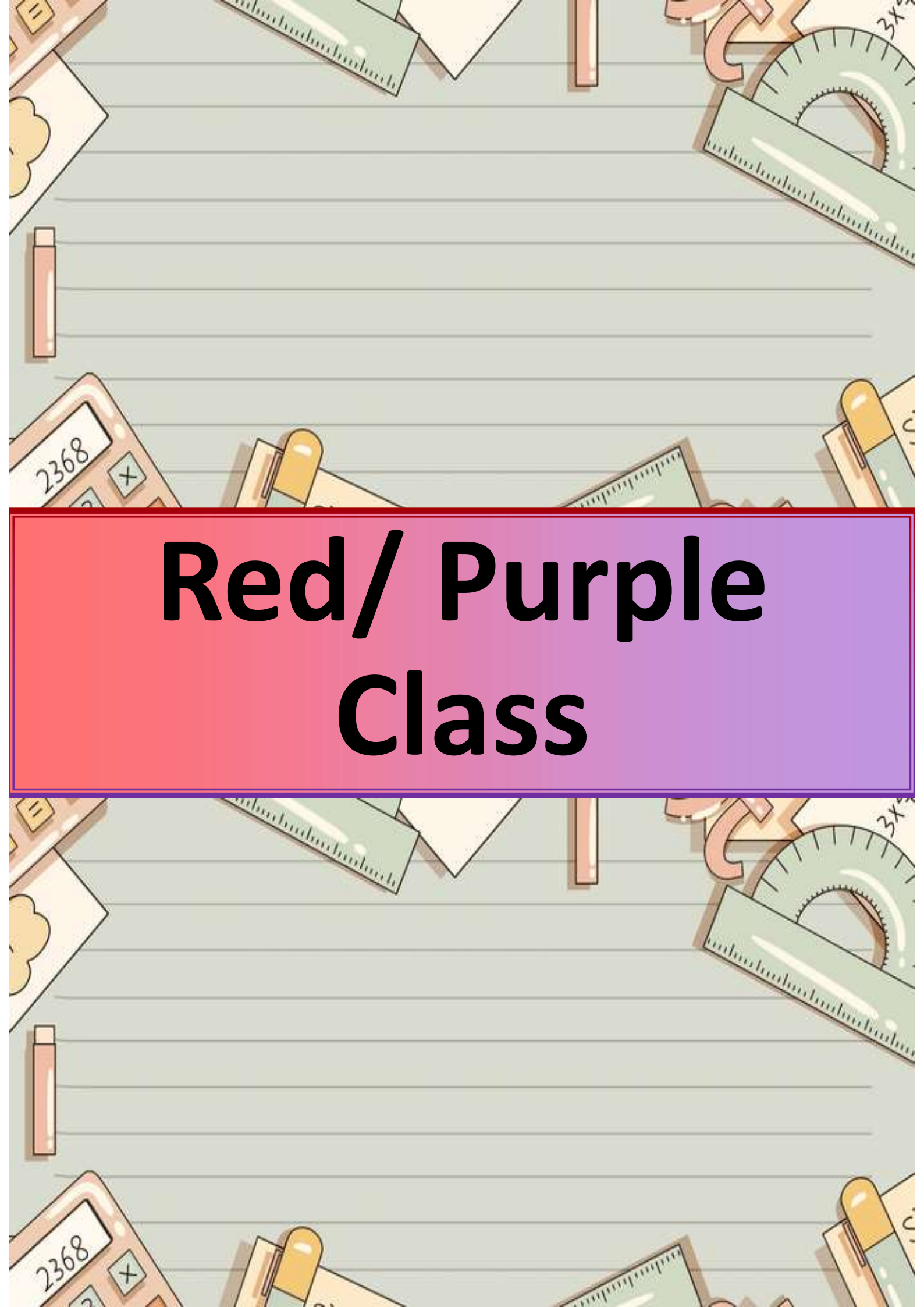
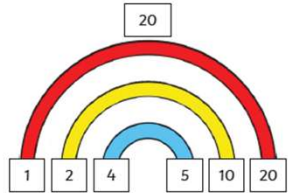
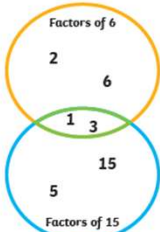
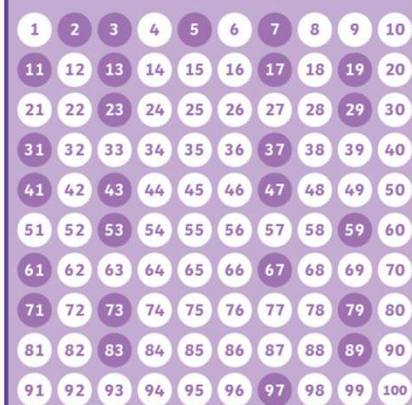
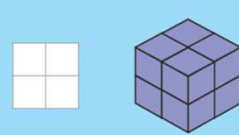
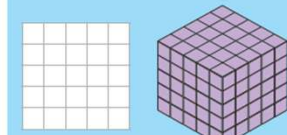
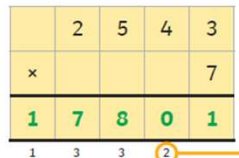
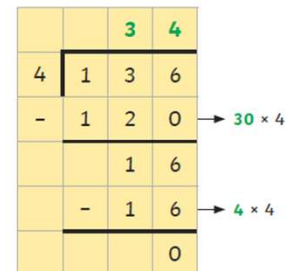
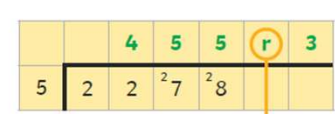


The background of the image is a light gray surface with horizontal lines, resembling a notebook page. Scattered around the edges are various colorful school supplies: a green ruler, a yellow protractor, a pink eraser, a yellow pencil, a green calculator, a yellow paperclip, a green paper, and a yellow ruler. A central rectangular box with a red-to-purple gradient background and a thin black border contains the text.

Red/ Purple Class

Multiplication and Division: Stage 5

Multiplication and Division		Knowledge Organiser
Key Vocabulary	Factors	Prime Numbers
multiply	A factor is a number that divides into another number exactly, without leaving a remainder.  A common factor is a factor of 2 or more numbers.  The factors of 20 are 1, 2, 4, 5, 10 and 20. The factor pairs are: 1 and 20 2 and 10 4 and 5	
groups of		
lots of		
times		
divide		
share		
remainder		
factor	Squared ² and Cubed ³ Numbers	Related Calculations
multiple	 $2^2 = 4$ $2 \times 2 = 4$ $2^3 = 8$ $2 \times 2 \times 2 = 8$  $5^2 = 25$ $5 \times 5 = 25$ $5^3 = 125$ $5 \times 5 \times 5 = 125$	$8 \times 9 = 72$ $80 \times 9 = 720$ $9 \times 8 = 72$ $90 \times 8 = 720$
product		$72 \div 9 = 8$ $720 \div 9 = 80$ $72 \div 8 = 9$ $720 \div 8 = 90$
		

Multiplication and Division		Knowledge Organiser
Short Multiplication		Long Multiplication
$2543 \times 7 = 17\ 801$  Remember to move any regrouped digits into the next column. After the next multiplication, add the regrouped number to the answer.		$2543 \times 67 = 170\ 381$  Before multiplying by the number in the tens column, remember to use zero as a placeholder because the 6 in 67 is 6 tens (60).
Division		Short Division
$136 \div 4 = 34$  $30 \div 4$ 4×4		 $15 \div 4 = 3$ remainder 3 Remember to regroup any remainders and move them into the next column.  $28 \div 5 = 5$ remainder 3 If your calculation has a remainder, remember to record it in the answer using the letter r.

Four Operations:

Stage 6

Four Operations

Knowledge Organiser

Key Vocabulary

Add
Total
Make
Plus
Sum
More
Altogether
Difference
Leave
Subtract
Difference between
Less
Minus
Take away
Mentally, Orally
Column Addition
Column Subtraction
Estimate
Inverse operation
Solve problems
Number facts
Place Value
Complex

Add and Subtract Whole Numbers

Column Method

	4	5	8	6	4
+	2	3	4	9	7
	6	9	3	6	1
		1	1	1	

Starting with the ones, add each column in turn. Regroup tens, hundreds, thousands, ten thousands as required.

	3	5	7	13	12
-		3	4	7	6
	3	2	2	6	6

Starting with the ones, subtract each column in turn. Exchange tens, hundreds, thousands and/or ten thousands as required.

Multiply up to 4-digit by 2-digit

1	8	2	
	1	5	4
×		2	6
	9	2	4
3	0	8	0
4	0	0	4
1	1		

Start with the ones.
 $154 \times 6 = 924$
 $154 \times 20 = 3080$
 $3080 + 924 = 4004$

Order of Operations

B	Brackets	$10 \times (4 + 2) = 10 \times 6 = 60$
O	Order	$5 + 2^2 = 5 + 4 = 9$
D	Division	$10 + 6 \div 2 = 10 + 3 = 13$
M	Multiplication	$10 - 4 \times 2 = 10 - 8 = 2$
A	Addition	$10 \times 4 + 7 = 40 + 7 = 47$
S	Subtraction	$10 \div 2 - 3 = 5 - 3 = 2$

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Four Operations

Short Division

Start from the left.

		4	4	0	5
12	5	2	8	6	0

$5 \div 12 = 0 \text{ r}5$
 $52 \div 12 = 4 \text{ r}4$
 $48 \div 12 = 4$
 $6 \div 12 = 0 \text{ r}6$

Long Division

		1	2	0	r	3
14	1	6	8	3		
	1	4	0	0		
		2	8	3		
		2	8	0		
				3		

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Knowledge Organiser

Common Factors

Factors of 48

1	2	3	4	6	8	12	16	24	48
---	---	---	---	---	---	----	----	----	----

Factors of 30

1	2	3	5	6	10	15	30
---	---	---	---	---	----	----	----

Common factors: 1, 2, 3, 6

Primes

A prime number has only 1 and itself as factors: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43

A composite number has factors other than 1 and itself.

Mental Calculations and Estimation

Order of calculations:

$50 \times 34 \times 2 = 50 \times 2 \times 34 = 100 \times 34 = 3400$

Money: £8.99 + £3.49 = £12.48

Use £9 + £3.50 = £12.50 and subtract 2p

Estimate on a number line

Subdivide line to estimate: 17

Common Multiples

Multiples of 3

3	...	18	21	24	...	39	42
---	-----	----	----	----	-----	----	----

Multiples of 7

7	14	21	28	35	42
---	----	----	----	----	----

Common multiples: 21, 42...

Squares and Cubes

Square numbers result from a number being multiplied by itself (e.g. $5 \times 5 = 25$):

1, 4, 9, 16, 25, 36, 49, 64, 81, 100

Cube numbers result from a number being multiplied by itself twice ($2 \times 2 \times 2 = 8$):

1, 8, 27, 64, 125

Reason from Known Facts

$90 \div 10 = 9$ so $90 \div 20 = 4.5$ and $90 \div 5 = 18$

$16 \times 9 = 144$ so $1.6 \times 9 = 14.4$

$4352 \div 17 = 256$

so $256 \times 18 = 4352 + 256 = 4608$

$3786 + 2850 = 6636$

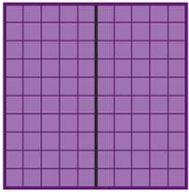
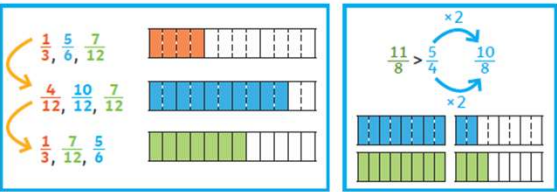
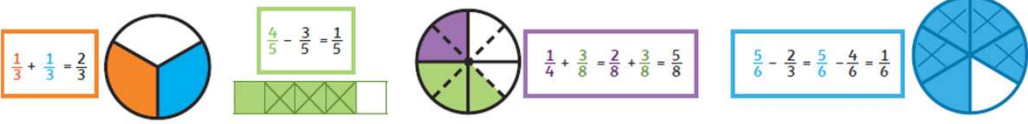
so $4786 + 2850 = 7636$

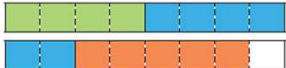
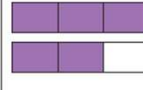
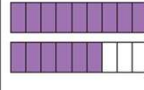
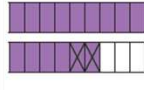
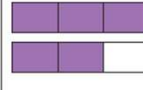
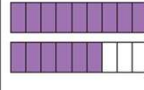
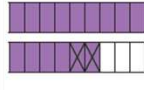
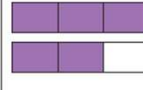
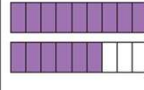
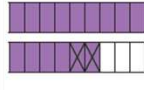
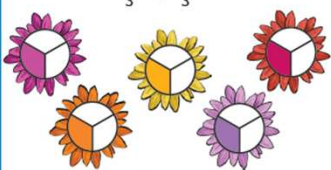
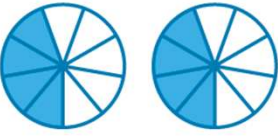
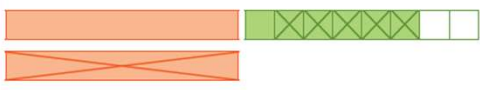
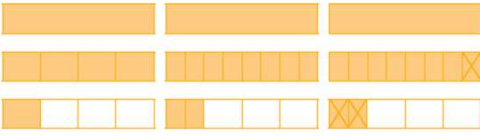
and $2786 + 3850 = 6636$

and $8636 - 3786 = 4850$

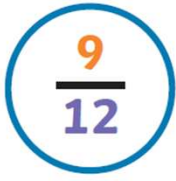
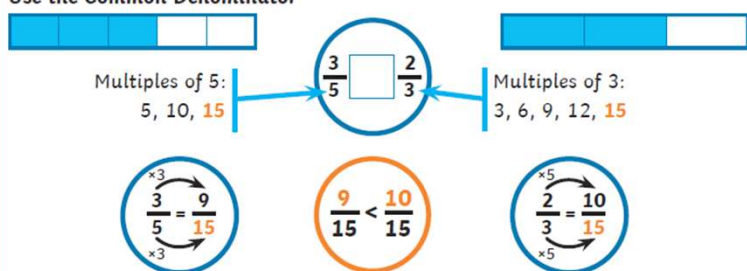
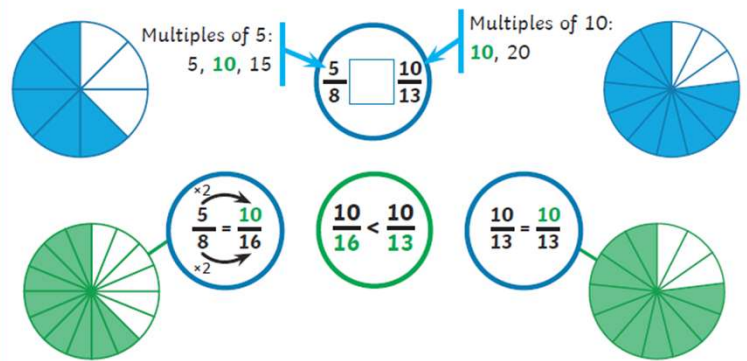
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Fractions: Stage 5

Fractions		Knowledge Organiser
Key Vocabulary	Equivalent Fractions	Compare and Order Fractions
numerator	To find equivalent fractions, we multiply or divide the numerator and denominator by the same number.  $\frac{1}{2} = \frac{5}{10} = \frac{50}{100}$ $\times 5$ $\times 10$ $\div 5$ $\div 10$	We can compare and order fractions by using common denominators. 
denominator		
unit fraction		
non-unit fraction		
whole		
equivalent	Mixed Numbers	Improper Fractions
mixed number	Mixed numbers contain a whole number and a fraction. 	An improper fraction has a numerator which is greater than or equal to the denominator. $\frac{5}{3}$
improper fraction	Convert an Improper Fraction to a Mixed Number	Convert a Mixed Number to an Improper Fraction
simplest form	$\frac{9}{4}$ $9 \div 4 = 2r1$ $2\frac{1}{4}$ Divide the numerator by the denominator. This shows you the whole number and the fraction.	Multiply the whole by the denominator to make an improper fraction. $2\frac{5}{6} = \frac{12}{6} + \frac{5}{6} = \frac{17}{6}$ Add the fractions together.
multiple	Adding and Subtracting Fractions	
common denominator	To add or subtract fractions with denominators that are multiples of the same number, we must change one fraction to have the same denominator.	
common numerator		

Fractions		Knowledge Organiser						
Add Fractions Where the Total is Greater Than 1		Subtract from a Mixed Number						
$\frac{1}{2} + \frac{3}{4} + \frac{5}{8} = \frac{4}{8} + \frac{6}{8} + \frac{5}{8} = \frac{15}{8} = 1\frac{7}{8}$ 		$1\frac{2}{3} - \frac{2}{9} = 1\frac{6}{9} - \frac{2}{9} = 1\frac{4}{9}$						
Add Mixed Numbers		<table border="1"> <thead> <tr> <th>starting number</th><th>find the equivalent fraction</th><th>subtract</th></tr> </thead> <tbody> <tr> <td></td><td></td><td></td></tr> </tbody> </table>	starting number	find the equivalent fraction	subtract			
starting number	find the equivalent fraction	subtract						
								
Multiply Unit Fractions by an Integer	Multiply Non-Unit Fractions by an Integer	Subtract Two Mixed Numbers						
$\frac{1}{3} \times 5 = \frac{5}{3}$ 	$2 \times \frac{4}{9} = \frac{8}{9}$ 	$2\frac{3}{4} - 1\frac{5}{8} = 1\frac{1}{8}$  $2 - 1 = 1$ $\frac{3}{4} - \frac{5}{8} = \frac{1}{8}$						
Multiply Mixed Numbers by Integers		Subtract from a Mixed Number - Breaking the Whole						
Convert to an improper fraction and multiply the numerator by the integer. $2\frac{1}{4} \times 2 = \frac{9}{4} \times 2 = \frac{18}{4} = 4\frac{2}{4} = 4\frac{1}{2}$ Use repeated addition. $2\frac{1}{4} \times 2 = 2\frac{1}{4} + 2\frac{1}{4} = 4\frac{2}{4} = 4\frac{1}{2}$		$2\frac{1}{4} - \frac{3}{8} = 2\frac{2}{8} - \frac{3}{8} = 1\frac{10}{8} - \frac{3}{8} = 1\frac{7}{8}$ 						

Fractions: Stage 6

Fractions		Knowledge Organiser
Key Vocabulary	Simplify Fractions	Compare and Order Fractions
numerator	 Factors of 9: 1, 3, 9 Factors of 12: 1, 2, 3, 4, 6, 12 $\frac{9}{12} = \frac{3}{4}$ 	Use the Common Denominator  Multiples of 5: 5, 10, 15 Multiples of 3: 3, 6, 9, 12, 15 $\frac{3}{5} = \frac{6}{15}$ $\frac{2}{3} = \frac{4}{6}$ $\frac{9}{15} < \frac{10}{15}$ 
denominator		Use the Common Numerator  Multiples of 5: 5, 10, 15 Multiples of 10: 10, 20 $\frac{5}{8} = \frac{10}{16}$ $\frac{10}{16} < \frac{10}{13}$ $\frac{10}{13} = \frac{10}{13}$ 
proper fraction		
improper fraction		
factor		
highest common multiple		
lowest common multiple		
equivalents		
common numerator		
common denominator		
decimal equivalent		
simplify		
simplest form		
mixed number		
whole number		
mixed number		

Fractions		Knowledge Organiser
Adding and Subtracting Proper Fractions		Adding and Subtracting Mixed Numbers
Same Denominators $\frac{4}{7} + \frac{2}{7} = \frac{6}{7}$ $\frac{8}{11} - \frac{3}{11} = \frac{5}{11}$ Different Denominators $\frac{2}{7} + \frac{3}{5}$ Multiples of 7: 7, 14, 21, 28, 35 Multiples of 5: 5, 10, 15, 20, 25, 30, 35 $\frac{2}{7} = \frac{10}{35}$, $\frac{3}{5} = \frac{21}{35}$ $\frac{10}{35} + \frac{21}{35} = \frac{31}{35}$ $\frac{9}{10} - \frac{1}{4}$ Multiples of 10: 10, 20 Multiples of 4: 4, 8, 12, 16, 20 $\frac{9}{10} = \frac{18}{20}$, $\frac{1}{4} = \frac{5}{20}$ $\frac{18}{20} - \frac{5}{20} = \frac{13}{20}$		Add or subtract the whole numbers and fractions separately. $2\frac{2}{5} + 1\frac{3}{10}$ $2 + 1 = 3$ $\frac{2}{5} + \frac{3}{10} = \frac{4}{10} + \frac{3}{10} = \frac{7}{10}$ $3 + \frac{7}{10} = 3\frac{7}{10}$ $2\frac{1}{2} - 1\frac{1}{4}$ $2 - 1 = 1$ $\frac{1}{2} - \frac{1}{4} = \frac{2}{4} - \frac{1}{4} = \frac{1}{4}$ $1 + \frac{1}{4} = 1\frac{1}{4}$ Convert the mixed numbers to improper fractions. $2\frac{2}{5} + 1\frac{3}{10}$ $2\frac{1}{2} - 1\frac{1}{4}$ $2\frac{2}{5} = \frac{12}{5}$, $1\frac{3}{10} = \frac{13}{10}$ $2\frac{1}{2} = \frac{5}{2}$, $1\frac{1}{4} = \frac{5}{4}$ $\frac{12}{5} + \frac{13}{10} = \frac{24}{10} + \frac{13}{10} = \frac{37}{10}$ $\frac{37}{10} = 3\frac{7}{10}$ $\frac{5}{2} - \frac{5}{4} = \frac{10}{4} - \frac{5}{4} = \frac{5}{4}$ $\frac{5}{4} = 1\frac{1}{4}$
Multiplying Proper Fractions Multiplying Fractions by Fractions $\frac{1}{2} \times \frac{1}{3} = \frac{1 \times 1}{2 \times 3} = \frac{1}{6}$ Multiplying Fractions by Whole Numbers $\frac{2}{5} \times 3 = \frac{2 \times 3}{5} = \frac{6}{5} = 1\frac{1}{5}$		Dividing Fractions by Whole Numbers $\frac{2}{5} \div 2 = \frac{2}{5} \times \frac{1}{2} = \frac{2 \times 1}{5 \times 2} = \frac{2}{10} = \frac{1}{5}$ Multiplication and division are the inverse of one another so: $\div 2$ is the same as $\times \frac{1}{2}$ $\frac{2}{5} \times \frac{1}{2} = \frac{2}{10}$

Decimals: Stage 5

Decimals		Knowledge Organiser
Key Vocabulary	Tenths, Hundredths and Thousandths	Order and Compare Numbers with Three Decimal Places
tenths		Ones: 0, Tenths: 2, Hundredths: 1, Thousandths: 3
hundredths		Ones: 1, Tenths: 0, Hundredths: 2, Thousandths: 2
decimal tenths		Ones: 2, Tenths: 1, Hundredths: 0, Thousandths: 3
decimal hundredths		
decimal equivalents		
part-whole model		
rounding		
decimal point		
place value		
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Decimals

Knowledge Organiser

Multiplying and Dividing by 10, 100 and 1000

Tens	Ones	Tenths	Hundredths	Thousandths
3	8			
3	8	0		

$\div 10$ (arrow from 8 to 0.8)
 $\times 10$ (arrow from 0.8 to 8)

Tens	Ones	Tenths	Hundredths	Thousandths
3	8			
3	8	0		

$\div 100$ (arrow from 8 to 0.08)
 $\times 100$ (arrow from 0.08 to 8)

Tens	Ones	Tenths	Hundredths	Thousandths
3	8			
3	8	0	0	

$\div 1000$ (arrow from 8 to 0.008)
 $\times 1000$ (arrow from 0.008 to 8)

Adding and Subtracting Decimals

$$0.8 + 0.001 = 0.801$$

$$1.031 - 0.23 = 0.801$$

$$0.4005 + 0.4005 = 0.801$$

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Rounding Decimals

1 2

If the tenths digit is 1, 2, 3 or 4, we round down to the nearest whole number.

If the tenths digit is 5, 6, 7, 8 or 9, we round up to the nearest whole number.

1.1 1.2

If the hundredths digit is 1, 2, 3 or 4, we round down to the nearest tenth.

If the hundredths digit is 5, 6, 7, 8 or 9, we round up to the nearest tenth.

Percentage and Decimal Equivalents

$$50\% = \frac{50}{100} = \frac{1}{2} = 0.5$$

$$25\% = \frac{25}{100} = \frac{1}{4} = 0.25$$

$$10\% = \frac{10}{100} = \frac{1}{10} = 0.1$$

$$40\% = \frac{40}{100} = \frac{2}{5} = 0.4$$

Crossing the Whole

$$0.82 + 0.63 = 1.45$$

$$2.531 - 0.6 = 1.931$$

$$20\% = \frac{20}{100} = \frac{1}{5} = 0.2$$

$$1\% = \frac{1}{100} = 0.01$$

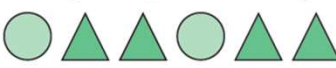
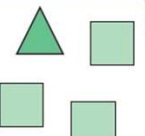
$$70\% = \frac{70}{100} = \frac{7}{10} = 0.7$$

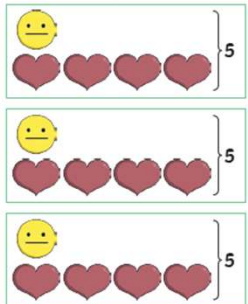
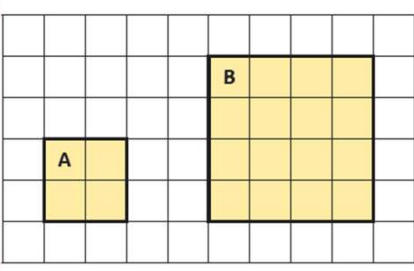
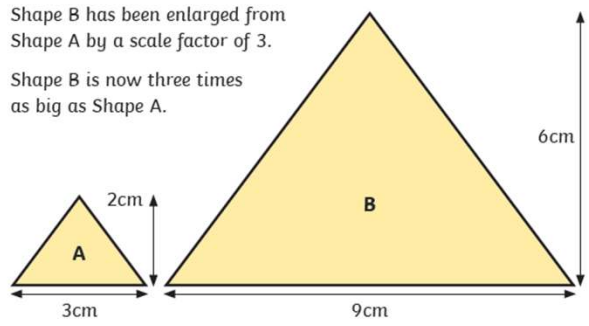
Decimals: Stage 6

Decimals		Knowledge Organiser																									
Key Vocabulary	Place Value	Fractions to Decimals																									
decimal place	Tens Ones 3 + $\frac{4}{10}$ + $\frac{2}{100}$ + $\frac{6}{1000}$ tenths hundredths thousandths 3.426 3 + $\frac{4}{10}$ + $\frac{2}{100}$ + $\frac{6}{1000}$ 3 + 0.4 + 0.02 + 0.006	$\frac{7}{20} = \frac{35}{100}$ or 0.35 $\frac{7}{25} = \frac{28}{100}$ or 0.28 $\frac{7}{50} = \frac{14}{100}$ or 0.14 $\frac{8}{200} = \frac{4}{100}$ or 0.04 When the denominator is not a factor or multiple of 100 $\frac{7}{8} = 7 \div 8$ <table border="1"> <tr><td>0</td><td>8</td><td>7</td><td>5</td></tr> <tr><td>8</td><td>7</td><td>0</td><td>6</td></tr> </table>		0	8	7	5	8	7	0	6																
0		8	7	5																							
8		7	0	6																							
decimal fraction																											
recurring decimal																											
equivalent fraction																											
tenth																											
sharing																											
partitioning																											
exchanging																											
rounding to 3d.p.																											
hundredth																											
thousandth																											
equal to																											
remainder																											
grouping																											
Dividing Decimals by Integers																											
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Decimals		Knowledge Organiser																																																																																																																	
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Ratio and Proportion: Stage 6

Ratio		Knowledge Organiser
Key Vocabulary	Ratio Language	The Ratio Symbol
ratio	For every 1 circle, there are 2 triangles.	 The ratio of footballs to rugby balls: 1:4 The ratio of rugby balls to footballs: 4:1
proportion		
"for every... there are..."	For every 2 bananas, there are 3 apples.	
part		
whole	For every 1 football, there are 3 rugby balls.	 The ratio of circles to triangles: 2:3 The ratio of triangles to circles: 3:2
scale factor		
enlargement	Ratio and Fractions	
similar shapes	 For every 1 rugby ball, there are 2 footballs. Ratio of rugby balls to footballs: 1:2 $\frac{1}{3}$ of the balls are rugby balls.	
length	 For every 1 triangle, there are 3 squares. Ratio of triangles to squares: 1:3 $\frac{1}{4}$ of the shapes are triangles.	 The ratio of apples to bananas: 1:2 The ratio of bananas to oranges: 2:3 The ratio of apples to bananas to oranges: 1:2:3 The ratio of oranges to bananas to apples: 3:2:1
width		
perimeter		
		

Ratio	Knowledge Organiser
Ratio and Proportion Problem-Solving	Scale Factors
To use the ingredients for 1 person, you divide all the quantities by 10 ($\div 10$). Ingredients for Fruit Smoothie (serves 10 people) 800g of bananas 500g of strawberries 200g of raspberries 700ml of milk 300ml of natural yogurt To use the ingredients for 5 people, you halve all the quantities ($\div 2$). To use the ingredients for 20 people, you double all the quantities ($\times 2$). In a bag of 15 sweets, there is 1 smiley face sweet for every 4 love heart sweets. Therefore, there will be 3 smiley face sweets and 12 love heart sweets in the bag. 	 Shape A has been enlarged by a scale factor of 2 to make Shape B. Shape B is now two times as big as Shape A.  Shape B has been enlarged from Shape A by a scale factor of 3. Shape B is now three times as big as Shape A.
	

Statistics: Stage 5

Statistics

Knowledge Organiser

Key Vocabulary

axis

continuous data

horizontal

data

interpret

label

line graph

maximum value

minimum value

pattern

predict

relationship

represent

scale

survey

table

tally

timetable

vertical

x-axis

y-axis

Reading and Understanding Tables

A table to show ticket prices at a local cinema.

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

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 that **each piece of information** falls under.

Completing Tables

Here is a table showing the favourite drink flavours of some children.

	Boys	Girls	Total
Orange	8		18
Blackcurrant		6	
Total	15		

To find how many boys voted for blackcurrant, look at the total number of boys who voted and subtract the number of votes for orange.

To find how many girls voted for orange, look at the total number of votes for orange and subtract the number of votes from boys.

To find the total number of votes for blackcurrant, the total number of girls or the total number of voters, simply add up the values from the appropriate row or column.

Timetables

Here is a bus timetable:

Three different buses

Bus stop locations	Mill Road	0726		0842
	High Street	0729	0803	
	Pitsmoor Road	0759	0833	
	Fulwood	0845	0919	0946

The bus starts at this time and location.

The bus does not stop here.

The bus terminates at this time and location.

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Statistics		Knowledge Organiser																		
Read and Interpret Line Graphs	Draw Line Graphs																			
Here is a line graph showing the average temperature for each month. The y-axis shows temperature in intervals of 2°C on a scale of 0°C to 16°C. The points show the average temperature for each month. The x-axis shows the months of the year.	Here is a table showing the number of different types of fruit sold each day. <table border="1"> <thead> <tr> <th></th><th>Bananas</th><th>Apples</th></tr> </thead> <tbody> <tr> <td>Mon</td><td>2</td><td>3</td></tr> <tr> <td>Tues</td><td>4</td><td>5</td></tr> <tr> <td>Wed</td><td>6</td><td>2</td></tr> <tr> <td>Thurs</td><td>5</td><td>4</td></tr> <tr> <td>Fri</td><td>8</td><td>1</td></tr> </tbody> </table> This graph can be used to represent the data from the table.		Bananas	Apples	Mon	2	3	Tues	4	5	Wed	6	2	Thurs	5	4	Fri	8	1	
	Bananas	Apples																		
Mon	2	3																		
Tues	4	5																		
Wed	6	2																		
Thurs	5	4																		
Fri	8	1																		
Use Line Graphs to Solve Problems To find the average temperature in May, follow the arrow up from May and across to the temperature. As this is halfway between 10°C and 12°C, the average temperature in May is 11°C. To find the difference between the average temperatures in August and in November, find the temperature for each month and calculate the difference between the two. The shape of the line graph can show how the temperature changed. The average temperature falls 9°C from August to November.	Mark each point for the number of bananas sold each day and join each point with a line. Mark each point for the number of apples sold each day and join each point with a line.																			

Statistics: Stage 6

Statistics

Key Vocabulary

bar chart

pictogram

frequency table

tally chart

pie chart

discrete data

continuous data

line graph

sum

difference

comparison

interpret

mean average

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Interpreting Data

Information can be shown in tables, charts or graphs.

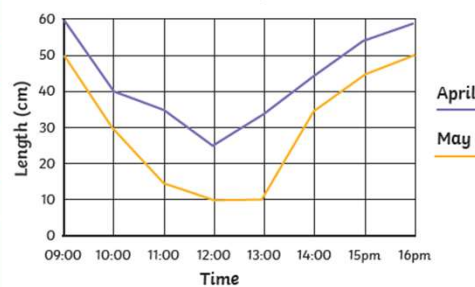
Interpreting data simply means understanding or working out what is being shown by a table, graph or chart and being able to answer questions about that information.

Line Graph

Line graphs are used to show changes to a measurement over time.

Data shown in a line graph is continuous. Sets of points are joined together to make the line.

A line graph to show the length of shadows over time



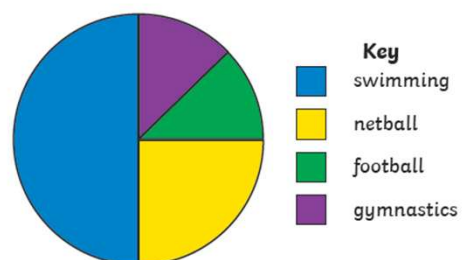
Knowledge Organiser

Pie Charts

Pie charts represent discrete data.

A circle is divided into segments, where each segment represents a data category. The size of each segment matches its proportion of the total amount.

A pie chart to show children's favourite sports



24 children were asked in total.

Swimming = $\frac{1}{2}$ so $\frac{1}{2}$ of 24 = 12 children

Netball = $\frac{1}{4}$ so $\frac{1}{4}$ of 24 = 6 children

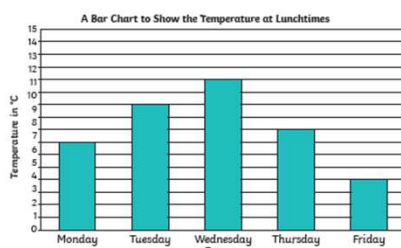
Football = $\frac{1}{8}$ so $\frac{1}{8}$ of 24 = 3 children

Gymnastics = $\frac{1}{8}$ so $\frac{1}{8}$ of 24 = 3 children

Statistics

Bar Chart

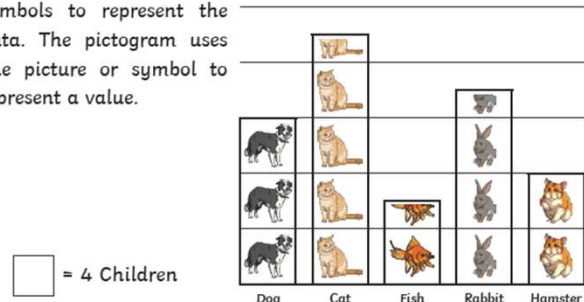
A bar chart has a horizontal axis and a vertical axis. Bars show the data value of each category. There must be a gap between each bar. The scale of the bar chart is chosen based on the data range.



Pictogram

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

Class 10's Pets



Frequency Table

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

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

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

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Mean Average

The mean is the average of a set of data.

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

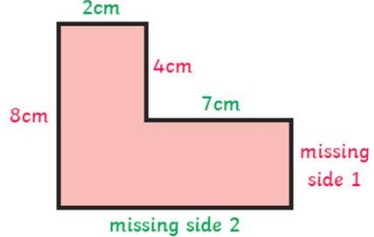
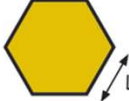
12	15	10	8	15
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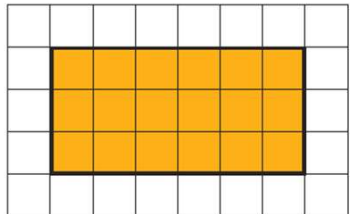
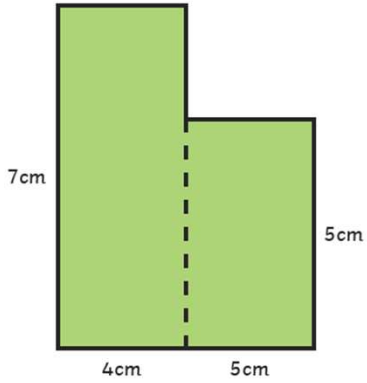
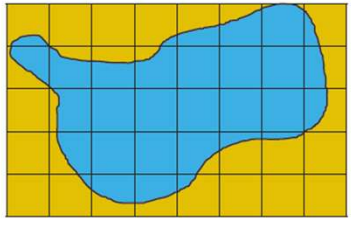
$$12 + 15 + 10 + 8 + 15 = 60$$

$$60 \div 5 = 12$$

The mean of this data is 12.

Perimeter and Area: Stage 5

Perimeter and Area		Knowledge Organiser
Key Vocabulary	Measure Perimeter	Calculate Perimeter
metre	Measure the perimeter of a rectangle: 	Calculate the missing sides of this rectilinear shape to find the perimeter: 
kilometre		
perimeter	Measure the length (l) and width (w). $\text{Perimeter} = l + w + l + w \text{ or } (l + w) \times 2$	* This shape is not drawn to the dimensions specified. $\text{Missing side 1} + 4\text{cm} = 8\text{cm},$ $\text{so missing side 1} = 4\text{cm}.$ $\text{Missing side 2} = 2\text{cm} + 7\text{cm} = 9\text{cm}$
length	Measure the perimeter of regular shapes:  Measure the length (l) and count the number of sides (s) on the shape. $\text{Perimeter} = l \times s$	
width	Measure the perimeter of irregular shapes: 	$\text{Perimeter} = \text{sum of all sides} =$ $2\text{cm} + 4\text{cm} + 7\text{cm} + 4\text{cm} + 9\text{cm} + 8\text{cm} = 34\text{cm}$
rectangle		
rectilinear		
dimensions		
 visit twinkl.com		

Length and Perimeter		Knowledge Organiser
Area of Rectangles	Area of Compound Shapes	Area of Irregular Shapes
The area of a rectangle on a grid:  Multiply the length $\times$ width $= 6 \times 3 = 18 \text{ squares}.$ The area of a rectangle = length (l) $\times$ width (w).   visit twinkl.com	To find the area of a compound shape, divide the shape into rectangles with known dimensions:  $\text{Area} = 7\text{cm} \times 4\text{cm} + 5\text{cm} \times 5\text{cm}$ $= 28\text{cm}^2 + 25\text{cm}^2$ $= 53\text{cm}^2$	To find the area of an irregular shape, find the number of whole squares and part squares.  Whole squares = 10 Part squares = 22 Estimate of area = whole squares + half part squares $= 10\text{cm}^2 + 11\text{cm}^2 = 21\text{cm}^2$ *There are other ways to estimate the area of irregular shapes.

Perimeter, Area and Volume: Stage 6

Perimeter, Area and Volume

Knowledge Organiser

Key Vocabulary

perimeter

area

volume

cubic units (e.g. cm^3)

cuboid

width

length

rectangle

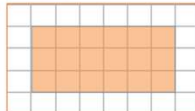
rectilinear

parallelogram

perpendicular height

Area of Rectangles

length $\times$ width = area of a rectangle



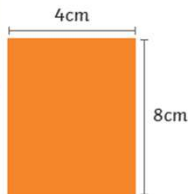
Counting squares:

area = 18cm^2

Use formula:

$6\text{cm} \times 3\text{cm}$

area = 18cm^2



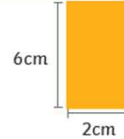
$8\text{cm} \times 4\text{cm}$ area = 32cm^2

Perimeter of Rectangles

perimeter = length + width + length + width or (length + width) $\times$ 2



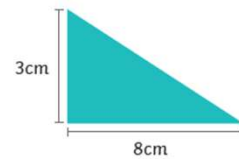
$5\text{cm} + 4\text{cm} + 5\text{cm} + 4\text{cm}$
area = 18cm^2



$(6 + 2) \times 2$
area = 16cm^2

Area of Triangles

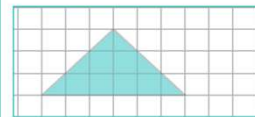
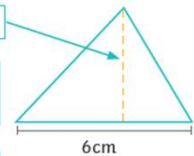
base $\times$ perpendicular height $\div$ 2 = area of a triangle



$8\text{cm} \times 3\text{cm} \div 2$
area = 12cm^2

perpendicular height = 5cm

$6\text{cm} \times 5\text{cm} \div 2$
area = 15cm^2



Counting squares:

6 whole squares = 6cm^2

6 half squares = 3cm^2

$6\text{cm}^2 + 3\text{cm}^2 = 9\text{cm}^2$

area = 9cm^2

Using formula:

$6\text{cm} \times 3\text{cm}$

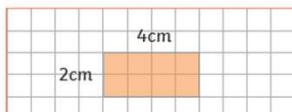
$\div 2 = 9\text{cm}^2$

Perimeter, Area and Volume

Knowledge Organiser

Perimeter and Area

Shapes with the same area can have different perimeters.

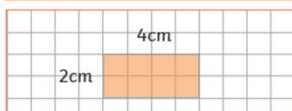


area = 8cm^2 perimeter = 12cm



area = 8cm^2 perimeter = 18cm

Shapes with the same perimeter can have different areas.

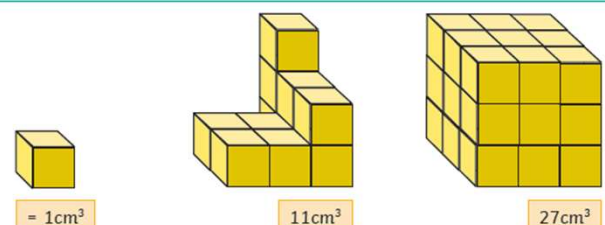


area = 8cm^2 perimeter = 12cm



area = 5cm^2 perimeter = 12cm

Volume - Counting Cubes



= 1cm^3

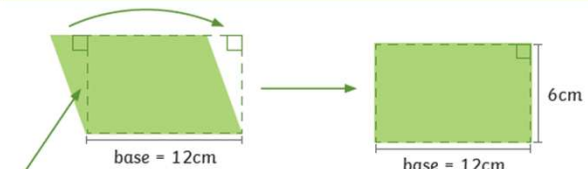
11cm^3

27cm^3

Area of Parallelograms

base $\times$ perpendicular height = area of a parallelogram

A parallelogram can be transformed into a rectangle.

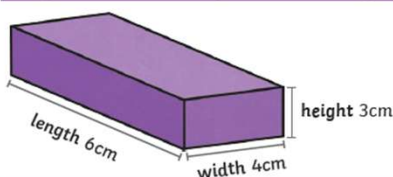


perpendicular height = 6cm

$12\text{cm} \times 6\text{cm} = 72\text{cm}^2$

Volume of Cuboids

length $\times$ width $\times$ height = volume of a cuboid



Multiply dimensions in **any** order:

$3\text{cm} \times 6\text{cm} \times 4\text{cm}$

volume = 72cm^3