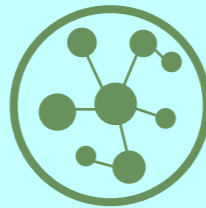


## Information

Isolated facts that can have no organisational basis or links

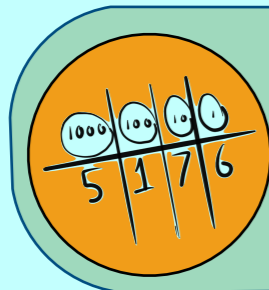


## Schema

Knowledge organised in a meaningful way - memories (emotional), concepts, knowledge

# Mathematical Strands

Key strands across mathematics from Early Years to Year 6



## Place Value and Number

**Place Value:** The numerical value that a digit has by virtue of its position in a number.  
**Number:** arithmetical value, expressed by a word, symbol, or figure, representing a particular quantity and used in counting and making calculations



## Multiplication and Division

The process of either calculating the number of times we multiply a number by or how we divide an amount into equal parts



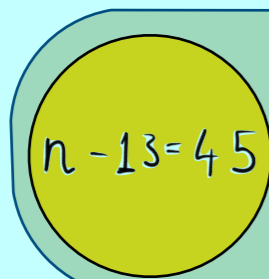
## Measurement

The size, length, or amount of something, as established by measuring



## Fractions

A numerical quantity that is not a whole number. This is also defined as an equal part of a whole

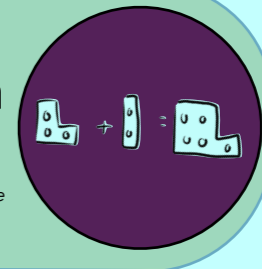


## Algebra

The part of mathematics in which letters and other general symbols are used to represent numbers and quantities in formulae and equations

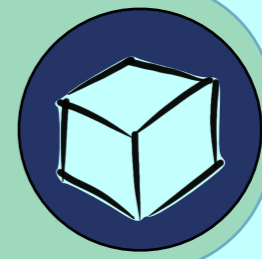
## Addition and Subtraction

The process of either calculating the total of two or more numbers or amounts; or taking away (something) from something else so as to decrease the size, number, or amount



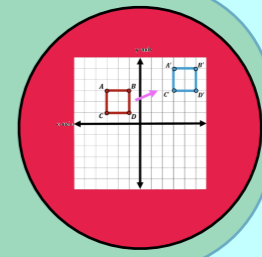
## Geometry: Properties of Shape

The process where we identify parts of shape, including details such as its angles and the number of its sides



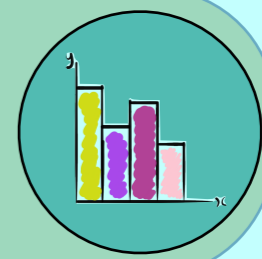
## Geometry: Position and Direction

Position in maths is the ability to describe where an object is in relation to another one. Direction involves describing how something moves, for example forwards, backwards or in a full or half turn



## Statistics

Collecting and analysing numerical data, through the use of tables, bar charts, line graphs, etc.



## Ratio & Proportion

Ratio tells us how much of one thing there is in relation to another thing. E.g. 'For every 2 apples we have 3 bananas'. Proportion tells us about how much of one thing there is in relation to the whole amount of something. E.g. 'There are 50 pieces of fruit, and 1 in every 5 of those is an apple



# EYFS

Count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers.

Count objects, actions and sounds.

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.

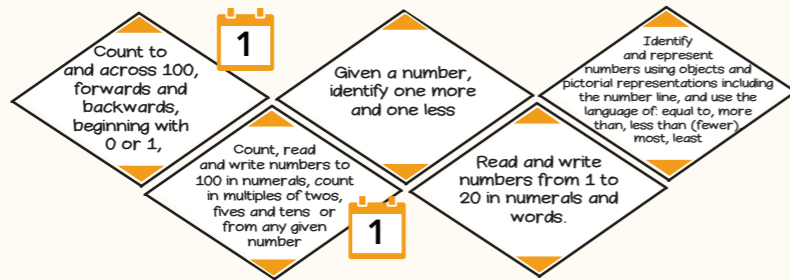
Verbally count beyond 20, recognising the pattern of the counting system.

Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.

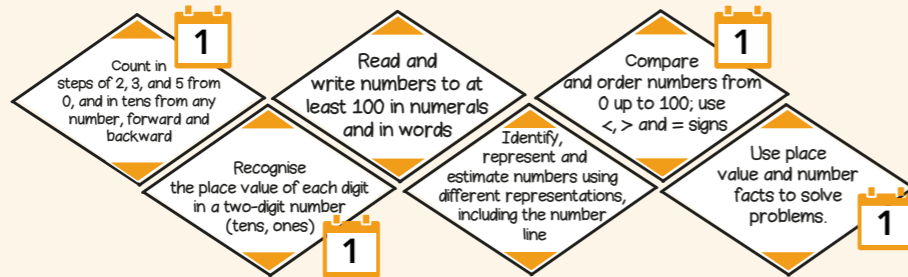
# Place Value and Number

**1** Identifies when a child will meet this objective for the first time within this strand.

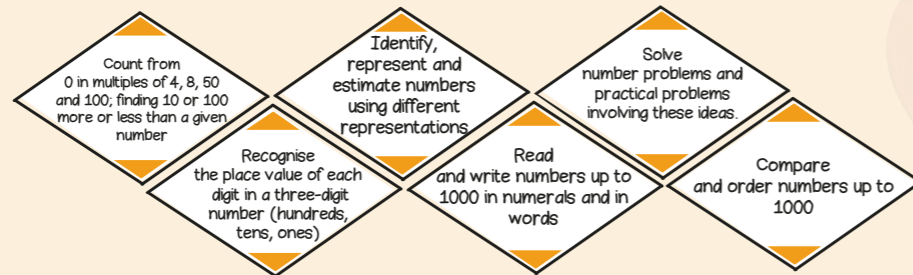
## Year 1



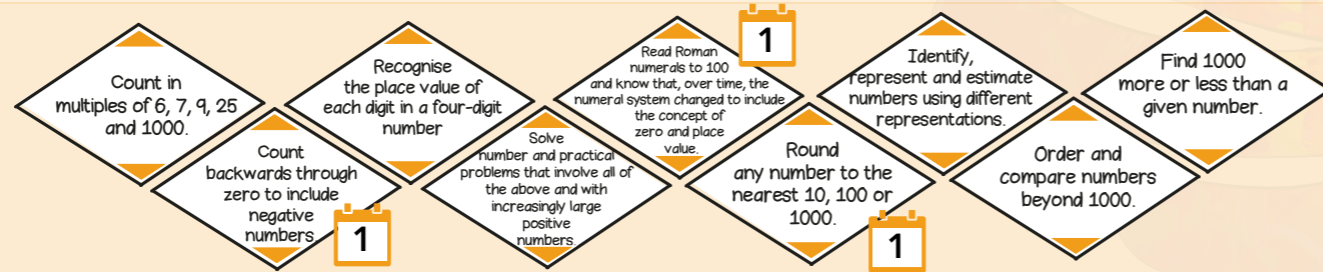
## Year 2



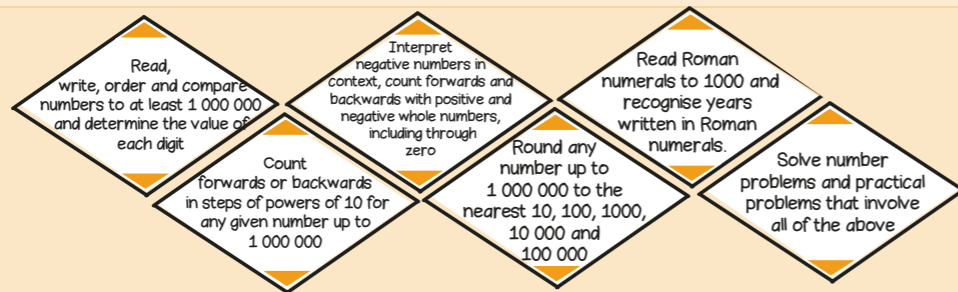
## Year 3



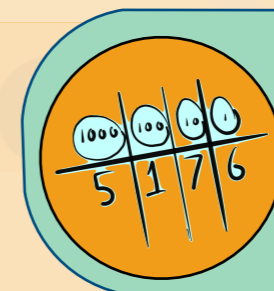
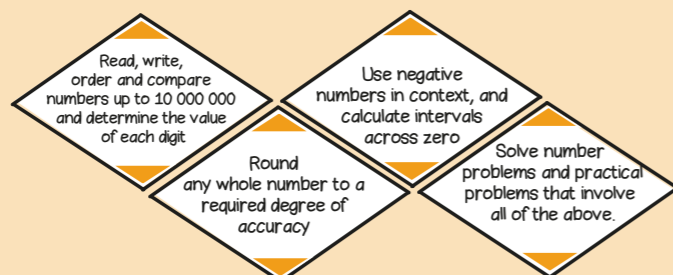
## Year 4



## Year 5



## Year 6



## Place Value and Number

Place Value: The numerical value that a digit has by virtue of its position in a number.

Number: arithmetical value, expressed by a word, symbol, or figure, representing a particular quantity and used in counting and making calculations


# EYFS

Recall number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts

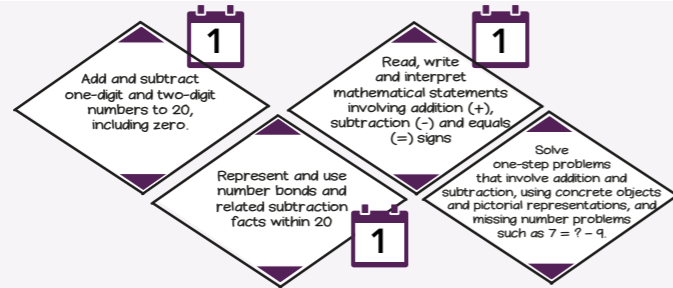
Understand the 'one more than/one less than' relationship between consecutive numbers.

Explore the composition of numbers to 10.

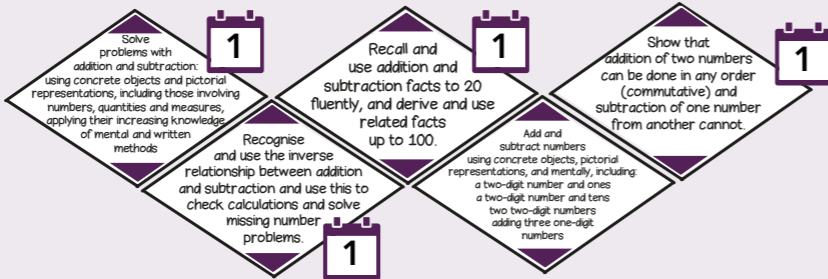
# Addition and Subtraction

 Identifies when a child will meet this objective for the first time within this strand.

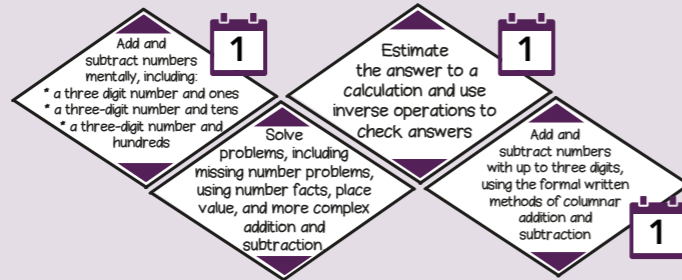
## Year 1



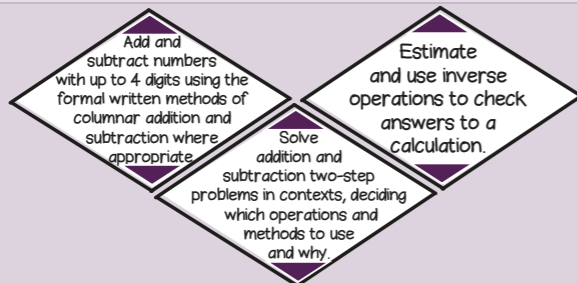
## Year 2



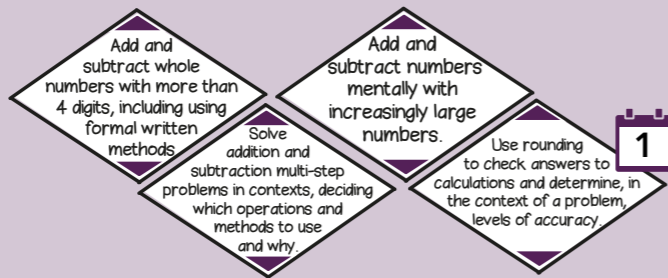
## Year 3



## Year 4



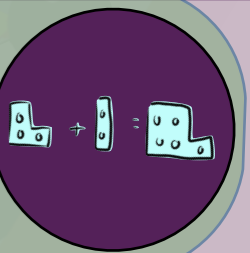
## Year 5



## Year 6

## Addition and Subtraction

The process of either calculating the total of two or more numbers or amounts; or taking away (something) from something else so as to decrease the size, number, or amount



# EYFS

Recall (without reference to rhymes, counting or other aids) number bonds up to 5 and some number bonds to 10, including double facts.

Share equally in two.

Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

# Multiplication and Division

**1** Identifies when a child will meet this objective for the first time within this strand.

## Year 1

Solve one-step problems involving multiplication and division by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher. **1**

## Year 2

Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers. **1**

Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot. **1**

Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication division and equals signs. **1**

Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts. **1**

## Year 3

Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables. **1**

Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for 2-digit numbers times 1-digit numbers using mental progressing to formal written methods. **1**

Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which  $n$  objects are connected to  $m$  objects. **1**

## Year 4

Recall multiplication and division facts for multiplication tables up to  $12 \times 12$ . **1**

Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers. **1**

Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems, such as  $n$  objects are connected to  $m$  objects. **1**

Recognise and use factor pairs and commutativity in mental calculations. **1**

Multiply two-digit and three-digit numbers by a one-digit number using formal written layout. **1**

## Year 5

Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers factor pairs of a number, and common factors of two numbers. **1**

Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers. **1**

Establish whether a number up to 100 is prime and recall prime numbers up to 19. **1**

Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000. **1**

Recognise and use square numbers and cube numbers, and the notation for squared and cubed. **1**

Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes. **1**

Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign. **1**

Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context. **1**

Multiply and divide numbers mentally drawing upon known facts. **1**

Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers. **1**

## Year 6

Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication. **1**

Use their knowledge of the order of operations to carry out calculations involving the four operations. **1**

Divide numbers up to 4 digits by a two-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. **1**

Divide numbers up to 4 digits by a two digit number using the formal written method of short division where appropriate, interpreting remainders according to the context. **1**

Identify common factors, common multiples and prime numbers. **1**

Solve problems involving addition, subtraction, multiplication and division. **1**

Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy. **1**

Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. **1**

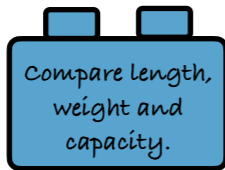
Use their knowledge of the order of operations to carry out calculations involving the four operations. **1**

$$9 \times 7 = 63$$

## Multiplication and Division

The process of either calculating the number of times we multiply a number by or how we divide an amount into equal parts

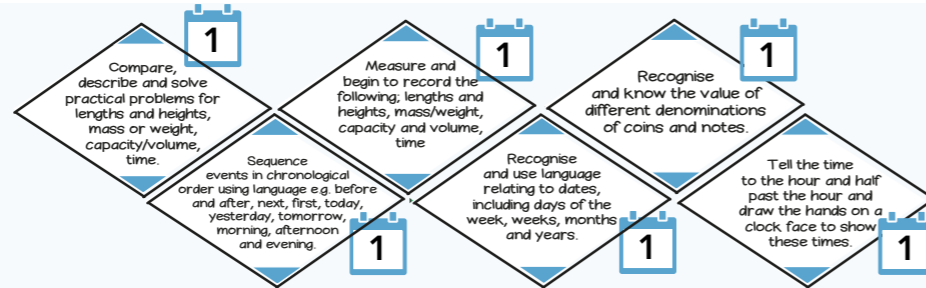
# EYFS



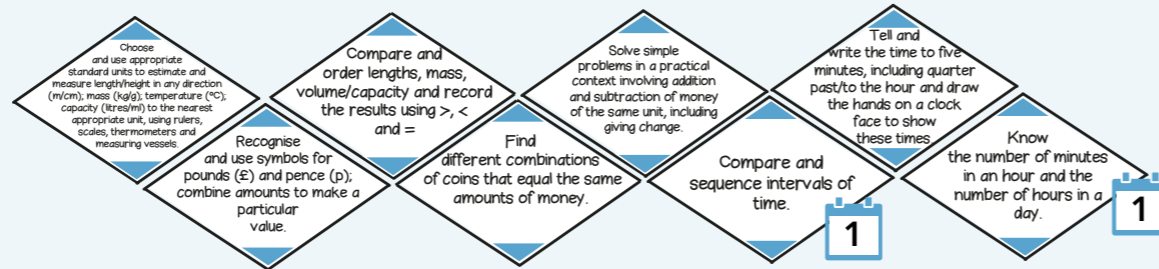
# Measurement

**1** Identifies when a child will meet this objective for the first time within this strand.

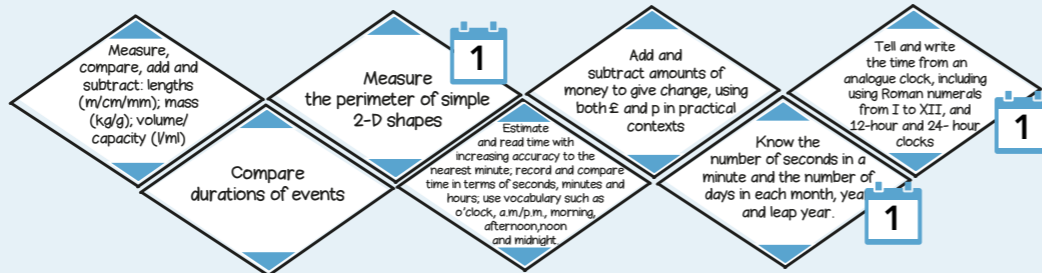
## Year 1



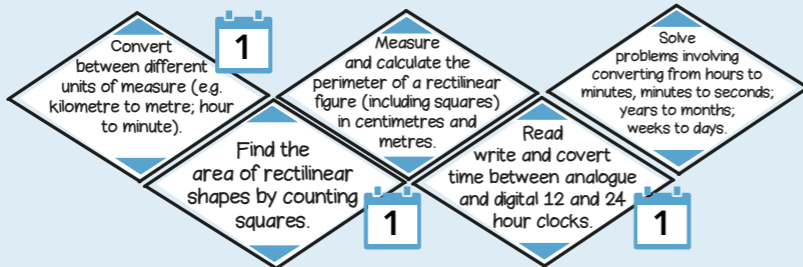
## Year 2



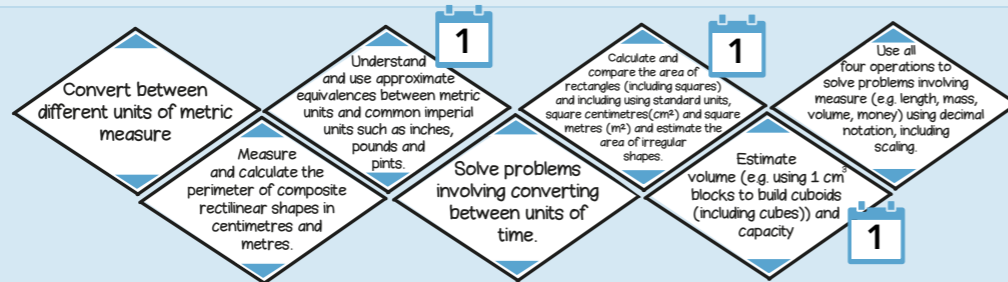
## Year 3



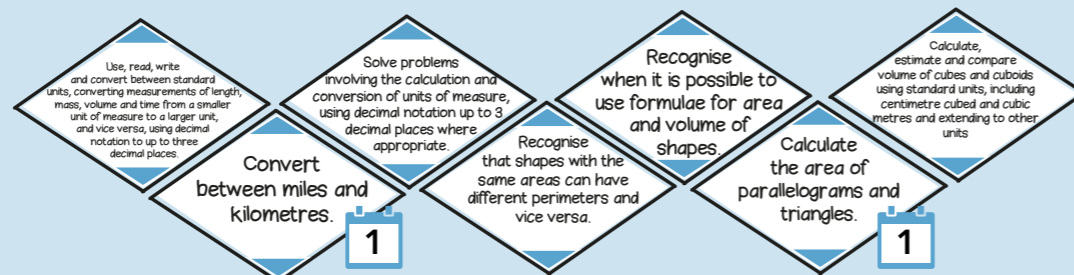
## Year 4



## Year 5



## Year 6



# Measurement

The size, length, or amount of something, as established by measuring

# EYFS



# Fractions

**1** Identifies when a child will meet this objective for the first time within this strand.

## Year 1

Recognise, find and name a half as one of two equal parts of an object, shape or quantity. **1**

Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity. **1**

## Year 2

Recognise, find, name and write fractions  $\frac{1}{3}$ ,  $\frac{1}{4}$ ,  $\frac{2}{4}$  and  $\frac{3}{4}$  of a length, shape, set of objects or quantity. **1**

Write simple fractions e.g.  $\frac{1}{2}$  of  $6 = 3$  and recognise the equivalence of two quarters and one half. **1**

## Year 3

Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators. **1**

Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10. **1**

Recognise and show, using diagrams, equivalent fractions with small denominators. **1**

Add and subtract fractions with the same denominator within one whole. **1**

Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators. **1**

Compare and order unit fractions and fractions with the same denominators. **1**

Solve problems that involve all of the above. (Fractions) **1**



## Fractions

A numerical quantity that is not a whole number. This is also defined as an equal part of a whole

## Year 4

Recognise and show, using diagrams, families of common equivalent fractions. **1**

Recognise and write decimal equivalents to  $\frac{1}{4}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$ . **1**

Recognise and write decimal equivalents of any number of tenths or hundredths. **1**

Count up and down in hundredths; recognise that hundredths arise when dividing an object by a hundred and dividing tenths by ten. **1**

Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number. **1**

Add and subtract fractions with the same denominator. **1**

Round decimals with one decimal place to the nearest whole number. **1**

Compare numbers with the same number of decimal places up to two decimal places. **1**

Solve simple measure and money problems involving fractions and decimals to two decimal places. **1**

Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths. **1**

## Year 5

Read and write decimal numbers as fractions. **1**

Read, write, order and compare numbers with up to three decimal places. **1**

Solve problems which require knowing percentage and decimal equivalents of  $\frac{1}{2}$ ,  $\frac{1}{4}$ ,  $\frac{1}{5}$ ,  $\frac{2}{5}$ ,  $\frac{4}{5}$  and those fractions with a denominator of a multiple of 10 or 25. **1**

Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents. **1**

Recognise the per cent symbol and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator hundred and as a decimal. **1**

Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths. **1**

Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams. **1**

Compare and order fractions whose denominators are all multiples of the same number. **1**

Recognise mixed numbers and convert from one form to the other and write mathematical statements  $> 1$  as mixed numbers. **1**

Round decimals with two decimal places to the nearest whole number and to one decimal place. **1**

Add and subtract fractions with the same denominator and denominators that are multiples of the same number. **1**

Solve problems involving number up to three decimal places. **1**

## Year 6

Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions. **1**

Use written division methods in cases where the answer has up to two decimal places. **1**

Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts. **1**

Multiply one-digit numbers with up to two decimal places by whole numbers. **1**

Associate a fraction with division and calculate decimal fraction equivalents for a simple fraction. **1**

Use common factors to simplify fractions; use common multiples to express fractions in the same denomination. **1**

Solve problems which require answers to be rounded to specified degrees of accuracy. **1**

Identify the value of each digit to 3 decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to 3 decimal places. **1**


Divide proper fractions by whole numbers. **1**

Multiply simple pairs of proper fractions, writing the answer in its simplest form. **1**


# EYFS

Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can.





# Geometry: Properties of Shape

 Identifies when a child will meet this objective for the first time within this strand.





## Year 1

Recognise and name common 2-D and 3-D shapes, including 2-D shapes e.g. rectangles (including squares) circles and triangles, and 3-D shapes e.g. cuboids, including cubes, pyramids and spheres. 





## Year 2

Identify 2-D shapes on the surface of 3-D shapes (for example a circle on a cylinder and a triangle on a pyramid)  Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line.  Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces.  Compare and sort common 2-D and 3-D shapes and everyday objects. 







## Year 3

Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations; and describe them.  Identify right angles; recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle.  Identify horizontal and vertical lines and pairs of perpendicular and parallel lines.  Recognise angles as a property of shape or a description of a turn. 






## Year 4

Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes.  Identify lines of symmetry in 2-D shapes presented in different orientations.  Complete a simple symmetric figure with respect to a specific line of symmetry.  Identify acute and obtuse angles and compare and order angles up to two right angles by size. 

## Year 5

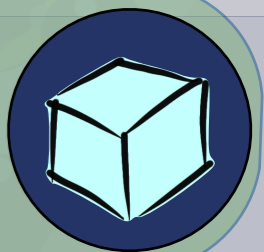
Identify angles at a point and one whole turn, angles at a point on a straight line and  $\frac{1}{4}$  a turn, other multiples of  $90^\circ$ .  Distinguish between regular and irregular polygons based on reasoning about equal sides and angles.  Know angles are measured in degrees; estimate and compare acute, obtuse and reflex angles.  Use the properties of a rectangle to deduce related facts and find missing lengths and angles.  Draw given angles and measure them in degrees.  Identify 3-D shapes, including cubes and other cuboids, from 2-D representations. 

## Year 6

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

## Geometry: Properties of Shape

The process where we identify parts of shape, including details such as its angles and the number of its sides



# EYFS

Continue, copy and create repeating patterns.

Select, rotate and manipulate shapes to develop spatial reasoning skills.

# Geometry: Position and Direction



Identifies when a child will meet this objective for the first time within this strand.

## Year 1

Describe position, direction and movement, including whole, half, quarter and three-quarter turns **1**

## Year 2

Order and arrange combinations of mathematical objects in patterns and sequences **1**

Use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns. **1**

## Year 3

## Year 4

Plot specified points and draw sides to complete a given polygon. **1**

Describe positions on a 2-D grid as coordinates in the first quadrant. **1**

Describe movements between positions as translations of a given unit to the left/right and up/down. **1**

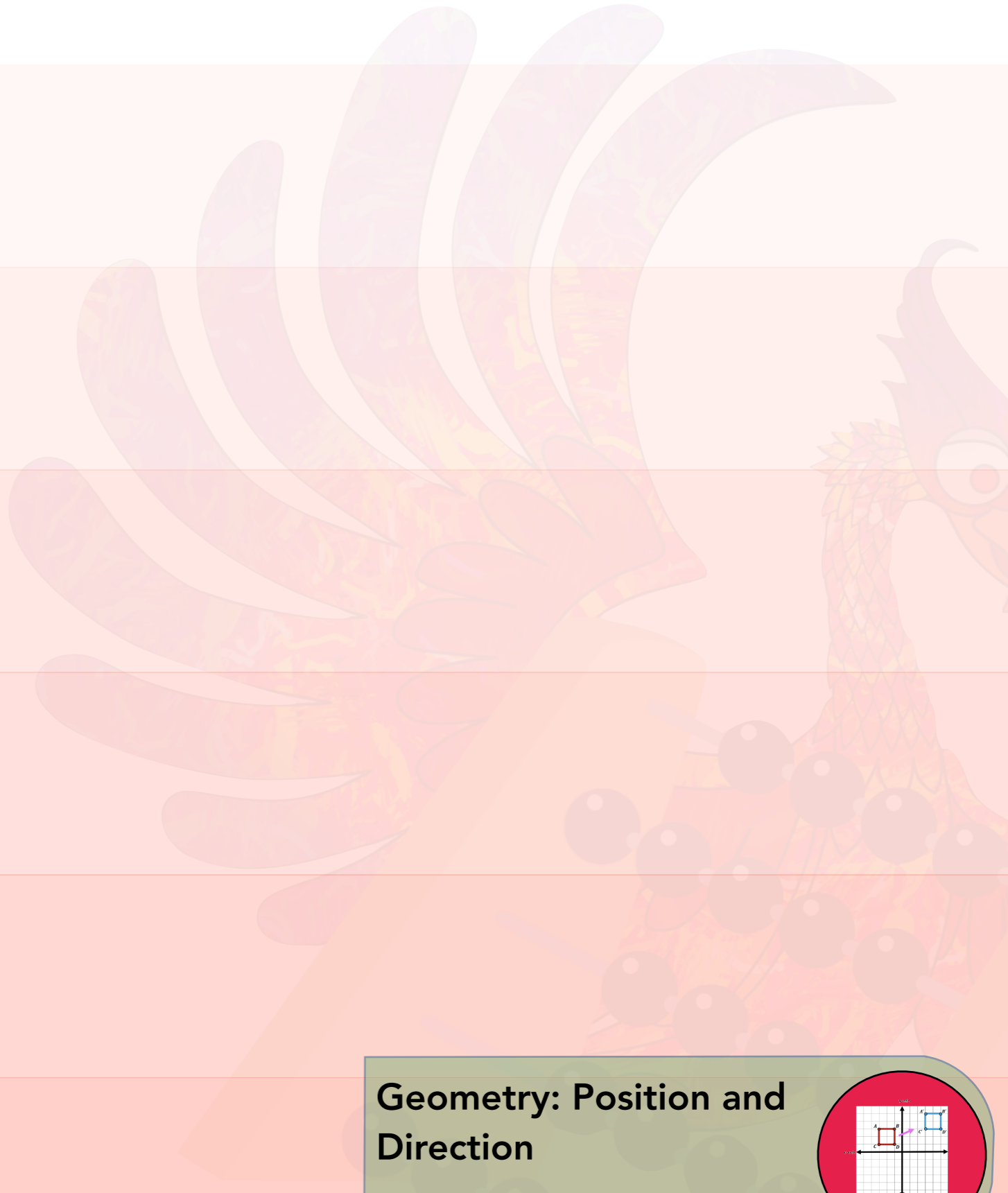
## Year 5

Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed. **1**

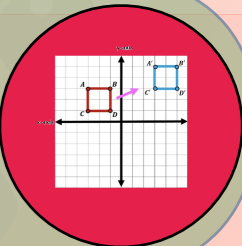
## Year 6

Draw and translate simple shapes on the coordinate plane, and reflect them in the axes.

Describe positions on the full coordinate grid (all four quadrants). **1**

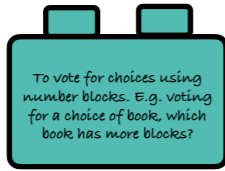


## Geometry: Position and Direction




Position in maths is the ability to describe where an object is in relation to another one. Direction involves describing how something moves, for example forwards, backwards or in a full or half turn

# EYFS



# Statistics

 Identifies when a child will meet this objective for the first time within this strand.

## Year 1


## Year 2


 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.


## Year 3

 Interpret and present data using bar charts, pictograms and tables.


 Solve one-step and two-step questions using information presented in scaled bar charts and pictograms and tables.


## Year 4

 Interpret and present discrete and continuous data using appropriate graphical methods including bar charts and time graphs.


 Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.


## Year 5

 Solve comparison, sum and difference problems using information presented in a line graph.

 Complete, read and interpret information in tables, including timetables.

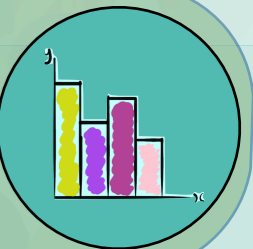
## Year 6

 Interpret and construct pie charts and line graphs and use these to solve problems.

 Calculate and interpret the mean as an average.

## Statistics

Collecting and analysing numerical data, through the use of tables, bar charts, line graphs, etc.



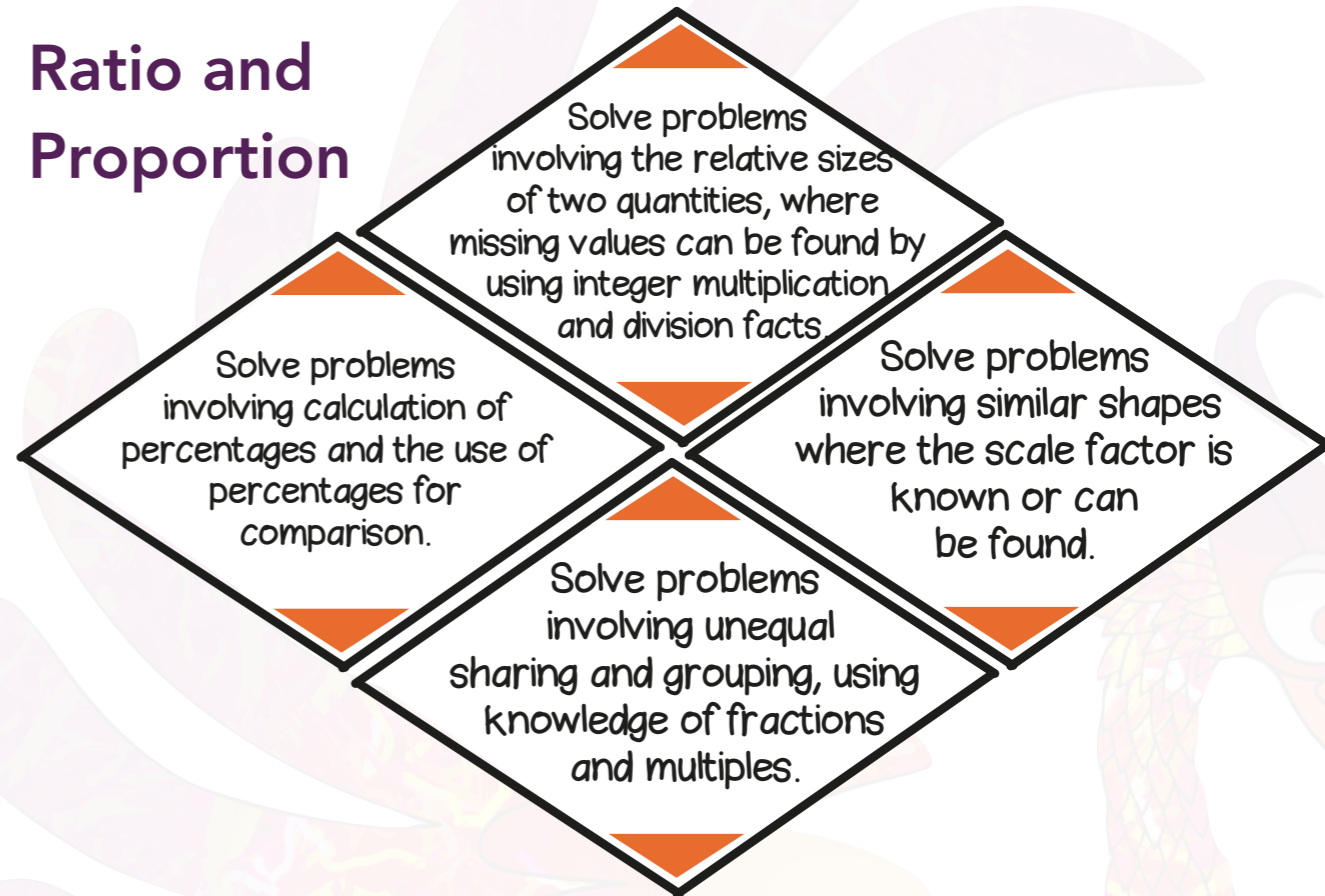
# Year 6 only strands

## Ratio & Proportion

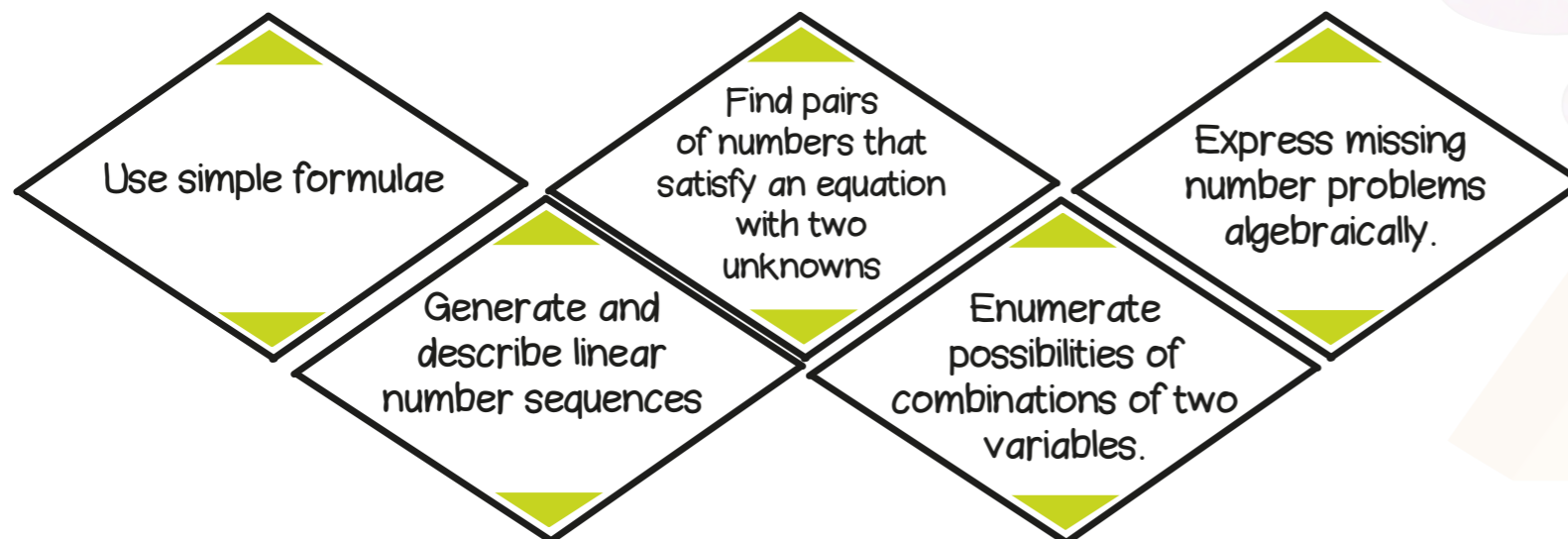
Ratio tells us how much of one thing there is in relation to another thing. E.g. 'For every 2 apples we have 3 bananas'. Proportion tells us about how much of one thing there is in relation to the whole amount of something. E.g. 'There are 50 pieces of fruit, and 1 in every 5 of those is an apple'

$$\frac{5 \text{ miles}}{8 \text{ km}}$$

## Ratio and Proportion



## Algebra



$n - 13 = 45$

### Algebra

The part of mathematics in which letters and other general symbols are used to represent numbers and quantities in formulae and equations