Bathwick St Mary Progression and Calculation Document—Overview **Year Six**

The following documents are used to provide us with a long term planning structure for teaching an learning over the year. We use the combination alongside our own teacher judgement and remain flexible for several reasons, taking into account:

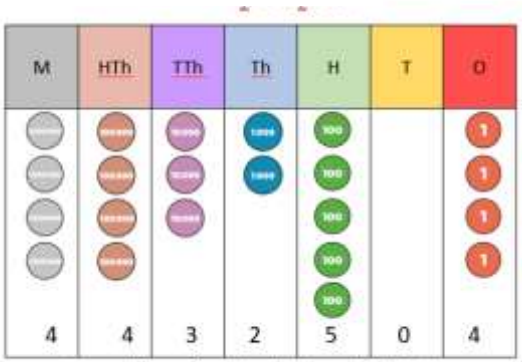
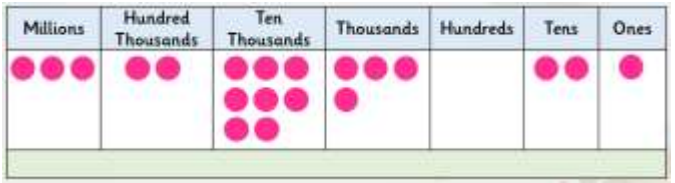
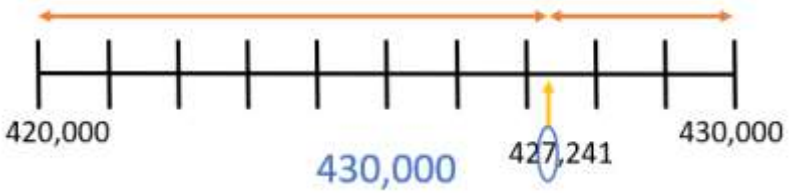
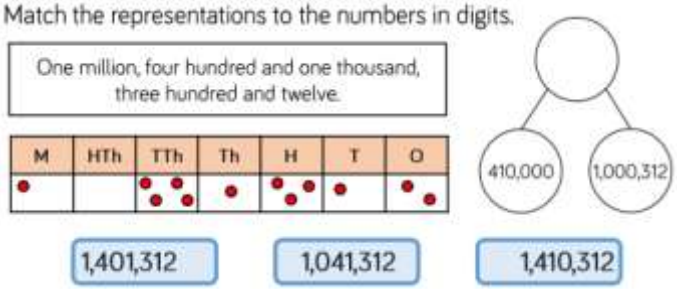
- The pace of the children's understanding in line with our whole class teaching for mastery approach

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number: Place Value		Number: Addition, Subtraction, Multiplication and Division				Fractions				Geometry: Position and Direction	
Spring	Number: Decimals		Number: Percentages		Number: Algebra		Measurement: Converting Units	Measurement: Perimeter, Area and Volume		Number: Ratio		Statistics
Summer	Geometry: Properties of Shapes		SATs week	Consolidation of all areas		Investigations and preparation for KS3 maths.						

Bathwick St Mary Church School — Progression and Calculation Document— Place Value Year Six

NC Learning Objectives:

- Read, write, order and compare numbers up to 10,000,000 and determine the value of each digit.
- Round any whole number to a required degree of accuracy.
- Use negative numbers in context, and calculate intervals across zero.
- Solve number and practical problems that involve all of the above.

Concrete	Pictorial	Abstract
-   Four million, four hundred and thirty two thousand, five hundred and four.	  Round 427,241 to the nearest 10,000 	Match the representations to the numbers in digits.  Complete the missing numbers. 6,305,400 = _____ + 300,000 + _____ + 400 7,001,001 = 7,000,000 + _____ + _____ 42,550 = _____ + _____ + _____ + 50

Key Vocabulary:

Digit	Ones	Thousands	Millions
Value	Tens	Tens of Thousands	Hundreds

STEM Sentences:

Why do we round up when the following digit is 5 or above?
Why is the zero in a number important when representing large numbers?
If one million is the whole, what could the parts be?

Additional Knowledge Covered in this area of Maths:

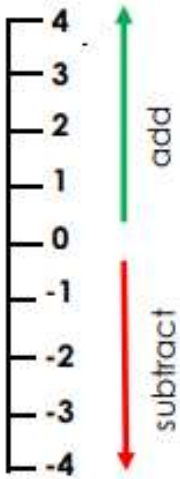
Place in here any additional Knowledge you think appropriate in each element having reviewed the knowledge organiser for your year group for each of the strands of maths.

Negative Numbers

If you count backwards from zero, you reach negative numbers.

Positive numbers are any numbers **more than** zero e.g. 1, 2, 3, 4, 5.

Negative numbers are any numbers **less than** zero e.g. –1, -2, -3, -4, -5.



When we add a positive number to a negative number, we count upwards towards zero.

-2 + 5 = 3

When we subtract a positive number from a negative, we count down away from zero.

-1 – 3 = -4

Ordering Numbers

When we put numbers in order, we need to compare the value of their digits.

2,123,518 **2,123,736** **2,122,845**

First, look at the millions digits in each number. Each number has the same digit in the millions place so you then keep comparing digits of the same place value until you find ones that are different. The thousands digits are different so that tells us that 2,12**2**,845 is the smallest number because it has a 2 in the thousands place. Looking at the hundreds digits, we can see that 2,123,**5**18 is the next smallest.

2,122,845 **2,123,518** **2,123,736**

Smallest

Rounding

When rounding, you first need to identify which digit will tell you whether to round up or down.

- To round a number to the **nearest 10**, you should look at the ones digit.
- To round a number to the **nearest 100**, you should look at the tens digit.
- To round a number to the **nearest 1000**, you should look at the hundreds digit.
- To round a number to the **nearest 10,000**, you should look at the thousands digit.
- To round a number to the **nearest 100,000**, you should look at the ten thousands digit.
- To round a number to the **nearest 1,000,000**, you should look at the hundred thousands digit.

527,356 to the **nearest 10** is 527,360

527,356 to the **nearest 100** is 527,400

527,356 to the **nearest 1000** is 527,000

527,356 to the **nearest 10,000** is 530,000

527,356 to the **nearest 100,000** is 500,000

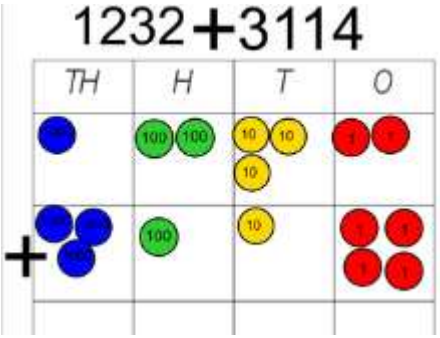
527,356 to the **nearest 1,000,000** is 1,000,000

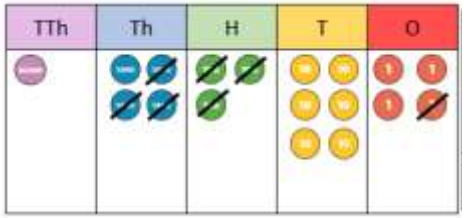
Bathwick St Mary Church School	Progression and Calculation Document— Addition and Subtraction	Year Six

NC Learning Objectives:

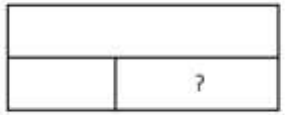
- Solve addition and subtraction multi step problems in contexts, deciding which operations and methods to use and why.
- Perform mental calculations, including with mixed operations and large numbers.
- Use their knowledge of the order of operations to carry out calculations involving the four operations.
- Solve problems involving addition, subtraction, multiplication and division.

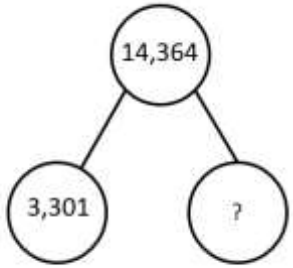
Concrete

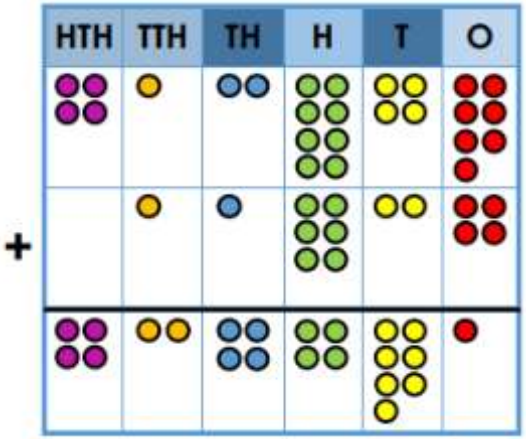




Pictorial







Abstract

	4	1	2	8	4	7
+		1	1	6	2	4
	4	2	4	4	7	1
			1		1	

	4	1 ~~2~~	1 1	4	6 ~~7~~	1 2
-		1	2	2	4	4
	4	0	9	2	2	8

Key Vocabulary:

Addition Carrying Sum Less than

Subtraction Column Difference

STEM Sentences:

Why is it important that we start subtracting the smallest place value first?
Does it matter that the two numbers don't have the same amount of digits?
What is the inverse of addition? What is the inverse of subtraction?

Additional Knowledge Covered in this area of Maths:

Place in here any additional Knowledge you think appropriate in each element having reviewed the knowledge organiser for your year group for each of the strands of maths.

Inverse Operations

Inverse means opposite. The opposite of addition is subtraction and therefore the opposite of subtraction is addition. Using an inverse operation is a useful way of checking your answer.

I have calculated that 214,257 - 15,483 = 198,774. How can I check my answer?

To check the answer to your subtraction, you can use the **inverse**, which is addition. If we add 15,483 to your answer of 198,774 it should total 214,257 - your original number. If it does, you have calculated correctly.

Find the missing digits. What do you notice?

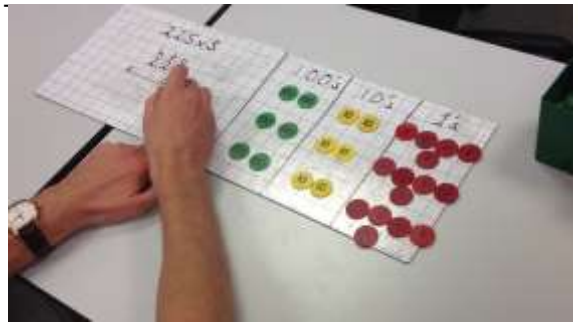
	5	2	2	4	7	?
+	3	?	5	9	0	4
	9	0	?	3	?	2

Bathwick St Mary Church School — Progression and Calculation Document— Multiplication and division Year Six

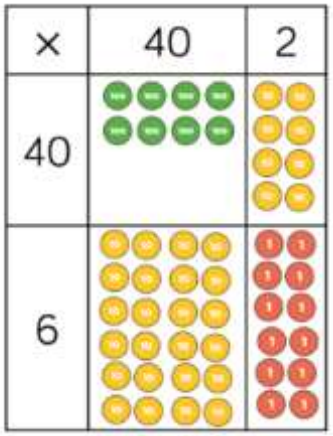
NC Learning Objectives:

- Multiply multi-digit number up to 4 digits by a 2-digit number using the formal written method of long multiplication.
- Divide numbers up to 4 digits by a 2-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding as appropriate for the context.
- Divide numbers up to 4 digits by a 2-digit number using the formal written method of short division, interpreting remainders according to the context.
- Perform mental calculations, including with mixed operations and large numbers.
- Identify common factors, common multiples and prime numbers.

Concrete



Pictorial



Abstract

		4	2	1	6
×				3	4
	1	6	8	6	4
1	2	6	4	8	0
1	4	3	3	4	4
	1	1	1		

			5	7	8	
1	5	8	6	7	0	
	-	7	5	↓		
		1	1	7		
	-	1	0	5		
			1	2	0	

Key Vocabulary:

Multiplication	Grouping	Decimal	Factors
Lots of	Place Value Holder	Remainder	Prime Numbers

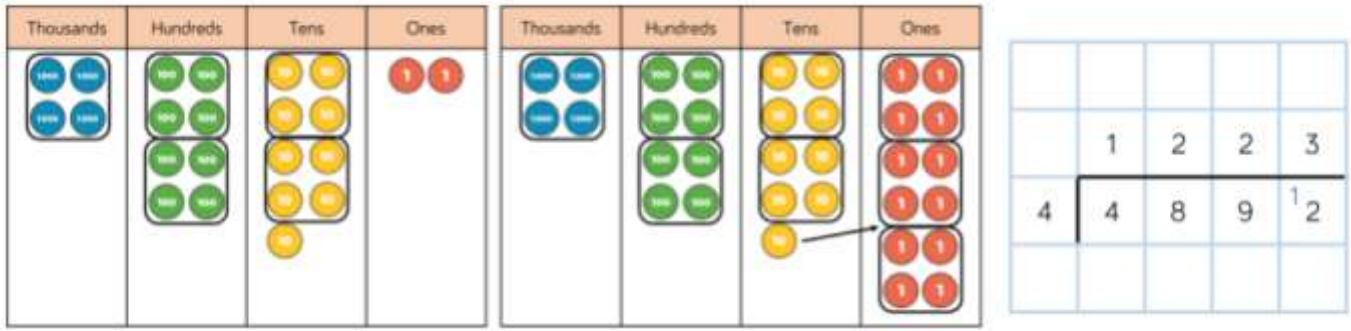
STEM Sentences:

What is important to remember as we begin multiplying by the tens number?
Why is the context of the question important when deciding how to round the remainders

Additional Knowledge Covered in this area of Maths:

Place in here any additional Knowledge you think appropriate in each element having reviewed the knowledge organiser for your year group for each of the strands of maths.

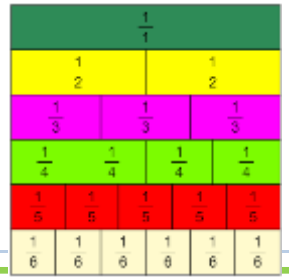
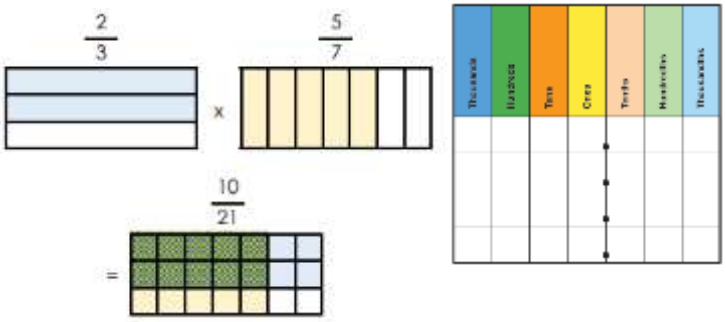
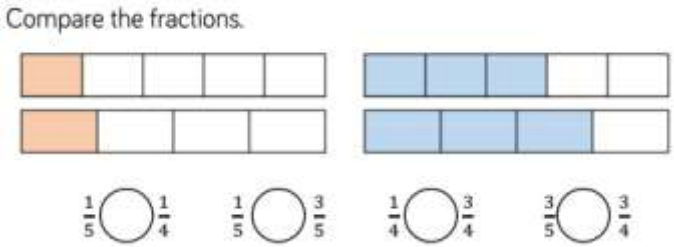
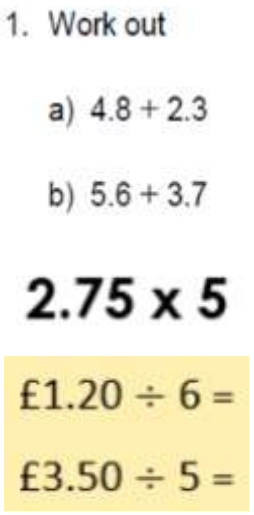
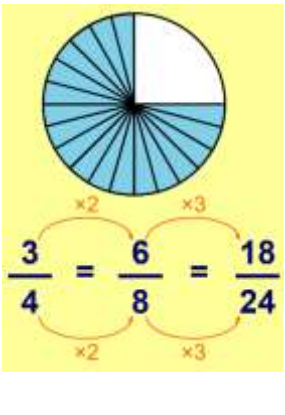
Additional pictorial representation of division:



Bathwick St Mary Church School **Progression and Calculation Document— Fractions and Decimals Year Six**

NC Learning Objectives:

- use common factors to simplify fractions; use common multiples to express fractions in the same denomination
- compare and order fractions, including fractions > 1
- add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
- multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, 1/4 × 1/2= 1/8]
- divide proper fractions by whole numbers [for example, 1/3 ÷ 2 = 1/6]
- associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, 3/8]
- identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places
- multiply one-digit numbers with up to two decimal places by whole numbers
- use written division methods in cases where the answer has up to two decimal places
- solve problems which require answers to be rounded to specified degrees of accuracy
- recall and use equivalences between simple fractions, decimals and percentages, including in different contexts

Concrete	Pictorial	Abstract
 	 	 

Key Vocabulary:

Division **Subtraction** **Common Denominator** **Part** **Equivalent** **Decimal Place**

Multiplication **Denominator** **Fraction** **Whole** **Decimal Point** **Place Value**

Addition **Numerator** **Lots of** **Top Heavy** **Mixed Number** **Simplify**

STEM Sentences:

How do I know if my answer is simplified fully?

Does multiplying two numbers always give you a larger product? Explain why.

Which equation has the largest answer? Can you order the answers to the equations in descending order?

Additional Knowledge Covered in this area of Maths:

Place in here any additional Knowledge you think appropriate in each element having reviewed the knowledge organiser for your year group for each of the strands of maths.

Simplify Fractions

We can use our knowledge of equivalent fractions to **simplify fractions**. To find the simplest form of a fraction, we divide the numerator and denominator by their highest common factor.

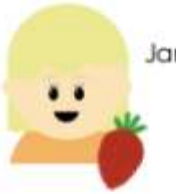
$\frac{12}{18}$ Factors of 12: 1, 2, 3, 4, 6, 12
Factors of 18: 1, 2, 3, 6, 9, 18

$$\frac{12 \div 6}{18 \div 6} = \frac{2}{3}$$

Find the Whole

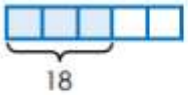
We can find the whole amount using the known value of a fraction.

To do this, we divide the known value by the numerator and multiply this by the denominator.



Jane ate $\frac{3}{5}$ of a box of strawberries.

She ate 18 of them altogether.



$18 \div 3 = 6$ so $\frac{1}{5} = 6$

$6 \times 5 = 30$ so the whole is 30

There were 30 strawberries in Jane's box.

Compare and Order Fractions

To **compare** and **order** fractions, we need to find a common denominator or numerator.

$\frac{10}{12}$ $\frac{5}{9}$

$\frac{10}{12} = \frac{5}{6}$ so $\frac{5}{6} > \frac{5}{9}$

These fractions have been ordered from smallest to greatest. Their equivalent fractions using common numerators are shown beneath.

$\frac{8}{18} \rightarrow \frac{4}{9}$ $\frac{12}{15} \rightarrow \frac{4}{5}$ $\frac{18}{7} \rightarrow 1\frac{4}{7}$

Multiply Fractions by Fractions

To **multiply fractions by fractions**, we multiply the numerators together and multiply the denominators together.

$$\frac{2}{3} \times \frac{5}{7} = \frac{10}{21}$$

Divide Fractions by Integers

To **divide fractions by integers**, we divide the numerator by the whole number.

If the numerator is a multiple of the integer, then this is nice and simple!

$$\frac{6}{11} \div 3 = \frac{2}{11}$$

If the numerator is not a multiple of the integer, then we could use diagrams to help us.

$$\frac{3}{4} \div 2 = \frac{3}{8}$$

Bathwick St Mary Church School — Progression and Calculation Document— Ratio and Proportion Year Six

NC Learning Objectives:

- solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts
- solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison
- solve problems involving similar shapes where the scale factor is known or can be found
- solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.

Concrete	Pictorial	Abstract
Using volunteers with distinguishing features (e.g. glasses, hair colour) to create ratio. 	Use cubes to help you complete the sentences.  For every ___ , there are ___ For every 8 , there are ___ For every 1 , there are ___  	The ratio of red to green marbles is 3 : 7 Draw an image to represent the marbles. What fraction of the marbles are red? What fraction of the marbles are green? Enlarge these shapes by: • Scale factor 2 • Scale factor 3 • Scale factor 4  How much of each ingredient is needed to make soup for: • 3 people • 9 people • 1 person What else could you work out? **Recipe for 6 people** • 1 onion • 60 g butter • 180 g lentils • 1.2 litres stock • 480 ml tomato juice

Key Vocabulary:

Part of Blocks Ratio Proportion Percentage Scale Factor Amount of

10% Conversion 'Out of a whole' Bar Model Colon

STEM Sentences:

What does the : symbol mean in the context of ratio?
Why do we have to double/triple all the sides of each shape?
Why is the order of the numbers important when we write ratios?
How would your sentence change if there were 2 more blue flowers?

Additional Knowledge Covered in this area of Maths:

Place in here any additional Knowledge you think appropriate in each element having reviewed the knowledge organiser for your year group for each of the strands of maths.

"1 to every 2" is a Ratio

*"1 Rovers fan **to every** 2 United fans"*

"The ratio of Rovers to United fans is 1 to 2"

"The ratio of United to Rovers fans is 2 to 1"

Ratios compare PART WITH PART

"1 out of 3" is a Proportion

*"1 **out of every** 3 fans is a Rovers fan"*

"The proportion of Rover fans is 1 out of 3"

Proportions compare PART WITH WHOLE

Ratio and Proportion Problem-Solving

To use the ingredients for 1 person, you divide all the quantities by 10 (÷ 10).

To use the ingredients for 5 people, you halve all the quantities (÷ 2).

Ingredients for Fruit Smoothie (serves 10 people)

800g of bananas

500g of strawberries

200g of raspberries

700ml of milk

300ml of natural yogurt

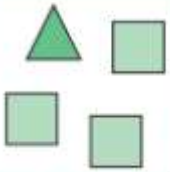
To use the ingredients for 20 people, you double all the quantities (× 2).

Ratio and Fractions

For every 1 rugby ball, there are 2 footballs.

Ratio of rugby balls to footballs: 1:2

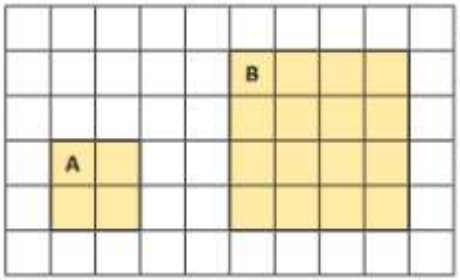
$\frac{1}{3}$ of the balls are rugby balls.



For every 1 triangle, there are 3 squares.

Ratio of triangles to squares: 1:3

$\frac{1}{4}$ of the shapes are triangles.

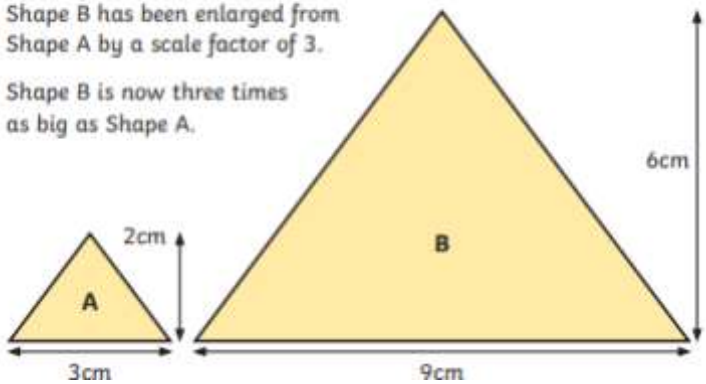


Shape A has been enlarged by a scale factor of 2 to make Shape B.

Shape B is now two times as big as Shape A.

Shape B has been enlarged from Shape A by a scale factor of 3.

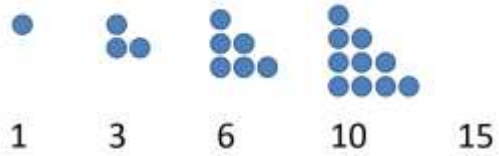
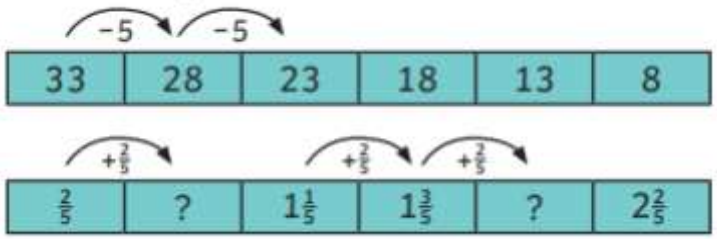
Shape B is now three times as big as Shape A.



Bathwick St Mary Church School — Progression and Calculation Document— Algebra Year Six

NC Learning Objectives:

- use simple formulae generate and describe linear number sequences
- express missing number problems algebraically
- find pairs of numbers that satisfy an equation with two unknowns
- enumerate possibilities of combinations of two variables.

Concrete	Pictorial	Abstract
Use items—such as cubes.   	 How is the sequence being generated? What is this sequence called?  	Complete the table for the given function machine. Input → × 3 → − 4 → Output Input: 1, 2, 3, 4, 5 Output: • What patterns do you notice in the outputs? • What is the input if 20 is the output? How did you work it out? Substitute the following to work out the values of the expressions. $w = 3 \quad x = 5 \quad y = 2.5$ • $w + 10$ • $w + x$ • $y - w$ Can you write a similar word problem to describe this equation? $74 = 15t + 2m$

Key Vocabulary:

Terms Represent Constant Value Alphabet Letters Function Expression

Equation Algebraic Solve Nth Term Sequence Pattern 'Collect Like Terms'

STEM Sentences:

What do you think 'one-step function' means?

If I change the order of the functions, is the output the same?

What does it mean when a number is next to a letter?

What tells you something is a formula?

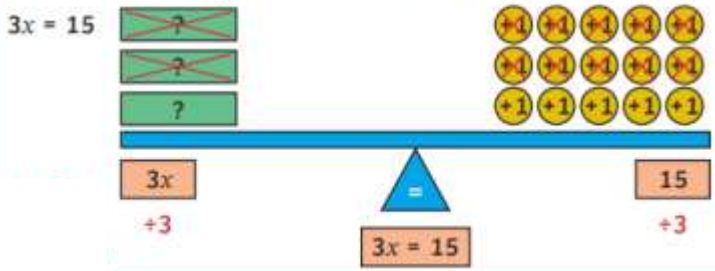
Additional Knowledge Covered in this area of Maths:

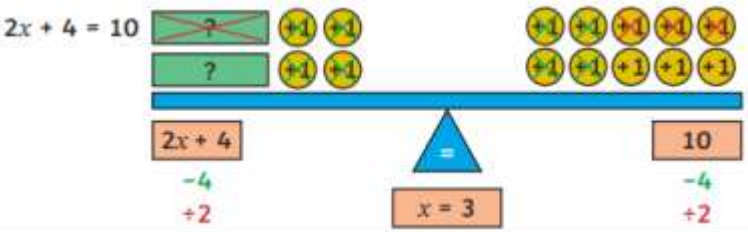
Place in here any additional Knowledge you think appropriate in each element having reviewed the knowledge organiser for your year group for each of the strands of maths.

Solving One-Step and Two-Step Equations

In algebra, missing numbers in equations are represented by letters. Any letter can be used but often the letter x is used. An algebraic x is written to look different to a normal letter 'x' to avoid confusion.

The multiplication sign is not used in algebra to avoid confusing it with the algebraic x used to show a missing number. Inverse operations are used to isolate the letter on one side of the equation.





Forming Expressions

An expression is a group of numbers, letters and operation symbols.

Add 14 to a	$a + 14$
Subtract 20 from b	$b - 20$
Multiply c by 4	$4c$
12 more than d	$d + 12$
Multiply e by 3 and subtract 5	$3e - 5$
Add 12 to f and then multiply by 2	$2(f + 12)$

Forming Equations

$a + 14 = 20$
$b - 20 = 15$
$4c = 28$
$d + 12 = 30$
$3e - 5 = 10$
$2(f + 12) = 44$

An equation is a number statement with an equal sign (=). Expressions on either side of the equal sign are of equal value.

Formulas / Formulae

(The word formula has two possible plural forms, formulae and formulas.)

A formula is a special type of equation that shows the relationship between different substituted variables. Formulas are often used in geometry to find area and volume.

Area of triangle = (base × height) ÷ 2

Area of rectangle = length × width

(12.5 × hours worked) + 25 = cost of job

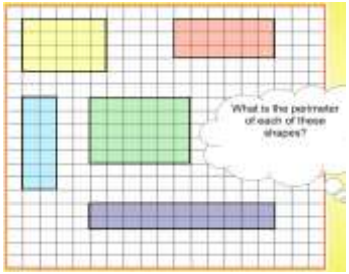
Bathwick St Mary Church School — Progression and Calculation Document— Measurement Year Six

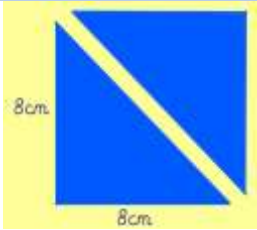
NC Learning Objectives:

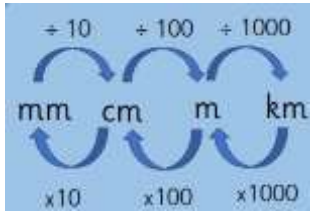
- solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate
- use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places
- convert between miles and kilometres
- recognise that shapes with the same areas can have different perimeters and vice versa
- recognise when it is possible to use formulae for area and volume of shapes
- calculate the area of parallelograms and triangles
- calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm3) and cubic metres (m3), and extending to other units [for example, mm3 and km3].

Concrete

Pictorial

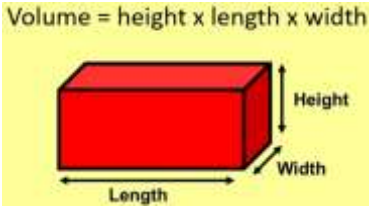






Perimeter = _____

Area = _____

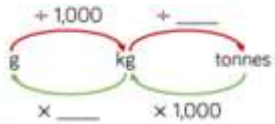


Abstract

There are ___ grams in one kilogram.

There are ___ kilograms in one tonne.

Use these facts to complete the tables.

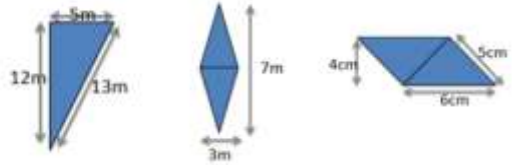


g	kg
1,500	
	2.05
1,005	

kg	tonnes
1,202	
	4.004
125	

Work out the missing values.

Calculate the area of each shape.



Key Vocabulary:

Cm m kg g l ml miles km mm tonnes measure units area perimeter

Multiply cm² cm³ 3D shapes volume dimensions

STEM Sentences:

What is the difference between the area and perimeter of a shape?

What is the same/different about the rectangle and triangle?

What is the formula for working out the area of a rectangle or square?

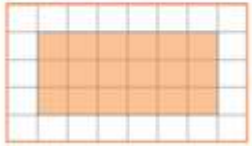
What do we mean by perpendicular height?

Additional Knowledge Covered in this area of Maths:

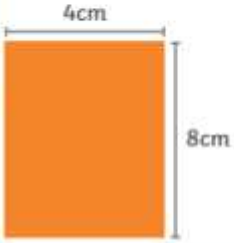
Place in here any additional Knowledge you think appropriate in each element having reviewed the knowledge organiser for your year group for each of the strands of maths.

Area of Rectangles

length × width = area of a rectangle



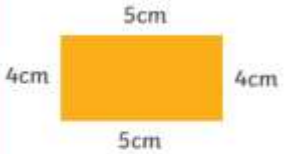
Counting squares:
area = 18cm²
Use formula:
6cm × 3cm
area = 18cm²

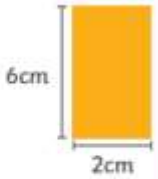


8cm × 4cm area = 32cm²

Perimeter of Rectangles

perimeter = length + width + length + width or (length + width) × 2



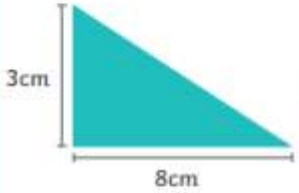


5cm + 4cm + 5cm + 4cm
perimeter = 18cm

(6 + 2) × 2
perimeter = 16cm

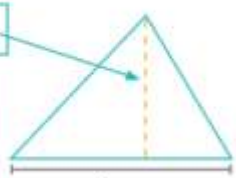
Area of Triangles

base × perpendicular height ÷ 2 = area of a triangle

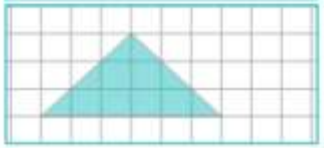


8cm × 3cm ÷ 2
area = 12cm²

perpendicular height = 5cm



6cm × 5cm ÷ 2
area = 15cm²

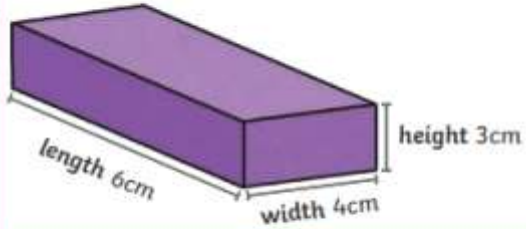


Counting squares:
6 whole squares = 6cm²
6 half squares = 3cm²
6cm² + 3cm² = 9cm²
area = 9cm²

Using formula:
6cm × 3cm
÷ 2 = 9cm²

Volume of Cuboids

length × width × height = volume of a cuboid



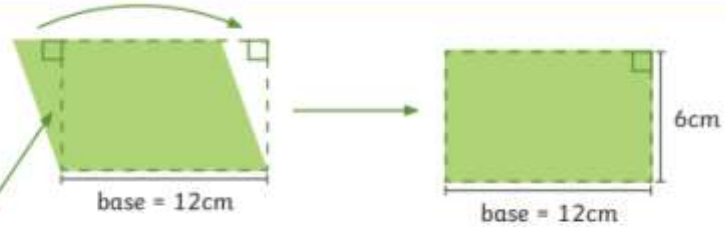
Multiply dimensions in **any** order:
3cm × 6cm × 4cm
volume = 72cm³

Images not drawn to scale

Area of Parallelograms

base × perpendicular height = area of a parallelogram

A parallelogram can be transformed into a rectangle.



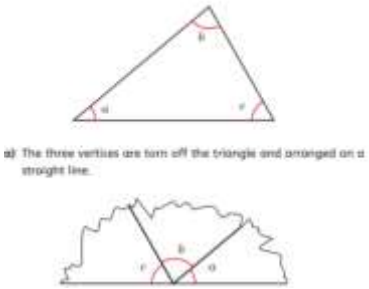
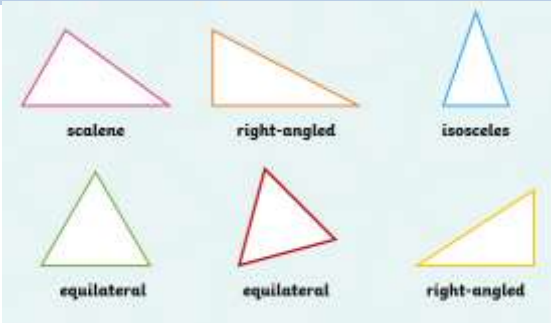
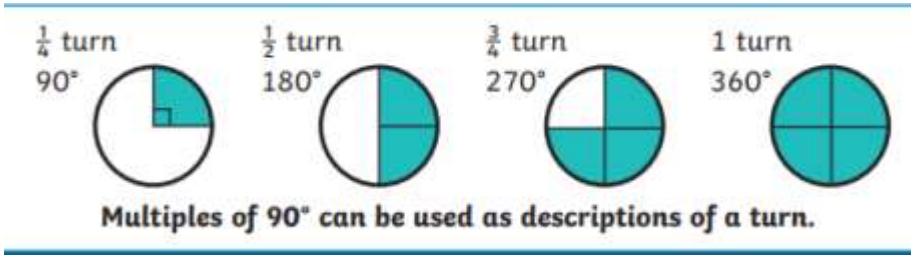
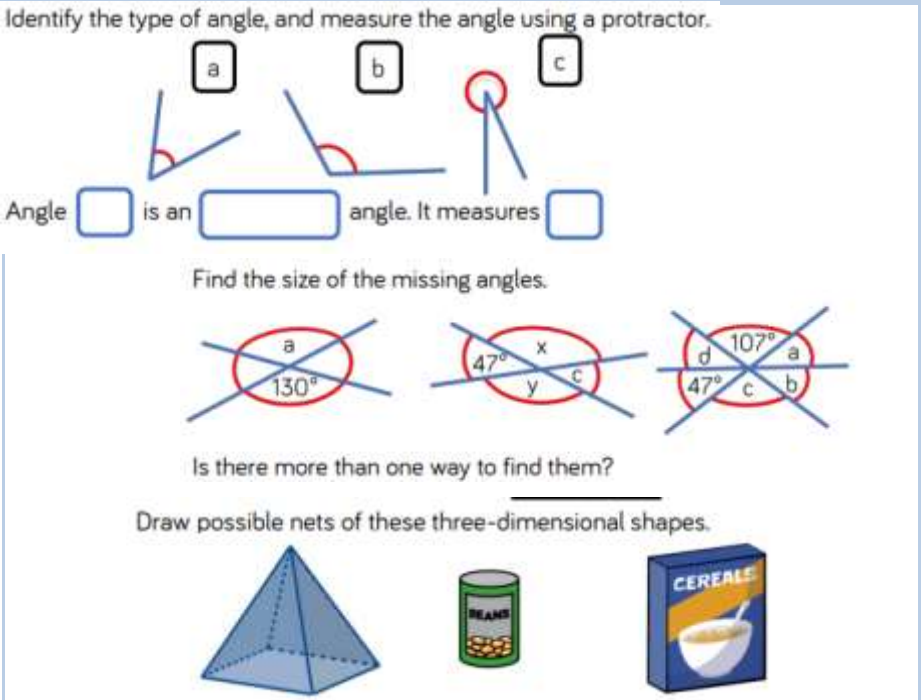
perpendicular height = 6cm

12cm × 6cm =72cm²

Bathwick St Mary Church School — Progression and Calculation Document— Geometry Properties of Shapes Year Six

NC Learning Objectives:

- draw 2-D shapes using given dimensions and angles
- recognise, describe and build simple 3-D shapes, including making nets compare and classify geometric shapes based on their properties and sizes and find unknown angles in any tri-angles, quadrilaterals, and regular polygons
- illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius
- recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.

Concrete	Pictorial	Abstract
 	  	

Key Vocabulary:

Angles Right Angle Acute Obtuse Reflex Area Perimeter Triangle

Right Angle Triangle Isosceles Triangle Scalene Triangle Circle Radius

Diameter Circumference Vertices Vertex Edges Faces

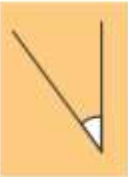
STEM Sentences:

If we place two right angles together, what do we notice?
What is the most efficient way to calculate a missing angle?
Can you have an isosceles right angle triangle?
How can we work out the sum of the interior angles of a pentagon?

Additional Knowledge Covered in this area of Maths:

Place in here any additional Knowledge you think appropriate in each element having reviewed the knowledge organiser for your year group for each of the strands of maths.

Angle Types

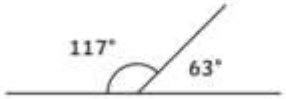


Acute Angles
Any angle that measures less than 90° is called an **acute** angle.

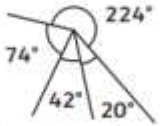
Obtuse Angles
Any angle that measures greater than 90° and less than 180° is called an **obtuse** angle.

Reflex Angles
Any angle that measures greater than 180° is called a **reflex** angle.

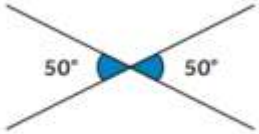
Calculating Angles

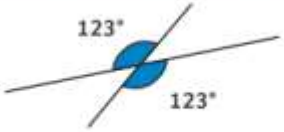


Angles on a straight line always total 180°.



Angles around a point always total 360°.





Opposite angles that share a vertex are equal.

Angles in Regular Polygons

As the number of sides of a polygon increases by one, the total of the interior angles increases by 180°. When n = number of sides, this formula can be used to find the size of each angle in a **regular polygon**:

Sum of Interior Angles = (n − 2) × 180°

Each Angle = $\frac{(n - 2) \times 180°}{n}$

Pentagon
n = 5
(5 - 2) × 180° = 540°
540° ÷ 5 = 108°

Hexagon
n = 6
(6 - 2) × 180° = 720°
720° ÷ 6 = 120°

Parts of Circles

A circle is a 2D shape. The perimeter of a circle is called the **circumference** (c). The distance across the circle, passing through the centre, is called the **diameter** (d).

The distance from the centre of the circle to the circumference is called the **radius** (r).

$r \times 2 = d$ $\frac{d}{2} = r$

Properties of 3D Shapes

3D shapes have three dimensions – **length**, **width** and **depth**.

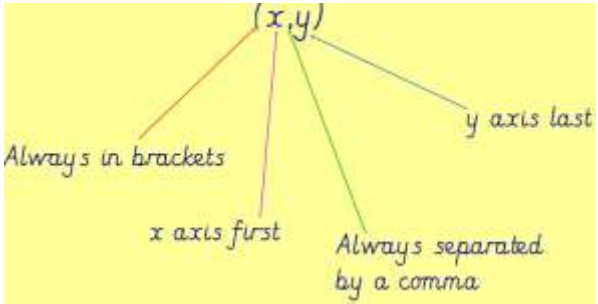
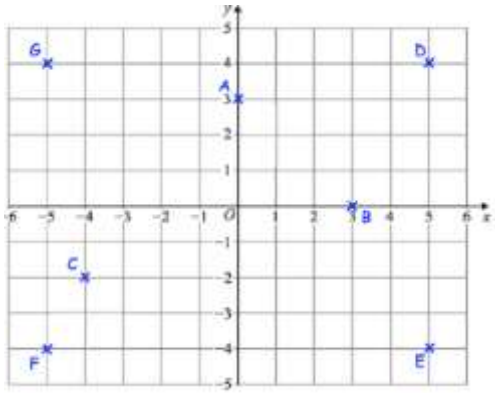
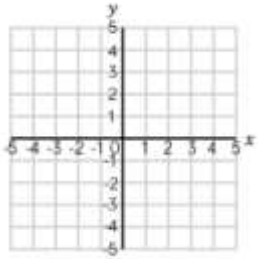
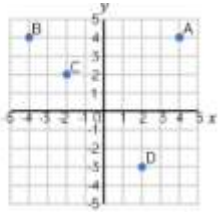
A **polyhedron** is a 3D shape with flat faces. Spheres, cylinders and cones are not polyhedrons as they have curved surfaces.

Cube  6 square faces, 12 edges, 8 vertices	**Tetrahedron**  4 triangular faces, 6 edges, 4 vertices	**Sphere**  1 curved surface, 0 edges, 0 vertices
Cuboid  6 faces, 12 edges, 8 vertices	**Octahedron**  8 faces, 12 edges, 6 vertices	**Triangular prism**  5 faces, 9 edges, 6 vertices
Square-based pyramid  5 faces, 8 edges, 5 vertices	**Cone**  1 circular face, 1 curved surface, 1 curved edge, 1 apex	**Cylinder**  2 circular faces, 1 curved surface, 2 curved edges, 0 vertices

Bathwick St Mary Church School — Progression and Calculation Document— Geometry Position and direction Year Six

NC Learning Objectives:

- describe positions on the full coordinate grid (all four quadrants)
- draw and translate simple shapes on the coordinate plane, and reflect them in the axes.

Concrete	Pictorial	Abstract
Use of mirrors for reflection. 	 	Draw the vertices of the polygon with the coordinates (7, 1), (7, 4) and (10, 1) What type of polygon is the shape? Draw a shape using the coordinates (-2, 2), (-4, 2), (-2, -3) and (-4, -2). What is the name of shape?  Use the graph to describe the translations. One has been done for you. From A to B translate 8 units to the **left**.  From C to D translate __ units to the **right** and __ units **down**. From D to B translate 6 units to the ____ and 7 units ____. From A to C translate __ units to the ____ and __ units ____.

Key Vocabulary:

X axis Y axis Coordinate Quadrant Positive Negative Brackets Comma
Reflect Translate Transformation Rotate Scale Factor Enlargement Origin

STEM Sentences:

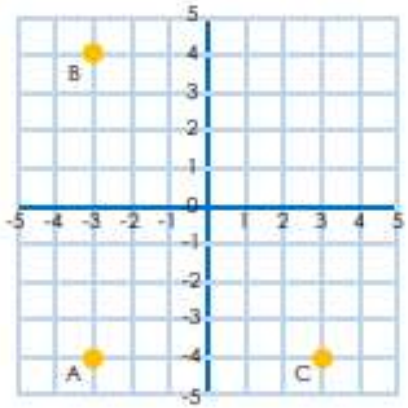
Can you draw a shape in the first quadrant and describe the coordinates?
Does each vertex translate in the same way?
How is reflecting different to translating?
Which way do you move along the y axis and x axis to find negative numbers?

Additional Knowledge Covered in this area of Maths:

Place in here any additional Knowledge you think appropriate in each element having reviewed the knowledge organiser for your year group for each of the strands of maths.

Reflections

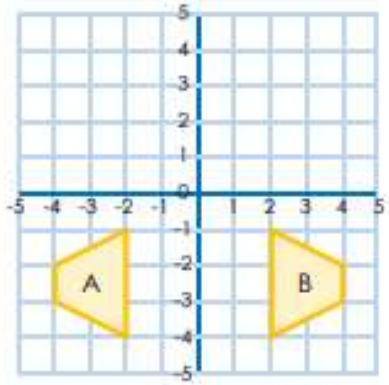
We can **reflect** points in the four quadrants by using the x or y axis as a mirror line.



A has been reflected in the x axis to create point B.

A has been reflected in the y axis to create point C.

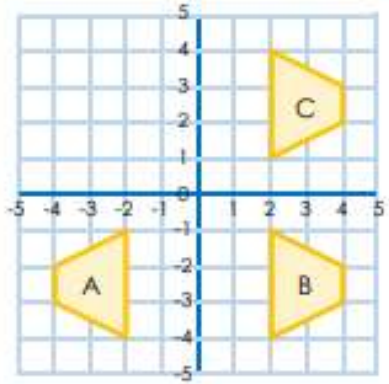
As with translation, we can change the position of shapes on a grid by reflecting one coordinate at a time.



A has been reflected in the y axis to create shape B.

If we reflect shape B in the x axis, the coordinates for shape C will be:

(2, 1) (2, 4) (4, 2) (4, 3)

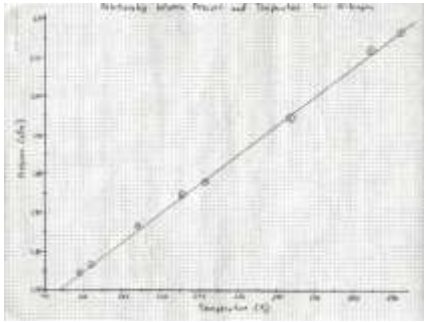


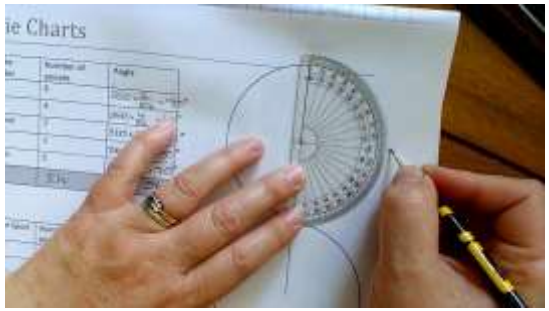
Bathwick St Mary Church School — Progression and Calculation Document— Statistics Year Six

NC Learning Objectives/Key Skills

- interpret and construct pie charts and line graphs and use these to solve problems
- calculate and interpret the mean as an average.

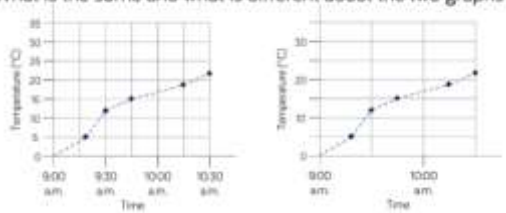
Concrete



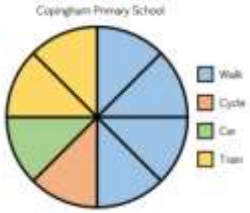


Pictorial

What is the same and what is different about the two graphs?



Work out how many pupils travel to school by:



a) Train
b) Car
c) Cycling
d) Walking

Here is a method to find the mean.

The mean number of glasses of juice drunk is 3

Use this method to calculate the mean average for the number of slices of pizza eaten by each child.

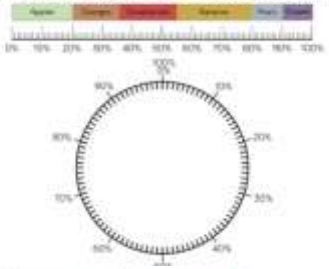
Abstract

This table shows the height a rocket reached between 0 and 60 seconds.

Create a line graph to represent the information.

Time (seconds)	Height (metres)
0	0
10	8
20	15
30	25
40	37
50	50
60	70

Construct a pie chart using the data shown in this percentage bar model.



A survey was conducted to show how children in Class 6 travelled to school.

Draw a pie chart to represent the data.

Type of transport	Number of children	Convert to degrees
Car	12	12 × 10 = 120°
Bike	7	
Walk	8	
Bus	5	
Scooter	4	
Total	36	360°

Key Vocabulary:

Mean Mode Median Range Average Line Graph Line of best fit

Pie Charts Percentage Axis Data Degrees

STEM Sentences:

Where might you see a line graph used in real life?
How will you make it clear which line represents which set of data?
What does the whole pie chart represent? What does each colour represent?
How many degrees are around a point? How will this help us construct a pie chart?

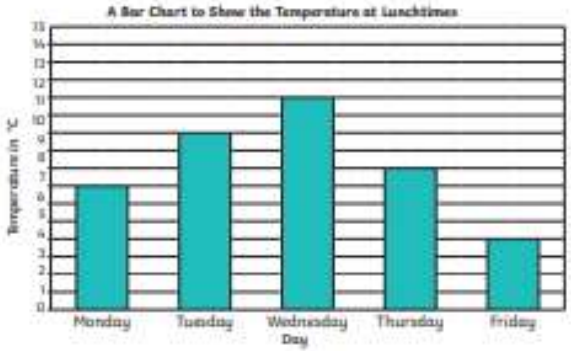
Additional Knowledge Covered in this area of Maths:

Place in here any additional Knowledge you think appropriate in each element having reviewed the knowledge organiser for your year group for each of the strands of maths.

Statistics — Knowledge Organiser

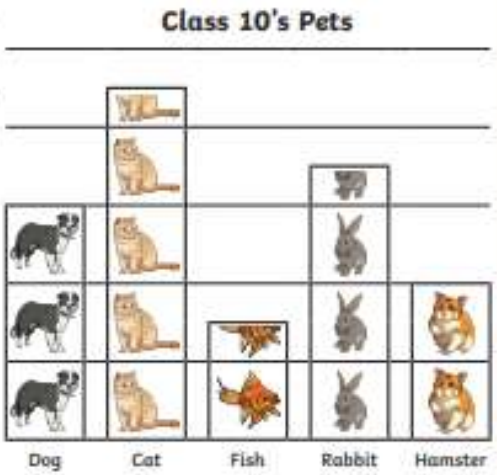
Bar Chart

A bar chart has a horizontal axis and a vertical axis. Bars show the data value of each category. There must be a gap between each bar. The scale of the bar chart is chosen based on the data range.



Pictogram

This graph uses pictures or symbols to represent the data. The pictogram uses one picture or symbol to represent a value.



= 4 Children

Frequency Table

Eye Colour	Tally	Frequency
brown	卌 |	6
blue	卌 |||	8
green	|||	3
grey	||||	4
hazel	卌	5

Tally marks are used to help count things. Each vertical line represents one unit. The fifth tally mark goes down across the first four to make it easier to count.

The frequency column is completed after all the data has been collected.

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Mean Average

The mean is the average of a set of data.

To find the mean or average, add up all of the values to find the total. Divide the total by the number of values that you added together. This will give you the mean.

12	15	10	8	15

12 + 15 + 10 + 8 + 15 = 60

60 ÷ 5 = 12

The mean of this data is 12.