



# Year 5

Power Maths Books A, B and C  
Knowledge organisers





# Year 5

Power Maths Book A  
Knowledge organisers  
Units 1 - 6



# Unit 1

## Place value within 100,000



In this unit we will ...

- ⚡ Find the value of each digit in numbers to 100,000
- ⚡ Partition numbers in different ways
- ⚡ Round numbers
- ⚡ Compare and order numbers up to 100,000
- ⚡ Represent numbers in different ways, including with Roman numerals

In Year 4, we used a place value grid and counters to represent numbers. What number does this show?

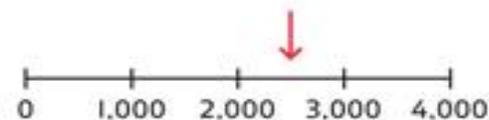
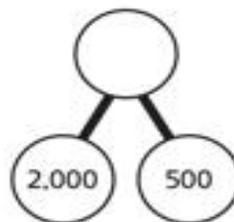
Th	H	T	O
●●	●●●	●●●●	●



We will need some maths words. Which of these have you met before?

ones (1s)      tens (10s)      hundreds (100s)  
 thousands (1,000s)      ten thousands (10,000s)  
 place value      partition      estimate  
 round      compare      order      equivalent  
 greater than (>)      less than (<)      convert

We will also use part-whole models and number lines. What number do these both represent?



# Unit 2

## Place value within 1,000,000



In this unit we will ...

- ⚡ Understand the value of any digit in a number up to 1,000,000
- ⚡ Compare and order numbers to 1,000,000
- ⚡ Round numbers to the nearest 10, 100, 1,000, 10,000 and 100,000
- ⚡ Use negative numbers
- ⚡ Create number sequences

We need to be able to extend the place value grid to include millions.

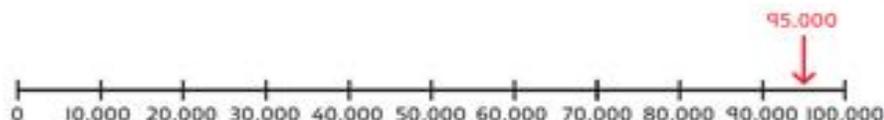
M	HTh	TTh	Th	H	T	O



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

ones (1s)      tens (10s)      hundreds (100s)  
 thousands (1,000s)      ten thousands (10,000s)  
 hundred thousands (100,000s)      million (1,000,000)  
 round      order      ascending      descending  
 less than (<)      greater than (>)      sequence

We need to be able to use a number line and recognise where each number lies on a number line.



# Unit 3

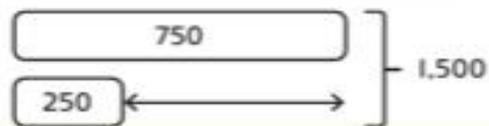
## Addition and subtraction



In this unit we will ...

- ⚡ Add and subtract numbers with up to 5 digits
- ⚡ Use the column method for addition and subtraction
- ⚡ Round numbers to estimate answers to problems
- ⚡ Add and subtract mentally
- ⚡ Solve problems involving addition and subtraction

What information does this comparison bar model give you?  
What can you use it to work out?

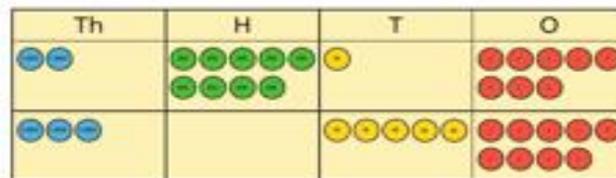


We will need some maths words.  
How many of these can you remember?

add      subtract      ones (1s)      tens (10s)  
hundreds (100s)      thousands (1,000s)  
ten thousands (10,000s)      mentally  
inverse      round      estimate  
distance chart

Laying a calculation out neatly in columns can help us to understand the value of each digit.

$$\begin{array}{r}
 \text{Th} \quad \text{H} \quad \text{T} \quad \text{O} \\
 2 \quad 9 \quad 1 \quad 8 \\
 + 3 \quad 0 \quad 5 \quad 9 \\
 \hline
 5 \quad 9 \quad 7 \quad 7
 \end{array}$$



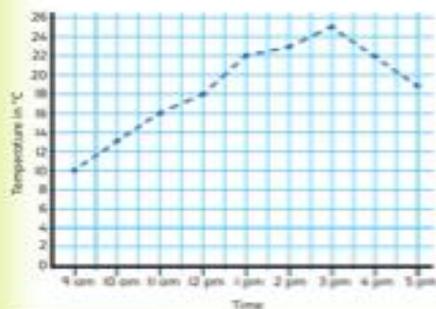
# Unit 4

## Graphs and tables



In this unit we will ...

- ⚡ Read information from tables
- ⚡ Understand and create two-way tables
- ⚡ Read information from line graphs
- ⚡ Answer questions relating to the information in graphs and tables
- ⚡ Draw simple line graphs



You will be able to draw a line graph from data in a table. Can you see how the line graph has been drawn?



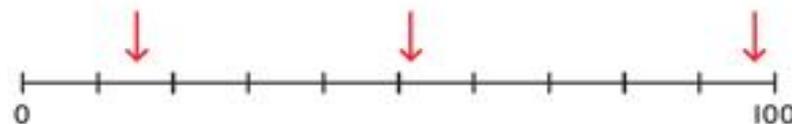
Time	9 am	10 am	11 am	12 pm	1 pm	2 pm	3 pm	4 pm	5 pm
Temp (°C)	10	13	16	18	22	23	25	22	19



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

graph	line graph	table
dual line graph	horizontal	vertical
two-way table	scale	axis/axes
data	kilometres (km)	kilograms (kg)
plot/plotted	tallies/tally	digits

You can think of the axes like number lines. What numbers are missing from the number line? What are the arrows pointing to?



# Unit 5

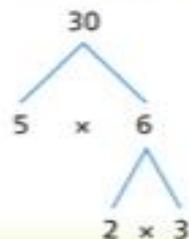
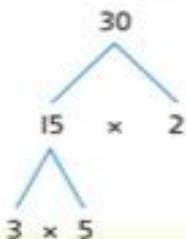
## Multiplication and division 1



In this unit we will ...

- ⚡ Recognise and find multiples and factors
- ⚡ Recognise and identify prime numbers
- ⚡ Calculate square and cube numbers
- ⚡ Use inverse operations
- ⚡ Multiply and divide by 10, 100 and 1,000
- ⚡ Multiply and divide by multiples of 10, 100 and 1,000

Do you know what these are called? We will use them to help us find factors!



We will need some maths words. Look for the words you do not already know. What might they mean?

prime number	composite number	
square number	cube number	square ( $x^2$ )
cube ( $x^3$ )	inverse operation	multiply
divide	multiple	factor
		prime factor

We will use multiplication squares too! They will help us spot patterns in the numbers we learn about!

x	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144



# Unit 6

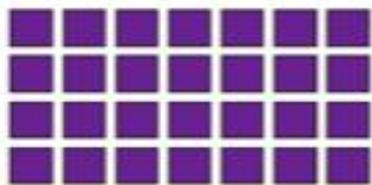
## Measure – area and perimeter



In this unit we will ...

- ⚡ Measure shapes to find their perimeter
- ⚡ Calculate the perimeter of squares, rectangles and other rectilinear shapes
- ⚡ Use a formula to find the area of squares and rectangles
- ⚡ Estimate the area of different shapes

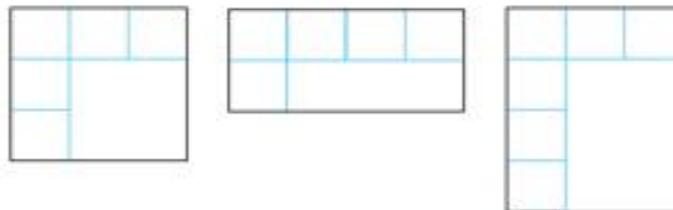
How many rows? How many in each row? How many altogether?



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

perimeter      distance      area      space  
length      width  
centimetres      square centimetres (cm<sup>2</sup>)  
metres      square metres (m<sup>2</sup>)      scale  
compare      estimate      formula  
2D shape      brackets

Which shape has the largest area?  
How do you know?





# Year 5

Power Maths Book B  
Knowledge organisers  
Units 7 - 11



# Unit 7

## Multiplication and division 2



In this unit we will ...

- ⚡ Multiply a number up to 4 digits by a 1- or 2-digit number
- ⚡ Divide a number up to 4 digits by a 1-digit number
- ⚡ Interpret remainders
- ⚡ Solve problems involving multiplication, division and remainders

How can you use the grid method to work out  $17 \times 4$ ?

	17	
	┌───┬───┐	
	10      7	
4	10 × 4 = 40	7 × 4 = 28

	T O
	4 0
+	2 8
	6 8

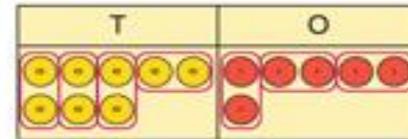


We will need some maths words.  
Do you know what they all mean?

multiply	divide	add	subtract
	place value	partition	
equal	factor	multiple	
remainder	sum	total	

We also need to be able to use the short division method.

$$2 \overline{) 86}$$



# Unit 8

## Fractions 1



In this unit we will ...

- ⚡ Find and use equivalent fractions
- ⚡ Convert between improper fractions and mixed numbers
- ⚡ Compare and order fractions
- ⚡ Understand fractions as division
- ⚡ Use fractions to show remainders

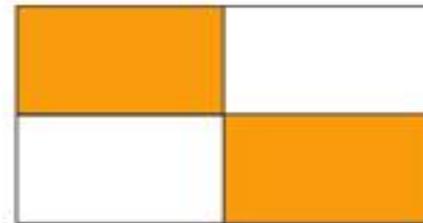
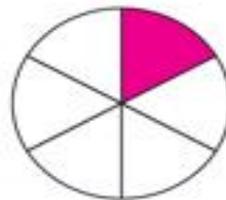
Do you remember what this model is called? We will use it to represent mixed numbers and improper fractions. Can you tell which is which?



We will need some maths words. Do you know what they all mean? Can you identify and explain the ones you already recognise?

equivalent	numerator	denominator
whole	fraction	simplify
expand	division	improper
mixed number	convert	sequence
order	greater than (>)	less than (<)
equal to (=)		

We will need to represent different fractions. What fractions are shown here?



# Unit 9

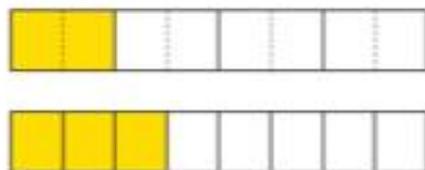
## Fractions 2



In this unit we will ...

- ⚡ Add and subtract fractions with the same denominator
- ⚡ Add and subtract fractions, including mixed numbers, where one denominator is a multiple of the other
- ⚡ Solve word problems involving fractions

How can you add these two fractions?



$$\frac{2}{5} + \frac{3}{5}$$



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

add	subtract	proper fraction
improper fraction	convert	simplify
equivalent fraction	mixed number	
	denominator	numerator
whole	efficient	common denominator

We need to be able to convert between mixed numbers and improper fractions.  
Use your skills to convert  $2\frac{1}{3}$  into an improper fraction.



# Unit 10

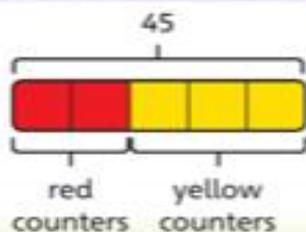
## Fractions 3



In this unit we will ...

- ⚡ Multiply proper fractions and mixed numbers by whole numbers
- ⚡ Find a fraction of an amount
- ⚡ Understand how fractions can be operators
- ⚡ Solve word problems involving fractions

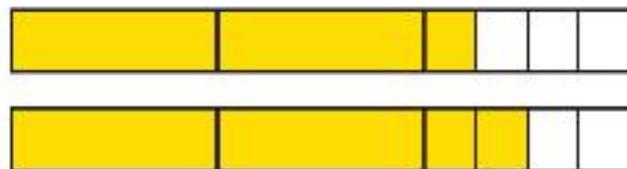
How can you work out what each part is worth? How many yellow counters are there?



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

multiply	proper fraction	
improper fraction	mixed number	
whole(s)	equal parts	divide
fraction of an amount	operator	
numerator	denominator	convert

We will also need to represent fractions and mixed numbers using fraction strips. Use this model to work out  $2\frac{1}{4} + 2\frac{2}{4}$ .



# Unit II

## Decimals and percentages



In this unit we will ...

- ⚡ Read and write decimals up to three decimal places, including numbers greater than 1
- ⚡ Round decimals to nearest whole number and to one decimal place
- ⚡ Order and compare decimal numbers up to three decimal places
- ⚡ Write percentages as fractions and as decimals.

Do you remember what this is called? We use it to understand the place value of digits in a number. How would you place 0.034 into the grid?

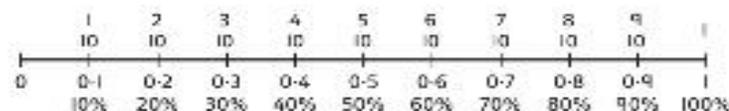
0	.	Tth	Hth	Thths
	.			



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

decimal	decimal place	tenths
hundredths	thousandths	decimal point
place value	digits	fractions
per cent (%)	percentages	

We need to use the number line too. Use it to help you show equivalent fractions, decimals and percentages.





# Year 5

Power Maths Book C  
Knowledge organisers  
Units 12 - 17



# Unit 12

## Decimals



In this unit we will ...

- ⚡ Add and subtract decimals with the same number of digits after the decimal point
- ⚡ Add and subtract decimals with a different number of digits after the decimal point
- ⚡ Add whole numbers to decimals
- ⚡ Subtract decimals from whole numbers
- ⚡ Solve problems involving addition and subtraction of decimals including money problems
- ⚡ Multiply and divide decimals and whole numbers by 10, 100 and 1,000

We will need to use column methods.  
How can we add these two numbers?

H	T	O
1	2	6
+	7	5

$$\begin{array}{r} \text{H T O} \\ 1 \ 2 \ 6 \\ + \quad 7 \ 5 \\ \hline \\ \hline \end{array}$$



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

add	subtract	decimal	tenths
hundredths	thousandths	multiply	
divide	decimal point	whole	
column	exchange	place value	
	decimal place	digit	

We also need to be able to subtract numbers.

Can you remember a way of making 500 - 367 easier?

Why are these two calculations the same?

$$\begin{array}{r} \text{H T O} \\ 5 \ 0 \ 0 \\ - \ 3 \ 6 \ 7 \\ \hline \\ \hline \end{array}$$

$$\begin{array}{r} \text{H T O} \\ 4 \ 9 \ 9 \\ - \ 3 \ 6 \ 6 \\ \hline \\ \hline \end{array}$$



# Unit 13

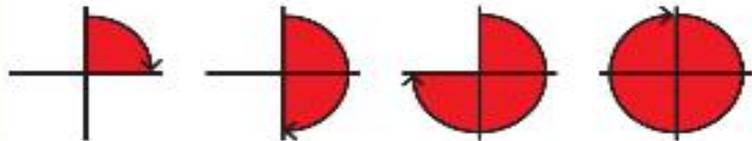
## Geometry – properties of shapes 1



In this unit we will ...

- ⚡ Measure angles in degrees
- ⚡ Learn to measure angles with a protractor
- ⚡ Draw lines and angles accurately
- ⚡ Calculate missing angles
- ⚡ Learn about angles in shapes

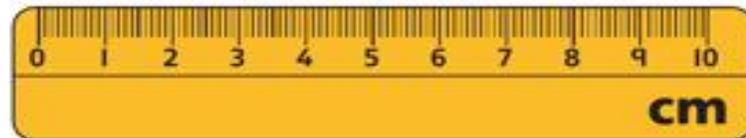
Do you remember about measuring angles as turns?



We will need some maths words. Which one can mean an angle that is a quarter turn?

angle	whole turn	right angle
acute angle	obtuse angle	reflex angle
	degrees ( $^{\circ}$ )	interior angle
clockwise	anticlockwise	orientation

We will need this too! Can you see where the mark for 55 mm is?



# Unit 14

## Geometry – properties of shapes 2



In this unit we will ...

- ⚡ Recognise and draw parallel lines
- ⚡ Recognise and draw perpendicular lines
- ⚡ Label parallel and perpendicular lines with the correct notation
- ⚡ Accurately identify regular and irregular polygons
- ⚡ Recognise different 3D shapes from different views

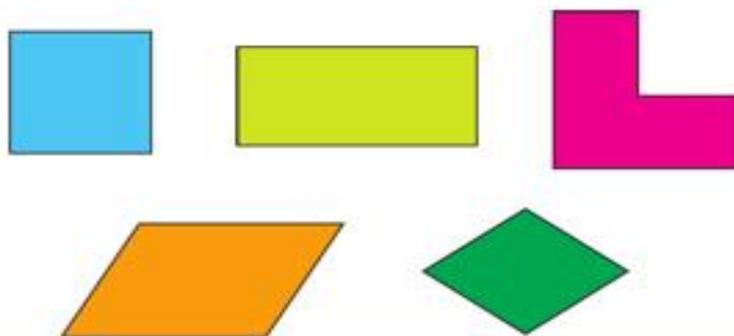
Do you remember how to spot parallel lines? Can you see the pair that are not parallel?



We will need some maths words. Which one can mean an angle inside a 2D shape?

parallel	perpendicular	angle	
right angle	interior angle	quadrilateral	
view	regular	irregular	
3D shape	pyramid	sphere	cone
hexagon	pentagon	triangle	
top view	plan view	side view	

We need to recognise shapes too. Can you find the one that is not a quadrilateral?



# Unit 15

## Geometry – position and direction



Here are some maths words we will be using. Are any of these words new?

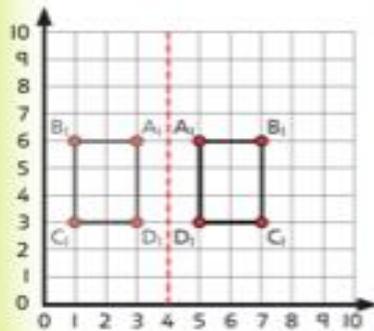
reflection      translation      vertex  
vertices      coordinates      mirror line  
horizontal axis      vertical axis



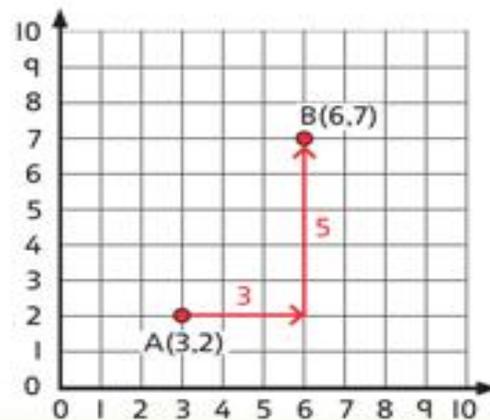
In this unit we will ...

- ⚡ Learn to reflect simple 2D shapes in vertical and horizontal lines
- ⚡ Plot and find coordinates of a reflected point on a grid
- ⚡ Use coordinates to calculate new points of a reflected shape
- ⚡ Translate 2D shapes on grid paper
- ⚡ Use coordinates to find translations

We need to be able to work out the distance between coordinates on a grid. How far apart are the coordinates A and B?



We will be reflecting shapes in a mirror line and using coordinates. What are the coordinates of this reflected shape? Do you notice anything about the reflection?



# Unit 16

## Measure – converting units



Here are some maths words we will be using.  
Are any of these words new?

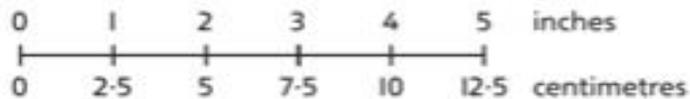
convert	metric units	imperial units
kilo	kilogram	gram
centimetre	metre	millimetre
litre	millilitre	pound (lb)
inch (in)	foot (ft)	ounce (oz)
pint	gallon	yard (yd)
approximately		stone (st)
		timetable



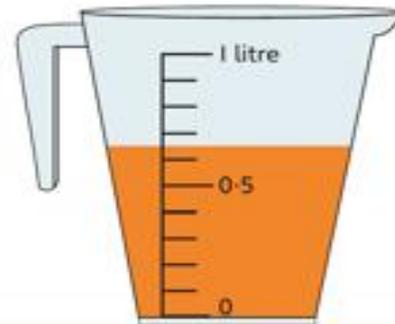
In this unit we will ...

- ⚡ Convert between metric units of length, mass and capacity
- ⚡ Recognise imperial units and understand how to convert them into metric units
- ⚡ Convert between units of time
- ⚡ Read timetables and understand the information they show
- ⚡ Solve problems based on measures

How many centimetres are approximately the same as 5 inches?



How many millilitres of orange juice are in this jug?



# Unit 17

## Measure – volume and capacity



In this unit we will ...

- ⚡ Learn what the volume of a shape is
- ⚡ Find volumes of shapes by counting unit cubes
- ⚡ Draw shapes with different volumes
- ⚡ Compare the volume of different shapes
- ⚡ Estimate the capacity of different shapes

How many unit cubes are used to make this cube?



We will need some maths words. Which of these are new?

volume	cube	cuboid	3D shape
solid	capacity	calculate	
estimate	unit cubes		
least	greatest		

Which container do you think has the greatest capacity? Why?

