



Year 6

Power Maths Books A, B and C
Knowledge organisers





Year 6

Power Maths Book A
Knowledge organisers
Units 1 - 6



Unit 1

Place value within 10,000,000



We will need some maths words. Can you explain the words you have met before?

ten thousands (10,000s)

hundred thousands (100,000s)

millions (1,000,000s)

ten million (10,000,000)

place value

partition

interval

estimate

compare

order

rounding

negative

positive



In this unit we will ...

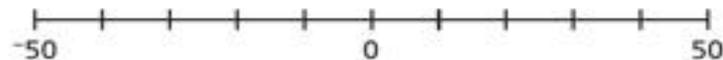
- ⚡ Learn to read and write numbers to 10,000,000
- ⚡ Partition, compare and order numbers up to 10,000,000
- ⚡ Round numbers
- ⚡ Work with negative numbers

Do you remember what this is called?
We will use it to help identify the place value of digits in a number.

M	HTh	TTh	Th	H	T	O
1	0	0	0	0	0	0



We will use this too! Can you find what the unlabelled values are?



Unit 2

Four operations 1



In this unit we will ...

- ⚡ Use written methods for addition and subtraction
- ⚡ Learn to use column multiplication
- ⚡ Learn different written methods for division
- ⚡ Learn checking strategies for our calculations

Do you remember what this model is called? We will use it to represent different multiplication calculations. What calculation is being shown here?

	3,000	400	50	6
7	21,000	2,800	350	42



We will need some maths words. Can you identify and explain the ones you already recognise?

column addition

column multiplication

short division

long division

remainder

factor

estimate

We could use this to help us represent division calculations. Can you explain how it has been used here?

$$750 \div 15$$

750		
-----	--	--

250	250	250
-----	-----	-----

50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
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Unit 3

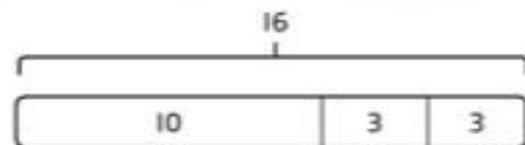
Four operations 2



In this unit we will ...

- ⚡ Find common factors and multiples
- ⚡ Learn about prime, square and cube numbers
- ⚡ Learn about the order of operations
- ⚡ Solve mental calculations

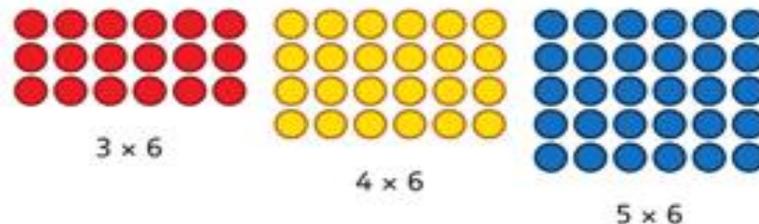
Do you remember what this model is called? We will use it to represent different calculations. Can you tell what calculation is being represented here?



We will need some maths words. Can you identify and explain the ones you recognise?

- | | | |
|-----------------|---------------------|-------------------|
| factor | common factor | common multiple |
| prime | composite | squared (x^2) |
| cubed (x^3) | order of operations | |
| brackets | inverse operation | |

We will need to remember multiplication facts. We could use arrays of counters to help us!



Unit 4

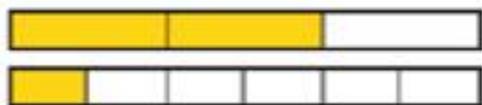
Fractions 1



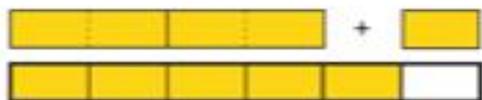
In this unit we will ...

- ⚡ Simplify fractions
- ⚡ Compare and order fractions
- ⚡ Add and subtract fractions including mixed numbers
- ⚡ Solve problems involving adding and subtracting fractions

Do you remember how to add two fractions where one denominator is a multiple of another?



$$\frac{2}{3} + \frac{1}{6}$$



$$\frac{2}{3} + \frac{1}{6} = \frac{5}{6}$$



We will need some maths words. Do you know what they all mean?

numerator denominator
 common denominator common factor equivalent
 simplify simplest form factor
 highest common factor lowest common multiple (LCM)
 compare order ascending descending
 proper fraction improper fraction
 mixed number convert
 lowest common denominator equivalent

We also need to be able to find where a fraction is on a number line.



Unit 5

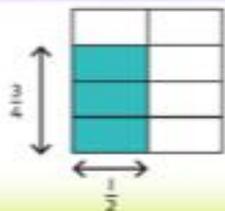
Fractions 2



In this unit we will ...

- ⚡ Multiply any fraction by a whole number or another fraction
- ⚡ Divide a fraction by a whole number
- ⚡ Solve problems involving all four operations with fractions
- ⚡ Solve problems involving a fraction of an amount

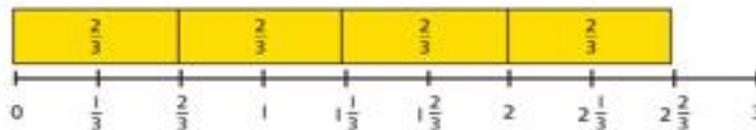
You will be able to multiply a fraction by a fraction by showing each fraction on the side of a grid. What is $\frac{1}{2} \times \frac{3}{4}$?



We will need some maths words. How many of these can you remember?

numerator denominator whole number
 mixed number proper fraction
 improper fraction convert simplify

We can use a fraction strip above a number line to help us multiply a fraction by a whole number and convert between improper fractions and mixed numbers. What is $\frac{2}{3} \times 4$ as a mixed number?



Unit 6

Geometry – position and direction



We will need some maths words. Which ones have you seen before?

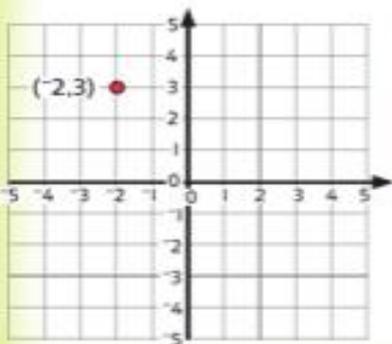
quadrant	four quadrants	translate
translation	x-axis	y-axis
axes	horizontal	vertical
vertex	reflect	reflection

We will need this too! Can you work out how we could describe the position of the point on the grid?

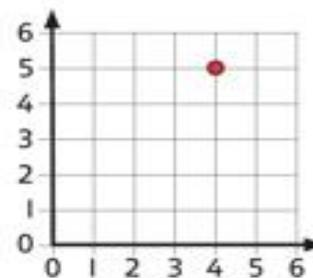


In this unit we will ...

- ⚡ Look at how we can use coordinates to describe the position of a point on a grid
- ⚡ Look at how coordinates can have positive or negative values
- ⚡ Explore how we can use our knowledge of properties of shape to help us solve problems on a coordinate grid
- ⚡ Explore how we can move and change shapes on a coordinate grid, through translations and reflections



We are going to use grids like this in this unit. How is it different to what you have met before?





Year 6

Power Maths Book B
Knowledge organisers
Units 7 - 12



Unit 7

Decimals



In this unit we will ...

- ⚡ Recognise the value of each digit in a decimal number
- ⚡ Multiply and divide decimals by 10, 100 and 1,000
- ⚡ Convert between fractions and decimals
- ⚡ Multiply and divide decimals by single digit numbers

Do you remember using place value grids?

H	T	O	•	Tth	Hth	Thth
			•			



We will need some maths words. Have you used any of these before? What can you remember about fractions?

multiply divide decimal
 decimal place (dp) recurring decimal
 placeholder place value
 tenths hundredths thousandths
 products fraction

Can you identify the value of each digit?
 Explain how you know to your partner.

H	T	O	•	Tth	Hth	Thth
3	0	4	•	9	0	8



Unit 8

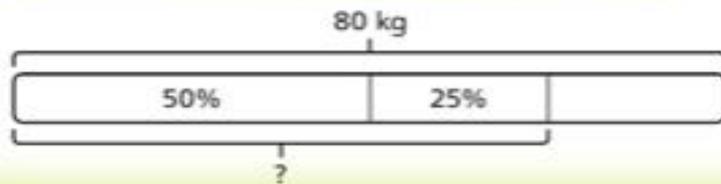
Percentages



In this unit we will ...

- ⚡ Develop a deeper understanding of percentages as parts of 100
- ⚡ Understand a range of methods to work out percentages
- ⚡ Find 1% and multiples of 1%
- ⚡ Work out missing values, such as 30% of ? = 60
- ⚡ Convert, order and solve problems involving fractions, percentages and decimals

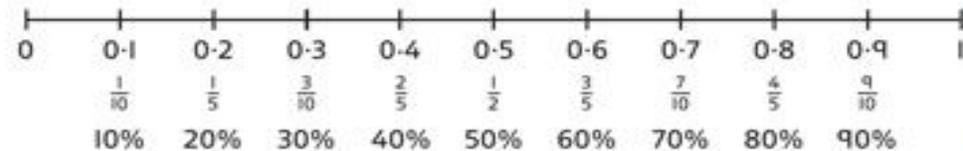
Do you remember what this model is called?
It can be used to represent percentages of amounts and to solve problems.



We will need some maths words.
Do you know what they all mean?

	per cent (%)	percentage	
parts	whole	decimal	fraction
divide	share	multiply	convert
compare	order	equivalent	fraction
simplify	less than (<)	greater than (>)	

We will need to use a number line too.
You can use this to help you to order decimals, fractions and percentages.



Unit 10

Measure – imperial and metric measures



In this unit we will ...

- Choose the most appropriate metric units of measurement to measure different things
- Convert between metric units, between imperial units and from one to the other
- Solve problems involving metric units
- Recognise the difference between metric and imperial units of measurement and what they are worth

What is 1 inch about the same as?
What are 5 inches about the same as?

5 inches

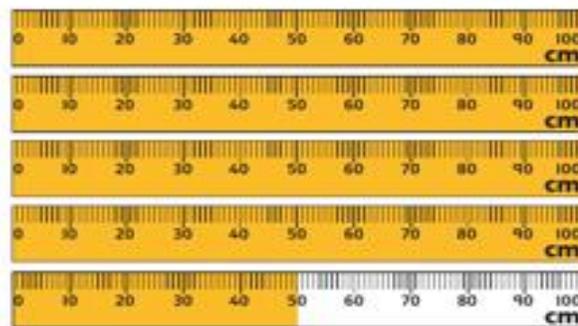
1 inch				
2.5 cm				



Here are some maths words we will be using.
Which words are new to you?

	metric	imperial	
	units of measurement (or measure)		
grams (g)	kilograms (kg)	pounds (lbs)	
ounces (oz)	mass	millilitres (ml)	
litres (l)	pints	capacity	millimetres (mm)
centimetres (cm)	metres (m)	kilometres (km)	
inches (in)	feet (ft)	yards	miles length
convert	conversion table	conversion graph	

If there are 100 cm in a metre, how would you convert 4.5 metres into centimetres?



1 m = 100 cm



Unit II

Measure – perimeter, area and volume



Here are some maths words we will be using. Which words are new?

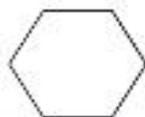
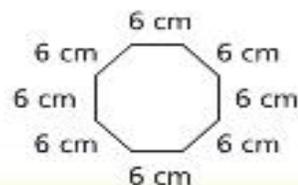
area	volume	perimeter
parallelogram	height	enclosed
width	length	square centimetres (cm ²)
square metres (m ²)	base	estimate
formula	compound shape	
cubic centimetres (cm ³)	cubic metres (m ³)	



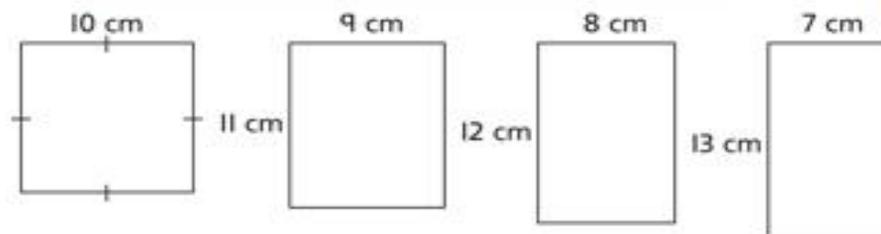
In this unit we will ...

- ⚡ Find and draw shapes with the same area or perimeter
- ⚡ Explore how the perimeter changes when the area changes and vice versa
- ⚡ Calculate the area of parallelograms and triangles
- ⚡ Calculate and estimate the volume of cubes and cuboids

The regular octagon and regular hexagon have the same perimeter. What is the length of one side of the hexagon?



Describe the pattern. Draw the next shape. Which shape has the largest perimeter? Which has the largest area? How do you know?



Unit 12

Ratio and proportion



In this unit we will ...

- ⚡ Calculate ratios
- ⚡ Use ratios to work out amounts
- ⚡ Enlarge shapes by a scale factor
- ⚡ Identify similar shapes
- ⚡ Solve problems involving ratio

We will use bar models to represent ratio problems. For every 1 slice of carrot cake there are 4 slices of lemon cake. If there are 20 slices in total, how many slices are carrot?



We will need some maths words. We will also often be using the phrase, 'For every ... there are ...'. What do you think it might mean?

ratio	proportion	part
whole	scale	scale factor
	similar	notation

We will need to know our multiplication and division facts. Write three multiplication or division facts that match this one.

$$8 \times 9 = \square$$





Year 6

Power Maths Book C
Knowledge organisers
Units 13 - 15



Unit 13

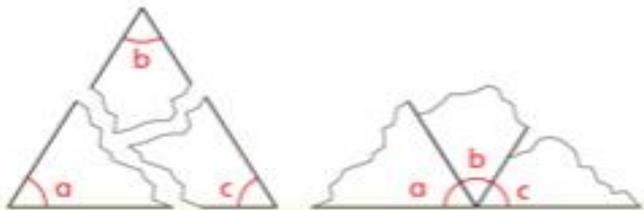
Geometry – properties of shapes



In this unit we will ...

- ⚡ Measure angles and draw shapes accurately using a ruler and protractor
- ⚡ Calculate unknown angles in shapes and on lines using angle facts
- ⚡ Explore properties of polygons and circles
- ⚡ Identify 3D shapes from 2D representations
- ⚡ Draw multiple nets for a 3D shape

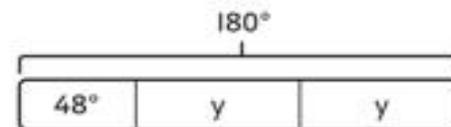
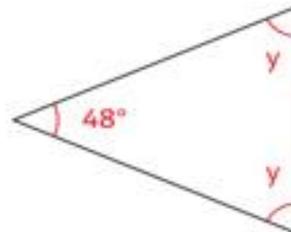
How can you use your knowledge of angles on a straight line to work out what the interior angles of a triangle add up to?



We will need some maths words. Which ones do you recognise? What do they mean?

degree angle obtuse acute reflex
right angle protractor triangle isosceles
equilateral scalene regular polygon quadrilateral
parallelogram kite rhombus trapezium diameter
radius circumference concentric perimeter
net pyramid tetrahedron cylinder prism
vertically opposite angles cuboid cube

We also need to be able to use bar models to calculate unknown angles. How can you work out the size of this angle without measuring?



Unit 14

Problem solving



In this unit we will ...

- ⚡ Solve problems about number, including fractions and ratio
- ⚡ Use representations to help make sense of problems
- ⚡ Use the four operations flexibly
- ⚡ Reason about problems with a context and without a context
- ⚡ Apply understanding of measurement and geometry to solve problems

In previous units, we used the four operations to solve calculations. Which operations do you need to find the value of the triangle?

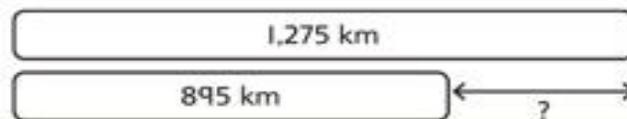
$$\triangle + \triangle - 120 = 300$$



We will need some maths words. Which ones do you remember?

partition	estimate	round
compare	equivalent	percentage
ratio	proportion	convert
common denominator		coordinates
translation	reflection	vertex
scaling	isosceles triangle	

We will also use bar models and number lines. What values do the question marks represent in the number line and bar model?



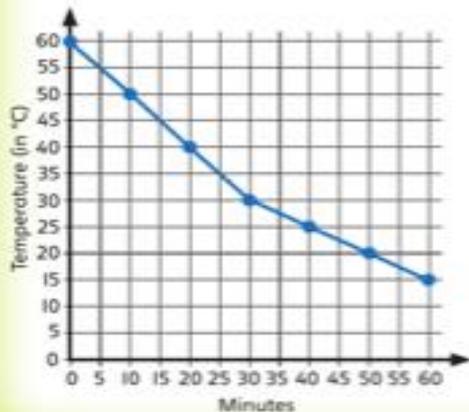
Unit 15

Statistics



In this unit we will ...

- ⚡ Learn to calculate the mean of a set of data
- ⚡ Use the mean to find missing data
- ⚡ Read and interpret pie charts using fractions
- ⚡ Read and interpret pie charts using percentages
- ⚡ Interpret and create line graphs



We will be interpreting line graphs.

Here is a line graph that shows the temperature of a hot chocolate drink that was left to cool.

What was the temperature of the hot chocolate after ten minutes?



We will need some maths words. Which ones do you recognise?

mean average
pie chart segment line graph
bar chart percentage
fraction data

We need to know that the angles around a point add up to 360° . Calculate the missing angle.

