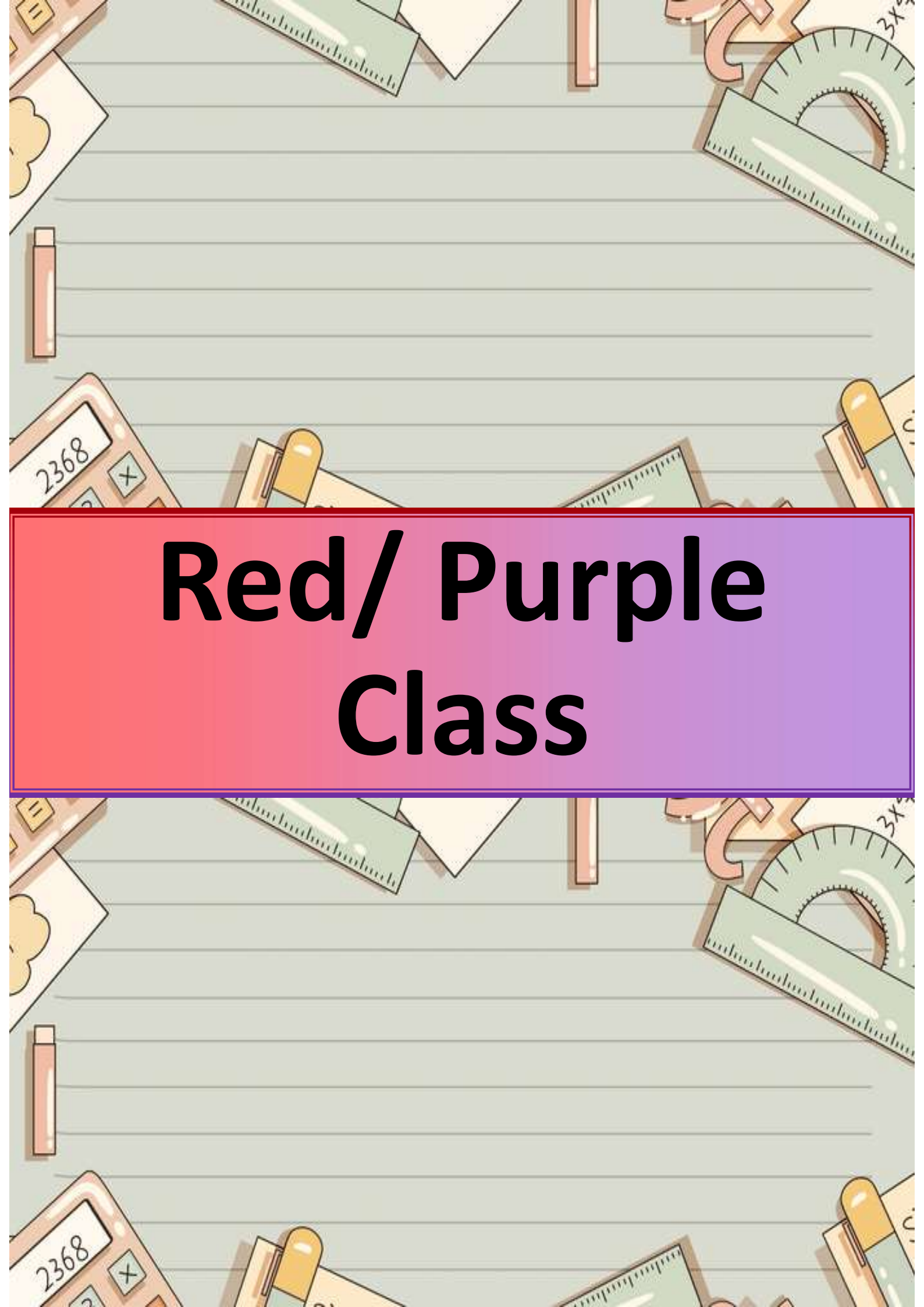


The background of the entire page is a light gray surface with horizontal white lines, resembling a notebook. Scattered around the edges are various colorful school supplies: a green ruler, a yellow protractor, a pink eraser, a yellow pencil, a pink calculator showing '2368', a yellow paperclip, and a small yellow notepad with a cloud drawing.

Red/ Purple Class

Addition and Subtraction: Stage 5

Addition and Subtraction		Knowledge Organiser	
Key Vocabulary	Addition	Subtraction	
Add	Place Value Grid: $3274 + 5601 = 8875$		
Total			
Make			
Plus			
Sum			
More			
Altogether			
Difference			
Subtract			
Less			
Minus			
Take away			
Column addition			
Column subtraction			
Estimate			
Inverse operation			
Number facts			
Place value			
Complex			

Th	
H	
T	
O	

Column Method

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

$$\begin{array}{r} 45864 \\ +23497 \\ \hline 69361 \\ 111 \end{array}$$

TTh		2 ten thousands left
Th		5 thousands – 6 thousands cannot be done. Exchange ten thousand for ten thousands becoming 15 thousands – 6 thousands = 9 thousands
H		7 hundreds – 3 hundreds = 4 hundreds
T		2 tens – 1 ten = 1 ten
O		7 ones – 3 ones = 4 ones

Column Method

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

$$\begin{array}{r} 35727 \\ - 6313 \\ \hline 29414 \end{array}$$

Addition and Subtraction

Knowledge Organiser

Estimate and Approximate

Inverse Operations

Rounding to Estimate

41 635 + 7386 = 49 021

Round to ten:

41 630 + 7380 = 49 010

41 630 + 7390 = 49 020

41 640 + 7390 = 49 030

Rounding is not as accurate when both numbers are rounded up. A better estimate comes from "rounding" one down and one up.

Estimating on a Number Line

10 000

50 000



The arrow is about $\frac{3}{4}$ of the way across the line so it is 40 000.



Use the inverse to check:

53 476

32 732

20 744

To check 53 476 - 32 732 = 20 744
use 32 732 + 20 744 = 53 476

Start with a number, subtract 409 and double. I end with 6264. To find the starting number use the inverse: halve, then add 409. Half of 6264 = 3132. 3132 + 409 = 3541. The starting number was 3541.

Multistep Problems

Using a Bar Model

The sum of two numbers is 25 567.

The difference is 1875.



Subtract 1875 from 25 567 = 23 692.
Halve 23 692 to find smaller number = 11 846.
Add 1875 to find larger number = 13 721.

£20

£3.75

£8.49

?

£12.24

£7.76

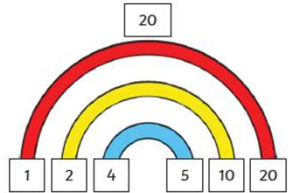
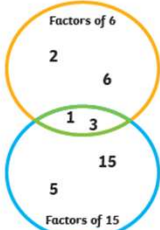
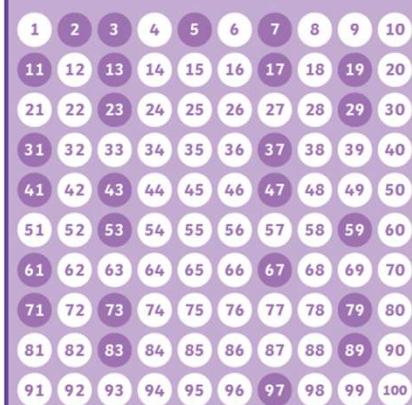
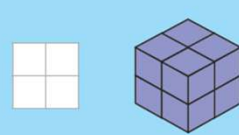
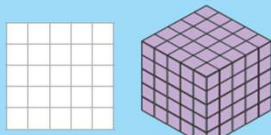
£20 is used to buy 2 books costing £3.75 and £8.49.

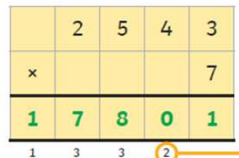
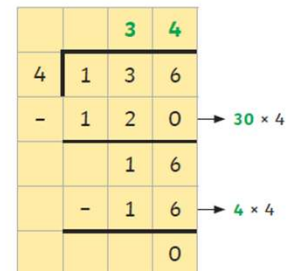
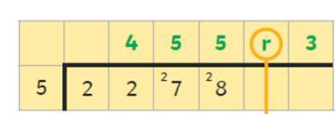
How much change is given?

£3.75 + £8.49 = £12.24

£20.00 - £12.24 = £7.76

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.  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 A common factor is a factor of 2 or more numbers. 		
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		$72 \div 9 = 8$ $720 \div 9 = 80$ $72 \div 8 = 9$ $720 \div 8 = 90$	
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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
$136 \div 4 = 34$   visit twinkl.com		 $15 \div 4 = 3$ 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 $8636 - 3786 = 4850$

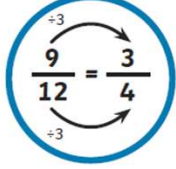
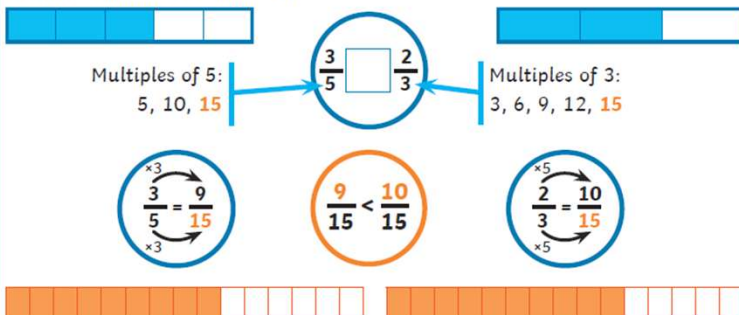
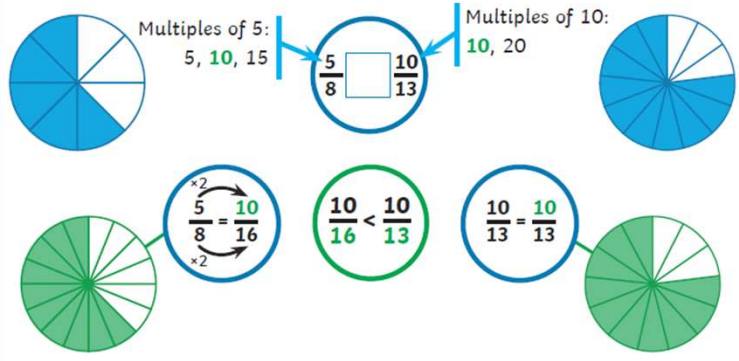
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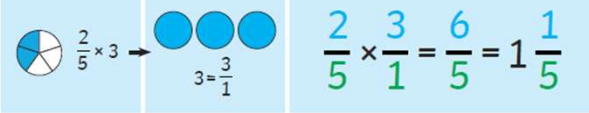
Fractions: Stage 5

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.	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	$\frac{9}{4}$ $9 \div 4 = 2 \text{ r } 1$ Divide the numerator by the denominator. This shows you the whole number and the fraction. $2 \frac{1}{4}$	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						
$\frac{1}{2} + \frac{3}{4} + \frac{5}{8} = \frac{4}{8} + \frac{6}{8} + \frac{5}{8} = \frac{15}{8} = 1 \frac{7}{8}$		$1 \frac{2}{3} - \frac{2}{9} = 1 \frac{6}{9} - \frac{2}{9} = 1 \frac{4}{9}$ <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						
Add Mixed Numbers								
$1 \frac{1}{4} + \frac{3}{8} = 1 \frac{2}{8} + \frac{3}{8} = 1 \frac{5}{8}$ $1 \frac{1}{4} + \frac{3}{8} = \frac{5}{4} + \frac{3}{8} = \frac{10}{8} + \frac{3}{8} = \frac{13}{8} = 1 \frac{5}{8}$								
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 denominator 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	 Factors of 9: 1, 3, 9 Factors of 12: 1, 2, 3, 4, 6, 12  	Use the Common Denominator  Use the Common Numerator 

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

Decimals: Stage 5

Decimals

Knowledge Organiser

Key Vocabulary

Tenths, Hundredths and Thousandths

tenths

hundredths

decimal tenths

decimal hundredths

decimal equivalents

part-whole model

rounding

decimal point

place value

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The figure displays three horizontal number lines, each with a blue box highlighting the first segment from 0 to 0.1.

- Tenths:** The top number line is marked from 0 to 1 in increments of 0.1. Above the line are fractions: $\frac{0}{10}, \frac{1}{10}, \frac{2}{10}, \frac{3}{10}, \frac{4}{10}, \frac{5}{10}, \frac{6}{10}, \frac{7}{10}, \frac{8}{10}, \frac{9}{10}, \frac{10}{10}$. Below the line are decimal equivalents: 0, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.
- Hundredths:** The middle number line is marked from 0 to 1 in increments of 0.01. Above the line are fractions: $\frac{0}{100}, \frac{1}{100}, \frac{2}{100}, \frac{3}{100}, \frac{4}{100}, \frac{5}{100}, \frac{6}{100}, \frac{7}{100}, \frac{8}{100}, \frac{9}{100}, \frac{10}{100}$. Below the line are decimal equivalents: 0, 0.01, 0.02, 0.03, 0.04, 0.05, 0.06, 0.07, 0.08, 0.09, 0.1.
- Thousandths:** The bottom number line is marked from 0 to 1 in increments of 0.001. Above the line are fractions: $\frac{0}{1000}, \frac{1}{1000}, \frac{2}{1000}, \frac{3}{1000}, \frac{4}{1000}, \frac{5}{1000}, \frac{6}{1000}, \frac{7}{1000}, \frac{8}{1000}, \frac{9}{1000}, \frac{10}{1000}$. Below the line are decimal equivalents: 0, 0.001, 0.002, 0.003, 0.004, 0.005, 0.006, 0.007, 0.008, 0.009, 0.01.

The figure shows four base ten blocks representing different place values, with arrows indicating multiplication and division by 10.

- A large yellow cube represents 1. An arrow labeled $\div 10$ points to a red flat representing $\frac{1}{10}$.
- The red flat is divided into 10 orange rods, each representing $\frac{1}{100}$. An arrow labeled $\div 10$ points to a small yellow cube representing $\frac{1}{1000}$.
- An arrow labeled $\times 10$ points from the small yellow cube back to the orange rod.
- An arrow labeled $\times 10$ points from the orange rod back to the red flat.
- An arrow labeled $\times 10$ points from the red flat back to the large yellow cube.

Order and Compare Numbers with Three Decimal Places

Ones	Tenths	Hundredths	Thousandths
	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$
0	2	1	3

Ones	Tenths	Hundredths	Thousandths
1		$\frac{1}{100}$	$\frac{1}{1000}$
1	0	2	2

Ones	Tenths	Hundredths	Thousandths
2	$\frac{1}{10}$		$\frac{1}{1000}$
2	1	0	3

Decimal Numbers as Fractions

$$0.71 = \frac{71}{100} = \frac{7}{10} + \frac{1}{100}$$

$$0.37 = \frac{37}{100} = \frac{3}{10} + \frac{7}{100}$$

Decimals

Knowledge Organiser

Multiplying and Dividing by 10, 100 and 1000

Tens	Ones	Tenths	Hundredths	Thousandths
3	8			
3	8	0		

Diagram showing multiplication by 10 and division by 10:

$38 \div 10 = 3.8$ (arrow from 38 to 3.8)

$3.8 \times 10 = 38$ (arrow from 3.8 to 38)

Tens	Ones	Tenths	Hundredths	Thousandths
3	8			
3	8	0	3	

Diagram showing multiplication by 100 and division by 100:

$38 \div 100 = 0.38$ (arrow from 38 to 0.38)

$0.38 \times 100 = 38$ (arrow from 0.38 to 38)

Tens	Ones	Tenths	Hundredths	Thousandths
3	8			
3	8	0	0	3

Diagram showing multiplication by 1000 and division by 1000:

$38 \div 1000 = 0.038$ (arrow from 38 to 0.038)

$0.038 \times 1000 = 38$ (arrow from 0.038 to 38)

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 $\leftarrow$ 1.1 1.2 1.3 1.4 $\rightarrow$ 1.5 1.6 1.7 1.8 1.9 $\rightarrow$ 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 $\leftarrow$ 1.11 1.12 1.13 1.14 $\rightarrow$ 1.15 1.16 1.17 1.18 1.19 $\rightarrow$ 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 tenths hundredths thousandths 3 + $\frac{4}{10}$ + $\frac{2}{100}$ + $\frac{6}{1000}$ 3.426 3 + 0.4 + 0.02 + 0.006 <table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr> <tr><td>0.1</td><td>0.2</td><td>0.3</td><td>0.4</td><td>0.5</td><td>0.6</td><td>0.7</td><td>0.8</td><td>0.9</td></tr> <tr><td>0.01</td><td>0.02</td><td>0.03</td><td>0.04</td><td>0.05</td><td>0.06</td><td>0.07</td><td>0.08</td><td>0.09</td></tr> <tr><td>0.001</td><td>0.002</td><td>0.003</td><td>0.004</td><td>0.005</td><td>0.006</td><td>0.007</td><td>0.008</td><td>0.009</td></tr> </table>	1	2	3	4	5	6	7	8	9	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	$\frac{7}{20} = \frac{35}{100}$ 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 $\frac{7}{8} = 7 \div 8$
1		2	3	4	5	6	7	8	9																													
0.1		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9																													
0.01		0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09																													
0.001		0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009																													
decimal fraction																																						
recurring decimal																																						
equivalent fraction																																						
tenth																																						
sharing																																						
partitioning																																						
exchanging																																						
rounding to 3d.p.																																						
hundredth																																						
thousandth																																						
equal to																																						
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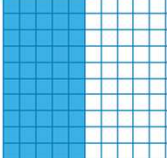
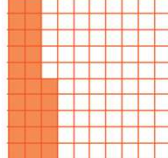
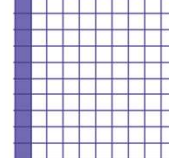
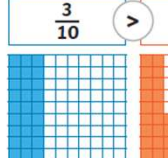
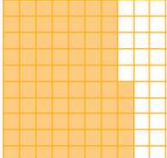
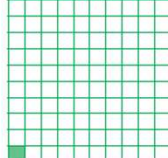
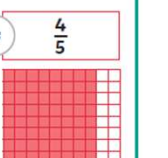
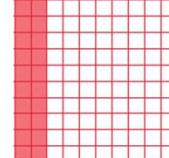
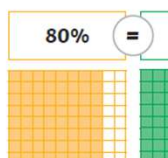
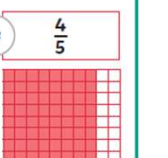
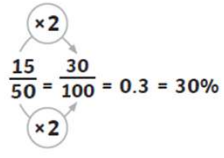
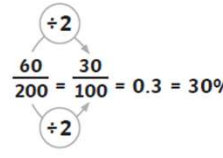
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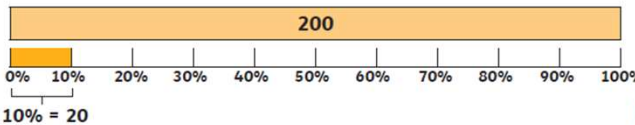
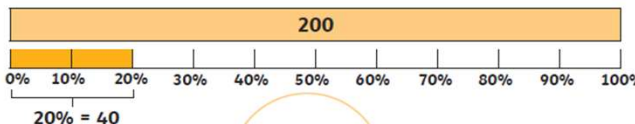
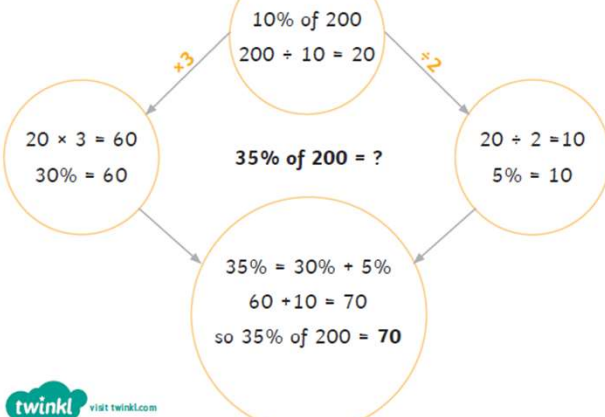
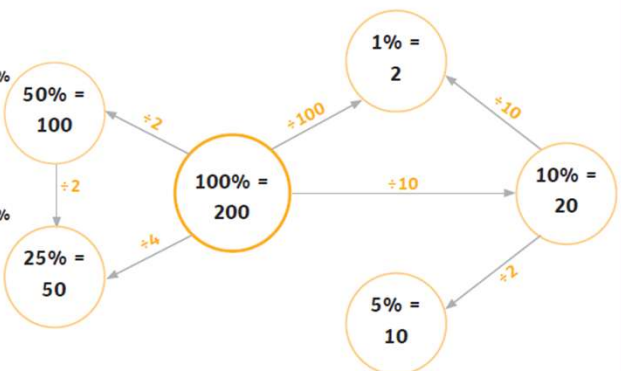
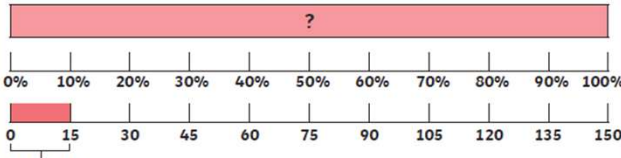
Decimals: Stage 6

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Percentages: Stage 6

Percentages		Knowledge Organiser
Key Vocabulary	Equivalent Fractions, Decimals and Percentages	Order Fractions, Decimals and Percentages
per cent (%) = 'out of 100'	 $\frac{50}{100} = \frac{1}{2} = 0.5 = 50\%$	$\frac{3}{10} > 25\% > 0.2$
percentage	 $\frac{25}{100} = \frac{1}{4} = 0.25 = 25\%$	 $\frac{25}{100} = 25\%$
discount	 $\frac{10}{100} = \frac{1}{10} = 0.1 = 10\%$	 $\frac{30}{100} = 30\%$
equivalent fraction	 $\frac{75}{100} = \frac{3}{4} = 0.75 = 75\%$	 $\frac{25}{100} = 25\%$
equivalent decimal	 $\frac{1}{100} = 0.01 = 1\%$	 $\frac{20}{100} = 20\%$
convert	 $\frac{20}{100} = \frac{2}{10} = 0.2 = 20\%$	 $\frac{80}{100} = 80\%$
compare		 $\frac{80}{100} = 80\%$
order		 $\frac{80}{100} = 80\%$
the whole		
	Fractions to Percentages  	

Percentages	Knowledge Organiser
Finding a Percentage of an Amount	
$50\% = \frac{1}{2}$ so we can divide by 2 $10\% = \frac{1}{10}$ so we can divide by 10 $25\% = \frac{1}{4}$ so we can divide by 4 $1\% = \frac{1}{100}$ so we can divide by 100	
 10% = 20	
 20% = 40	
 35% of 200 = ? $20 \times 3 = 60$ $30\% = 60$ $20 \div 2 = 10$ $5\% = 10$ $35\% = 30\% + 5\%$ $60 + 10 = 70$ so 35% of 200 = 70	 $1\% = 2$ $10\% = 20$ $5\% = 10$ $25\% = 50$ $100\% = 200$
	Percentages – Missing Values Whole value (100%) of bar model = ?  10% = 15 We know 10% = 15 $10\% \times 10 = 100\%$ (the whole) so $15 \times 10 = 150$

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> <tr> <th></th><th>Bananas</th><th>Apples</th></tr> <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> </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



Interpreting Data

Information can be shown in tables, charts or graphs.

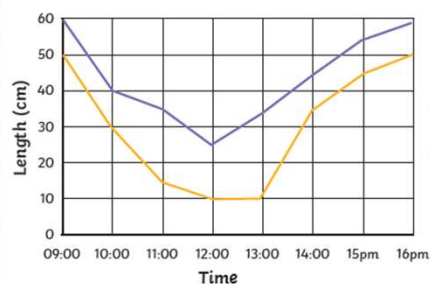
Interpreting data simply means understanding or working out what is being shown by a table, graph or chart and being able to answer questions about that information.

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



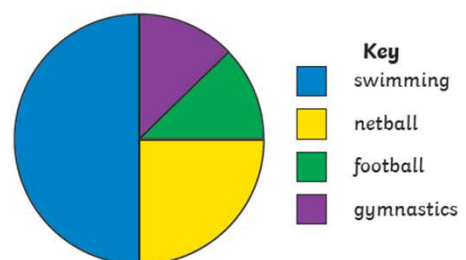
Knowledge Organiser

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

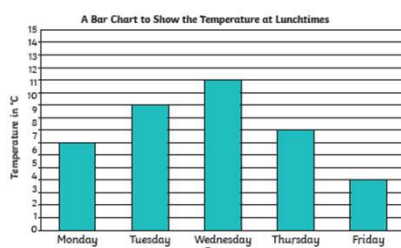
Football = $\frac{1}{8}$ so $\frac{1}{8}$ of 24 = 3 children

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.

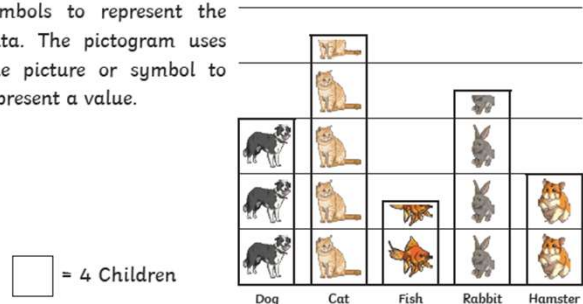


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Pictogram

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.



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
----	----	----	---	----

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

$$60 \div 5 = 12$$

The mean of this data is 12.