead children will read 25 to as 35 minutes past etc.
- Always showing the hour hand at the number in the time instead of showing it accurately e.g. at the 2 for 2:30 p.m. instead of ½ way between 2 and 3.
- Thinking that 105 minutes = 1 hour and 5 minutes.
- Measuring objects starting at the end of the ruler instead of 0.
- A larger coin means it's worth more.
- The tallest container has the largest capacity.

## Key Definitions

⇒ **Capacity** – the amount a container or object can hold, (measured in ml/l).

⇒ **Volume** – amount of space occupied by an object (measured in $cm^3$).

⇒ **Scale** – lines on measuring instruments that identify the measurement.

⇒ **Mass** – the amount of matter or substance that makes up an object.

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# TEACH IT: GEOMETRY

# YEAR 2

## KEY OBJECTIVES

- Identify and describe the properties of 2D shapes, including, the number of sides and line symmetry in a vertical line.
- Recognise and name common 2D shapes.
- Identify and describe the properties of 3D shapes, including the number of edges, vertices and faces.
- Recognise and name common 3D shapes.
- Identify 2D shapes on the surface of 3D shapes.
- Compare and sort common 2D and 3D shapes and everyday objects.
- Order and arrange combinations of mathematical objects in patterns and sequences.
- Use mathematical vocabulary to describe position, direction and movement, including in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns-clockwise and anticlockwise.
- Describe position, directions and movements, including whole, half, quarter and three quarter turns.

## POSSIBLE TEACHING SEQUENCE

**Geometry: Shape**

⇒ Revise recognition and naming of 2D and 3D shapes in varying sizes and orientations.

⇒ Describe properties of 2D shapes, including irregular shapes (sides and corners/vertices).

⇒ Create 2D shapes using geoboards.

⇒ Explore vertical lines of symmetry in 2D shapes (folding papers and use of mirrors).

⇒ Sort 2D shapes into different categories.

⇒ Create patterns using 2D shapes including different orientations.

⇒ Recognise a repeated pattern and continue the pattern using concrete materials and pictorially.

⇒ Explore 3D shapes to identify 2D shapes on their surface.

⇒ Identify an edge as the line where two faces meet.

⇒ Identify a vertex as the point where two or more edges meet.

⇒ Sort 3D shapes in different ways.

⇒ Create patterns using 3D objects, including different orientations.

**Geometry: Position and Direction.**

⇒ Practically give and follow directions.

⇒ Write and record routes on grids.

⇒ Practically turn objects using the language: full, half, quarter, three-quarter turns; clockwise and anti-clockwise.

⇒ Describe turns that objects and shapes have made.

⇒ Describe movement and turns to record directions-use PE and Computing also.

## STEM SENTENCES

- 'Half turn means you or the object will face the opposite way.'
- 'If something is symmetrical it can be divided into 2 matching half shapes.'
- '2D shapes have sides and corners/ vertices.'
- '3D shapes have faces, edges and vertices.'
- 'A side is the line between 2 vertices.'
- 'A corner/vertex is the point where 2 sides meet.'
- 'An edge is where 2 faces meet.'
- 'A vertex is where 2 or more edges meet.'
- 'If something moves clockwise it goes around to the right, like the hands of a clock.'
- 'If something moves anticlockwise it goes around to the left.'

## VOCABULARY

- **Pentagon**
- **Hexagon**
- **Octagon**
- **Prism**
- **Side**
- **Corner/vertex**
- **Face**
- **Edge**
- **Vertex/vertices**
- **Property**
- **Sort**
- **Flat**
- **Curved**
- **Straight**
- **Orientation**
- **Forwards**
- **Backwards**
- **Up, down, left, right**
- **Direction**
- **Movement**
- **Turn**
- **Clockwise/anticlockwise**
- **Repeat**
- **Continue**

## COMMON MISCONCEPTIONS

- Thinking that a square is no longer a square if it has been rotated e.g.  .
- Not knowing that irregular six-sided shapes are still hexagons, five-sided shapes are still pentagons etc. For example, knowing that this is a pentagon  but thinking this is not  .
- Only recognising the properties of 3D shapes that can be seen and counted in visual representations i.e. only counting the faces they can see in an image.

## KEY DEFINITIONS

⇒ **Face** - a flat surface within a 3D shape.

⇒ **Edge** - the line where two faces meet.

⇒ **Vertex** - the point where two or more edges meet.

⇒ **Side** - the line between 2 vertices.

⇒ **Line of symmetry** - a line that cuts a shape/pattern in half so that both sides match exactly.

⇒ **Rotate** - to turn something around a given point.

⇒ **Pattern** - a sequence that repeats.

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# TEACH IT: STATISTICS

## YEAR 2

### KEY OBJECTIVES

- Interpret and construct simple pictograms, tally charts, block diagrams and simple tables.
- Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity.
- Ask and answer questions about totalling and comparing categorical data.

### POSSIBLE TEACHING SEQUENCE

**Interpret and construct simple pictograms, tally charts, block diagrams and simple tables.**

⇒ Construct tally charts- linking to the wider curriculum where possible.

⇒ Complete tally charts with missing tallies or totals.

⇒ Interpret tally charts-answering questions.

⇒ Build pictograms using concrete apparatus-both horizontally and vertically.

⇒ Create pictograms, using data from tallies, by drawing own pictures.

⇒ Complete missing columns or rows within a pictogram.

⇒ Interpret and answer questions about data presented in a pictogram, including comparison of categories.

⇒ Draw pictograms where symbols represent 2, 5 or 10 items.

⇒ Build block diagrams using cubes.

⇒ Draw block diagrams using number line knowledge for scale.

⇒ Interpret block diagrams-answering questions.

### STEM SENTENCES

- 'Each symbol represents 2 so half a symbol represents 1.'

### VOCABULARY

- **Total**
- **Altogether**
- **More**
- **Less**
- **Difference**
- **Complete**
- **Construct**
- **Horizontal**
- **Vertical**
- **Block diagram**
- **Column**
- **Row**
- **Represent**
- **Interpret**
- **Symbol**
- **Scale**
- **Key**
- **Tally chart**
- **Table**
- **Axis**
- **Category**
- **Compare**
- **Same**

### COMMON MISCONCEPTIONS

- Ignoring key  = 2 then answering  as 3 instead of 6 or  as ½ instead of 1.
- Interpreting 'How many more…' as an addition or scale reading exercise, instead of as subtraction.

### KEY DEFINITIONS

⇒ **Tally** - a mark used for counting results OR a way of keeping count by drawing marks.

⇒ **Pictogram** -use of pictures or symbols to present information.

⇒ **Block diagram** - a graph using blocks to show quantities or numbers.

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# APPLY IT: PROBLEM-SOLVING & REASONING YEAR 2

**PROBLEM SOLVING AND REASONING SHOULD BE APPLIED THROUGHOUT ALL TEACHING NOT JUST WITHIN ISOLATED LESSONS.**

## PROBLEM-SOLVING AND REASONING.

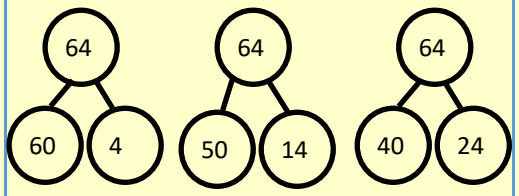
The following strategies are a very powerful way of developing pupils' problem-solving and reasoning skills and can be used flexibly across all strands of maths.

- **Spot the mistake/Which is different?**
- **True or false?**
- **What comes next?**
- **Do, then explain.**
- **Make up an example/Write more statements/Create a question/Another and another.**
- **Possible answers/other possibilities.**
- **Missing numbers/Missing symbols/Missing information.**
- **Working backwards/Use of inverse/Undoing/Unpicking.**
- **Hard and easy questions/Order from easiest to hardest.**
- **What else do you know?/Use a fact.**
- **Fact families.**
- **Convince me/Prove it/Generalising/Explain thinking**
- **Connected calculations.**
- **Make an estimate/Size of an answer.**
- **Always, sometimes, never.**
- **Making links/Application.**
- **Can you find?**
- **Odd one out.**
- **Complete/continue the pattern.**
- **Ordering.**
- **The answer is…**
- **Visualising**
- **Answer free zone.**
- **Justify.**

## PROBLEM-SOLVING AND REASONING EXAMPLES FOR YEAR 2

### Place Value

Complete each part-whole model in a different way.




### Addition & Subtraction

Complete the pattern

15 + 85 = 100

20 + 80 = 100

25 + 75 = 100

30 + __ = 100

__ + __ = 100

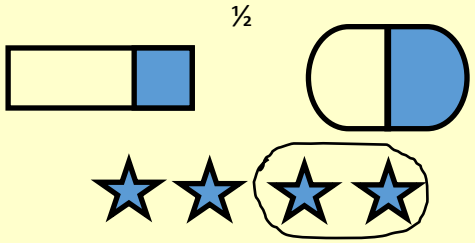
### Multiplication & Division

Is this correct? Why?

5 + 5 + 5 = 5 x 5

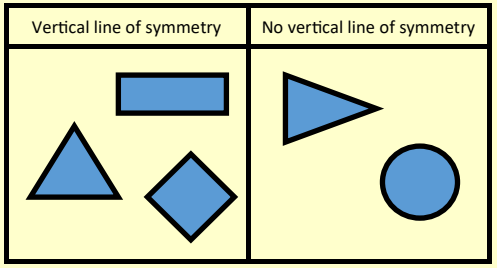
### Fractions

Which is the odd one out?




### Geometry-Shape

Which shape is in the wrong set? Why?




### Geometry-Position & Direction

ALWAYS SOMETIMES NEVER

If two objects turn in different directions they will not be facing the same way.

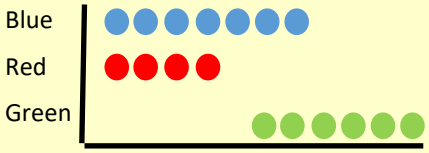
OR

A quarter turn clockwise is the same as a three-quarter turn anti-clockwise.

CONVINCE ME

### Statistics

Here is a pictogram



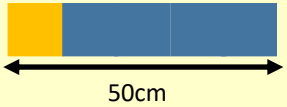

'The most popular colour is green.'

Do you agree? Explain why.

### Measures

Here is a strip of orange paper 

A blue strip is four times longer than the orange strip 

The strip are joined together end to end 


How long is the orange strip?