

Fractions

Knowledge Organiser

Key Vocabulary

numerator

denominator

unit fraction

non-unit fraction

equivalent

halves

thirds

quarters

fifths

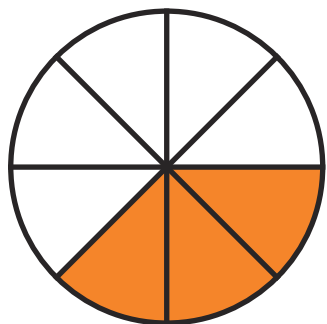
sixths

eighths

tenths

decimal tenths

Recognising Fractions



$\frac{3}{8}$

Numerator

How many equal parts of the whole are needed?

Denominator

How many equal parts are in the whole?

Comparing Fractions

$\frac{1}{3}$

Less than

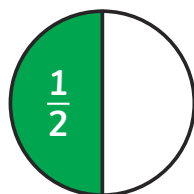
$\frac{2}{3}$

$\frac{4}{5}$

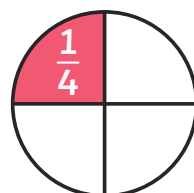
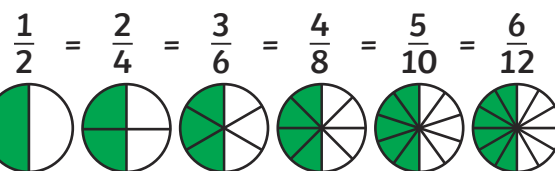
Greater than

$\frac{3}{5}$

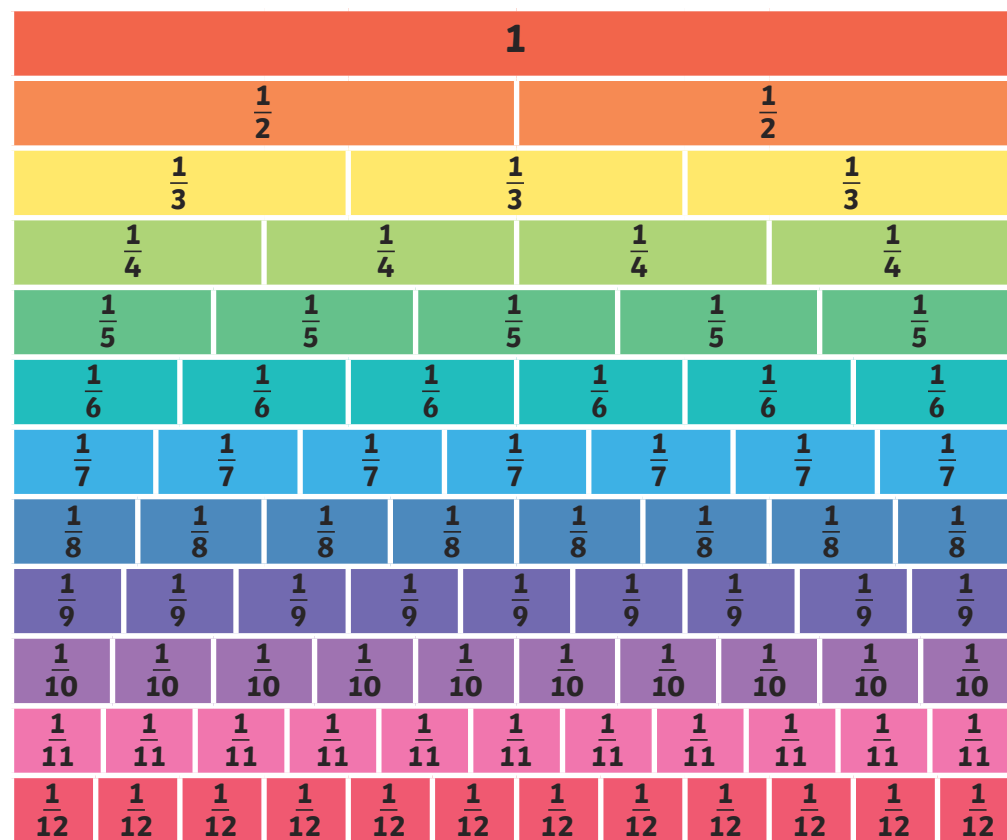
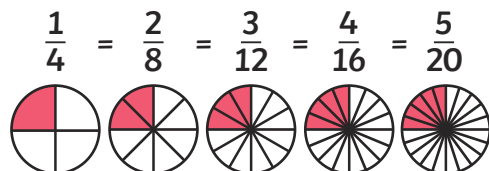
Equivalent Fractions



is equal to...



is equal to...



Fractions

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Add and Subtract Fractions

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



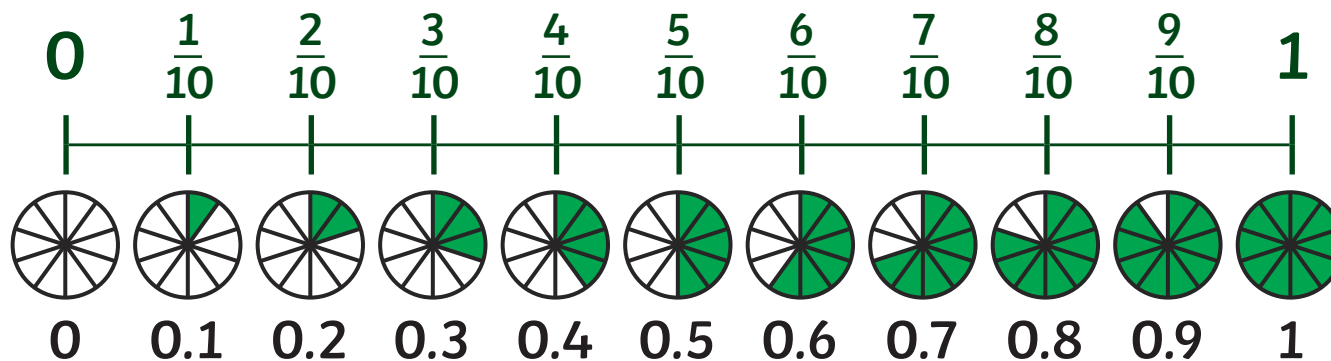
$$\frac{3}{7} + \frac{2}{7} = \frac{5}{7}$$



$$\frac{5}{6} - \frac{2}{6} = \frac{3}{6}$$



Tenths



Fractions of Amounts

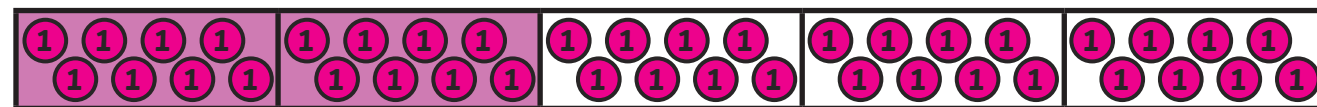
$$\frac{1}{4} \text{ of } 24 = 6$$



$$\frac{1}{3} \text{ of } 72 = 24$$



$$\frac{2}{5} \text{ of } 40 = 16$$



Key Vocabulary

Analogue and Digital Clocks

12-hour time

24-hour time

Roman numerals

analogue

digital

hours

minutes

seconds

o'clock

half past

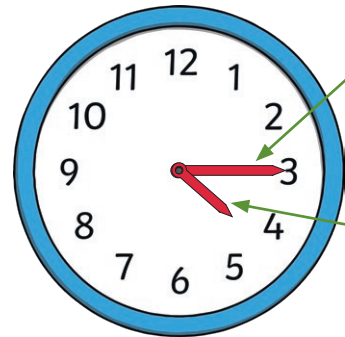
quarter past

quarter to

midday

midnight

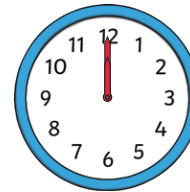
noon

**Minute Hand**

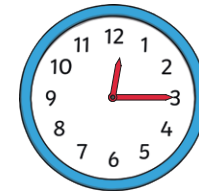
The long hand points to the minutes past or the minutes to the hour.

Hour Hand

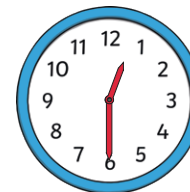
The short hand points to the hour. If this hand is pointing between hours, it is either past the earlier hour or to the later hour.



twelve
o'clock



quarter past
twelve

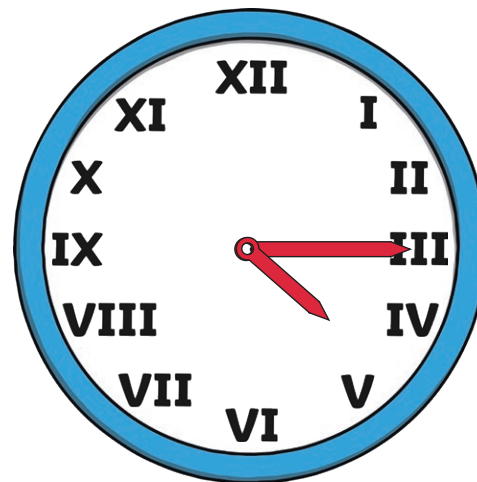


half past
twelve



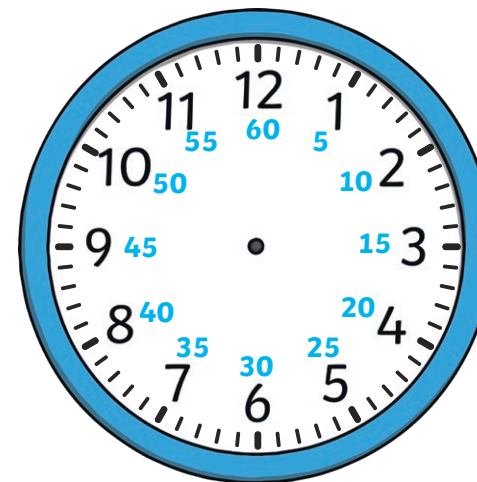
quarter to
one

Time and Roman Numerals



Hours, Minutes and Seconds

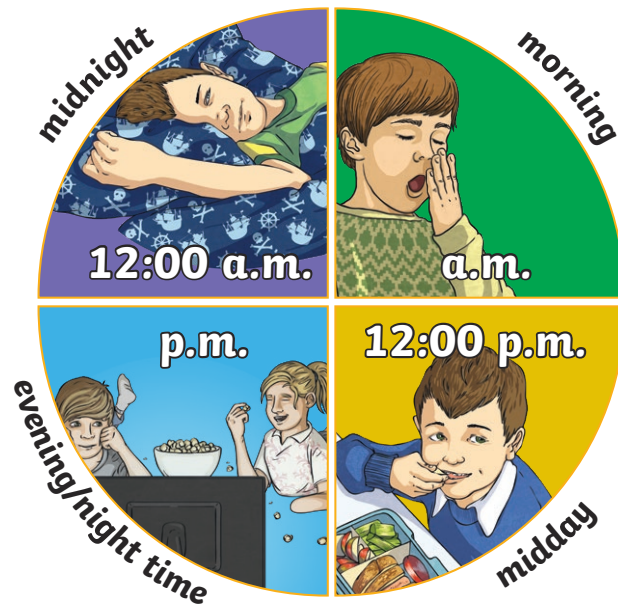
There are
60 seconds
in an minute.



There are
60 minutes
in an hour.

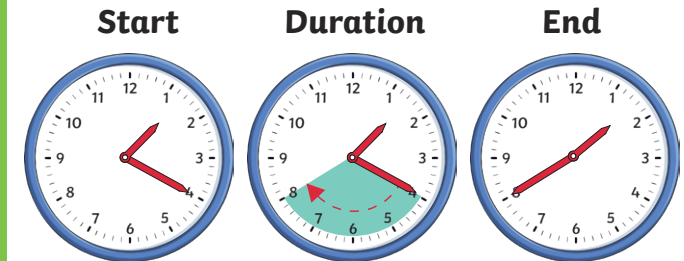
24-Hour Time

There are 24 hours
in a day.



	13:00	1 p.m.	1 o'clock	
	14:00	2 p.m.	2 o'clock	
	15:00	3 p.m.	3 o'clock	
	16:00	4 p.m.	4 o'clock	
	17:00	5 p.m.	5 o'clock	
	18:00	6 p.m.	6 o'clock	
	19:00	7 p.m.	7 o'clock	
	20:00	8 p.m.	8 o'clock	
	21:00	9 p.m.	9 o'clock	
	22:00	10 p.m.	10 o'clock	
	23:00	11 p.m.	11 o'clock	
	00:00	12 a.m.	12 o'clock	

Calculate Durations of Time



20 minutes has passed.

Compare Durations of Time

Compare the time using the vocabulary 'longer' and 'shorter'.

180 seconds	is the same as	3 minutes.
90 minutes	is shorter than	2 hours.
48 hours	is longer than	1 day.

Addition and Subtraction

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Key Vocabulary

add

total

plus

sum

more

altogether

difference

subtract

less

minus

take away

column addition

column subtraction

exchange

estimate

inverse operation

solve problems

number facts

place value



Addition and Subtraction Methods

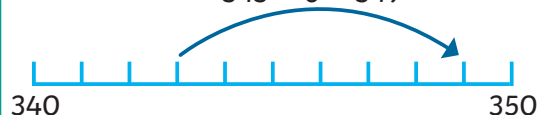
3 digit and 1 digit numbers

Not crossing 10s

$$268 - 4 = 264$$

Hundred	Ten	Ones

$$343 + 6 = 349$$



Crossing 10s (Exchanging)

324		
300	20	4
300	10	14

$$316 + 8 = 324$$

316	8

$$324 - 8 = 316$$

3-digit and 2-digit numbers

Add and subtract tens

Hundred	Ten	Ones

$$451 + 3 \text{ tens} = 481 \quad (5 + 3 = 8)$$

$$451 - 4 \text{ tens} = 411 \quad (5 - 4 = 1)$$

Crossing 10s (Exchanging)

$$258 + 80 = 338$$

- Column method
- Count in 10s mentally
- Add 100, subtract 20

Crossing 10 and 100

$$\begin{array}{r} 368 \\ +73 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 368 \\ -73 \\ \hline 8 \end{array}$$

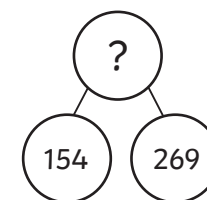
3-digit numbers

Not crossing

$$679 - 351 = 328$$

Hundred	Ten	Ones

Crossing 10s (Exchanging)



$$\begin{array}{r} 269 \\ +154 \\ \hline 423 \\ 11 \end{array}$$

514	
268	?

$$\begin{array}{r} 4101 \\ 514 \\ -268 \\ \hline 246 \end{array}$$

Add and Subtract 100s

$$284 + 300 = 584$$

Hundred	Ten	Ones

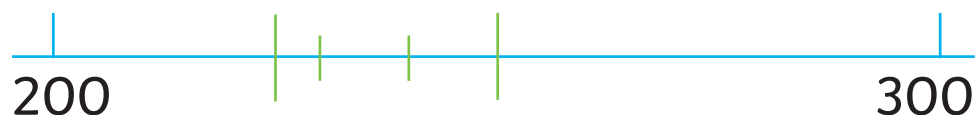
Addition and Subtraction

Knowledge Organiser

Estimate

Estimate by dividing the hundred into 250 and 225.

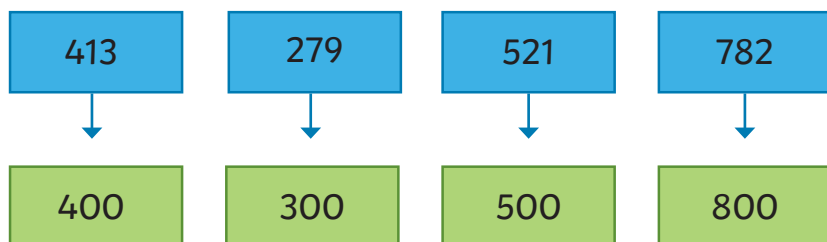
Estimate 10s (330, 340) between 325 and 350.



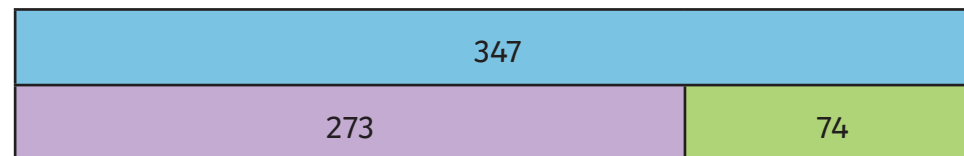
Estimate $167 - 89$

Use near numbers $170 - 90 = 80$

Near numbers:



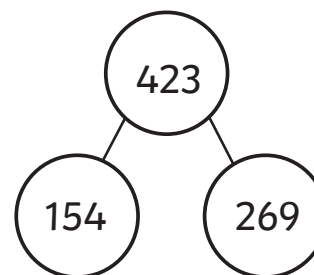
Check Answers



$347 - 74 = 273$ can be checked using

$273 + 74 = 347$

This part whole shows the inverse calculations using these three numbers.



$154 + 269 = 423$	$269 + 154 = 423$
$423 - 154 = 269$	$423 - 269 = 154$

Key Vocabulary

metre (m)

centimetre (cm)

millimetre (mm)

height

length

width

perimeter

further/furthest

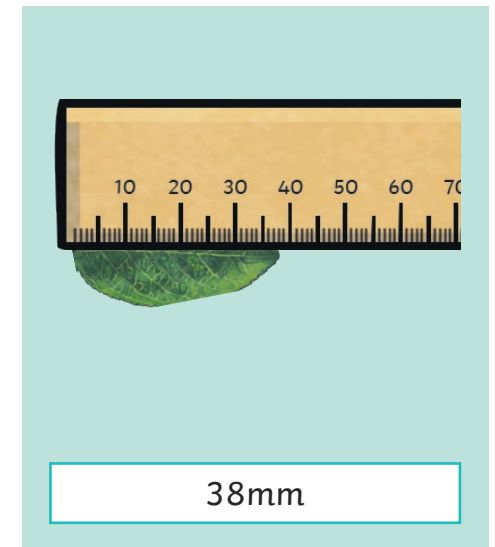
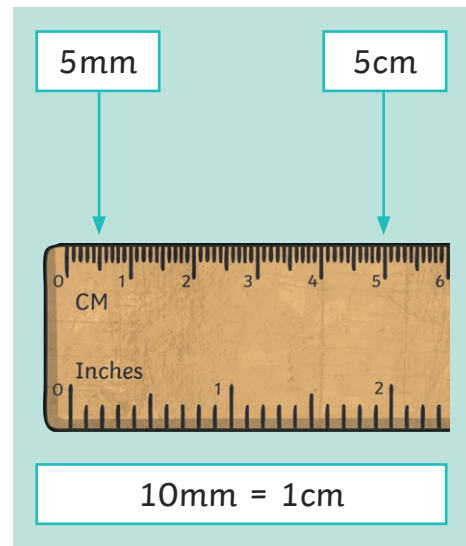
higher/highest

longer/longest

shorter/shortest

taller/tallest

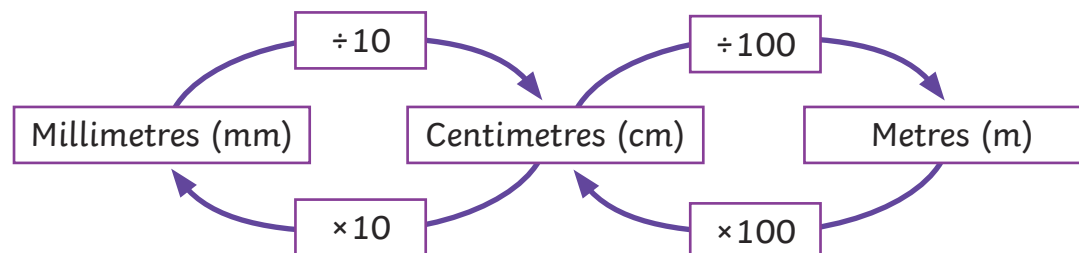
Measure Length



Equivalent Length

100 centimetres = 1 metre

10 millimetres = 1 centimetre



317cm	
300cm	17cm
3m	17cm
3m 17cm	

Compare Lengths

$6\text{mm} < 6\text{cm}$
 $6\text{cm} = 60\text{mm}$
 6mm is shorter than 6cm

$320\text{cm} > 2\text{m } 6\text{cm}$
 $320\text{cm} > 200\text{cm} + 60\text{cm}$
 320cm is longer than 2m 60cm

$98\text{mm} < 12\text{cm } 3\text{mm}$
 $98\text{mm} < 120\text{mm} + 3\text{mm}$
 98mm is shorter than 12cm 3mm

Add and Subtract Lengths

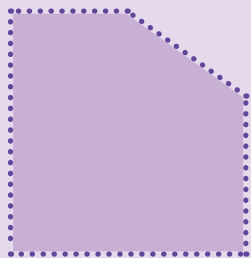
$14\text{cm} + 19\text{cm} = 33\text{cm}$
 $8\text{cm } 2\text{mm} + 16\text{mm} =$
 98mm or $9\text{cm } 8\text{mm}$

?	
8cm 2mm	16mm
82mm	16mm

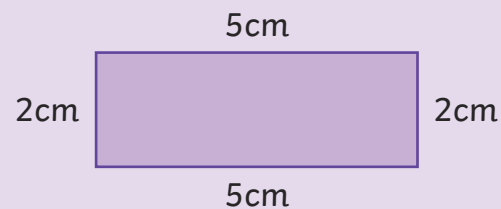
$6\text{m} - 2\text{m } 28\text{cm}$
 $6\text{m} - 2\text{m} = 4\text{m}$
 $4\text{m} - 28\text{cm} = 3\text{m } 72\text{cm}$

6m	
2m 28cm	?

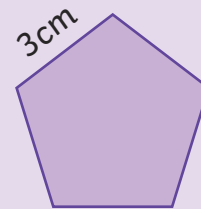
Perimeter



..... = perimeter



$$5\text{cm} + 2\text{cm} + 5\text{cm} + 2\text{cm} = 14\text{cm}$$



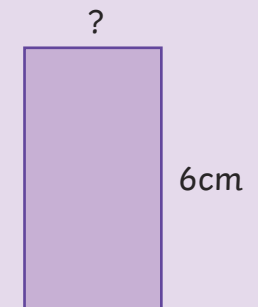
$$3\text{cm} + 3\text{cm} + 3\text{cm} + 3\text{cm} + 3\text{cm} = 15\text{cm}$$

perimeter = 20cm

$$6\text{cm} + 6\text{cm} = 12\text{cm}$$

$$20\text{cm} - 12\text{cm} = 8\text{cm}$$

$$8\text{cm} \div 2\text{cm} = 4\text{cm}$$



Key Vocabulary

mass

gram

kilogram

capacity

volume

millilitre

litre

lighter

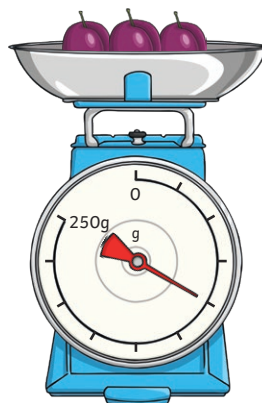
heavier

Measure and Compare Mass

Scales can be used to measure grams.

A gram is a unit of measurement that is used to measure the mass of something.

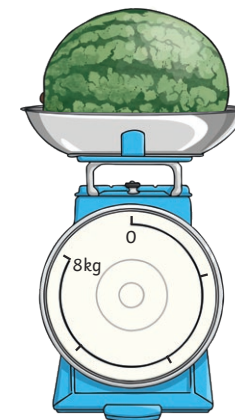
Grams can be written as **g**.



Scales can be used to measure kilograms.

A kilogram is a unit of measurement that is greater than a gram. It is also used to measure the mass of something.

Kilograms can be written as **kg**.



$$1000\text{g} = 1\text{kg}$$

To compare mass, we can use the words 'heavier' and 'lighter'.

Measure and Compare Capacity

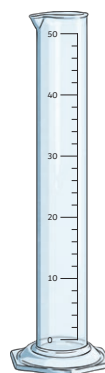
Capacity is the amount of liquid a container can hold.

Volume is how much liquid is in the container.

Measuring cylinders can be used to measure smaller volumes.

Smaller volumes are measured in millilitres.

Millilitres can be written as **ml**.



Measuring jugs can be used to measure larger volumes.

Greater volumes are measured in litres.

Litres can be written as **l**.

$$1000\text{ml} = 1\text{l}$$

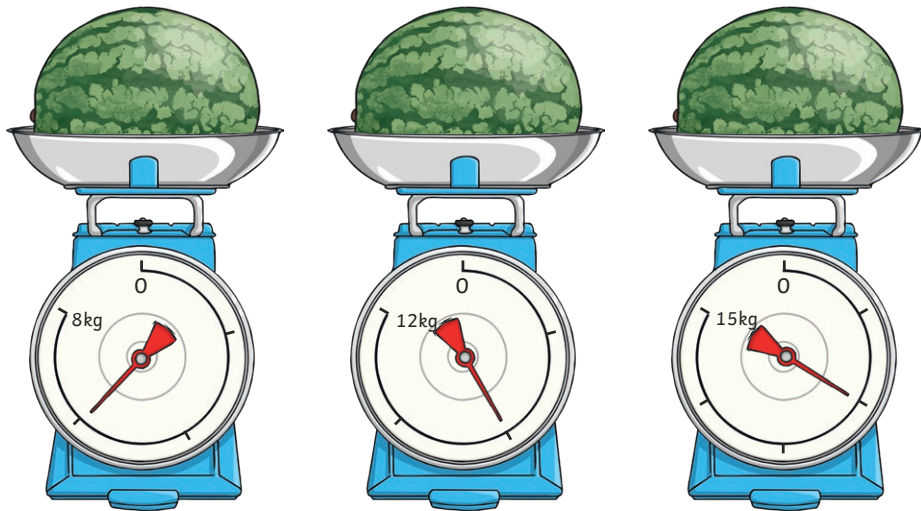


To compare capacities, we can use the word 'full'.

Reading Scales

Mass

Each of the melons has a mass of 6kg but the arrows are all pointing at different points on the scales. This is because each of the measuring scales have different increments marked on them.

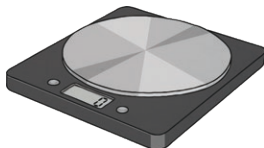


Always look carefully at how the numbers on the scales increase when reading a measurement.

Add and Subtract Mass

$$600\text{g} + 500\text{g} = 1100\text{g} = \mathbf{1\text{kg } 100\text{g}}$$

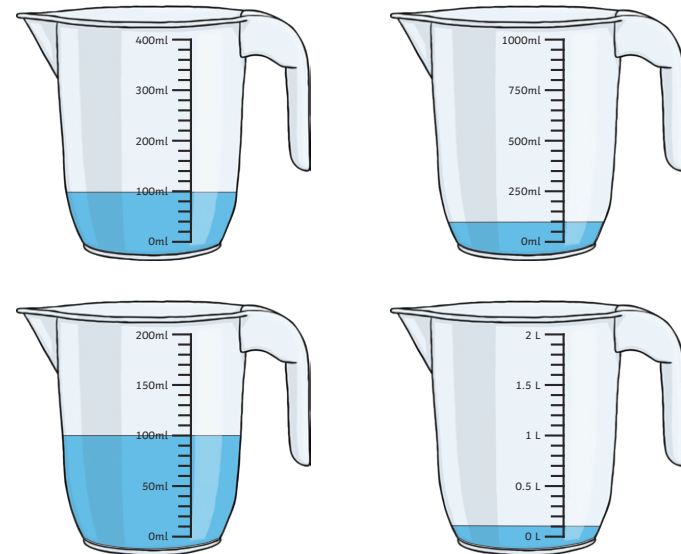
$$1\text{kg} - 300\text{g} = 1000\text{g} - 300\text{g} = \mathbf{700\text{g}}$$



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Capacity

Measuring containers all have different capacities.



Each of these containers contain the same volume of 100 millilitres but have different capacities and scales. Always look carefully at how the numbers on the scales increase when reading a measurement.

Add and Subtract Capacities

$$800\text{ml} + 400\text{ml} = 1200\text{ml} = \mathbf{1\text{l } 200\text{ml}}$$

$$1\text{l } 300\text{ml} - 200\text{ml} = \mathbf{1\text{l } 100\text{ml}}$$



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Key Vocabulary

UK Coins

amount

change

coin

combinations

convert

note

pence

penny

pounds

value



1p



2p



5p



10p



20p



50p



£1



£2

one penny coin two pence coin five pence coin ten pence coin twenty pence coin fifty pence coin one pound coin two pound coin

UK Notes



£5

five pound note



£10

ten pound note



£20

twenty pound note



£50

fifty pound note

Pounds and Pence



£3 and 25 pence



£52 and 13 pence

Convert Pounds and Pence



120 pence

100 pence is £1

120 pence is £1 and 20 pence.

Adding Amounts



?		
£1 and 60p		

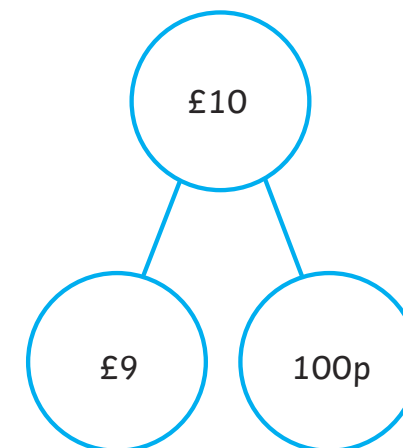
£1 and 60p + £1 and 52p
 There is £2 and 112p.
 112p is £1 and 12p
 Altogether there is £3 and 12p.

Subtracting Amounts

£2 and 35p - £1 and 80p



Giving Change



£9 - £5 = £4
 100p - 67p = 33p
 £4 and 33p change

Key Vocabulary

times tables

multiply by

divide by

array

fact families

regrouping

Multiplication and Division Facts (3, 4 and 8 multiplication tables)

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

3 x Tables

$$1 \times 3 = 3$$

$$2 \times 3 = 6$$

$$3 \times 3 = 9$$

$$4 \times 3 = 12$$

$$5 \times 3 = 15$$

$$6 \times 3 = 18$$

$$7 \times 3 = 21$$

$$8 \times 3 = 24$$

$$9 \times 3 = 27$$

$$10 \times 3 = 30$$

$$11 \times 3 = 33$$

$$12 \times 3 = 36$$

$$3 \div 3 = 1$$

$$6 \div 3 = 2$$

$$9 \div 3 = 3$$

$$12 \div 3 = 4$$

$$15 \div 3 = 5$$

$$18 \div 3 = 6$$

$$21 \div 3 = 7$$

$$24 \div 3 = 8$$

$$27 \div 3 = 9$$

$$30 \div 3 = 10$$

$$33 \div 3 = 11$$

$$36 \div 3 = 12$$

4 x Tables

$$1 \times 4 = 4$$

$$2 \times 4 = 8$$

$$3 \times 4 = 12$$

$$4 \times 4 = 16$$

$$5 \times 4 = 20$$

$$6 \times 4 = 24$$

$$7 \times 4 = 28$$

$$8 \times 4 = 32$$

$$9 \times 4 = 36$$

$$10 \times 4 = 40$$

$$11 \times 4 = 44$$

$$12 \times 4 = 48$$

$$4 \div 4 = 1$$

$$8 \div 4 = 2$$

$$12 \div 4 = 3$$

$$16 \div 4 = 4$$

$$20 \div 4 = 5$$

$$24 \div 4 = 6$$

$$28 \div 4 = 7$$

$$32 \div 4 = 8$$

$$36 \div 4 = 9$$

$$40 \div 4 = 10$$

$$44 \div 4 = 11$$

$$48 \div 4 = 12$$

8 x Tables

$$1 \times 8 = 8$$

$$2 \times 8 = 16$$

$$3 \times 8 = 24$$

$$4 \times 8 = 32$$

$$5 \times 8 = 40$$

$$6 \times 8 = 48$$

$$7 \times 8 = 56$$

$$8 \times 8 = 64$$

$$9 \times 8 = 72$$

$$10 \times 8 = 80$$

$$11 \times 8 = 88$$

$$12 \times 8 = 96$$

$$8 \div 8 = 1$$

$$16 \div 8 = 2$$

$$24 \div 8 = 3$$

$$32 \div 8 = 4$$

$$40 \div 8 = 5$$

$$48 \div 8 = 6$$

$$56 \div 8 = 7$$

$$64 \div 8 = 8$$

$$72 \div 8 = 9$$

$$80 \div 8 = 10$$

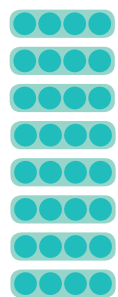
$$88 \div 8 = 11$$

$$96 \div 8 = 12$$

Write and Calculate Mathematical Statements

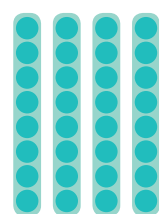
$$4 \times 8 = 32$$

$$32 \div 8 = 4$$



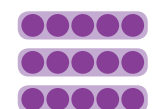
$$8 \times 4 = 32$$

$$32 \div 4 = 8$$



$$5 \times 3 = 15$$

$$15 \div 3 = 5$$



$$3 \times 5 = 15$$

$$15 \div 5 = 3$$



Related Calculations

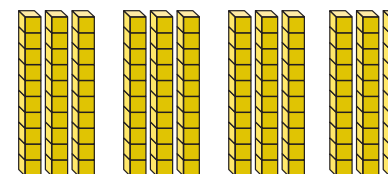
$$3 \times 4 = 12$$



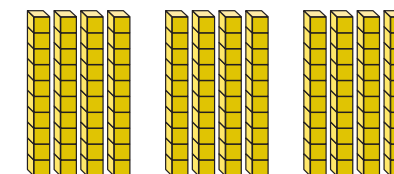
$$4 \times 3 = 12$$



$$30 \times 4 = 120$$



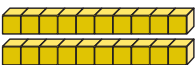
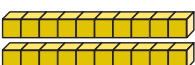
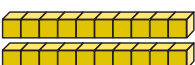
$$40 \times 3 = 120$$



Multiplication and Division

Knowledge Organiser

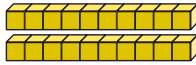
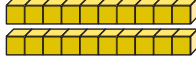
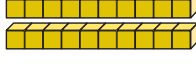
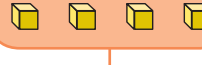
Written Multiplication Methods - No Regrouping

Tens	Ones
	
	
	

$$23 \times 3 = 69$$

	T	O
	2	3
×		3
	6	9

Written Multiplication Methods - With Regrouping

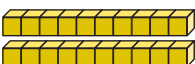
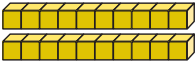
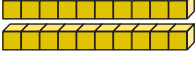
Tens	Ones
	
	
	
	



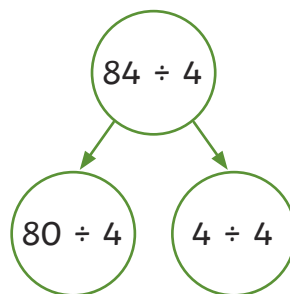
$$24 \times 4 = 96$$

	T	O
	2	4
×		4
	9	6
	1	

Written Division Methods - No Regrouping

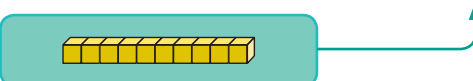
Tens	Ones
	
	
	
	

	2	1
4	8	4

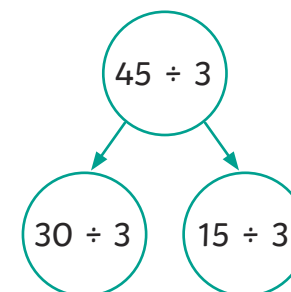


Written Division Methods - With Regrouping

Tens	Ones
	
	
	



	1	5
3	4	¹ 5



Number and Place Value

Knowledge Organiser

Key Vocabulary

hundreds

tens

ones

zero

place value

greater than

less than

order

more

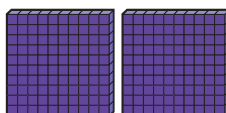
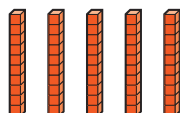
less

partition

digit

3-Digit Numbers

256

two hundred	fifty	six
		
200	50	6

Counting in 4s and 8s

0	4	8	12	16	20	24	28	32	36	40
---	---	---	----	----	----	----	----	----	----	----

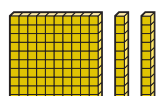
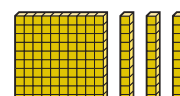
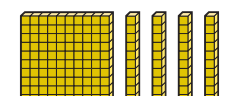
0	8	16	24	32	40	48	56	64	72	80
---	---	----	----	----	----	----	----	----	----	----

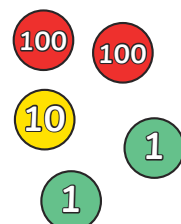
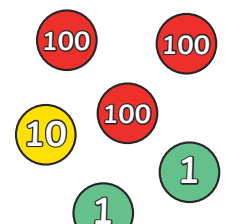
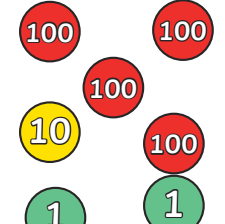
Counting in 50s and 100s

0	50	100	150	200	250	300	350	400	450	500
---	----	-----	-----	-----	-----	-----	-----	-----	-----	-----

0	100	200	300	400	500	600	700	800	900	1000
---	-----	-----	-----	-----	-----	-----	-----	-----	-----	------

10 and 100 More or Less

Ten Less		Ten More
		
120	130	140

One Hundred Less		One Hundred More
		
212	312	412

Number and Place Value

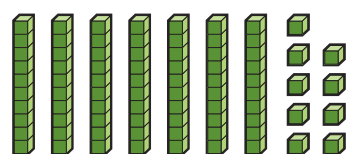
Knowledge Organiser

Compare and Order

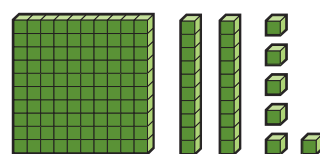
100s	10s	1s
		

$324 > 243$
greater than

100s	10s	1s
		

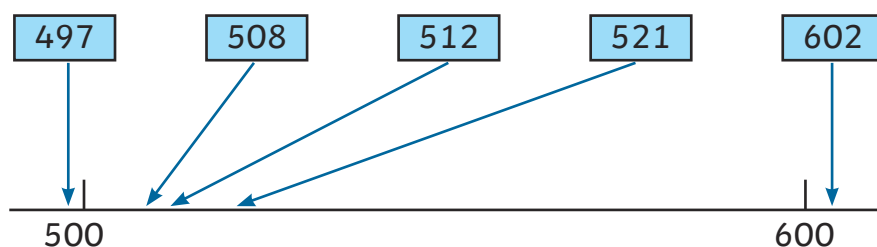


$79 < 126$
less than



smallest

greatest

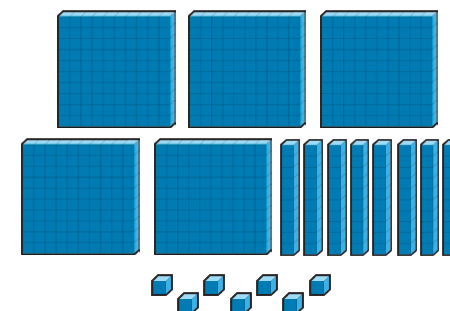


Represent Numbers to 1000

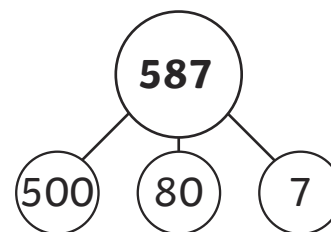
587

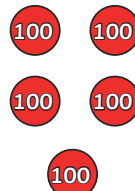
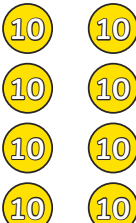
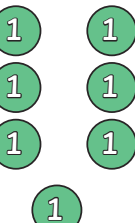
five hundred and eighty-seven

Hundreds	Tens	Ones
		

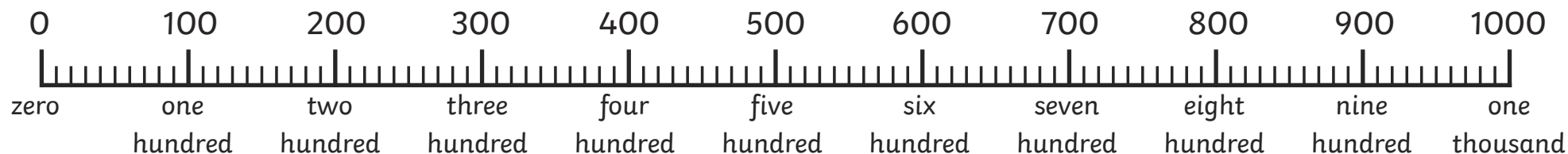


$$500 + 80 + 7$$



Hundreds	Tens	Ones
		

Numerals and Words to 1000



Properties of Shapes

Knowledge Organiser

Key Vocabulary

quarter turn

half turn

three-quarter turn

angle

right angle

acute

obtuse

horizontal

vertical

parallel

perpendicular

polygon

two-dimensional

three-dimensional

flat face

curved surface

edge

curved edge

vertex

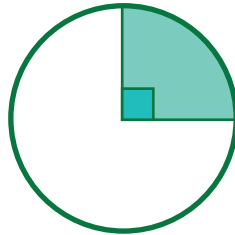
vertices

apex

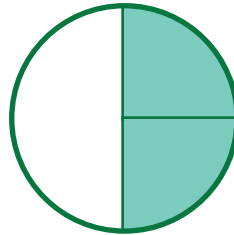


Turns and Angles

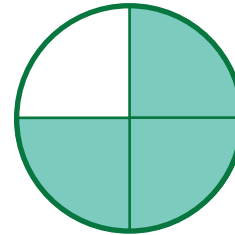
Angles can be used as a description of a turn.



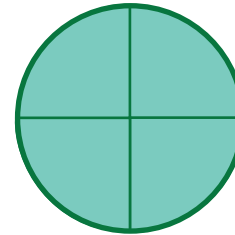
$\frac{1}{4}$ turn



$\frac{1}{2}$ turn



$\frac{3}{4}$ turn



1 turn



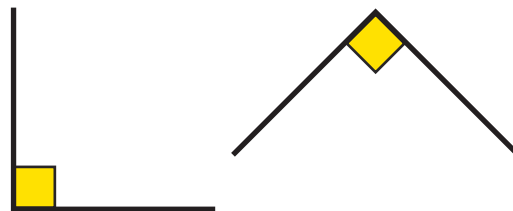
clockwise



anticlockwise

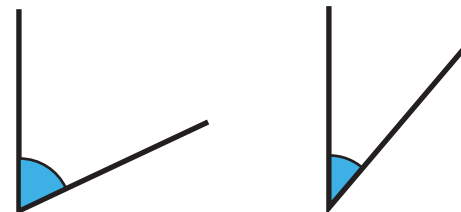
An angle is created when two straight lines meet at a point or intersect.

Right Angle



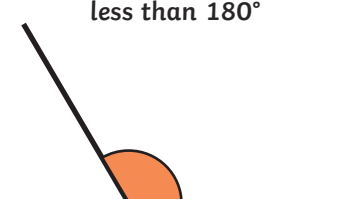
Acute Angle

Less than 90°



Obtuse Angle

Greater than 90° and less than 180°



Type of Lines

horizontal



vertical



parallel



perpendicular



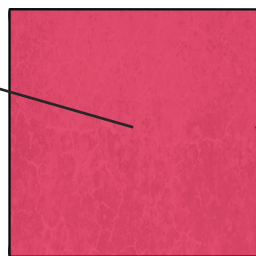
Properties of Shapes

Knowledge Organiser

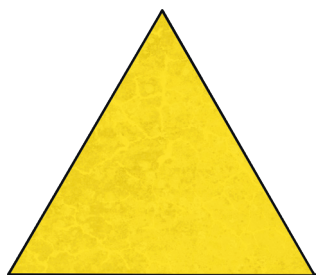
Recognise and Describe 2D Shapes

Recognise and Describe 3D Shapes

flat
side
corner



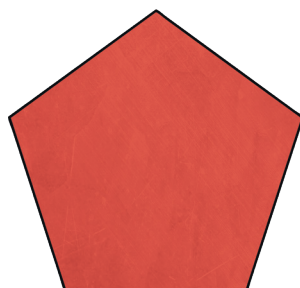
square



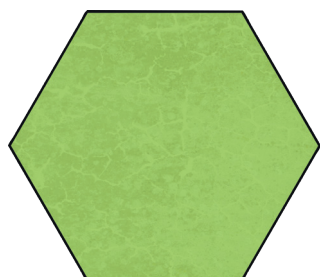
triangle



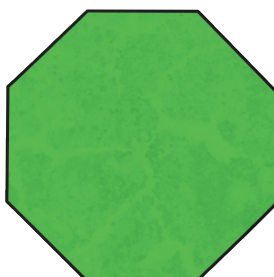
rectangle



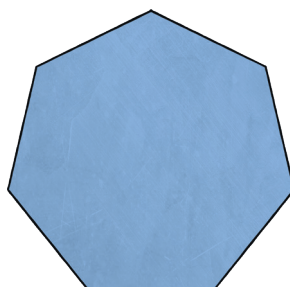
pentagon



hexagon

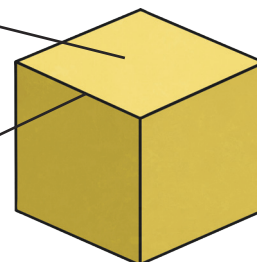


octagon

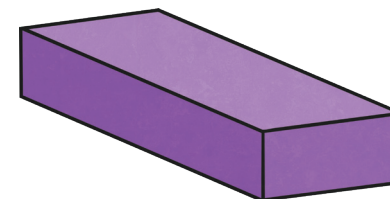


heptagon

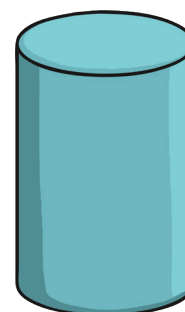
face
edge
vertices



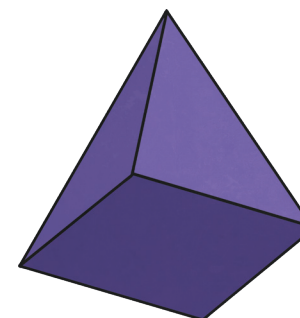
cube



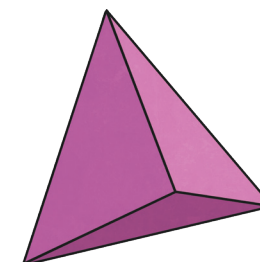
cuboid



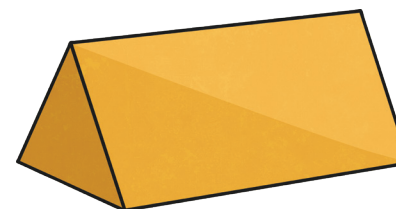
cylinder



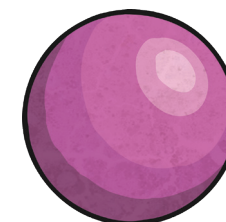
square-based
pyramid



tetrahedron



triangular
prism



sphere

Key Vocabulary

data

pictogram

symbol

bar chart

horizontal axis

vertical axis

axes

scale

intervals

table

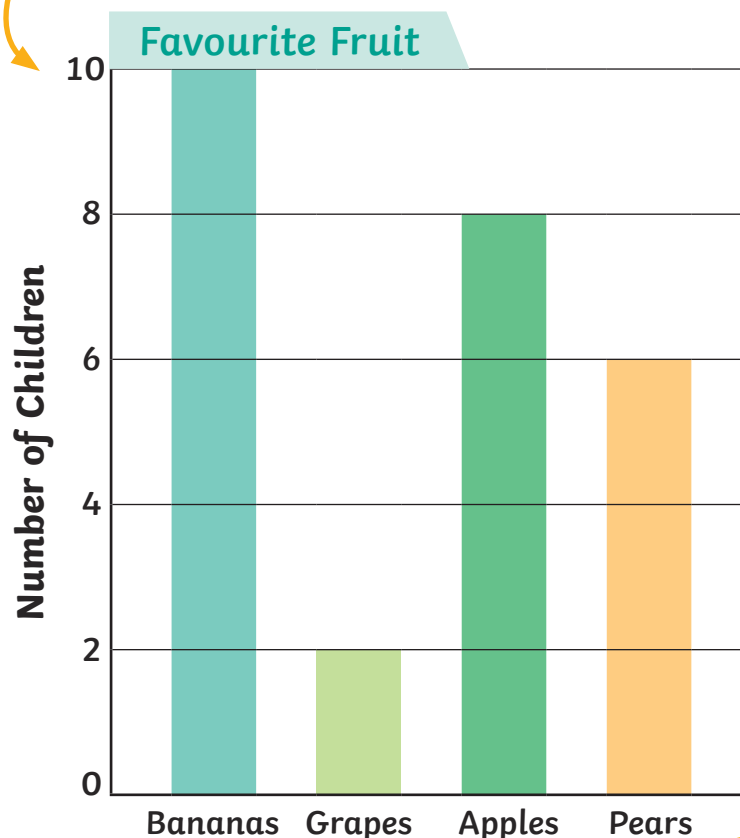
interpret

Bar Charts

Bars are used to show the data in each category. There must be a gap between each bar. Bar charts can have different scales.

vertical axis

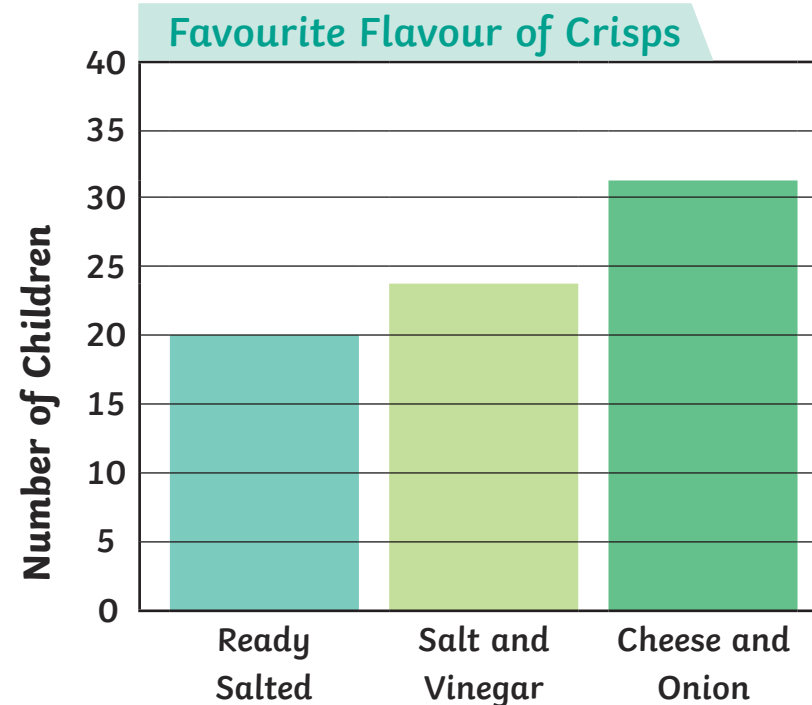
The scale on this bar chart counts in twos.



horizontal axis

Fruit

The scale on this bar chart counts in fives.



Favourite Flavour of Crisps

The scale on the bar chart depends on the range of the data.

Tables

In order to understand the data presented in a table, you must read the table's title and the headings. Remember to always look at the heading above each piece of information.

title

Table to Show Ticket Prices at a Local Cinema

heading

Ticket Type	Weekday Price	Weekend Price
Adult	£6	£7.50
Child	£4	£4.50
Student	£5.50	£6

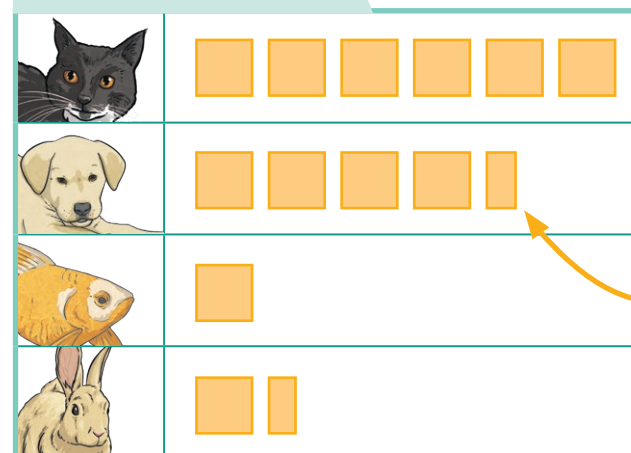
information

Using the table, we can see the cost of an adult and a child visiting the cinema on a Monday would be £10.

Pictograms

Pictograms use pictures or symbols to represent data. The key shows what each symbol represents. This pictogram uses 1 symbol to represent 2 pets.

Class A's Pets

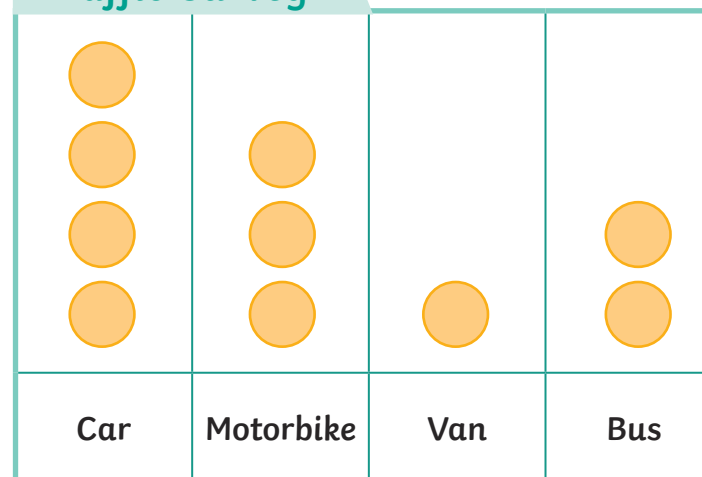


Key

 = 2 pets

To represent 1 pet, a picture of half a square is used.

Traffic Survey



Key

 = 8 vehicles

Using the key, we can see that 16 people travel by bus.