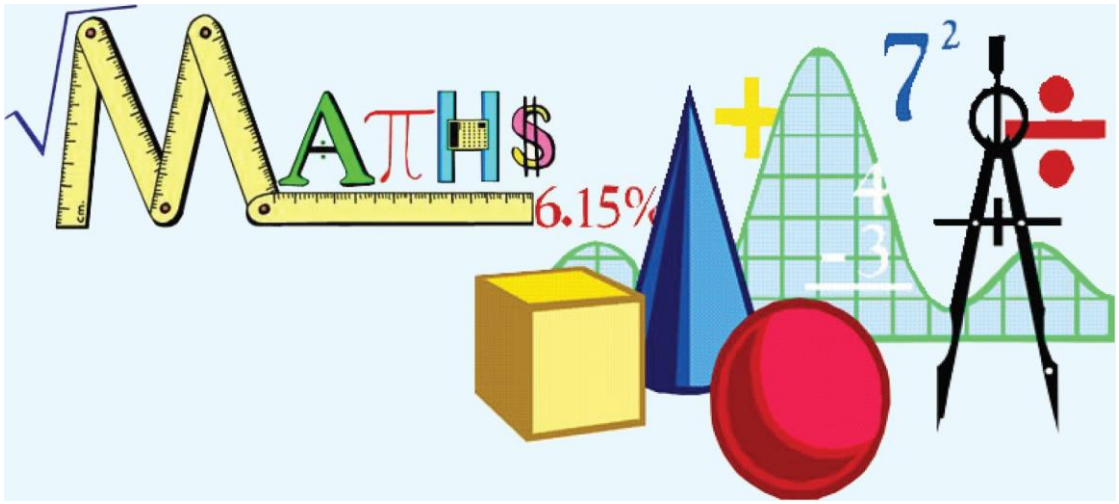
London Borough of Redbridge

Key Stage 2 Mathematics

New Curriculum - 2014



Compiled by:

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Mathematics in the new National Curriculum 2014

Changes

Change of mathematical terms and elimination of some topics	Replacement
Shape and Space	Replaced by Geometry
Handling data	Replaced by Statistics
Algebra	New and teach in year 6
Probability	Taken off from the primary curriculum
Roman numerals	Added as a new topic
Timetables	End of year 4, pupils should have memorised their multiplication tables up to 12
Written calculations methods	Introduce written calculation methods in year 2 and by end of year 6 pupils should be fluent in written methods for all four operations.

Compiled by Mahbub Hossain
September 2014

<table>
<tr><th></th><th>Programme of study</th><th>Examples</th></tr>
<tr><td>Y3</td><td>Number and place value
Pupils should be taught to:
count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number.</td><td>0 4 8 12 16 --- --- find the next two numbers.
0 8 16 24 32 --- ---- find the next two numbers
0 50 100 150 --- ---- ---- find the nest three numbers
100 more than 150 is ------ . What is 100 more than 171
What is 100 less than 117

<table><tr><th></th><th>than 342</th><th>153</th><th>212</th><th>465</th><th>575</th><th>983</th></tr><tr><td>100 more</td><td>442</td><td>253</td><td>312</td><td>565</td><td>675</td><td>1083</td></tr><tr><td>100 less</td><td>242</td><td>53</td><td>112</td><td>365</td><td>475</td><td>783</td></tr><tr><td>10 more</td><td>352</td><td>163</td><td>222</td><td>375</td><td>485</td><td>993</td></tr><tr><td>10 less</td><td>332</td><td>143</td><td>202</td><td>455</td><td>565</td><td>973</td></tr></table>
My starting number is 217. I count on by 100s seven times.
What is the last number I count? Explain your thinking:

Fill in the blanks.
a) 10 more than 439 is _____. b) 100 less than 724 is _____.
c) _____ more than 352 is 362. d) _____ more than 467 is 567.
e) 1 more than _____ is 601. f) 10 less than _____ is 341.
g) 100 less than _____ is 878. h) 10 more than _____ is 754

Mr. Fox’s class is collecting cans for recycling. Adam collected 502 cans, Jade collected 512cans, and Isha collected 602 cans.
a) How many more cans did Isha collect than Adam?
b) How many less cans did Adam collect than Jade?

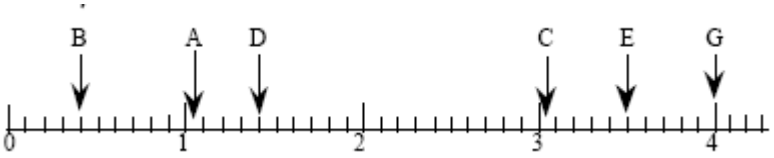
Show a way to count from 170 to 410 using tens and hundreds.</td></tr>
<tr><td></td><td>recognise the place value of each digit in a three-digit number (hundreds, tens, ones)</td><td>463 = 400 + 60 + 3 781 = 700 + ☐ + 21

What is the value of bold digit in each of these numbers?
534 708 913 860571 10762165

Say each number, then write it in figure: thirty nine, seven hundred and twenty one, eight hundred and twelve, five thousand, two hundred and five.

Write the number that is made up of: 7 units and 9 tens, 7 hundreds and 4 unites, 2 unites, 7tens and five hundreds.

What is the largest number can you make with the digits 0, 5, 8, and 1?
What is the smallest number can you make with the digits 1 , 7 0, 5, and 2?</td></tr>
</table>

	compare and order numbers up to 1000	Ordering 4 digit numbers: 2461 4715 6321 7851 2154 8623 5032 5701 5021 6732 5 4 7 Use the above digits to make 5 different numbers: Now use these numbers to make these statements true Write the letter that corresponds to each number that represents the quantity on the number line:  1) _____ 1.04 2) _____ 3.05 3) _____ 4.0 4) ____ 0.40 5) _____ 3.50 6) _____ 1.4 Which number sentence is true? 394 < 385 394 > 394 394 < 394 394 > 385 Ⓐ Ⓑ Ⓒ Ⓓ Which sign makes the number sentence true? 10 ☐ 5 + 11 26 ☐ 20 + 6
	identify, represent and estimate numbers using different representations	How would you write 1 as a Roman numeral? What number does this Roman numeral represent? What number does this Roman numeral represent? What number does this Roman numeral represent How would you write 18 as a Roman numeral? What number is shown? Which place value model shows 28? Estimate, how many marbles are there?

	read and write numbers up to 1000 in numerals and in words	Write eight hundred and nine in figure. What is another way to write 2 units, 6 hundreds and 7 tens? Write 905 in unit form. Write the following in number form (in figure): nine hundreds + seven tens + two units = Match the figures with the correct words: five hundred and six 417 one hundred and five 105 nine hundred, three tens and 9 units 506 four hundred seventeen 231 Write two hundred seventeen and seventy then add them together.
	solve number problems and practical problems involving these ideas.	**5 2 8** Make five different numbers using the digit above and ask questions to your partner to answer them. E.g. Write the smallest and biggest number. Find the number that is 100 more than the smallest number. What is the 100 less than the biggest number? Use the digits above and make a number that is multiple of 4. Compare 21 ones to 21 tens with your partner. Billy found a bag full of money. He counted up 23 ten pound notes, 2 twenty pound notes, 5 five pound notes and a pound coin. How much money was in the bag?
	Addition and subtraction Pupils should be taught to: add and subtract numbers mentally, including: • a three-digit number and ones • a three-digit number and tens • a three-digit number and hundreds	Add 7 to 231. What is 601 plus 9? What is the sum of 101 and 5? What is the total of 921 and 9? Count on 4 from 901. Subtract 9 from 219. What is 472 minus 7? Decrease 5 from 761. Count back 5 from 871. What is the difference between 11 and 7? What is 9 less than 102? Take away 6 from 871. What number is needed to add to 341 to make 391? Count on 80 from 207. What number is needed to takeaway from 702 to make 692? 801 + 90 = ☐ 415 + 60 = ☐ ☐ + 463 = 493 782 - ☐ = 702 901 - 871 = 213 - 90 = 219 + 100 = ☐ ☐ + 708 = 908 413 + ☐ = 813 119 + ☐ = 419 902 – ☐ = 402 727 – 400 = ☐ 400 + 300 = ☐ 200 + ☐ = 500 600 + 200 = ☐ What is the difference between 305 and 705?

add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction

Addition and subtraction

789 + 642 becomes	874 – 523 becomes	932 – 457 becomes	932 – 457 becomes
7 8 9 + 6 4 2 1 4 3 1 1 1	8 7 4 – 5 2 3 3 5 1	8 12 1 9 3 2 – 4 5 7 4 7 5	1 1 9 3 2 – 4 5 7 5 6 4 7 5
Answer: 1431	Answer: 351	Answer: 475	Answer: 475

You may carry on the digit at the top, e.g.

$$\begin{array}{r} {\scriptstyle 1} \\ 729 \\ +163 \\ \hline 892 \end{array} \qquad \begin{array}{r} {\scriptstyle 3\ 1} \\ 8\cancel{4}5 \\ -\ 238 \\ \hline 607 \end{array}$$

calculate these:

57 + 9	75 +13	231 +176	974 +458	383 +189
180 - 130	178 - 99	647 -458	921 - 672	705 -254

Complete the table using formal written methods:

Add 228

150	
383	
597	
749	

subtract 78

398	
90	
675	
784	

estimate the answer to a calculation and use inverse operations to check answers

187 + 248 = estimate : 190 + 250 = 440

$$\begin{array}{r} {\scriptstyle 1\ 1} \\ 187 \\ +\ 248 \\ \hline 435 \end{array}$$

Check using inverse operation:

$$\begin{array}{r} {\scriptstyle 3\ 12\ 1} \\ 4\cancel{3}\cancel{5} \\ -\ 248 \\ \hline 187 \end{array} \qquad \begin{array}{r} 435 \\ -\ 187 \\ \hline 248 \end{array}$$

Fill in the missing numbers:

$$\begin{array}{r} \square\square\square \\ -\ 79 \\ \hline 277 \end{array} \quad 4 \qquad \begin{array}{r} 317 \\ \square\square\square \\ \hline 597 \end{array} \qquad \begin{array}{r} 324 \\ +\ \square\square \\ \hline \end{array} \qquad \begin{array}{r} \square\square\square \\ -\ 271 \\ \hline \end{array}$$

Estimate first and then check using formal written methods:

281 + 127 = 78 + 123 = 492 – 278 =

Which number makes the equation true?

19 + ☐ = 20 + 8 74 – 8 = ☐ + 25

	solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	Bruce jumped on the sofa 487 times, and his friend Pam jumped on it 179 times. How many times did they jump on the sofa altogether? Crowed attendance at two football matches was 903 and 798. What was the total attendance? A total of 967 people landed at the airport today. Only 185 people landed on time. How many people did not land on time at the airport today? What is the difference between 345 and 876? A cook fed 535 adults and 49 children. How many people did the cook feed? Write an addition number sentence that fits the story. Grayson is looking for index cards in his desk. He found 437 index cards. 72 of the index cards are lined and the rest are plain. How many of the index cards are plain? Write a subtraction number sentence that fits the story. Write the related addition fact for **11 + 14 = 25**. Addition fact : 11 + 15= 25 15 + 11 = 25 You can add numbers in any order. Write the related addition fact for 23 + 10 = 33, and 54 + 46 = 100. Write the related subtraction fact for **12 – 8 = 4**. Fact 12 – 4 = 8. Write the related subtractions fact for 25 – 9 = 16, and 76 – 57 = 19. What fact is missing from this fact family? 17 – 16 = 1 1 + 16 = 17 17 – 1 = 16 What is 400 + 20 + 3? Add 297 to 615 and then subtract 289. What is 209 + 176 + 261? Subtract 205 and 115 from 912. What is 4000 + 200 + 20 + 5 ? What is 700 + 90 + 7 ? A carpet costs £12 per square meter. How much will it cost to carpet a room 5m long and 3m wide? Luke has two twenty pound notes. His sister Lisa has three five pound notes. They combine their money to buy a gift for their dad that costs £25.50 . How much change will they receive?

Multiplication and division

Pupils should be taught to:
recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables

Fill in the missing numbers:

3 x 8 = 4 x 3 □ x 4 =32 3 x 9 = 8 x 5 = 4 x 9 =

3 x 7 = 4 x 10 8 x 7 = 3 x □ = 18 8 x 9 = □ x 7 = 28

45 ÷ 5 = 90 ÷ □ = 10 72 ÷ 9 = 56 ÷ □ = 8 63 ÷ □ = 7

What is 10 times 7? Multiplied 9 by 8. Divide 45 by 5?

Complete the table:

x	5	7	9	2	8	4
3						
8						
4						
8						
3						
4						

÷	16	84	32	56	72	24
4						
8						

÷	12	24	72	60	48
3					
4					

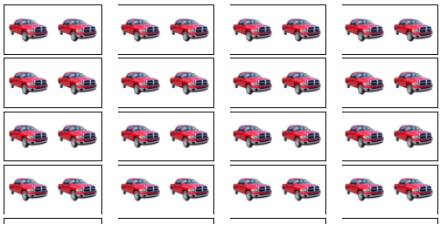
write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods

Write the multiplication number sentences to match the picture below:

There are 2 groups of 5. The multiplication number sentence is
2 × 5 = 10
or 5 x 2 = 10

There are 5 groups of 3.
How would you write a multiplication number sentence for this question?

Write the multiplication number sentences to match the picture below:



Try these:

8 x 10 = 7 x 9 = 0 x 12 = 24 x 3 = 21 x 4 =

15 x 6 = 11 x 9 = 23 x 4 = 45 x 3 = 56 x 7 =

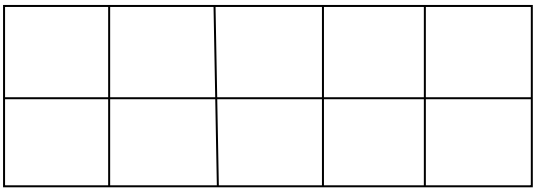
15 ÷ 3 = 27 ÷ 9 = 45 ÷ 5 = 81 ÷ 9 = 63 ÷ 7 =

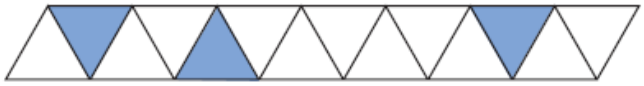
56 ÷ 8 = 75 ÷ 5 = 36 ÷ 4 = 42 ÷ 6 = 72 ÷ 9 =

Complete the table: Use formal written methods: 28 x 4

Total	Number of Equal Groups	Amount in Each Group
18		3
30	3	
33		11
87		29

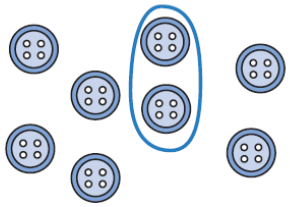
3
2 8
x 4
1 1 2

	solve problems, including missing number problems, involving multiplication and division, including integer scaling problems and correspondence problems in which n objects are connected to m objects.	William had 50 apples. He cut each apple into 2 slices. How many apple slices did William make? A camp owns 8 vans. There are 6 seats in each van. How many seats in total are there in the camp's vans? Abby worked for 10 hours last week. She earned £4 per hour. How much money did Abby earn last week? Steve bought 12 bunches of carrots. There were 10 carrots in each bunch. How many carrots did Steve buy? A hospital ordered 7 boxes of cotton swabs. There were 10 cotton swabs in each box. How many cotton swabs did the hospital order in all? Billy needs to buy swimming hats for the swim team. At the sporting goods store, each package contains 3 swimming hats. If Billy needs to get 9 swimming hats, how many packages should he order? An aeroplane has 5 rows of seats. The plane can seat 10 passengers. How many seats are in each row? Ellen can fit 3 oranges in each bowl. If she has 27 oranges, how many bowls will Ellen need? Fill in the missing numbers: 25 ÷5 = ☐ 36 ÷ ☐ = 9 ☐ ÷5 = 9 56 ÷ ☐ = 7 ☐ X 7 = 35 9 x 6 = 54 6 x ☐ = 36 4 x 9 = ☐ 5 x b = 35 b = 7 b x 8 = 16 b = ☐ 3 x b = 15 b = ☐ a x 9 = 27 a = ☐ 6 x a = 42 a = ☐ a x 4 = 32 a = ☐ 45 ÷ m = 9 m = 5 m ÷ 9 = 72 m = ☐ 63 ÷ m = 9 m = ☐
	Fractions Pupils should be taught to: count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10	The concept of fraction is to represent a part of a whole. If a number divided into 5 parts and want to separate 3 parts from the 5 so it can be written as 3/5. The following diagram illustrate this fraction:  Recognise 1⁄10 as one tenth, and know that it means one whole divided into 10 equal parts. Such as Shade one half. Shade one tenth. Shade three tenth.  Complete the shading on this diagram so that one half of it is shaded.



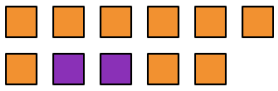
- What fraction of the set of buttons is ringed?

  Say what fraction of the set of buttons is not in the ring.



recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators

What fraction of the squares are orange?



- $\frac{9}{11}$
- $\frac{1}{2}$
- $\frac{3}{9}$
- $\frac{1}{9}$

What fraction of the tubs are blue?

- $\frac{6}{8}$
- $\frac{2}{10}$
- $\frac{5}{7}$
- $\frac{1}{8}$

Find half of each of the numbers to 20. What is 1⁄10 of 20? What is three quarters of 20?

Write a fraction to show how much each person gets when:
1 cake is divided equally among 10 people;
5 cakes are divided equally between 2 people.

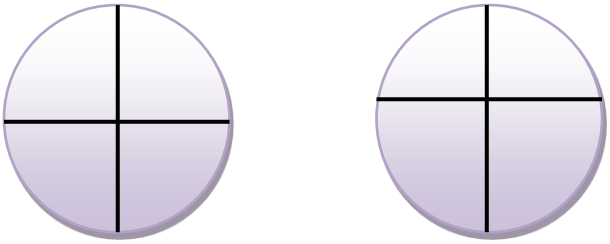
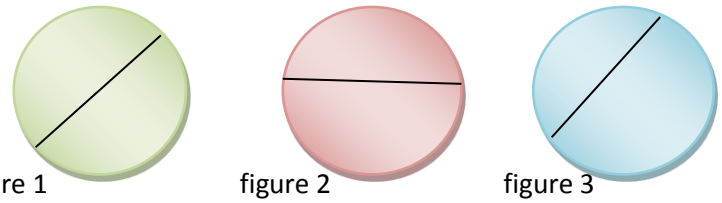
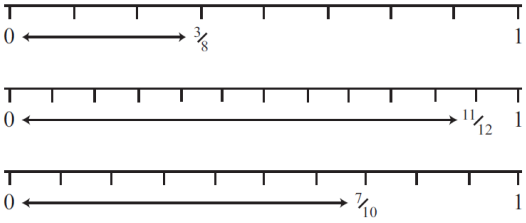
Take 20 cubes. Make a shape which is 1⁄2 red and 1⁄10 blue.

What fraction of this shape is orange?

- $\frac{6}{11}$
- $\frac{2}{12}$
- $\frac{2}{6}$
- $\frac{2}{5}$

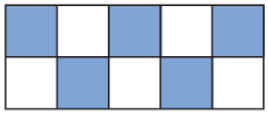
What fraction of this shape is pink?

- $\frac{6}{7}$
- $\frac{7}{8}$
- $\frac{2}{7}$
- $\frac{6}{8}$

	recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators	Which figure shows quarters  Which figure shows half ?  Figure 1 figure 2 figure 3 Explain why this shape is not divided into thirds.  We can also represent fractions on a section of a number line. We take the section from 0 to 1, and divide it up into the total number of pieces. Then we count off the number of pieces we have taken. 
	recognise and show, using diagrams, equivalent fractions with small denominators	Equivalent fractions have the same value to each other and appear in different form. E.g. ½ = 5/10 = 15/30. Equivalent fractions can be found by multiplying the numerator and denominator by the same number or by dividing the numerator and denominator by the same number . E.g. 5/7 equivalent fraction is 10/14 (denominator and numerator multiplied by 2), 20/28 = 5/7 (denominator and numerator divided by 4). two quarters are the same as one half; 2/4 ½  $\frac{1}{3} = \frac{2}{6}$. One third is the same as two sixth. chocolate bar ⅓ bar each 

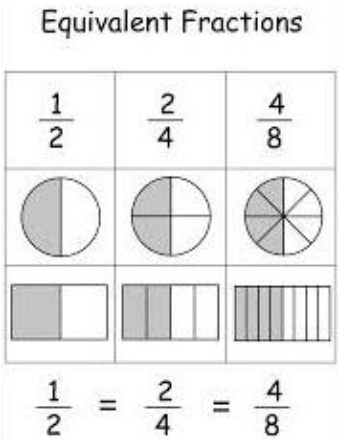
This whole shape consists of ten tenths;
five tenths or one half is shaded.

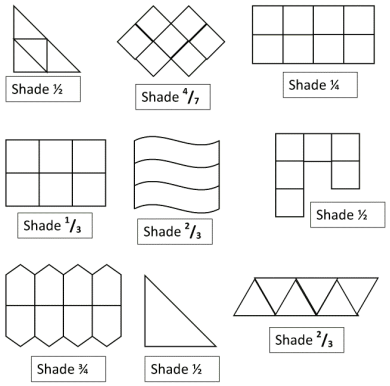
5/10 = ½



What fraction is equivalent to 1/3 ? 4/8, 2/6, 3/12,

What fraction has a numerator of 8 and is equivalent to ½?
4/8, 8/16, 32/64, 8/9, 8/12.
What fraction has a denominator of 12 and is equivalent to 2/3?
8/12, 9/12, 11/12, 12/18.
What number is half way between 3 and 4?
Between 21⁄2 and 3?
Which one of the following fractions are NOT equivalent to 1/5?
2/4, 5/25, 2/8, 5/15,





add and subtract fractions with the same denominator within one whole (e.g. $^{5}/_{7} + {}^{1}/_{7} = {}^{6}/_{7}$)

To add...

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

Just add up the numerators

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

2/4 + ¼ = 3/5 + 1/5 = 1/6 + 4/6 =

1/3 + 1/3 = 3/8 + 5/8 = 3/8 + 2/8 =

2/7 + 3/7 = 5/9 + 1/9 = 3/10 + 1/10 =

$$\frac{3}{4} - \frac{1}{4} =$$

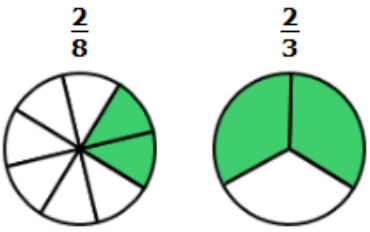
Just subtract the numerators

$$\frac{3}{4} - \frac{1}{4} = \frac{3-2}{4} = \frac{2}{4} = \frac{1}{2}$$

3/8 – 2/8 = 4/9 – 1/9= 6/7 – 2/7 = 9/10 – 7/10=

compare and order unit fractions, and fractions with the same denominators

Which fraction is **greater**?

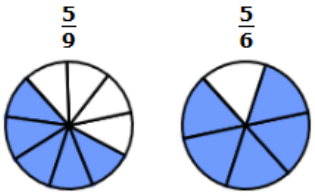


$\frac{2}{8}$ ☐

$\frac{2}{3}$ ☐

neither; they are equal ☐

Which fraction is **less**?



$\frac{5}{9}$ ☐

$\frac{5}{6}$ ☐

neither; they are equal ☐

Put these fractions in order from smallest to largest:
½ 1/6 1/3 ¼

Put these fractions in order starting from the biggest:
1/10 5/10 7/ 10 3/5

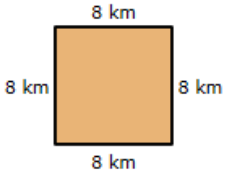
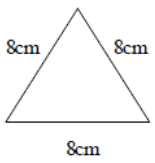
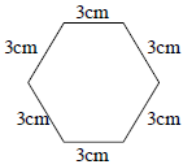
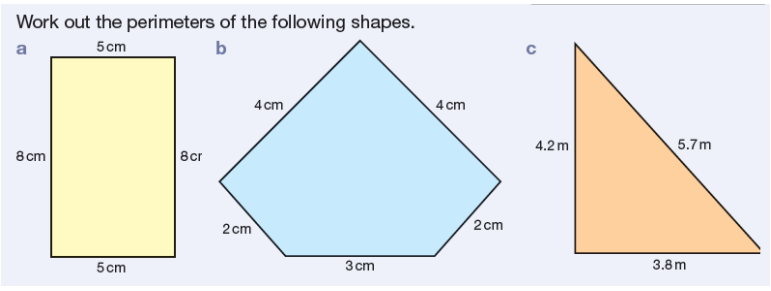
Solve problems that involve all of the above.

The table shows decimal numbers and equivalent fractions. Complete the table below:

Decimals	Equivalent fractions
0.50	½
0.25	
0.75	
0.60	
0.10	
0.20	

Complete this fraction grid

Start Number	24	48	72	96	144
To find 1/3 (divide by 3)	8		24		48
To find 1/6 (divide by 6 Or half of 1/3)	4	8			

	Measurement Pupils should be taught to: measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)	Tyler's garage door opener is 13 centimetres long. Martha's garage door opener is 1 centimetre longer than Tyler's. Emma's garage door opener is 2 centimetres shorter than Tyler's. Which garage door opener is longer than 13 centimetres? Two rolls of tape are 35 cm and 41 cm long. What is the total length? Mia's pine tree is 13 metres tall. Dalton's pine tree is 8 metres shorter than Mia's. How many metres tall is Dalton's pine tree? A big of potato weighs about ½ kg on the scales. What would be the weight on the scales of 10 big potatoes? A bottle of medicine holds 75ml. A teaspoon holds 5ml. How many teaspoon of medicine in the bottle? Which is more, 6,000 millilitres or 6 litres? ○ 6,000 millilitres ○ 6 litres ○ neither; they are equal Which is more, 858 millilitres or 1 litre? ○ 858 millilitres ○ 1 litre ○ neither; they are equal
	measure the perimeter of simple 2-D shapes	***Perimeter Is distance around the edge of a flat shape.*** What is the perimeter?  8 + 8 + 8 + 8 = 32cm or 8 x 4 = 32cm Calculate the perimeter of these shapes.  Perimeter…….. cm  Perimeter…….. cm  A square piece of gold has sides that are 11 millimetres long. What is the piece of gold's perimeter?

	add and subtract amounts of money to give change, using both £ and p in practical contexts	How much money is there?  Which is **not** equal to 9 fifty pence coins? ○ 5 fifty pence coins, 7 twenty pence coins, and 6 ten pence coins ○ 3 one pound coins, 7 twenty pence coins, and 7 two pence coins ○ 8 fifty pence coins, 1 twenty pence coin, and 3 ten pence coins ○ 4 one pound coins, 8 five pence coins, and 10 pennies Write these amounts as £: 47p, 89p, 73, 80p, 56p, 90p, 62p. Write these as pence: £2.05, £173, £8.09, £1.13, £9.01 Luther had 50p until he spent 3 two pence coins. How much money does Luther have now? Nate spends 5 five pence coins on a spool of gold wire. Farah spends 5 two pence coins on a ball of twine. How much money do they spend in total? Irene buys a hamster wheel costing £4.06. She gives the cashier five one pound coins. The cashier gives her change using the least number of coins possible. How many of each coin does she receive? Erin spends 4 two pence coins on a pencil, then Joseph spends 3 one pound coins on a stapler. How much money do they spend in total? Add these amounts: 43p + 76p + 15P 17p + 87p + 12p 32p + 19P + 50P £1.27 + £3.13 £9.72 + £1.12 £10.50 + £1.75 Subtract : 95p – 73p – 9p 91p – 69p 87p – 19p – 17p £3.45 – £1.30 £5.25 – £2.75 £10.40 – £7.60
	tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks	What time does the clock show?  What time does the clock show?  Which time matches?   ☐ ☐ ☐ ☐

What time is it?




Roman Numerals:

1	5	10	50	100	500	1000
I	V	X	L	C	D	M

1	2	3	4	5	6	7	8	9
I	II	III	IV	V	VI	VII	VIII	IX

10	20	30	40	50	60	70	80	90
X	XX	XXX	XL	L	LX	LXX	LXXX	XC

100	200	300	400	500	600	700	800	900
C	CC	CCC	CD	D	DC	DCC	DCCC	CM

What time is it?

estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight

How long does it take to make a cup of tea?

- ☐ 5 minutes
- ☐ 5 hours
- ☐ 5 seconds

How long does it take to Wash the dishes?

- ☐ 15 hours
- ☐ 15 minutes
- ☐ 15 years

. Complete the table.

Film	Start	Finish	Film length
The 3 Wolves	10.35am	11.45am	
Moon Wars	11.05am	12.50pm	
Spider Story		1.10pm	50 mins

know the number of seconds in a minute and the number of days in each month, year and leap year

Look at this calendar for June 2001.

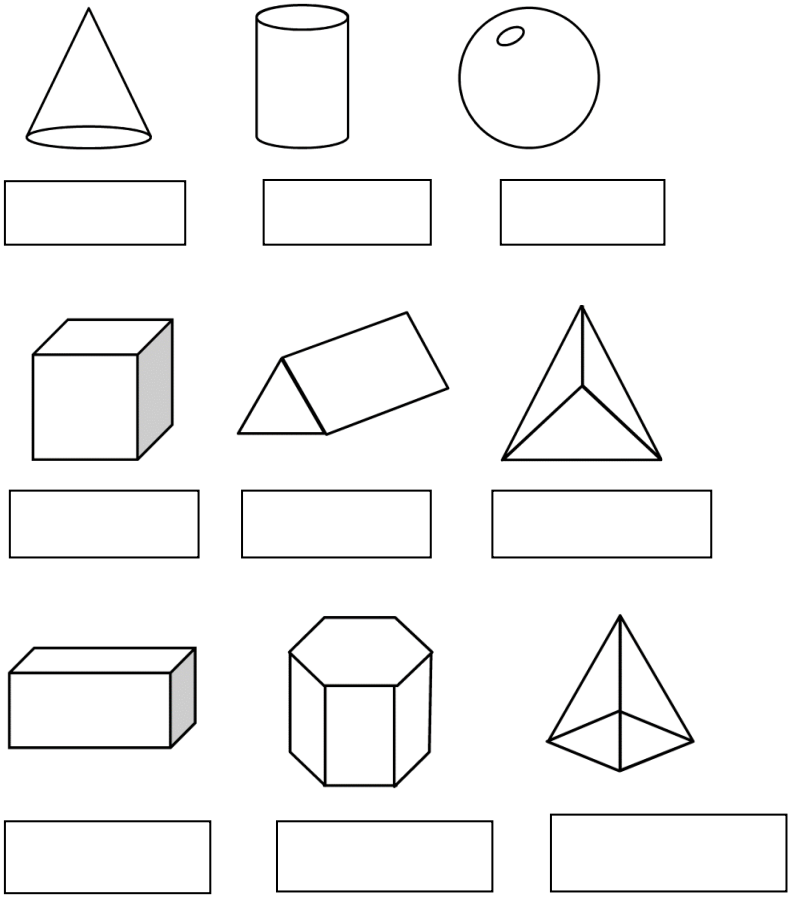
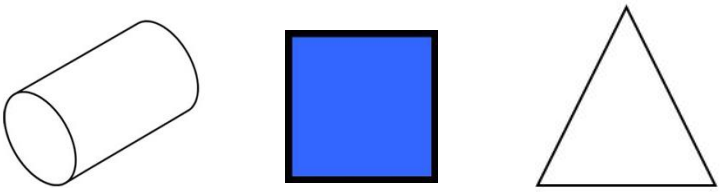
June						
S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

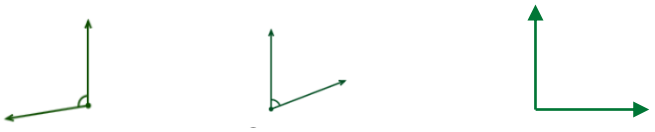
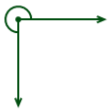
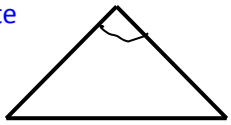
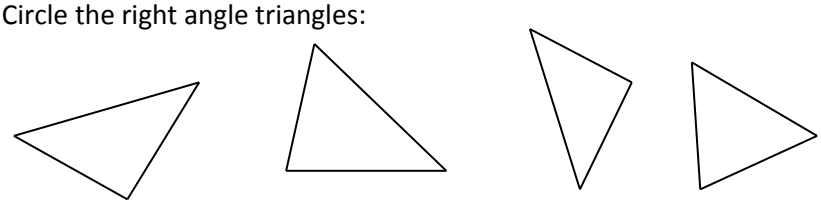
Which day of the week is 16th June?

What is the date of the second Monday in June?

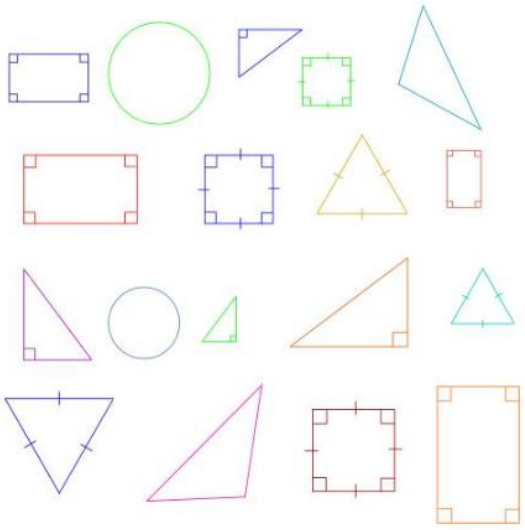
The Smith family are going on holiday 2 weeks after the 14th June. What date will that be?

How many hours are in a day? How many days are in leap year? How many days are in a normal year? How many whole weeks are in a year? How many whole weeks are in a month? How many months in a year? How many days are in a week?

	compare durations of events, for example to calculate the time taken by particular events or tasks.	Lunch takes 50 minutes. It ends at 1:00pm. What time does it start? The cake went into the oven at 10:20. It came out at 10:45. How long was it in the oven? Mark got into the pool at 3:35pm. He swam for 40 minutes. What time did he get out? Robin left the airport at 08:45 to Milan. The flight lasting for 2 hours and 4 minutes. At what time did he land at Milan Airport?
	Geometry **Properties of shapes** Pupils should be taught to: draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them	Write the correct mathematical name for each figure underneath:  Which of these is a triangle? 

	recognise that angles are a property of shape or a description of a turn	Is this angle greater than, equal or less than a right angle?  What fraction of a turn is this angle?  ○ $\frac{1}{4}$ turn ○ $\frac{1}{2}$ turn ○ $\frac{3}{4}$ turn ○ 1 full turn What fraction of a turn is this angle?  ○ $\frac{3}{4}$ turn ○ 1 full turn ○ $\frac{1}{2}$ turn ○ $\frac{1}{4}$ turn What kind of angle is this? acute  obtuse ☐ right angle ☐ Draw a shape to match the following description: a) Two equal sides and two equal angles b) three equal sides and three equal angles. c) All four sides are equal but all angles are unequal. d) Opposite sides are equal in length and all angles are 90^0 . e) All sides are equal and all angles are right angles. f) Opposite sides are equal and all angles are not equal.
	identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle	Circle the right angle triangles:  A triangle is isosceles and right angled. Which of the following statements must be **false**? A The triangle has angles 45°, 45° and 90° B The triangle has two of its sides equal C The triangle has one line of symmetry D The triangle has sides of lengths 3, 4 and 5

How many right angle triangles are there in the diagram?



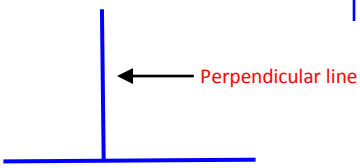
What happens when you put two right angles together?

identify horizontal and vertical lines and pairs of perpendicular and parallel lines.

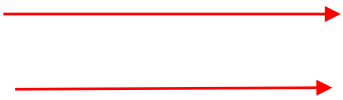
Horizontal line: A horizontal line is a line which goes straight from left to right.

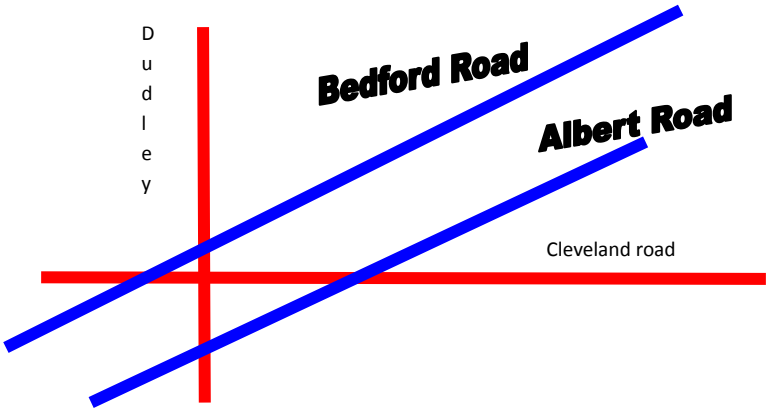
Vertical Line: A line goes straight and 90^0 to the horizontal.

Perpendicular Line: Two lines are drawn at right angle to each other are called perpendicular line:



Parallel line: Parallel lines are those never meet and they go in the same direction.



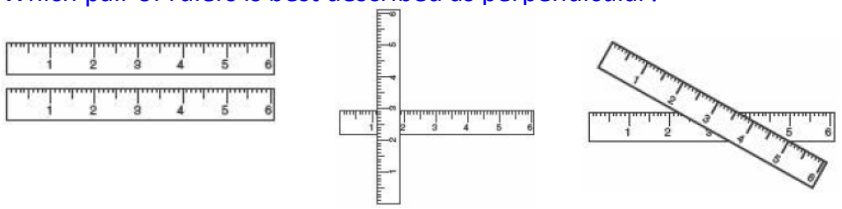


Which two streets appear to be perpendicular?
Which street appears as a horizontal line?
Which street appears as a vertical line?

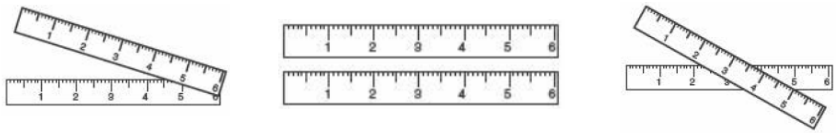
Statistics
Pupils should be taught to:
interpret and present data using bar charts, pictograms and tables

 solve one-step and two-step questions such as 'How many more?' and 'How many fewer?' using information presented in scaled bar charts and pictograms and tables.

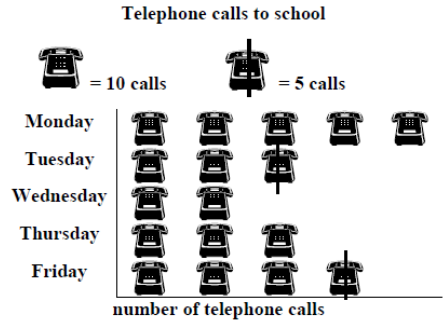
Which pair of rulers is best described as perpendicular?



Which pair of rulers is best described as parallel?



Answer these questions about the pictogram.



a) **On which day does the school get most calls?**

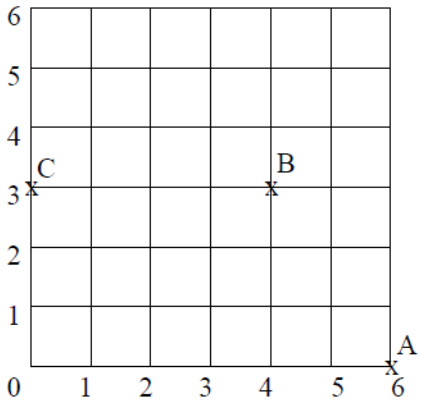
How many?

b) **On which day does the school get least calls?**

How many?

c) **How many calls were received altogether during the week?**

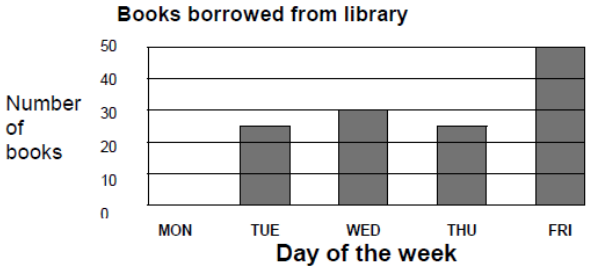
d) **How many more calls were received on Monday than on Friday?**



a) Write the coordinates of each point:

A(__ , __) B(__ , __) C(__ , __)

b) Draw a cross at the point D (2,0). Now draw another two crosses so that you can make the rectangle DEBF



a) 15 books were borrowed on Monday. Draw in the bar.

b) On which day were the most books borrowed?

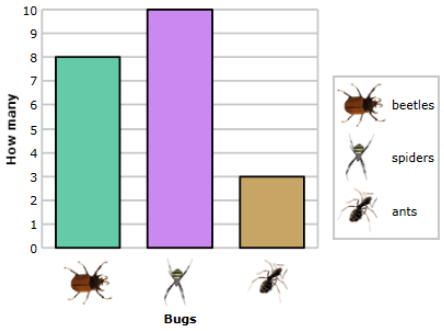
c) How many books were borrowed on Thursday?

d) How many books were borrowed altogether during the week?

For Earth day, the environment club tracked the number of seeds planted by its members. Use the data in the tally chart to create a bar graph.

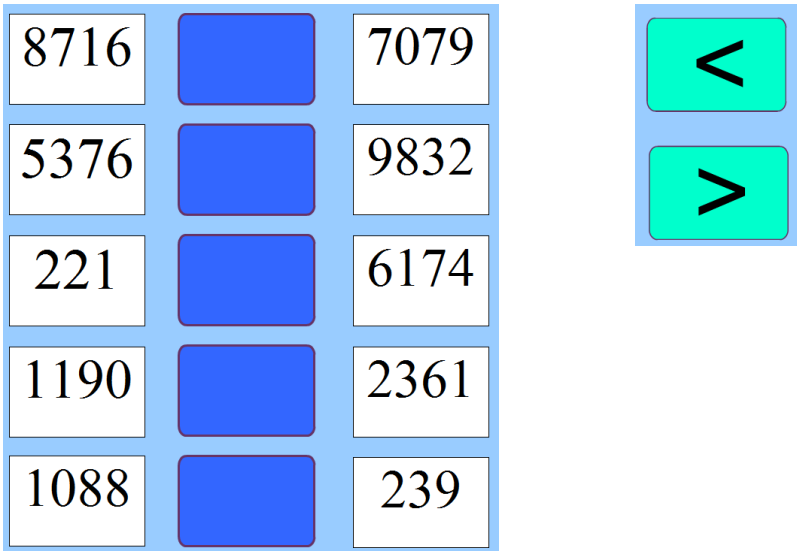
Planting seeds in the garden	
Seeds planted	Number of members
0	𝍸 II
1	𝍸
2	𝍸 I
3	𝍸 𝍸
4	𝍸 IIII
5	IIII

Mali asked her friends to vote for their favourite bug. She made a bar graph of the result. How many more people voted for beetles than voted for ants?

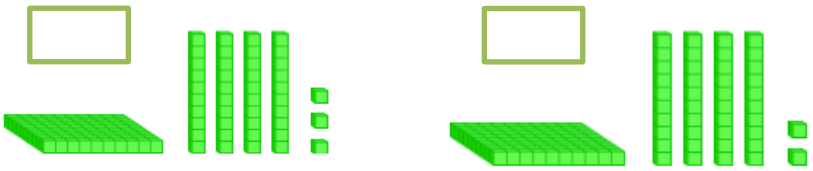
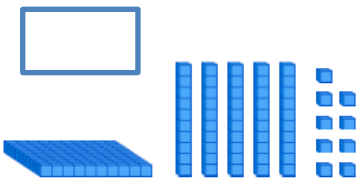


Y4	**NUMBERS** **Number and place value** Pupils should be taught to count in multiples of 6, 7, 9, 25 and 1000 find 1000 more or less than a given number	Which numbers are missing from these sequences? -- 43 37 -- 25 19 -- 7 61 86 -- 75 82 -- -- 27 93 -- 111 120 -- 138 231 331 -- 531 631 -- 9001 -- 7001 6001 -- Fill in the missing numbers: 12 x ☐ = 12000 10 x ☐ x 10 = 1000, 50 x ☐ = 1000 20 x 20 ☐ = 4000 30 x 30 x 10 = ☐ What is 1000 more than 219? What is 1000 less than 1929? **Complete the table below:** Write the numbers that are 1000 more or less than the number 6735. What comes next? 4021 5021 ----- What will last number be? 712 1712 2712 3712 Write the symbols greater than or less than to complete theses number sentences:

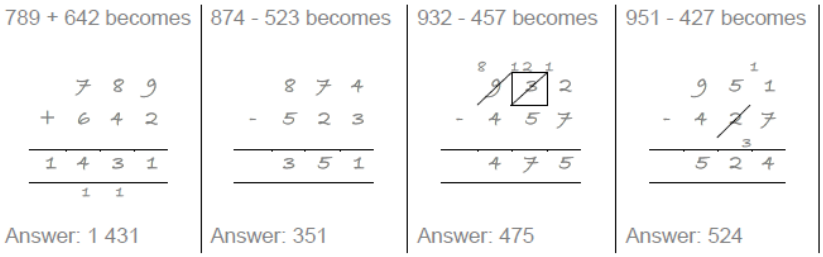
	than 671	492	971	549	807	989
100 more	771					1089
100 less						
1000 more						
1000 less			-29			



	count backwards through zero to include negative numbers	Fill in the missing numbers: 109 59 ------ 9 - 41 ----- 520 445 ---- 305 235 165 --- --- 25 -- --- -15 - 25 --- --- -55 -- --- A number line can help us to understand changes in temperature. For example, if the overnight temperature fell to −4°C, and by midday it had risen to 7°C, then, counting from −4 up to 7 on the number line,  At 6pm, the temperature was 3°C. By midnight, it had dropped to −5°C. How great was the fall in temperature?
	recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)	In 2941, what digit is in the **hundreds** place? In 762, which digit is in the tens place? Which number's underlined digit is worth 20? 76<u>2</u>267 67<u>2</u> What is the value of the digit underlined? 3<u>4</u>29 <u>6</u>021 291<u>0</u> 81<u>0</u>2 51<u>2</u>9 In 5074, which digit is in the thousands place? Write these numbers in figures: four thousand and forty, three hundred three, nine thousand and ninety, six hundred, five thousand and three units. Write these numbers in words: 5323, 8910, 70921, 102, 691, 1099 Fill in the missing numbers: 721 x ☐ = 7210 271 x 100 = ☐ 27 x ☐ = 27000 What is the largest number can you make with the digits 2, 0, 9, and 5? What is the smallest number can you make with the digits 1, 3, 0 and 4? Write the number is made up of: 5 units and 9 tens, 7 hundreds and 7 units, 6 thousands, 4 units and 8 hundreds.
	order and compare numbers beyond 1000	Put the following numbers in order starting from the smallest: 102 201 1021 20.1 10.21 1201 102.1 If you arrange these numbers from **largest** to smallest, which number will come **second**? 179 86 772 83

	identify, represent and estimate numbers using different representations	Which sign makes the statement true? < or > or = 567 ☐ 418 178 ☐ 187 721 ☐ 721 Which number is smaller ? 4213 or 4123 A technical support line tracked how many calls it received each day. **Phone calls received** Day / Number of calls Friday 434 Saturday 493 Sunday 439 Monday 448 On which day did the support line receive the fewest calls? ○ Friday ○ Saturday ○ Sunday ○ Monday Use these digits to make the biggest and the smallest number and then find the difference between them. 8 3 1 5 What is **2,000 + 200 + 30 + 2** in standard form? two thousands = ☐ tens five thousands = ☐ hundreds one thousand two hundred and ten = ☐ tens Write sis hundred sixty four in figure? Write 969 in words? Which place value model shows 142 ?  What number is shown ?  Write this number. 7207 = ☐ thousands + ☐ hundreds + ☐ tens + ☐ units

	round any number to the nearest 10, 100 or 1000	To round a number to the nearest tens, look at the unit digit. If it is less than 5 the tens stay the same (round down), e.g 14 → 10, 72 → 70. If it is 5 or more than 5, then add 1 ten to the tens column (round up) e.g 15 → 20 77 → 80 To round to hundreds or thousands you work the same way, looking at the tens column or hundreds column. E.g 134 → 130 176 → 200 2761 → 2800 839 → 800 3456 → 3000 3512 → 4000 3991 → 4000 Round each number to the nearest 10. 64 71 97 457 7621 5361 561 749 Round each numbers to the nearest hundred. 3471 3441 871 951 2652 4321 Round each number to the nearest thousand. 5607 2189 1567 3543 9829 6281
	solve number and practical problems that involve all of the above and with increasingly large positive numbers	What is £9.85 rounded to the nearest pound? Tony buys the following items for his birth day party on Sunday. Party hat cost £1.09 each candles £0.85 balloons £2.18    Ribbons 99p cake £10.24   Put the prices in order starting with largest price. What is the difference between the largest and smallest prices?

	read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value.	1. Learn the meanings of the letters:**M=1000, D=500, C=100, L=50, X=10, V=5, and I=1.** 2. The letters (Roman numerals) are arranged from left to right in descending order of valuation and are simply added to each other (MM = 1000 + 1000 = 2000 and MDCLXVI = 1000 + 500 + 100 + 50 + 10 + 5 + 1 = 1666), 3. Sometimes there is a lower value numeral in front of (to the left of) a higher value numeral to indicate that the lower value should be subtracted from the adjacent higher value (XL = ten taken from fifty = 40 or (IX = one taken from ten = 9). Read the following Roman numeral and add them together. XII + CL = 12 + 150 = 162 DL + VIII = ☐ MDCV - MXV = ☐
	Addition and Subtraction Pupils should be taught to: ▯ add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate	 789 + 642 becomes Answer: 1 431 874 - 523 becomes Answer: 351 932 - 457 becomes Answer: 475 951 - 427 becomes Answer: 524 487 + 736 = 1223 548 + 736 = 1284 2898 + 1599 = 4497 763 – 282 = 481 850 – 573 = 277 8423 – 5796 = 2627 Using formal written method to solve these addition and subtraction problems: 927 + 120 457 + 871 2015 + 4926 2991 + 3297 768 – 136 651 – 389 2015 – 1916 5652 – 3484

	estimate and use inverse operations to check answers to a calculation	Fill in the missing digit: 3 5 6 + □□□ = 8 4 2 □□□ + 1 9 5 = 3 1 7 3 0 1 8 + □□□ = 3 5 8 7 □□□ - 6 3 0 = 2 8 5 2 9 1 3 - □□□ = 2 0 4 1 □□□□ - 2 4 9 6 = 2 7 3 9 Which number makes the equation/sentence true? 135 + 157 = □ + 178 Which number must be in the box to so that both sides are the same value? 422 - □ = 983 – 675 Which sing **< > =** makes the statement true. 131 – 11 □ 132 – 127 Estimate. Which sign > or < makes the statement true? 630 ÷ 6 □ 21038 x 9 2 6 0 x 5 □ 1310 Estimate the product. 69 × 8 The product is approximately: **70 x 8 = 560** Try these: 61 x 9 137 x 5 142 x 6 544 x 4 Luna calculates 20.4 x 5.3. She says the answer is 1081.2. Estimate if Luna's answer is correct?
	solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.	A local bakery sold 243 chocolate-chip biscuits, 23 lemon biscuits, and 150 oatmeal biscuits. How many biscuits did the bakery sell in all? Fred and Luna buy a football costs £9.50. Luna has £7.50. She pays half the price of the football. How much money does Luna have after they buy the football? Last year, Ela's school gave out 535 attendance awards, 27 improvement awards, and 38 spirit awards. How many awards did the school give out in all? Marie bought some aeroplane tickets for trips all over the world. She spent £1,312 on a flight to Japan, £5,957 on a flight to Norway, and £2,602 on a flight to Argentina. How much money did Marie spend in all?

Multiplication and division

Pupils should be taught to:

- recall multiplication and division facts for multiplication tables up to 12 × 12

Last year, the marble factory made 1,440 green marbles, 6,064 blue marbles, and 1,556 red marbles. 10% marbles were cracked. How many good marbles did the factory make in all?

Bernie needs 66 cupcakes for a birthday party. He already has 29 chocolate cupcakes and 21 vanilla cupcakes. How many more cupcakes should Bernie buy?

Ali and Scott already had 6 shells in their shell collection. Then they went to the beach to collect even more. Ali found 10 limpet shells, 5 sand dollars, and 6 conch shells. Scott found 6 more shells than Ali did. How many shells do the pair have all together?

The 12 Times Table

×	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

Fill in the missing box.

9 x 8 = ☐ 5 x ☐ = 45 ☐ x 8 = 56

8 x ☐ = 64 4 x ☐ = 32 6 x 7 = ☐

☐ X 7 = 63 12 x ☐ = 96 48 = ☐ x 6

32 ÷ 4 = ☐ 84 ÷ ☐ 12 ☐ ÷ 6 = 8

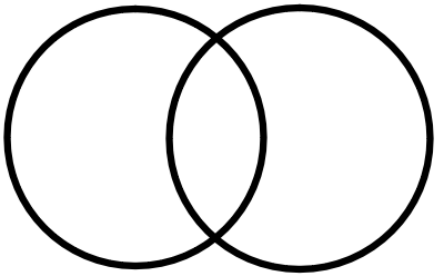
64 ÷ ☐ = 8 144 ÷ 12 = ☐ 72 ÷ 9 = ☐

Multiply 12 by 6? What is 9 x 4? What is the product of 7 and 5?
Divide 65 by 8. What is 132 divide by 11?

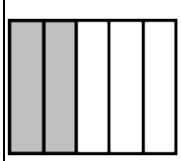
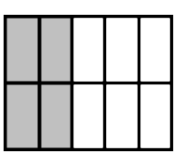
Complete these tables:

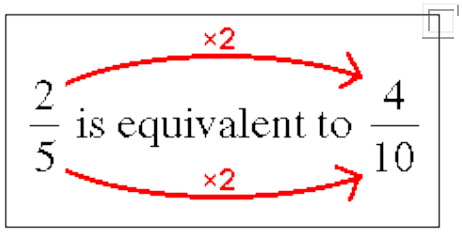
X	4	6	7	8	9	11	12
6							
7							
8							
9							
11							
12							

X	10	3	4	6	7	8	9
2							
3							
4							
6							
7							

	use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers	Draw lines to match, which are equal in value. 9 x 10 — 45 x 2 56 — 9 x 9 81 — 5 x 5 + 25 5 x 10 — 30 + 70 8 x 8 + 6 — 8 x 7 Write each of these numbers in its correct place on the Venn Diagram: 30 15 18 27 45 54 90 155 20 21 **multiple of 5** **multiple of 9**  Complete the pattern: ☐ × 6 = 48 ☐ × 6 = 480 ☐ × 6 = 4,800 ☐ × 6 = 48,000 Complete the pattern: 9 × 3 = ☐ 9 × 30 = ☐ 9 × 300 = ☐ 9 × 3,000 = ☐ Complete the pattern: ☐ ÷ 7 = 1 ☐ ÷ 7 = 10 ☐ ÷ 7 = 100 ☐ ÷ 7 = 1,000 Complete the pattern: 9 ÷ 9 = ☐ 90 ÷ 9 = ☐ 900 ÷ 9 = ☐ 9,000 ÷ 9 = ☐ 60 x 7 = 80 x 4 = 200 x 6 = 60 x 9 = 120 x 4 = 100 x 10 = 200 x 12 = 150 x 3 = 200 ÷ 5 = 90 ÷ 3 = 600 ÷ 5 = 210 ÷ 7 810 ÷ 9 = 360 ÷ 6 450÷ 3 = 320 ÷ 8 2600 x 1 = 1101 x 0 = 601 x 0 = 2001 x 1 = 4 x 2 x 5 = 2 x 2 x 3= 3 x 3 x 5 = 7 x 3 x 2 = 6 x 6 x 1 = 7 x 7 x 2 = 9 x9 x 2 = 10 x 10 x 2 =

	recognise and use factor pairs and commutativity in mental calculations	Find the missing factor: 5 x ☐ = 35 ☐ x 8 = 72 12 x ☐ = 60 Solve for, t, m and n. 7 x t = 63 m x 8 = 40 6 x n = 54 Each package of kitchen towels contains 2 rolls. If Tracy needs 4 rolls of kitchen towel, how many packages should she buy? Each pie is cut into 5 slices. If Daniel wants 10 slices of pie for a party, how many pies should he buy? 3 x 5 x 3 = 3 x 3 x 5 = 5 x 3 x 3 =
	multiply two-digit and three-digit numbers by a one-digit number using formal written layout	**Short multiplication** 24 × 6 becomes 2 4 × 6 1 4 4 2 Answer: 144 24 × 12 becomes 2 4 × 1 2 2 8 8 4 Answer: 288 124 × 12 becomes 2 4 1 2 4 × 1 2 1 4 8 8 Answer: 1 488 **Long multiplication** 24 × 16 becomes 2 2 4 × 1 6 1 4 4 2 4 0 3 8 4 Answer: 384 24 × 32 becomes 1 2 4 × 3 2 4 8 7 2 0 7 6 8 Answer: 768 124 × 26 becomes 1 2 1 2 4 × 2 6 7 4 4 2 4 8 0 3 2 2 4 1 1 Answer: 3 224 86 x 6 72 x 8 94 x 9 56 x 7 87 x 5 683 x 4 209 x 3 278 x 5 169 x 5 728 x 7 527 x 9 824 x 8 A flat building has 8 floors. There are 16 flats per floor. How many flats are in the building? A muffin company owns 3 bakeries. Each bakery makes 237 muffins per day. How many muffins in total do the bakeries make each day? Each question on a game show is worth 8 points. There are 664 questions on each episode of the show. How many points are there in total on each episode?

	solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.	Zak has one 50p coin and three 20p coins. He buys a grapefruit that costs 45p and a melon that costs 59p. How much money does he have left? A restaurant purchased 9 boxes of ketchup packets. Each box contained 805 packets of ketchup. How many ketchup packets in total did the restaurant purchase? A biscuit factory produced 6 packages of biscuits. There were 52 biscuits in each package. How many biscuits did the factory produce in all? A bread company makes 7 types of bread. A restaurant chain ordered 744 loaves of each kind of bread. How many loaves of bread in total did the restaurant chain order? A crayon company puts 5 crayons in each box. The boxes of crayons are arranged 3 across and 4 deep in a crate. How many crayons are in the crate? (2 x 3) x 4 = 2 x (3 x 4) Use brackets to make equation correct: 36 ÷ 4 + 2 = 6 36 ÷ 4 + 2 = 11 36 ÷ **(**4 **+ 2)** = 6 **(**36 ÷ 4**)** + 2 = 11 36 ÷ 6 = 6 9 + 2 = 11 Put one pair of brackets in each number sentence below to make both number sentences correct. 35 – 10 ÷ 5 = 5 40 ÷ 4 + 6 = 4 40 + 5 ÷ 9 = 5 56 ÷ 8 + 20 = 27 4 + 7 x 2 = 22 4 + 7 x 2 = 18
	Fractions (including decimals) Pupils should be taught to: recognise and show, using diagrams, families of common equivalent fractions	Equivalent fractions are which appear differently but have the same value. E.g. ½ is the same as 2/4.  $\frac{1}{2}$ We can see that the fraction shaded in the left-hand shape is $\frac{1}{2}$, and the fraction shaded in the right-hand shape is $\frac{2}{4}$.  $\frac{2}{4}$ The same proportion of the shape is shaded in total, so these two fractions must be the same: $\frac{1}{2} = \frac{2}{4}$   Again, the same fraction of each shape is shaded in total, so the two fractions must be equal: $\frac{2}{5} = \frac{4}{10}$



Multiply the numerator and denominator by the same number to find the equivalent

Circle equivalent fractions of 4/5 :

16/20 12/18 8/10 20/25 12/ 16 24/30

Find five equivalent fractions for 3/7:

Type the missing number that makes these fractions equal:

$\frac{3}{9} = \frac{1}{\square}$ $\frac{5}{\square} = \frac{1}{2}$ $\frac{6}{9} = \frac{\square}{3}$ $\frac{\square}{8} = \frac{2}{4}$

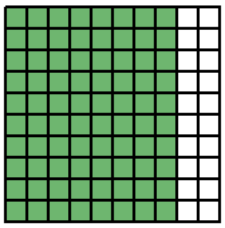
Write the simplest form for the following fractions:

$\frac{6}{8}$ $\frac{2}{8}$ $\frac{2}{10}$ $\frac{4}{6}$

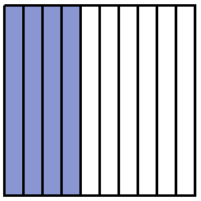
Explain how you know ½ is greater than ¼.

count up and down in hundredths; recognise that hundredths arise when dividing an object by a hundred and dividing tenths by ten.

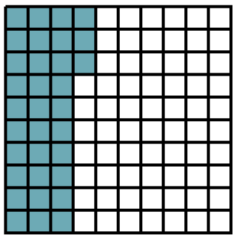
What decimal numbers are illustrated?



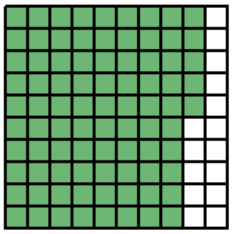
0.91 0.92 0.80 0.81



0.4 0.3 0.2 0.1



0.33 0.43 0.34 0.44



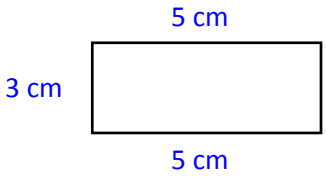
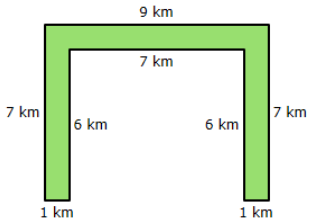
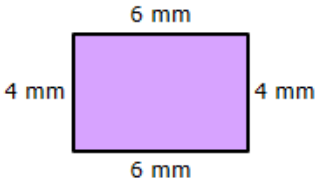
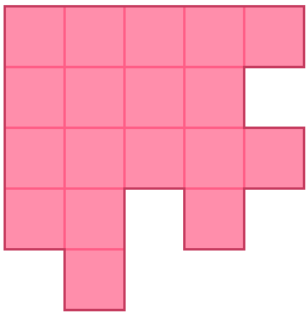
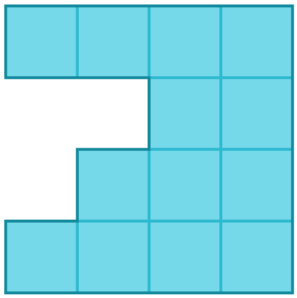
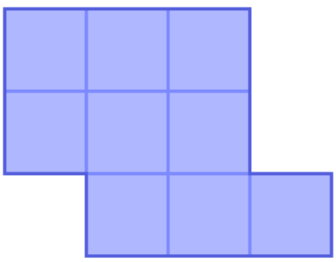
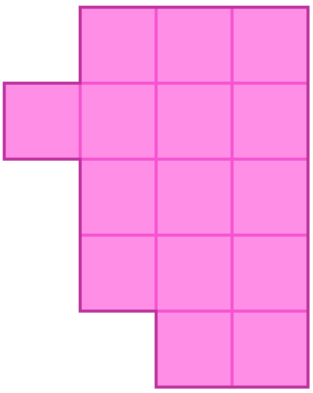
0.85 0.74 0.87 0.84

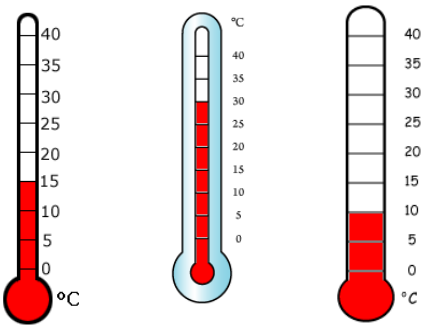
	solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number	There are 10 students eating lunch in the canteen. Two-fifths of them brought lunches from home. How many students brought lunches from home? Four-sixths of the 12 people at the beach are wearing sunglasses. How many people are wearing sunglasses? Two-sevenths of the 7 people in a restaurant are eating pasta. How many people are eating pasta? The pupils in a school collected £2000. They shared the money among four charities in this way: ¼ to Save the Children 2/5 to Working for Clean Water 1/5 to MM Trust 3/20 to Disability Aid Work out how much money each charity received. Which fraction is larger? 3/5 or 2/3 What is 1/5 of 20? What is 4/5 of 40? What is ¾ of 60? Navid bakes 63 cakes. Two ninths are eaten. How many are left? There are 32 children in class. Three eighths are boys. How many are girls?
	add and subtract fractions with the same denominator	$\frac{2}{5} + \frac{1}{5} = \frac{3}{5}$ $\frac{5}{11} - \frac{3}{11} = \frac{2}{11}$ $\frac{4}{7} + \frac{2}{7} = \frac{6}{7}$ $\frac{7}{9} - \frac{2}{9} = \frac{5}{9}$ Solve the following: 2/7 + 3/7 4/15 + 2/15 6/11 – 4/11 5/9 – 2/9 3/ 8 + 1/8 2/5 + 1/5
	recognise and write decimal equivalents of any number of tenths or hundredths	Write $\frac{4}{100}$ as a decimal number. Write $3\frac{53}{100}$ as a decimal number. Write 0.7 as fraction. Write 5.05 as mixed number Write 4.64 as a mixed number.. Write **eight and fifty-eight hundredths** as a decimal number. Write **nine and seven hundredths** as a decimal number. Write **nine and seven hundredths** as a decimal number. Write **two and one tenth** as a decimal number. Write **five and eighty-six hundredths** as a decimal number.

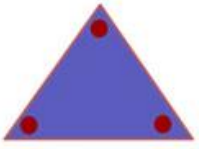
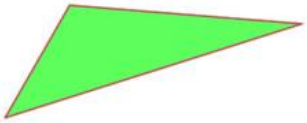
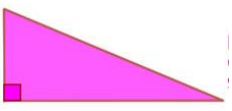
	recognise and write decimal equivalents to $^{1}/_{4}$; $^{1}/_{2}$; $^{3}/_{4}$	¼ = 0.25 , ½ = 0.50 ¾ = 0.75 Write the following decimal numbers as fractions. 2.5 2.05 7.25 1.75 3.01 5.05 Write the following fractions a decimal. 25/100 2/5 1 ½ 3 ¾ 6 ¼ Write 3.05 and 6.25 as a mixed number. Write $7\frac{7}{10}$ as a decimal number. Write $6\frac{8}{10}$ as a decimal number.
	find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as units, tenths and hundredths	To divide a decimal number by 10, 100 or 1000, the digit moves to the right. The number of places it moves is the same as the number of zeros in the number you dividing it by. E.g. 2.5 ÷ 10 = 0.25 (the digit moves one place to the right). 2.5 ÷ 100 = 0.025 (the digit moves two places to the right) 2.5 ÷ 1000 = 0.0025 (the digit moves three places to the right) **Try these :** 76 ÷ 10 = 76 ÷ 100 = 7.6 ÷ 10 = 7.6 ÷ 100 = 2.35 ÷ 10 24.05 ÷ 100 = 5.5 ÷ 10 = 0.5 ÷ 100 = Divide £19.99 equally among 10 children. How much will each child get? Sanjay buys a pack of paper palates. There are 10 plates in a pack. She pays £35.00 for the pack. How much does a plate cost?
	round decimals with one decimal place to the nearest whole number	Rounding decimal numbers is the same way to round whole number to the nearest ten, hundred or thousand. When the digit in the place you working on with is 5 or more you, you round to the nest number, and if less then you keep the digit same. 2.43 is 2.4, rounded to the one decimal place. 2.45 is 2.5 rounded to the one decimal place. 3.2 is 3, rounded to the whole number. 3.7 is 4, rounded to the whole number. What is 9.2 rounded to the nearest whole number? What is 32.51 rounded to the nearest whole number? What is 6.444 rounded to the nearest hundredth? What is 6.6 rounded to the nearest whole number? What is 5.44 rounded to the nearest tenth? What is 6.772 rounded to the nearest whole number?

	compare numbers with the same number of decimal places up to two decimal places	Put these numbers in order from largest to smallest. 0.1 2.8 3.1 0.2 0.6 0.5 1.2 Arrange each set of numbers in order from smallest to largest: 2.01 0.98 1.02 1.98 0.87 2.24 Which sign makes the statement true? < or > 0.9 ☐ 0.19 1.2 ☐ 0.12 0.45 ☐ Which is bigger? 3.05 or 3.50
	solve simple measure and money problems involving fractions and decimals to two decimal places.	Which is more?  or  How much money is there?  Which picture shows more?   Which pictures shows less?  

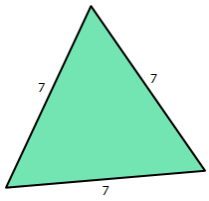
		A beach towel costs £5.06. Do you have enough money to buy it?  You pay £3.00 to buy a bottle of chocolate syrup costing £2.62. How much change will you receive? Shahana buys a biscuit sheet costing £5.73. She gave the cashier £10.00. The cashier gives her change using the least number of coins. How many of each coin does she receive? Jane wants to hang maps on the walls of her room. Jane picked out a map of Africa for £3.83 and a map of Europe for £5.72. What will the total cost be? Sania buys 40m of fabric at a sale for £2.50 per metre. She sells the fabric to her friends for £4.25 per metre. How much money does she make?
	MEASUREMENT Pupils should be taught to: Convert between different units of measure (e.g. kilometre to metre; hour to minute)	Metric system of measurement: Length: Kilometre (km) Metre (m) Centimetre (cm) 1 km = 1000m 1m = 100cm 1cm = 10mm Mass: kilogram (kg) gram(g) milligram (mg) 1 kg = 1000 g 1g = 1000mg Capacity : kilolitre(kl) Litre (l) Millilitres (ml) 1kl = 1000 L 1 litre = 1000 ml Change these lengths to centimetres: 2m 3.5m 7.25 m 20mm 200mm Change these weights to grams: 2 kg 6.35kg 0.525kg 3.5kg Which is more, 6 millimetres or 1 centimetre? Which is more, 245 metres or 1 kilometre? Which is more, 1 metre or 1,000 millimetres? Which is more, 1,000 milligrams or 1 gram? Which is more, 863 grams or 1 kilogram? Which is more, 2 litres or 2,002 millilitres? Which is more, 8,000 millilitres or 8 litres?

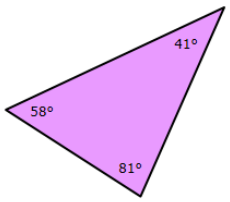
	measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres	Perimeter is the distance around the edge of a flat shape. You can find the perimeter of a shape by adding the lengths of the sides. E.g  Perimeter = 3 + 3 + 5 + 5 = 16 cm You can also use a formula to find the perimeter of rectangular shapes. P = 2 x (L + W) L = length W = width What is the perimeter?  What is the perimeter ? 
	find the area of rectilinear shapes by counting squares	**Area is the amount of space covered by the flat shape.** The following shapes are made out of unit squares. What are the areas?  Square units  square units  Square units  square units The area of a rectangle is 54 cm^2 , the width is 9 cm. What is the length?

	estimate, compare and calculate different measures, including money in pounds and pence	What is the temperature of a hot bowl of soup? Choose the more reasonable answer. 200^0 C or 80^0 C What is the temperature of a hot cup of tea? Choose the more reasonable answer. 85^0 C or 165^0 C Which is a better estimate for the height of a 5-storey building? 19 m or 19cm Which is a better estimate for the length of a car? 4 m or 4 cm Which is a better estimate for the weight of a cat? 4kg or 4g Which is a better estimate for the weight of a fly? 2g or 2kg Which is a better estimate for the volume of a water jug? What is the temperature? 
	read, write and convert time between analogue and digital 12 and 24-hour clocks	What does the clock shows?  Which of these clocks shows the time **seven o'clock**?  What time does the clock show? Answer using digits and a colon (for example, *11:58*).  Write this time using digits and a colon. **Twenty-five to eight** Write this time using digits and a colon. **Quarter to two**

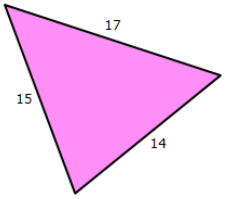
	solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.	How many minutes are in an hour? How many second in a minute? How many years are in a millennium? How many years are in a century? How many whole weeks are in a month? How many days in a week? How many weeks are in a year? How many months in a year? Convert ☐ minutes = 1 quarter ☐ half hour = 30 minutes ☐ minutes = 1 quarter ☐ minutes = 1 hour 1 half hour = ☐ quarter hours 2 half hours = ☐ hours
	GEOMETRY **Properties of shapes** Pupils should be taught to: compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes	***Geometry deals with shapes, lines, surface, curved, points and angles.*** Different types of triangles: **Isosceles triangle**: A triangle with two sides the same length is called an isosceles triangle. The two based angles are the same in size.  **Equilateral triangle**: All three sides are the same in length. The three angles are equal in size and each angle is 60^0 .  **Scalene triangle**: A triangle with three unequal sides.  Right angle triangle: One of the angles is 90^0 . 

Which triangle is an equilateral?



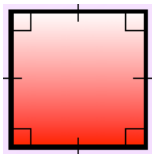


What kind of triangle is this?

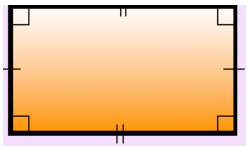


A quadrilateral is a flat shape with 4 sides.
The sum of the angles of a quadrilateral is 360^0 .

Square:4 equal sides, 4 right angles, opposite sides are parallel

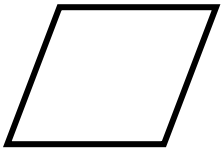


Rectangle: 4 right angles, opposite sides are equal and parallel.

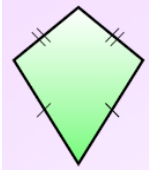


Parallelogram: Opposite sides are equal In length and parallel. Angles are not right angles but opposite angles are the same in size.

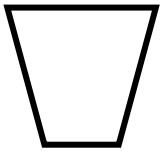
Rhombus: All 4 sides are equal in length, opposite sides are parallel, angles are not right angle but opposite angles are the same values.



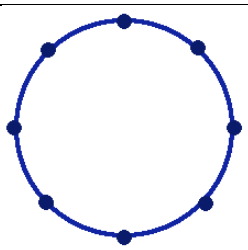
Kite: Two pairs of adjacent sides are equal.



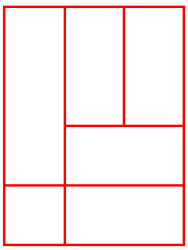
Trapezium: one pair of parallel sides.



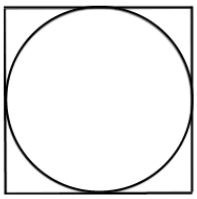
How many different quadrilaterals can be made by joining the dots on the circle?
Can you work out the angles of all your quadrilaterals?



How many rectangles can you find in this shape?
Is a square a rectangle?



Circles in Quadrilaterals: Draw a circle inside a quadrilateral so that the circumference just touches all four sides of the shape, like this:

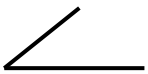


For each of the following types of quadrilaterals, decide whether it is always, sometimes or never possible to construct a circle inside which just touches all four sides.
Square , rectangle, parallelogram, kite, trapezium, rhombus,

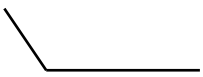
identify acute and obtuse angles and compare and order angles up to two right angles by size

Angle: *An angle is a measure of the space between two straight lines that meet together. The unit of the measurement of rotation is degree.*

Acute angle: An angle that is greater than 0^0 and smaller than 90^0 .

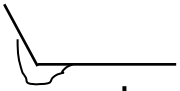


Obtuse angle: An angle that is greater than 90^0 and smaller than 180^0 .

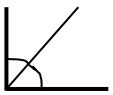


Right angle: An angle of 90^0 .

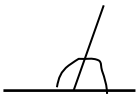
Reflex angle: An angle that is greater than 180^0 and smaller than 360^0 .



Complementary angle: Two angles, which add up to 90^0 are called complementary angle.



Supplementary angle: Two angles, which add up to 180^0 are called supplementary angle.



Is this angle greater than, equal to or less than a right angle?

Is this angle greater than, equal to or less than a right angle?

What fraction of a turn is this angle?

- $\frac{1}{2}$ turn
- $\frac{3}{4}$ turn
- $\frac{1}{4}$ turn
- 1 full turn

What is the measurement of this angle?

- 180°
- 360°
- 90°
- 270°

What is the measurement of this angle?

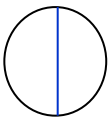
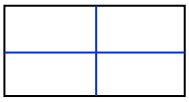
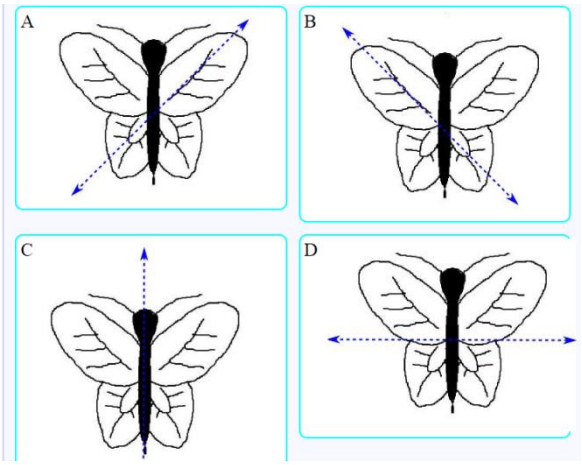
- 360°
- 180°
- 270°
- 90°

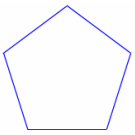
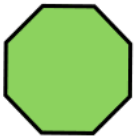
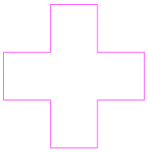
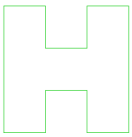
What fraction of a turn is this angle?

- $\frac{3}{4}$ turn
- $\frac{1}{2}$ turn
- $\frac{1}{4}$ turn
- 1 full turn

What fraction of a turn is this angle?

- $\frac{1}{4}$ turn
- 1 full turn
- $\frac{1}{2}$ turn
- $\frac{3}{4}$ turn

	identify lines of symmetry in 2-D shapes presented in different orientations	**Symmetry:** When a shape divided into two halves and one half is a reflection of the other is called symmetry.  **Line of symmetry:** A line passes through middle of a shape and one side of the line is a reflection of the other side.  Which blue line correctly shows the line of symmetry for the butterfly?  How many line of symmetry does the square have ?  Complete the table:

Shapes	Number of line of symmetry
regular pentagon 	
Regular Octagon 	
This plus sign 	
Letter H 	

Does this picture have symmetry?

Does this picture have symmetry?

Does this picture have symmetry?

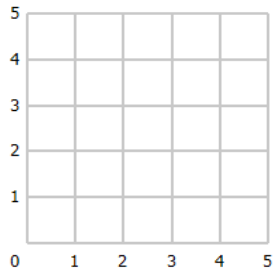
Does this picture have symmetry?

Position and direction

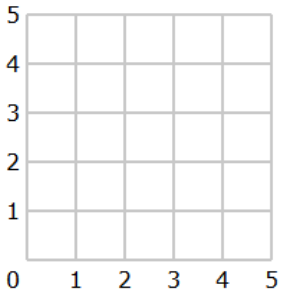
Pupils should be taught to:
describe positions on a 2-D grid as coordinates in the first quadrant

Coordinates: This is a way to describe the positions of points on a grid/ graph. The distance from X- axis is written first and the distance from Y-axis is written second. The coordinates are put in brackets and numbers are separate by a comma. E.g (4,7).

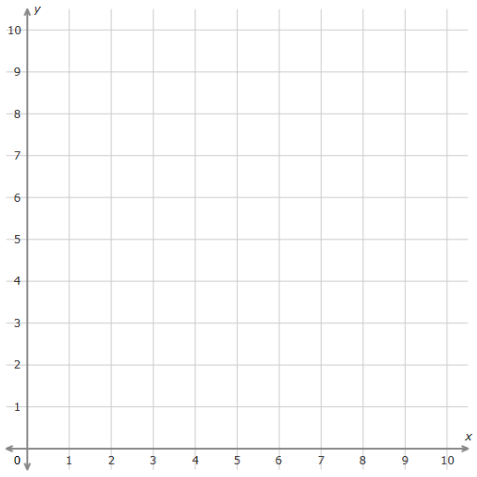
If you connect the following points, what letter of the alphabet do they form? Connect (1,1) and (1,4), connect (1,4) and (4,1), Connect (4,1) and (4,4).

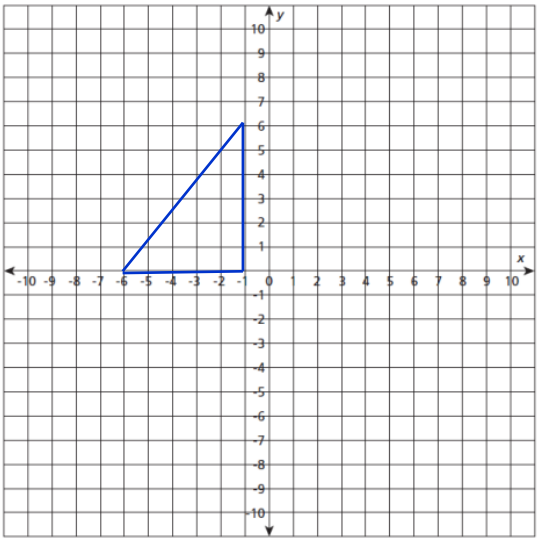
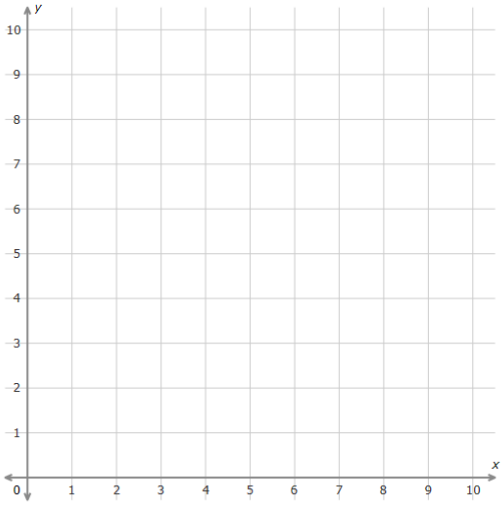
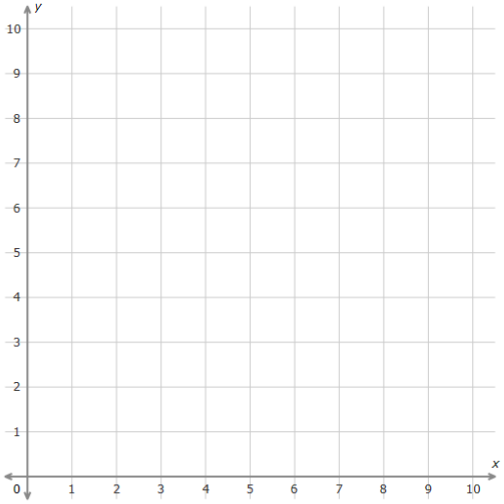


If you connect the following points, do they form a square?
connect (4,4) to (3,4), connect (3,4) to (3,3), connect (3,3) to (4,3), connect (4,3) to (4,4)



Plot the points A(1,4), B(2,1), C(4,3) and join to make an isosceles triangle. Write down the coordinates of midpoint of the line BC. Find the coordinates of fourth points D, so that ABCD is a parallelogram.



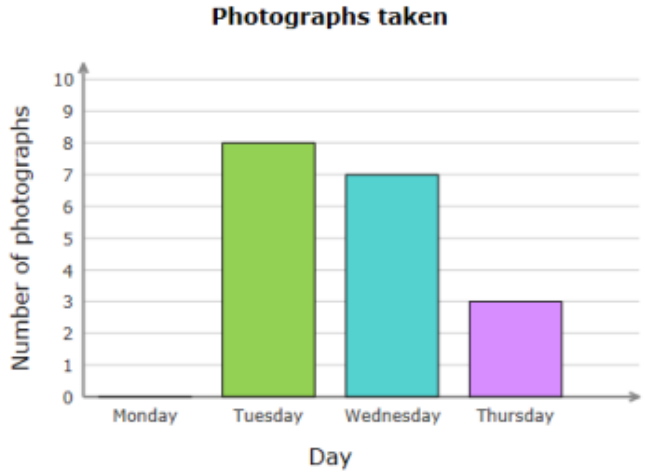
	describe movements between positions as translations of a given unit to the left/right and up/down	Draw the position of this triangle after it has been translated 4 squares to the right and 3 squares down. 
	plot specified points and draw sides to complete a given polygon.	Plot these points: (2,2) (6,2) (10,2) (6,0) (6,4) (4,9) (8,9) . Join them up in threes to make as many isosceles triangles as you can.  Plot the points A(3,1) and B(6,5) and loin them with a straight line. The line makes a side of a rhombus. Write down the coordinates of the other vertices of the rhombus . Explain how you knew where these other vertices would be. 

Statistics

Pupils should be taught to:

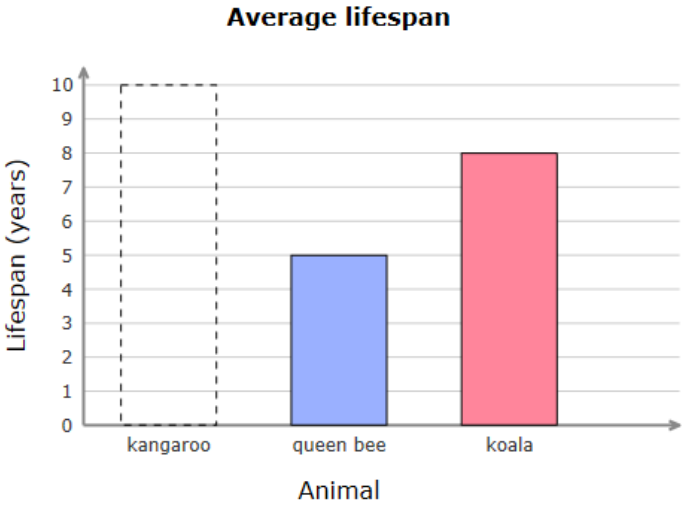
Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs

Maureen looked at the dates of the digital photos on her computer to find out how many she had taken in the past 4 days. On which day did Maureen take the most photographs? On which day did she take the least photographs? How many more photographs did she take on Tuesday than Thursday?

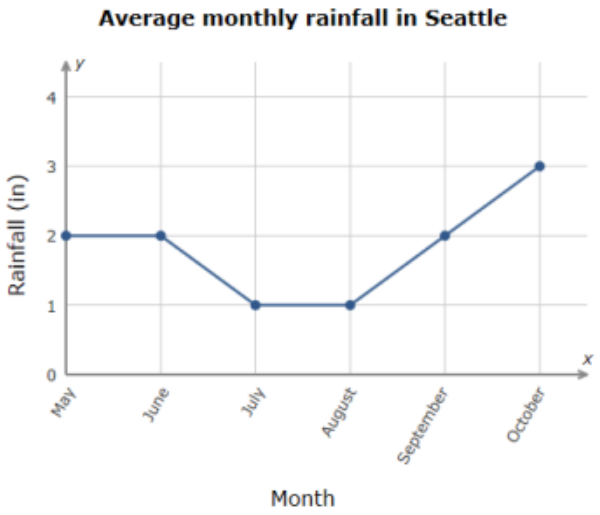


A biology class researched the average lifespan of various animals. Use the data in the table to complete the bar graph below.

Average lifespan	
Animal	**Lifespan (years)**
kangaroo	9
queen bee	5
koala	8

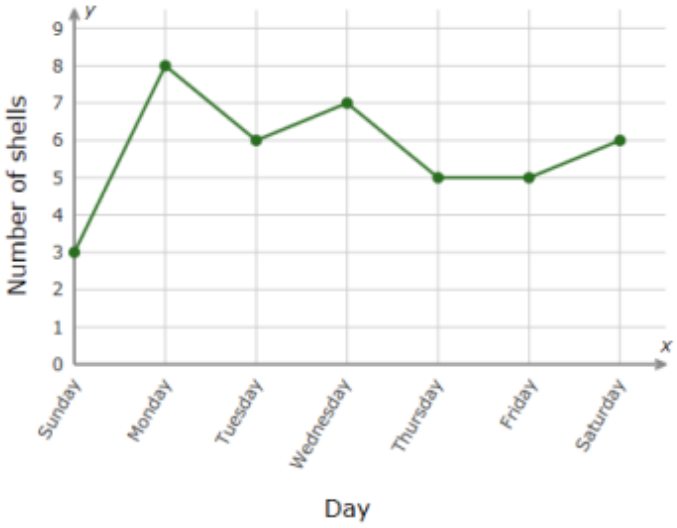


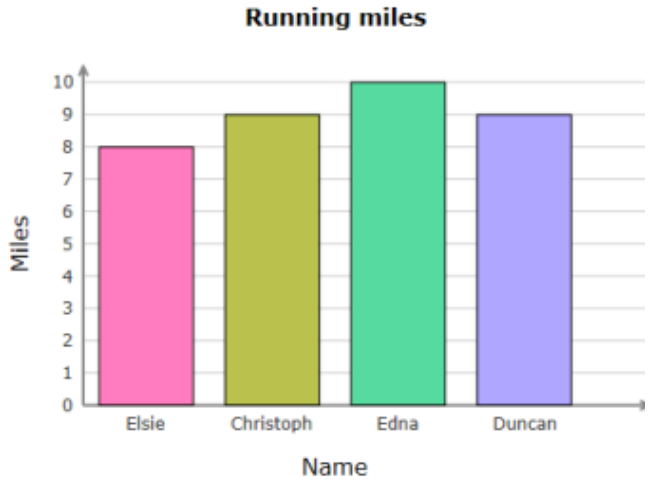
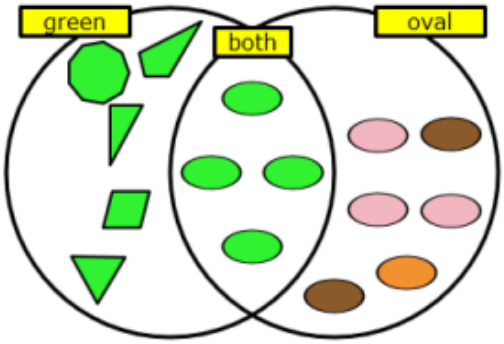
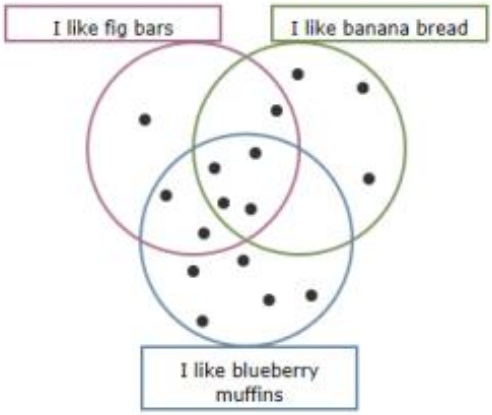
Before scheduling a family holiday, the Liam family looked at the rainfall in Seattle each month. What is the average rainfall in June?



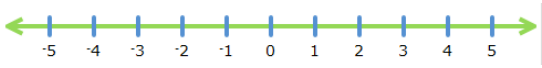
Maria spent a week at the beach and recorded the number of shells she founded each day. How many shells did Maria find on the beach on Friday? How many more shells did she find on Monday than Saturday?

Shells Maria found



	Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs	The members of the track team compared how many miles they ran last week. Who ran the fewest miles?  Look at this Venn diagram:  How many are not green? Look at this Venn diagram:  How many children like fig bars or blueberry muffins?

Y5	**Numbers** **Number and place value** Pupils should be taught to: read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit	Which number is bigger? 2097 or 2079 Use these digits to make the smallest and largest number. 2 6 3 9 Which number is smallest? 3210, 3214, 3209 A city school board compared how many pupils attend each secondary school. **Secondary school attendance** School / Number of students Magnolia High 751 Oak High 754 Lakeview High 774 Watson High 745 Which school has the most pupils? thousands / hundreds / tens / units 2 / 7 / 7 / 0 What is the number? Write the number that made up of 2 units, 6 tens and 4 thousands. What is the value of the digit underlined? 5̲04675 4̲081 15̲7 39671̲4 4576̲2 8̲017 2̲6510 50̲91 Rewrite the following numbers in order starting with the smallest one. 209, 9810, 36720, 1972, 3672 Which number is largest? 98721 or 98712 Which number is smallest? 62012 or 62112. Write these numbers in figures: ninety thousand ninety nine, forty five thousands, five hundred and fifteen. Write these numbers in words: 75030, 7521 and 1909. What is the value of the digit underlined? Write the number that made up of: 7 units, 9 tens and 8 thousands. 2 units, 6 tens and 24 thousands. 8 hundreds, 1 tens , 1 units and 53 thousands (use unit chart if you needed)
	count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000	Count forwards in 10s starting from 7 Count backward in 100s starting from 9990 Count on in 50s up to 1000 Find the next three numbers for each of the sequence: -176 -156 -136 -116 -- -- -- 1201 1301 1401 1501 -- -- -- 2020 1920 1820 1720 -- -- - Count on in 10s from 10010 up to 100100

	interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers through zero	Introduce the negative numbers with number line. Negative numbers are shown to the left of zero on a horizontal number line or below zero on a vertical number line. (Positive numbers are above zero and negative numbers are below zero). Negative numbers are written with the minus sign in front of the digit, e.g -5.  **-7 + 5 = -2, 13 – 15, -3 - 2** **Demonstrate this sum using the number line below.**  Which sign makes the statement true? < > = **-5 ☐ - 4** **0 ☐ - 1** **7 ☐ - 5** On Monday night the temperature was – 2^0 C. By 4.30 am Tuesday, the temperature had dropped by 4 degrees. What was the temperature at 4.30 am? Using a vertical number line to solve this problem. The children to complete the following: Which sign makes the statement true? -8 ☐ - 2 10 ☐ - 1 0 ☐ - 2 - 3 ☐ -4 12 – 15 = -8 – 9 = -5 + 7 = -10 + 4 = On Friday night the temperature was -5^0C. By 5.30 am Saturday the temperature raised 7^0C . What was the new temperature at 5.30 am? Count forward in 4s starting from -32 to 0 . Count backward in -5 from 75 to 0. City / Temperature at midnight / Temperature at midday Birmingham -2^0 C 9^0 C Leeds -2^0 C 8^0 C Newcastle -7^0 C 2^0 C Norwich 3^0C 8^0 C Nottingham -4^0 C 7^0 C Put these temperatures in order, the lowest first. a) 2°C, -8°C, -1°C, -6°C, -4°C b) 16°C, 18°C, -23°C, -25°C, -13°C, 12°C, 20°C Which of these temperatures is lowest? i) -4°C or -2°C ii) -8°C or 8°C Use the number line to solve the following problem: The temperature at 4am was -3^0 C. By 11 am it had risen by 9^0 C. What is the new temperature? Draw a line graph to show these temperatures at 9.00 a.m. each day for 2 weeks. -2°C, 3°C, -1°C, 1°C, 4°C, 2°C, -1°C, 2°C, 5°C, 4°C, 1°C, -3°C, -5°C, 0°C

	round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000	To round a number to the nearest tens, look at the unit digit. If it is less than 5 the tens stay the same (round down), e.g 14 → 10, 72 → 70. If it is 5 or more than 5, then add 1 ten to the tens column (round up) e.g 15 → 20 77 → 80 To round to hundreds or thousands you work the same way, looking at the tens column or hundreds column. E.g 134 → 130 176 → 200 2761 → 2800 839 → 800 What is 3004 rounded to the nearest ten? What is 55447 rounded to the nearest thousand? What is 65628 rounded to the nearest hundred? What is 15742 rounded to the nearest ten thousand? estimate the sum by rounding each to the nearest 100 and then adding: 550 + 319 1482 + 743 Estimate the sum by rounding each to the nearest 100o and then adding: 5550 + 3791 17529 + 12453
	solve number problems and practical problems that involve all of the above	A dust storm sweeps across the prairie. It covers 9,234 acres of the prairie in dust, but leaves 2,673 acres untouched. About how many acres does the prairie cover? Estimate the sum by rounding each number to the nearest ten, hundred, thousand, ten thousand and then adding. 96 + 66 762 + 943, 1845 + 871, 15209 + 21397 To fill an order, the factory dyed 88,463 metres of silk red and 69,318 metres white. About how many metres of silk did it dye for that order? The temperature at midnight is -6^0 C. By midday it has risen by 8^0 C. What is the new temperature? Put these numbers in order, starting with the smallest. -6, 12, 21, 0, -1, 45, -18, -9, 3, -5 Write down the next three numbers in each of these sequences: 7, 4, 1, -2, ------ -2, -4, -6, -8 ---------- -7, -5, -3, -1 ---------- Find the value of each of the following: 6 – 9, 5-12, -127 + 200, -7 -2, -4 + 8, -6 -10. Jenna had £837 invested in the stock market until she lost £444 on those investments. About how much money does she have in the stock market now? Choose the better estimate. £400 or £700 Estimate the difference by rounding each number to the nearest hundred and then subtracting. 507 – 67

	read Roman numerals to 1000 (M) and recognise years written in Roman numerals.	

1	5	10	50	100	500	1000
I	V	X	L	C	D	M

1	2	3	4	5	6	7	8	9
I	II	III	IV	V	VI	VII	VIII	IX

10	20	30	40	50	60	70	80	90
X	XX	XXX	XL	L	LX	LXX	LXXX	XC

100	200	300	400	500	600	700	800	900
C	CC	CCC	CD	D	DC	DCC	DCCC	CM

How would you write 1 to 10 as a Roman numeral?
What number does this Roman numeral represent? XLIV

How would you write 21, 399, 501, 23, 17, 199 as a Roman numeral?

What number do these Roman numeral represent?

XLI XXIII LXXXIV LVIII

Addition using Roman Numerals:
XLV + CCIX DM + LXIV CLX + LDII

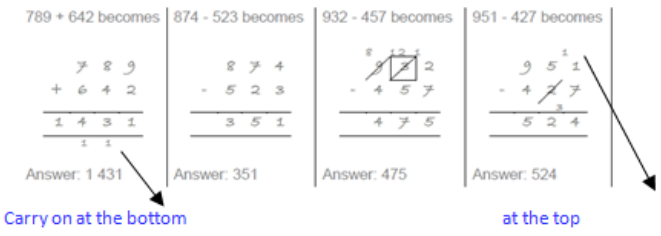
Subtraction using Roman Numerals:

CM – XL DCX – LXXV CMD – DC

Addition and subtraction

Pupils should be taught to:
add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)

Addition and subtraction using formal written methods:



It is better to carry on the digit at the top so it is consistent with subtraction.

$$\begin{array}{r} {\scriptstyle 1\ \ 1\ \ 1} \\ 8\,7\,1\,9 \\ +\ 6\,5\,8\,7 \\ \hline 1\,5\,3\,0\,6 \end{array} \qquad \begin{array}{r} {\scriptstyle 6\ \ 12\ \ \ 1} \\ 8\,\not{7}\,\not{3}\,2 \\ -\ 5\,4\,8\,3 \\ \hline 3\,2\,4\,9 \end{array}$$

Write the missing digit:

$$\begin{array}{r} \square,6\,0\,0 \\ +1,2\,1\,5 \\ \hline 8,8\,1\,5 \end{array} \qquad \begin{array}{r} 5,\square\,4\,6 \\ +2,4\,5\,0 \\ \hline 7,6\,9\,6 \end{array} \qquad \begin{array}{r} 7\,8\,5\square \\ +2\,5\,8\,9 \\ \hline 1\,0\,4\,4\,5 \end{array}$$

What is 1345 + 2668? Estimate first by rounding each numbers to the nearest 1000 and then use column method to check.

Try these using standard methods:
3456 + 2080 2109 + 1592 87320 + 10187 + 10289
190002 + 7021 761001 + 101001 34762 + 49012 + 9081

Crowd attendance at three football matches was 9034, 7654 and 18976. What was the total attendance?

Town A has a population of 345000, Town B has a population of 423510. What is their combined population?

During December at an airport, 305722 passengers travelled through Terminal 1 and 395184 passengers travelled through Terminal2. How many passengers altogether travelled through Terminal 1 and ?

What is 4645 – 2668? First estimate by rounding each number to the nearest 1000 and then use column method to check.

Set out in column method and then subtract:

4567 – 1987 68020 – 17899 57080 – 12794

5695 – 2045 60871 – 29876 7610 – 4589

Find the difference between 1345 and 9876.
Take away 28901 from 78900.

Subtract and check your answer by doing the inverse operation:
12987 – 7653 20804 – 17450 5876 – 2199

Sammy sold 13689 spare parts in June and 25908 spare parts in July. How many spare parts did he sell altogether? How many more parts did he sell in July?

Write the missing digit:

$$\begin{array}{r} \square\,3\,7 \\ -\,1\,7\,9 \\ \hline 4\,5\,8 \end{array} \qquad \begin{array}{r} 7\,6,2\,0\,\square \\ -\,1\,2,8\,0\,5 \\ \hline 6\,3,3\,9\,8 \end{array} \qquad \begin{array}{r} 8\,2,8\,6\,0 \\ -\,4\,7,8\,8\,3 \\ \hline 3\,4,9\,\square\,7 \end{array}$$

Work out:
29870 – 2979 – 2517 3561 + 29102 – 18095

87109 – 43896 + 6529 102010 – 99091 + 7201

0 1 4 6 8 9

Use all the digit above to make the largest and smallest number and then find the difference between the two.

	add and subtract numbers mentally with increasingly large numbers	Add 1300 to 4500. What is the total of 9500 and 4500? What is the sum of 27200 and 2800? What is 94500 plus 4500? What is 10000 more than 5500? Subtract 500 from 2100? Take away 4500 from 20500? What is 75200 minus 25200? What is the difference between 100100 and 95500? Count back 10000 from 63000? What is 500 less than 9400? Complete the pattern: □ − 2 = 4 □ − 20 = 40 □ − 200 = 400 □ − 2,000 = 4,000 Complete the pattern: 9 − 2 = □ 90 − 20 = □ 900 − 200 = □ 9,000 − 2,000 = □ Complete the pattern: 4 + 3 = □ 40 + 30 = □ 400 + 300 = □ 4,000 + 3,000 = □ Complete the pattern: 4 + 3 = □ 40 + 30 = □ 400 + 300 = □ 4,000 + 3,000 = □
	use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy	There was an oil spill in a coral reef. As a result the oil company lost £93096 in profit. In addition, the company spent £46458 on clean up and repair. About how much money did the spill cost the company? At a busy ant colony, there are 11,968 ants inside the ant hill and 38,361 exploring outside. About how many ants total are there? A poultry company owned 9,089 egg-laying chickens. To produce more eggs, it bought 1,988 more chickens. About how many chickens are there now? Estimate the sum by rounding each number to the nearest , 10, 100, 1000, 10000 and then adding. 94 + 65 726 + 468 1726 + 1498 17973 + 20126 A crayon company recently changed its labels. It currently has a total of 621 crayons in stock, 195 of which have the new label. About how many crayons with the old label does the company have in stock? The Princeton bakery had 2673 bags of sugar. Then an employee used 1384 bags of sugar to make some pumpkin pie. About how much sugar is left? Estimate the sum by rounding each number to the nearest, 10, 100, 1000, 10000 and then adding. 94 − 65 726 − 468 1726 − 1498 20126 − 17973

	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.	These tables show some information about agriculture in Egypt.

Agriculture	Annual Production (tonnes)
Cereals	213150
Meat	143784
Fruit & vegetables	241053
Root crops	293807
Beans	483216
Sugar crops	1909123
Milk	4501275

Resources

Arable land (Hectares)	280130
Cattle (Per head)	821436
Sheep and goats(per head)	893214

Use the tables to answer these

a) How many tonnes of cereal and root crops are produced in total?

b) What is the weight difference between the meat production and the production of fruit & vegetables?

c) How many tonnes of milk and sugar are produced in total?

d) What is the total number of cattle, sheep and goats in Egypt?

e) How many more sheep & goats are there than cattle?

f) What is the difference in weight between the production of root crops and beans?

During a science experiment, Mia collects samples from a material for further testing. The masses of the collected samples are:

A	B	C	D
1.024g	0.0045g	2.705g	0.3081g

The mass of material was 29.45 g after sample A and B were removed. What was the original mass of the material? What is the final mass of material left after all the samples have been removed?

Multiplication and Division

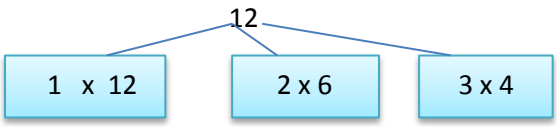
Pupils should be taught to:
identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.

When you **multiply** two numbers you get a multiple. E.g.

Multiple of 4 are: 4 8 12 16 20 24 28 32 36 40
Multiple of 6 are : 6 12 18 24 30 36 42 48 54 60
Common multiple of these two numbers are: 12 24 36

A number that divides exactly into another number without a reminder is called a factor of that number. E.g

factors of 12 are :



Factors of 12 are : 1 2 3 4 6 12

Factors of 20 are: 1 2 4 5 10 20

Common factors of these two numbers are: 1 2 4

Which of the following numbers are multiples of -------- ?

3	5	9	11	8	12	7	6
13	15	19	22	32	18	29	56
9	21	27	84	64	34	42	63
24	57	93	77	94	96	84	54
112	225	108	121	256	252	441	186

4 6 9 2

Choose two numbers from the above to complete the multiplication number sentence

☐ X ☐ = 54

12 6 8 4

4 6 7 8

Choose two numbers from the above to complete the multiplication number sentence

☐ x ☐ = 28

15 7 14 12

Choose two numbers from the above to complete the multiplication number sentence

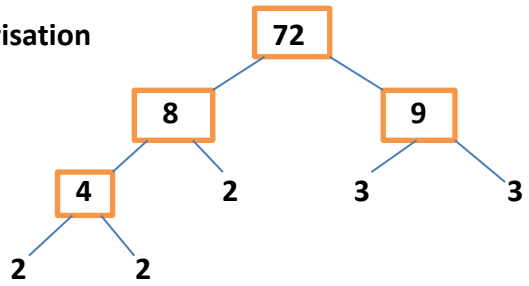
☐ x ☐ = 96

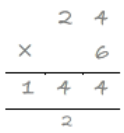
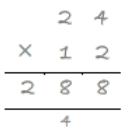
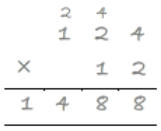
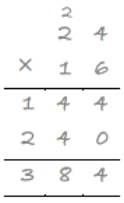
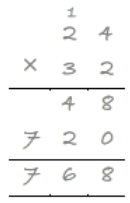
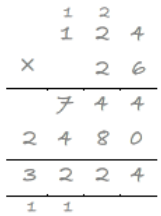
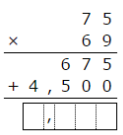
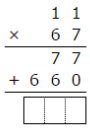
Choose two numbers from the above to complete the multiplication number sentence

☐ x ☐ = 105

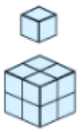
Chester's age is a multiple of 9. Next year it will a multiple of 8. How old is chester?

	solve problems involving multiplication and division where larger numbers are used by decomposing them into their factors	There are 60 people on a coach trip. The number of boys is a multiple of 5. The number of adult is a multiple of 9. There are seven possible combinations of boys, girls and adults. Can you find them all? Find the first three common multiples of each of these sets of numbers: 6 and 8 5 and 10 3 and 9 Find a number less than 50 that is a multiple of 9 and a multiple of 12? Find a number whose digits add up to 10 that is a common multiple of 2, 4 and 7. Find the all factors of each number: 30 36 48 54 63 72 List all the pairs of factors that can be multiplied to get each of these numbers: 90 56 110 44 108 84 96 105 27 81 Find the common factors of 72 and 63, 27 and 45. A shop sells 873 newspapers every week. How many will they sell in 9 weeks? A truck carries 1225 boxes each time it makes a delivery. How many boxes will carry in 8 deliveries? Solve the following problems by breaking the second number into prime factors: 37 x 12 61 x 48 65 x 56 53 x 42 89 x 72 Fill in the three missing whole numbers in this calculation. Each number is less than 10  Two numbers have difference of 12 They multiply together to make 133. What are the two numbers? Write the missing number. 

	know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers	*A prime number is a number which is only divisible by itself and by one.* *A factor which is also a prime number is a prime factor.* Find the prime numbers from the list below: 12 7 2 9 19 13 57 31 18 21 3 23 67 81 89 The number 1 is not a prime number. Can you explain why? Find the three prime numbers to multiply together to give a product of a) 105 b) 385 Find six pairs of prime numbers which give a total of 100. **Prime factorisation**  **The prime factors are: 2 x 2 x 2 x 3 x 3 = 72** Find all the prime factors of: 63 75 54 81 75 90 144 162 84 256 **Even number > 2 can be written as the sum of two prime numbers. E.g 6 = 3 + 3, 4 = 2+ 2, 8 = 5 + 3** Write the following numbers as the sum of two prime numbers: 10 16 24 30 36
	establish whether a number up to 100 is prime and recall prime numbers up to 19	Is 10 a prime number? Is 7 a prime number? Explain your answer. Is 12 a prime number or a composite number? *(A composite number has more factors than just 1 and itself.)* Is 11 a prime number or a composite number? Is 83 a prime number? Find two prime numbers that add up to 100. Use this 100 square to find all prime numbers. |									
---	---	---	---	---	---	---	---	---	---
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

	multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers	**Short multiplication** 24 × 6 becomes  Answer: 144 24 × 12 becomes  Answer: 288 124 × 12 becomes  Answer: 1 488 **Long multiplication** 24 × 16 becomes  Answer: 384 24 × 32 becomes  Answer: 768 124 × 26 becomes  Answer: 3 224 *These examples are taken from the maths curriculum.* Multiply larger numbers by a 1 digit number: 90000 X 7 70000 x 6 65000 x 5 49000 x4 Multiply a two digit number by a 2 digit number. 54 x18 67 x35 82 x26 49 x47 73 x29 37 x42 92 x29 Multiply a four digit number by U or by TU. 7204 X9 3690 x 27 7819 x 49 8927 x74 5080 x 38 A bus company has 47 buses. Each bus can hold 52 passengers. What is the maximum number of people that bus company could take? A cinema has 43 rows of seats with 56 seats in each row. How many seats are there in total? Small cans of lemonade contain 330ml. If there are twenty-four cans in a layer and eight layers in a box, how much lemonade does a box contain? An exercise book has 134 pages. How many pages will there be in 54 exercise books? Find the missing number digits:  

	multiply and divide numbers mentally drawing upon known facts	Multiply : 6 x 7 9 x 8 10 x 5 9 x 8 4 x 7 8 x 6 7 x 7 Divide : 56 ÷ 7 81 ÷ 9 72 ÷ 8 36 ÷ 4 147 ÷ 7 Complete these pattern: 7 × ☐ = 42 7 × ☐ = 420 7 × ☐ = 4,200 7 × ☐ = 42,000 9 × 1 = ☐ 90 × 1 = ☐ 900 × 1 = ☐ 9,000 × 1 = ☐ 9 ÷ 3 = ☐ 90 ÷ 3 = ☐ 900 ÷ 3 = ☐ 9,000 ÷ 3 = ☐ Estimate the product. Round each factor to the nearest ten, then multiply. 52 × 39 = 48 x 63 91 x 58 Estimate. Which sign makes the statement true? < or > 95,278 ÷ 4 32,544
	divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context	**Short division** 432 ÷ 5 becomes Answer: 86 remainder 2 574 ÷ 15 becomes Answer: 38 4/15 511 ÷ 35 becomes Answer: 14.6 **Long division** 432 ÷ 15 becomes Answer: 28 remainder 12 432 ÷ 15 becomes Answer: 28 4/5 432 ÷ 15 becomes Answer: 28.8 *Division involves working out how many times one number goes into another.* A school is taking 950 children to a theme park at the end of the term. A bus carries 52 passengers. How many buses will they need to hire? There are 99 chairs set up in the gym for an assembly. After the assembly, the chairs will be put away in stacks of 4. How many chairs will be in the final stack? Mrs. Cyan paid £504 for flower boxes. Each flower box cost £9. How many flower boxes did she buy? Egg trays hold 36 eggs each. How many trays will be needed for 2700 eggs? **Calculate:** 1170 ÷ 6 7461 ÷ 9 3408 ÷ 5 7091 ÷ 7 6312 ÷ 8 49080 ÷ 4 4625 ÷ 8 8426 ÷3 8706 ÷ 7

	multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	Multiply whole numbers by 10, 100 and 1000. Try these: 123 x 10, 102 x 100, 456 x 10, 209 x 1000, 3467 x 100, 702 x 100 39 x 1000, 876 x 100, 985 x 10, 1297 x 100, 6770 x 10, 2912 x 1000 Divide whole numbers by 10, 100 and 1000. Try these: 7000 ÷ 10, 60000 ÷1000, 54000 ÷ 100, 98700 ÷ 10 576 ÷ 10, 8701 ÷ 100, 23019 ÷ 1000, 467 ÷ 100 491 ÷ 1000 **Calculate** : 156 x 20, 345 x 200, 876 x 30, 876 x 40, 60 x 349. Multiply decimal numbers by 10, 100 and 1000. Try these: 0.876 x 10, 12.3 x 1000, 123.67 x 100, 0.345 x 1000, 1.56 x 100 2.356 x 100, 23.45 x 1000, 4.88 x 100, 342.7 x 1000, 0.24 x 10 Divide decimal numbers by 10, 100 and 1000. Try these: 23.45÷ 1000, 4.78 ÷ 100, 3.678 ÷ 10, 5.981 ÷ 100, 5002 ÷ 1000 45.09 ÷ 100, 0.9 ÷ 10, 20.89 ÷ 1000 3.78 ÷ 1000, 919.28 ÷ 1000 Sanja needs to by 3000 paper plates for the school fate. The plates cost £0.45 for 10. What is the total cost of 3000 plates?
	recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3})	*A **square number** is formed when you multiply any number by itself.* E.g. $2^2 = 4 \times 4 = 16$, $5^2 = 5 \times 5 = 25$, $3^2 = 3 \times 3 = 9$ List the first ten square numbers: Fill in the missing numbers: First one has been done for you. 9 = 3^2 25 = ☐ 81 = ☐ 144 = ☐ 1 = ☐ 6^2 = ☐ 7^2 = ☐ 10^2 = ☐ 11^2 = ☐ 13^2 = ☐ **Cube numbers** are formed by multiplying a digit by itself three times. e.g $3^3 = 3 \times 3 \times 3 = 27$, $5^3 = 5 \times 5 \times 5 = 125$, $6^3 = 6 \times 6 \times 6 = 216$ etc. Calculate these: 7^3 = ☐ 9^3 = ☐ 4^3 = ☐ 8^3 = ☐ List the first five cube numbers:  **1** is the first cube number. because 1 x 1 x 1 = **1** **8** is the second cube number, because 2 x 2 x 2 = **8** Find the next two numbers in the sequence: 64 125 216 ------ --------

	solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign	Derek runs his own baking company. This morning, Derek's workers baked 316 key lime pies. They also baked some more after lunch. In total, they baked 444 key lime pies. How many key lime pies did Derek's workers bake after lunch? Danielle's town built a new fence. Each section of the fence has 4 fence posts. The fence has 61 sections. How many fence posts does the fence have in all? A gym teacher has £704 to spend on new basketballs. If each basketball costs £4, how many basketballs can the gym teacher buy? Brandon's mum gave him £59 to go shopping. He bought a jumper for £13, a T-shirt for £4, and a pair of shoes for £13. How much money does Brandon have left? Tess bought 8 rolls of brown gift wrap and 20 rolls of green gift wrap. There were 17 metres of gift wrap on each roll. How many metres of gift wrap did Tess buy in all? How many boxes of cakes, each holding 12 cakes, will be needed to give 120 guests at a garden party three cakes each?
	Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.	Find the unit rate. 20 plates in 4 stacks = ☐ plates per stack 120 orders in 5 days = ☐ orders per day 36 stamps on 3 sheets = ☐ stamps per sheet Of the 56 flowers in a vase on the table, one-half are yellow roses. How many yellow roses are in the vase? A summer camp has 49 campers. One-seventh of them like to hike. How many campers like to hike? Of the 27 students in Miss Uppal's class, five-ninths are girls. How many girls are in Miss Uppal's class? There are 125 children on the playground. Three-fifths of them are playing football. How many children are playing football? One-third of the 36 pens in a drawer have blue ink. How many pens with blue ink are in the drawer?

Fractions (including decimals and percentages)

Pupils should be taught to:
compare and order fractions whose denominators are all multiples of the same number

Fractions are ways of writing parts of whole numbers. For example if wetake a pizza, and divide it up equally between 4 people, each person will have ¼ or, one quarter of the pizza.

If one person were to take 2 quarters of the pizza, they would have 2/4 , which is the same as ½ or half the pizza.

So $\frac{2}{4} = \frac{1}{2}$ (equivalent fraction)

If three pieces of the pizza have been eaten, then ¾ or three quarters has gone, and ¼ or one quarter remains.

Anna says 4/7 is greater than 5/9? Is she correct? Explain how you know.

Making a common denominator:

$\frac{4}{7} = \frac{36}{63}$ $\quad$ $\frac{5}{9} = \frac{35}{63}$

$\frac{36}{63} > \frac{35}{63}$

There is a $\frac{1}{63}$ difference between the two.

Making a common numerator:

$\frac{4}{7} = \frac{20}{35}$ $\quad$ $\frac{5}{9} = \frac{20}{36}$

$\frac{20}{35} > \frac{20}{35}$

Converting to decimals:

$\frac{4}{7} = 0.5714$ $\quad$ $\frac{5}{9} = 0.5555$

$0.5714 > 0.5555$

Converting to percentages:

$\frac{4}{7} = 0.5714 = 57.14\%$ $\quad$ $\frac{5}{9} = 0.5555 = 55.55\%$

$57.14\% > 55.55\%$

	identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths	Which is bigger 4/5 or 5/8? Explain how you know. Nishat says 4/5 is bigger than 8/9? Is she correct? Put the following fractions in order starting with the biggest one. $\frac{5}{8}$ $\frac{8}{9}$ $\frac{2}{6}$ $\frac{10}{10}$ $\frac{1}{2}$ $\frac{4}{5}$ $\frac{3}{4}$ Order from least to biggest 7/6, 7/5, 7/2,7/4
	recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number (e.g. $^{2}/_{5} + {}^{4}/_{5} = {}^{6}/_{5} = 1\,{}^{1}/_{5}$)	Equivalent Fractions have the same value, even though they may look different. E.g ½ = 5/10 = 20/40 Find an equivalent fraction with a denominator of 12 for each of these: $\frac{1}{4}$ $\frac{3}{4}$ $\frac{5}{6}$ $\frac{4}{24}$ $\frac{16}{24}$ $\frac{2}{3}$ $\frac{1}{6}$ Work out the missing number: $\frac{1}{2} = \frac{\quad}{6}$ $\frac{4}{7} = \frac{\quad}{35}$ $\frac{5}{12} = \frac{10}{\quad}$ Which fractions are equivalent to $\frac{4}{6}$? $\frac{6}{9}$ $\frac{8}{12}$ $\frac{7}{11}$ $\frac{5}{10}$ Which fraction is equivalent to $\frac{2}{5}$? $\frac{6}{12}$ $\frac{1}{6}$ $\frac{4}{10}$ $\frac{2}{8}$ Write the missing number to complete the equivalent fraction. $\frac{3}{5} = \frac{\square}{10} = \frac{18}{\square} = \frac{\square}{60}$ **Proper fraction** is a common fraction where the numerator is smaller than the denominator. E.g $\frac{2}{3}$ $\frac{5}{7}$ $\frac{7}{9}$ **Improper fraction** is a type of fraction where the numerator is bigger than the denominator. E.g $\frac{3}{2}$ $\frac{7}{5}$ $\frac{9}{7}$

A mixed number is made by a whole number and a proper fraction.

E.g. $3\frac{1}{2}$ $5\frac{1}{4}$

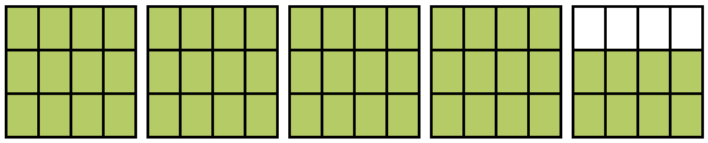
Converting an improper fraction to a mixed number: Divide the numerator my the denominator. The remainder will be the numerator and the denominator will stay the same. E.g $\frac{12}{5}$

12 ÷ 5 = 2 , remainder 2 so the mixed number = $2\frac{2}{5}$

Connverting mixed number to an improper fraction: Multiply the whole number by the denominator and add the numerator (the result will be the numerator and the denominator will stay the same). E.g $9\frac{1}{4}$

9 x 4 + 1 = 37 so the improper fraction is $\frac{37}{4}$

Write the following as a mixed number:



Write $5\frac{1}{8}$ as an improper fraction

Write $\frac{13}{6}$ as a mixed number.

add and subtract fractions with the same denominator and multiples of the same number

Add and subtract fractions with common denominator:

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

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

$\frac{4}{7} + \frac{2}{7}$

$= \frac{4+2}{7} = \frac{6}{7}$

$\frac{4}{7} - \frac{2}{7}$

$= \frac{4-2}{7} = \frac{2}{7}$

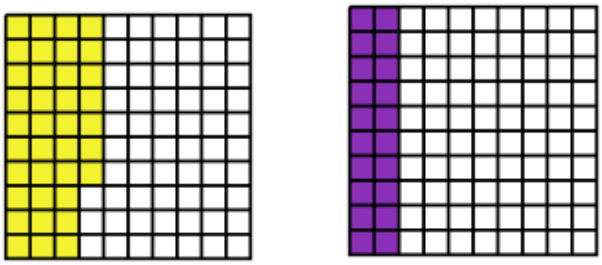
$\frac{2}{5} - \frac{1}{5}$

$= \frac{2-1}{5} = \frac{1}{5}$

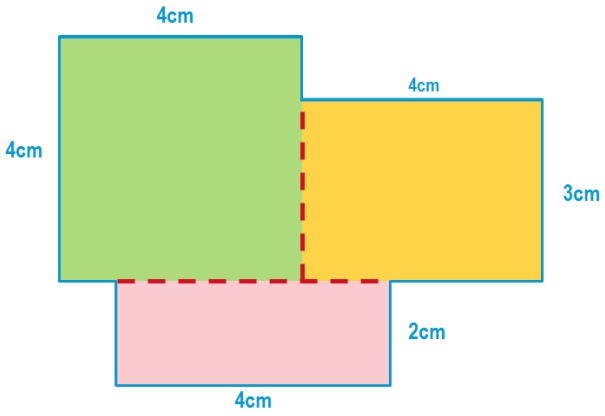
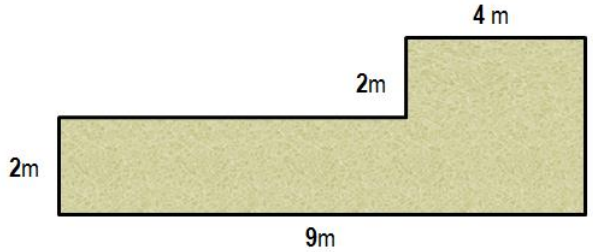
		When Christine looked at her mobile phone bill for the month, she saw that she had spent 1/3 of her minutes talking to her mother and 1/3 of her minutes talking to her best friend. What fraction of the minutes did Christine spend talking to either her mum or her best friend? Find the missing numbers: $\frac{17}{18} - \frac{13}{18} = \frac{\square}{9}$. Write down five fractions equivalent to $\frac{2}{3}$. Write down $1\frac{4}{9}$ in five different ways, including at least one improper fraction. Share a chocolate bar with 32 pieces, equally between four friends. Write down the fraction they each receive in five different ways. Write 7 as a fraction in five different ways. How many thirds make 5 whole ones? Convert these improper fractions into mixed fractions: $\frac{10}{3}, \frac{7}{2}, \frac{16}{5}, \frac{29}{10}, \frac{15}{4}$. Convert these mixed fractions into improper fractions: $2\frac{1}{2}, 6\frac{1}{3}, 7\frac{2}{5}, 11\frac{1}{4}, 7\frac{2}{9}$.
	multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams	$\frac{1}{7} \times 35 = 5$ 35 ÷ 7 = 5 5 x 1 = 5 $\frac{2}{9} \times 36 = 8$ 36 ÷ 9 = 4 4 x 2 = 8 $2\frac{2}{5} \times 45 = \frac{12}{5} \times \cancel{45}^{9} = 108$ 2 2/5 = 12/5 (2 x 5 + 2 = 12) 45 ÷ 5 = 9 12 x 9 = 108 $3\frac{1}{4} \times 24 = \frac{13}{\cancel{4}} \times \cancel{24}^{6} = 78$ 3 ¼ = 13 / 4 (3x 4 + 1 = 13) 24 ÷ 4 = 6 13 x 6 = 78

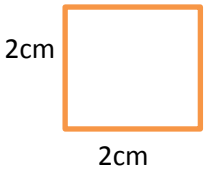
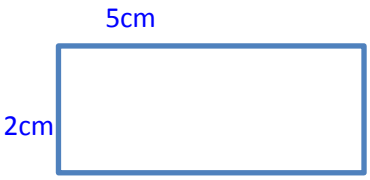
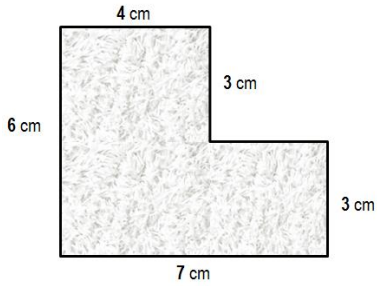
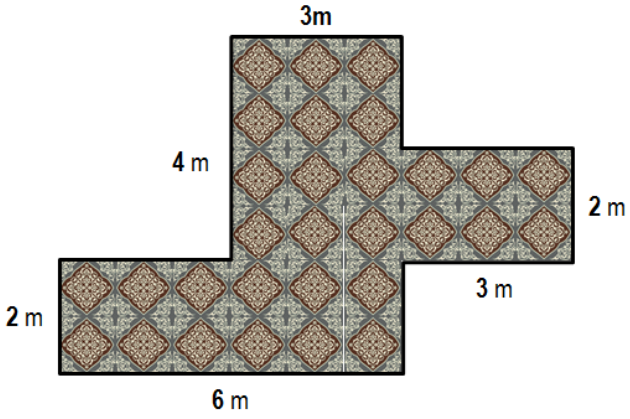
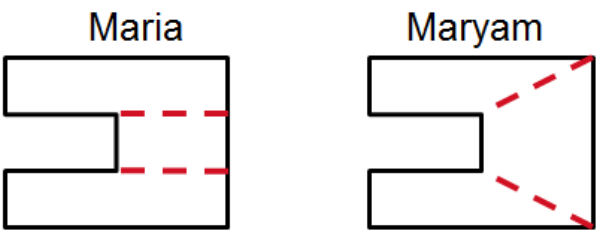
		Calculate : $\frac{1}{5}$ X 35 = $\frac{3}{7}$ X 49 = $\frac{4}{9}$ X 72 = 1 $\frac{6}{7}$ X 21 = 2 $\frac{2}{11}$ X 88 = 2 $\frac{5}{8}$ X 48 = A biscuit factory puts 2/3 of a barrel of flour into each batch of biscuits. How much flour will the factory use for 5 batches?
	read and write decimal numbers as fractions (e.g. 0.71 = $^{71}/_{100}$)	Write $\frac{939}{1000}$ as a decimal number. Write $\frac{9}{100}$ as a decimal number. Convert the following as decimal numbers: $\frac{50}{100}$ $\frac{43}{10}$ $\frac{93}{1000}$ $\frac{7}{10}$ $\frac{15}{100}$ 231/100 $\frac{3}{10}$ Write the folloing as a fraction: 0.07 1.9 0.23 5.25 11.7 99.3 7.05 1.19 9.99 17.02 0.098 3.02 Write these mixed number as decimal numbers. 3 $\frac{4}{10}$ 2 $\frac{5}{100}$ 3 $\frac{2}{5}$ 1 $\frac{3}{20}$
	recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents	Write **forty-nine hundredths** as a decimal number. Write **twelve hundredths** as a decimal number. Write **five tenths** as a decimal number. Write **five hundred forty-nine thousandths** as a decimal number. Write **six hundredths** as a decimal number. Write **nine tenths** as a decimal number. In 5.984, which digit is in the units place? In 74.309, in which place is the 7? In 549.708, in which place is the 8? In 41.0, which digit is in the tens place?

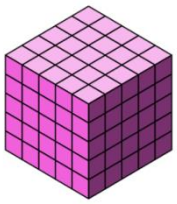
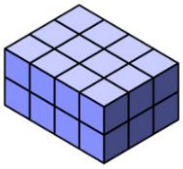
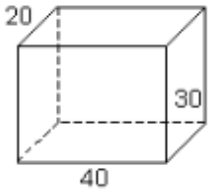
	round decimals with two decimal places to the nearest whole number and to one decimal place	*23.27 is 23.3to the nearest tenth because the hundredth digit is 7 , which is more than 5. It is 23.0 to the nearest whole number.* *41.53 is 41.5 to the nearest tenth because the hundredth digit is 3 , which is less than 5. It is 42.0 to the nearest whole number, because the tenths digit is 5.* What is 8.781 rounded to the nearest tenth? What is 4.572 rounded to the nearest hundredth? Round each of these distance to the nearest kilometre. 176.8km 134.2km 312.5km 159.1km 165.7km Round these number to one decimal place. 4.09 123.49 456.13 762.87 108.15
	read, write, order and compare numbers with up to three decimal places	Work out the perimeter of each rectangle and give your answer to two decimal places. 3.6 cm, 4.25cm 8.2cm, 2.36cm 2.9cm, 5.2cm Use the sign (< or >) to make the statement true. 19.05 ☐ 19.5 0.98 ☐ 0.89 4.5 ☐ 0.45 0.4 ☐ 0.38 7.67 ☐ 7.6 0.048 ☐ 0.2 Write **seven and six tenths** as a decimal number. Write **three and fourteen hundredths** as a decimal number. Write **three and twenty-five hundredths** as a decimal number. Write **one and ninety-four hundredths** as a decimal number. Write **six and five tenths** as a decimal number. Put these numbers in order starting from the smallest one. 8.09 7.89 2.98 3.08 1.99 5.02 2.309 0.89 0.75 0.001 3.02 0.010 0.1 0.97 2.01 9.21 Put these number in order starting from the biggest one. 78.02 87.01 39.098 87.98 46.98 34.09 19.09 90.19 9.99 91.09 0.099 9.90

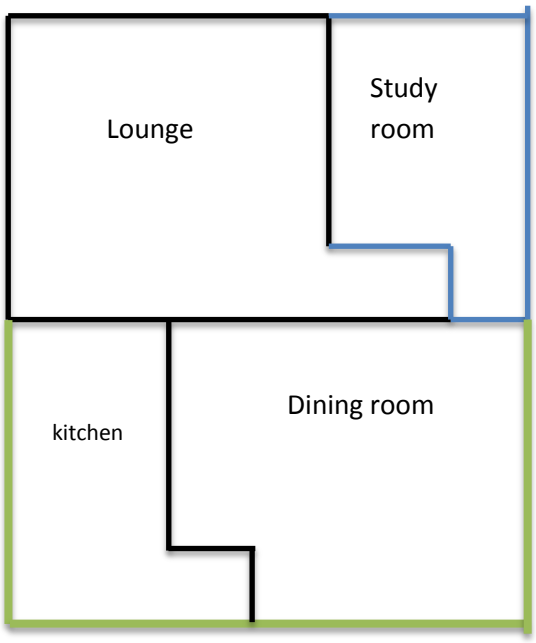
	solve problems involving number up to three decimal places	Adding decimal numbers up to three decimal places: 198.08 + 20.34 0.098 + 12.07 45.6 + 0.762 29.08 + 12.43 + 0.87 1870.98 + 12.082 0.72 + 1.02 + 3.271 Brooke mixed 5.15 grams of salt into a pot of soup she was cooking. Before she served the soup, Brooke added 1.8 grams of salt. How much salt did Brooke put into the soup in all? Robbie biked 8.4 kilometres on Thursday and 1.6 kilometres on Friday. How far did Robbie bike in all on Thursday and Friday? Subtracting decimal numbers: 12.09 – 9.07 54.5 – 17.25 459.452 – 124.24 A carpenter bought a piece of wood that was2 0.3 metres long. Then she sawed1 0.1 metres off the end. How long is the piece of wood now? Robert had 0.45 grams of pepper. Then he used 0.36 grams of the pepper to make some scrambled eggs. How much pepper does Robert have left?
	recognise the per cent symbol (%) and understand that per cent relates to "number of parts per hundred", and write percentages as a fraction with denominator hundred, and as a decimal fraction	A percentage is a number out of 100. The symbol **%** is used to write percentages. Such as 85 out of 100 is written like this: **85%** What percentage of the shape is yellow/purple ? What percentage of the shape is unshaded ?  *Write 1.0 as percentage.* *Multiply the decimal by 100. Move the digit two places to the left.* *1.0 × 100 = 100* *Write the result as a percentage: 100%* Write the following numbers as percentage: 3.0 0.75 0.6 0.25 36 0.1 How do you write **3%** as a fraction in simplest form? How do you write $\frac{\mathbf{6}}{\mathbf{10}}$ as a percentage? Write the following fractions as percentage. 2/5, 3/5, 5/10, 8/100, 25/100, 65/100, 45/100 How do you write **50%** as a decimal? Write the following as decimal numbers: 45% 85% 0.05% 36% 49% 72%

	solve problems which require knowing percentage and decimal equivalents of $^1/_2$, $^1/_4$, $^1/_5$, $^2/_5$, $^4/_5$ and those with a denominator of a multiple of 10 or 25.	Write 76% as a fraction in simplest form. Write the three equivalent fractions for 1/5. Convert the following into fractions and then put them in order, starting with the smallest one: 0.5 0.25 0.6 0.75 0.66 0.4 0.20 0.8 How do you write **80%** as a decimal? How do you write $\frac{9}{10}$ as a percentage? Convert the following fraction numbers into decimals and then put them in order starting with the biggest one: 2/8 2/4 40/100 80/100 20/100 75/100 Can you make the common denominator for these fractions: $\frac{2}{10}$ $\frac{1}{5}$ $\frac{2}{5}$ $\frac{1}{2}$ $\frac{2}{7}$ $\frac{3}{5}$
	MEASUREMENT Pupils should be taught to: convert between different units of metric measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)	Write true or false for each statement: 12 km 15000m 600 g = 0.6kg 2.5kg > 2600g 2.5 L = 250ml 0.5m > 500 2000g < 1.9kg 1 litre = 100 centilitres 400 centilitre > 4 litres Convert the following to metres: 0.5km 7.5km 900cm 1.7km 700cm Convert the following to litres : 8500ml 800ml 250ml 175ml Which is more,5 3 centimetres or 0.5m? Which is more, 1 metre or 1,000 millimetres? 1 metre = ☐ millimetres ☐ millimetres = 3 metres Convert the following to grams: 12.5kg 0.5kg 0.25kg 1.6kg 1.75kg Harry buys a bag of potatoes weighing 1.5kg, a bunch of bananas weighing 900g, a bag of sugar weighting 1kg and a packet of coffee weighing 227g. What is the weight his shopping, in kilograms? **Calculate :** 2kg + 1600g 0.5L + 1500ml 6.5km – 6200 m

	understand and use equivalences between metric units and common imperial units such as inches, pounds and pints	Which is more, 1 mile or 2520 yards? (1 mile = 1,760 yards) 2 inches = ☐ yard (1 yard = 36 inches) Which is more, 3 feet or 1 yard ? **1 km = $^{5}/_{8}$ mile** **1 m = 39.37 inches** **1 foot = 30.5 cm** **1 inch = 2.54 cm** **1 kg = 2.2 lb** **1 gallon = 4.5 litres** **1 litre = 1 $^{3}/_{4}$ pints** The length of this line is 10 inches Work out the length in cm.  This car tank holds 15 litres of petrol. How much petrol does it hold in gallons? Nishat drinks 2 litres milk in every day. How much milk is this in pints? Mary weighs 25kg. Can you find her weight in pounds?
	measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres	**Find the perimeter of this Composite Shape**  Now can you find the area of this shape? What is the perimeter of the grass? 

	calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes	Calculate the area of this square. Now double the length of each side and calculate the area. How Many times greater has the area Become?  Work out the area of this rectangle. Double the length of each and calculate the area. How many times greater has the area become? How many times greater has the Perimeter become?  **What is the area of this composite shape?**  **Calculate the area of this floor?**  Maria and Maryam split a composite shape to find the area. They both split the shape in a different way. Who split the shape correctly? Explain. 

	estimate volume (e.g. using 1 cm^3 blocks to build cubes and cuboids) and capacity (e.g. using water)	***Volume:*** *Volume I the amount of space inside a 3D shape. It is measured in cubic units (cm^3).* *Thr formula to work out the volume of a cube/cuboid = Length x Width x Height* *Volume of a cylinder = $\prod r^2 h$* What is the volume of these objects? (1 little squar = 1cm)   Calculate the volume of these shapes:  volume = _____ cm^3  volume = _____ cm^3
	solve problems involving converting between units of time	1 minute = ☐ seconds 1 hour = ☐ minutes 1 day = ☐ hours 1 month = ☐ days Add: 7 seconds + 2 Minutes + 57 seconds = ☐ minutes + ☐ second Subtract: 7 years 9 months – 5 years 6 months = ☐ How many weeks are in a month/a year? 49 days = ☐ weeks and = ☐ days 2 quarter hours = ☐ half hours How many days in a week/ in a year? Shely left her house at 7:25 am. It took her 5 minutes to get to the bus stop. After 45 minutes she get off the bus and walk 2 more minutes to the school gate.What time was it when she arrived at the school gate?

	use all four operations to solve problems involving measure (e.g. length, mass, volume, money) using decimal notation including scaling.	A beach volleyball court is 8 metres wide and 18 metres long. The rope used for the boundary line costs £1.50 per metre. How much would it cost to buy a new boundary line for the court? A school wants to buy a flipchart that measures 1.5 metres by 2 metres. The flipchart costs £15.00 per square metre. How much will the flipchart cost? **Scale 1cm : 1m**  Find the area and perimeter of each room. The lounge and dining room are carpeted. The carpet costs £12 per m^2. What is the total cost of carpet for these two rooms? The kitchen and study are carpeted at £8 per m^2 . What is the total cost of carpet for these two rooms? Carpet grip goes round the perimeter of each room. It costs 22p per metre. Calculate the cost of carpet grip for each room. Paul purchased Filet-o-Fish for £2.14. He paid £5. How much change did Paul receive?

GEOMETRY

Properties of shapes
Pupils should be taught to:
identify 3-D shapes, including cubes and other cuboids, from 2-D representations

1-D shape

This is a line

It has **1 dimension** (length). All 1-D shapes only have length. The only 1-D shape is a line, even a wavy one.

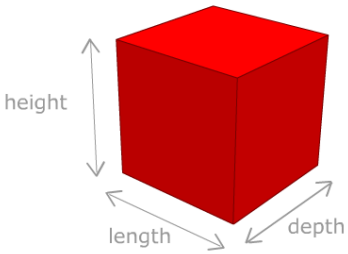
2-D shape

This is a rectangle

It has **2 dimensions** - length and breadth. All 2-D shapes have area but no depth (they are flat). Some 2-D shapes are triangles, rectangles, pentagons etc.

3-D shape

This is a cube



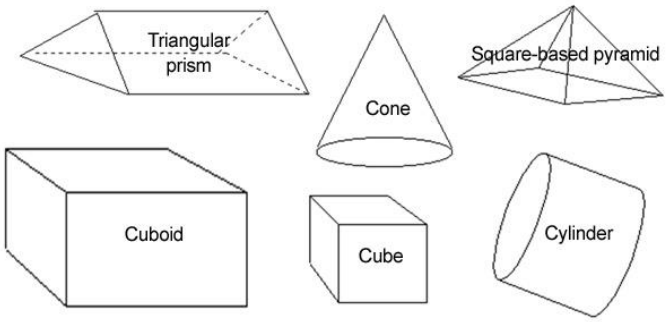
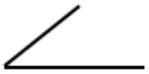
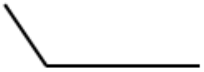
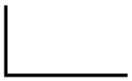
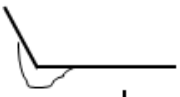
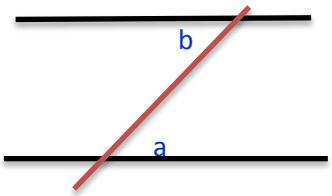
It has **3 dimensions** - length, height and depth.
All 3-D shapes are solids.

Eva built a 3-dimensional figure that had 6 vertices and 9 edges. Which figure could Eva have built?

Debbie built a 3-dimensional figure that had 12 edges and 6 faces. Which figure could Debbie have built?

Alan saw a 3-dimensional figure that had 5 vertices and 8 edges. Which figure could Alan have seen?

Cole saw a 3-dimensional figure that had 6 edges and 4 faces. Which figure could Cole have seen?

	know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles	 Which shape has two circular faces? Which shape only one circular face? Which shape has 6 square faces and 12 edges? Which shape has two rectangular faces? ***Angle:*** *An angle is a measure of the space between two straight lines that meet together. The unit of the measurement of rotation is degree.* **Acute angle:** An angle that is greater than 0^0 and smaller than 90^0 .  **Obtuse angle**: An angle that is greater than 90^0 and smaller than 180^0 .  **Right angle:** An angle of 90^0 .  **Reflex angle**: An angle that is greater than 180^0 and smaller than 360^0 .  **Complementary angle:** Two angles, which add up to 90^0 are called complementary angle.  **Supplementary angle:** Two angles, which add up to 180^0 are called supplementary angle.  **Alternate angle:** Angles from between parralelle lines and angles on either sides of a transversal. Alternate angles are equal in size. A staright line crossed two or more parallel lines is called a transversal.  a = b as alternate

Is this angle greater than, equal to or less than a right angle?

Is this angle greater than, equal to or less than a right angle?

What fraction of a turn is this angle?

- $\frac{1}{2}$ turn
- $\frac{3}{4}$ turn
- $\frac{1}{4}$ turn
- 1 full turn

What is the measurement of this angle?

- 180°
- 360°
- 90°
- 270°

What is the measurement of this angle?

- 360°
- 180°
- 270°
- 90°

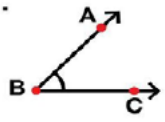
What fraction of a turn is this angle?

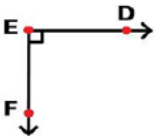
- $\frac{3}{4}$ turn
- $\frac{1}{2}$ turn
- $\frac{1}{4}$ turn
- 1 full turn

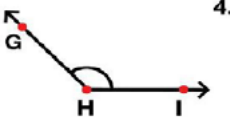
What fraction of a turn is this angle?

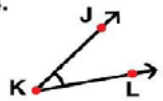
- $\frac{1}{4}$ turn
- 1 full turn
- $\frac{1}{2}$ turn
- $\frac{3}{4}$ turn

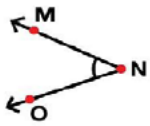
Label each angle as acute, obtuse, or right.

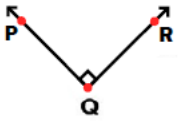
1. 

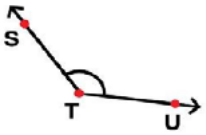
2. 

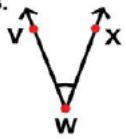
3. 

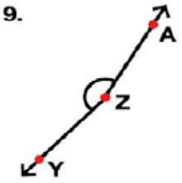
4. 

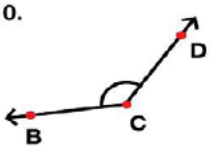
5. 

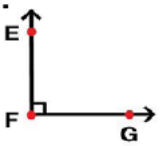
6. 

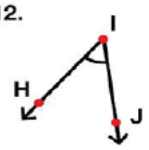
7. 

8. 

9. 

10. 

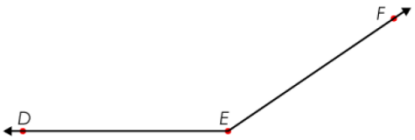
11. 

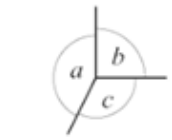
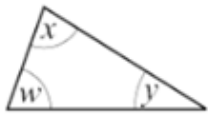
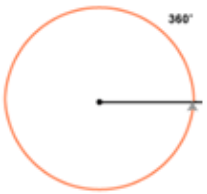
12. 

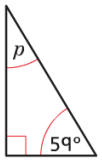
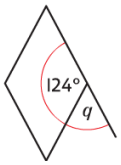
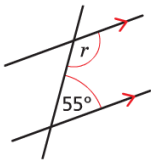
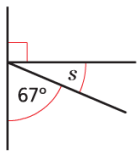
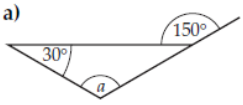
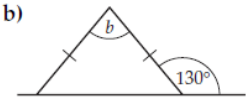
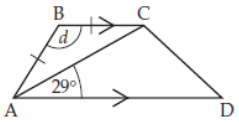
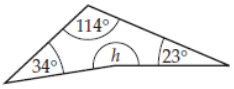
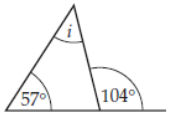
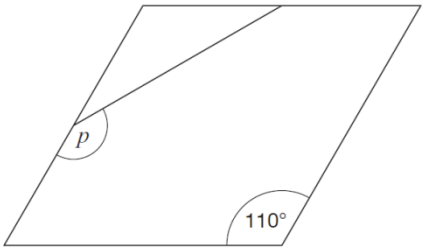
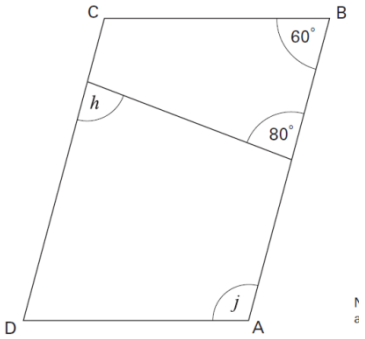
Draw these angles accurately using a ruler and protractor. Label each angle as reflex or obtuse.

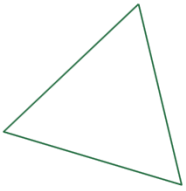
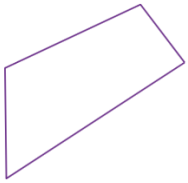
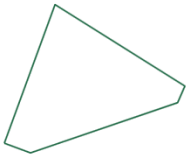
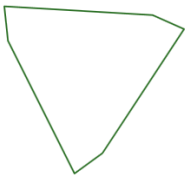
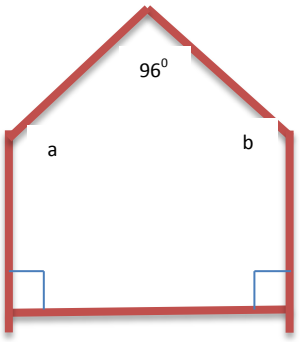
138^0 294^0 197^0 176^0 145^0

Use a protractor to measure the angles.



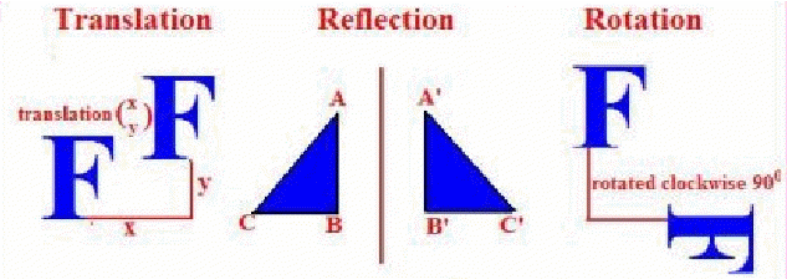
	draw given angles, and measure them in degrees (^{o}) identify: angles at a point and one whole turn (total 360^{o}) angles at a point on a straight line and ½ a turn (total 180^{o}) other multiples of 90^{o}	**Angle facts:** Angles around a point add up to 360^0  $a + b + c = 360^\circ$ Angles on a straight line add up to 180^0  $e + f = 180^\circ$ Angles in a triangle add up to 180^0  $w + x + y = 180^\circ$ Angles in quadrilateral add up to 360^0 **a + b + C + d = 360^0**  A full turn in an angle of 360^0 (angle in a circle).  Draw an isosceles triangle that has the non-base angle of 40^0 . Now draw an isosceles right triangle. Two angles in a triangle are 45^0 and 85^0 . How many degrees is the other angle? Can you draw the triangle using a ruler and protractor? Draw a quadrilateral that has two right angles. Draw a parallelogram and measure the angles. Remember all angles in a quadrilateral add up to 360^0 .

	use the properties of rectangles to deduce related facts and find missing lengths and angles	Calculate the missing angle in each diagram. **a**  **b**  **c**  **d**  Calculate the size of the lettered angles, giving reasons for your answers. **a)**  **b)**  **c)**  **d)**  **e)**  The diagram shows a rhombus. The midpoints of two of its sides Are joined with a straight line. Calculate the size of the angle p.  ABCD is a parallelogram. Work out the size of the angle h and j. 

	distinguish between regular and irregular polygons based on reasoning about equal sides and angles.	Look these polygons. Write R for regular and I for irregular polygon.       This is a pentagon. Work out the size of the angle a and b. Is this a regular pentagon? Explain your answer. 

Position and direction

Pupils should be taught to:
identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed.

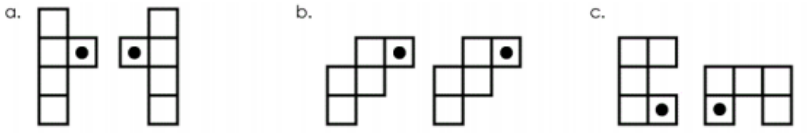


A **transformation** moves a shape to a new position. The starting shape is called the object. The image is the shape after the transformation. You can perform more than one transformation on the same shape. This is a combination of transformations. The object and the image of a reflection, rotation or translation always have the same lengths and angles.

A **reflection** flips an object over a mirror line. You describe a reflection by giving the mirror line.

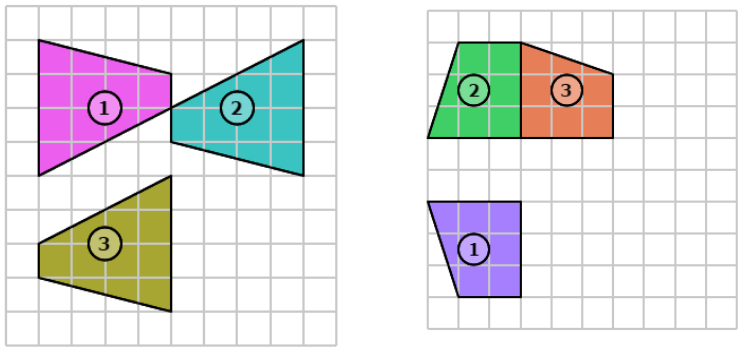
A **rotation** turns an object about a point, called the centre of rotation. You describe a rotation by the centre of rotation or the angle of rotation or the direction of turn (Colockwise or anti-clockwise).

A **translation** slids an object. You describe a translation by giving the distance moved left or right, then the distance moved up or down.



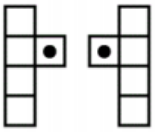
reflection translation rotation

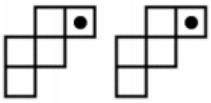
What combination of transformations are shown below?

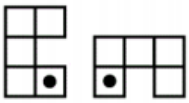


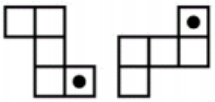
- rotation, then translation
- translation, then rotation
- rotation, then reflection
- translation, then reflection
- reflection, then rotation
- translation, then reflection
- reflection, then translation
- translation, then rotation

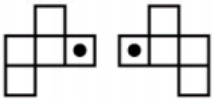
Tell How each fihure was moved. Write reflection, rotation or translation.

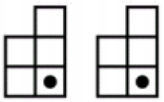
a. 

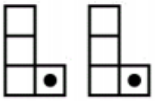
b. 

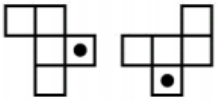
c. 

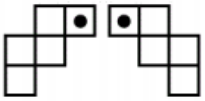
d. 

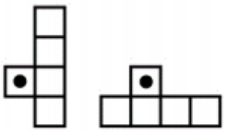
e. 

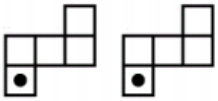
f. 

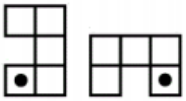
g. 

h. 

i. 

j. 

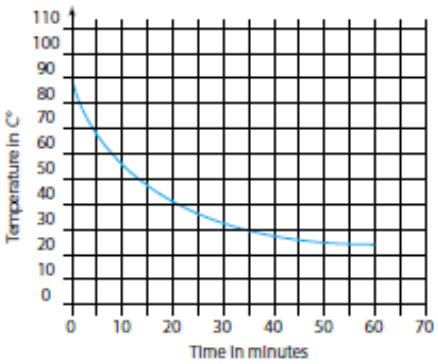
k. 

l. 

STATISTICS

Pupils should be taught to:
solve comparison, sum and difference problems using information presented in a line graph

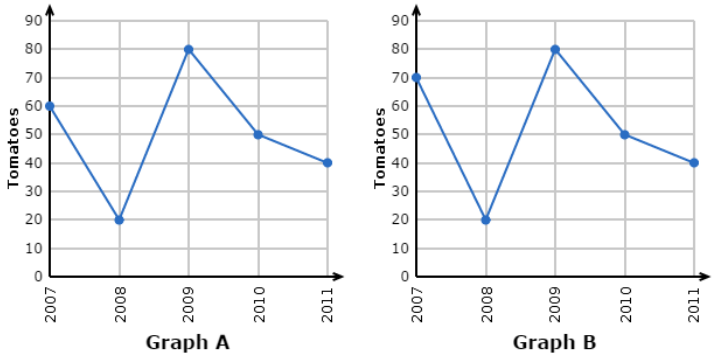
In a science experiment, a hot liquid is left to cool. This graph shows how the temperature of the liquid changes as it cools. Read from the graph how many minutes it takes for the temperature to reach 40°C and for how many minutes the temperature is above 60°C.



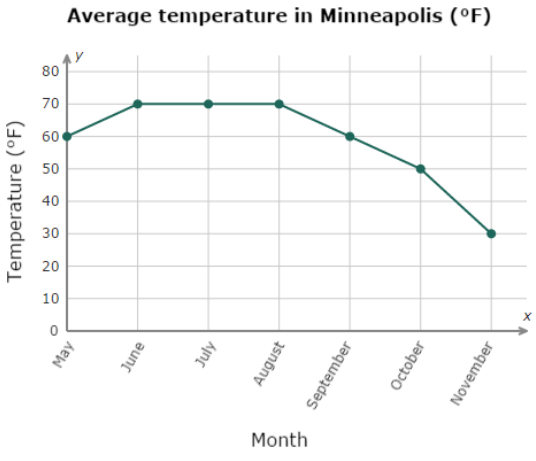
To monitor the health of her tomato plants, Mrs. Weber recorded the number of tomatoes that grow in her garden each year.

Tomatoes in Mrs. Weber's garden	
Year	Tomatoes
2007	60
2008	20
2009	80
2010	50
2011	40

Which line graph correctly shows the data?



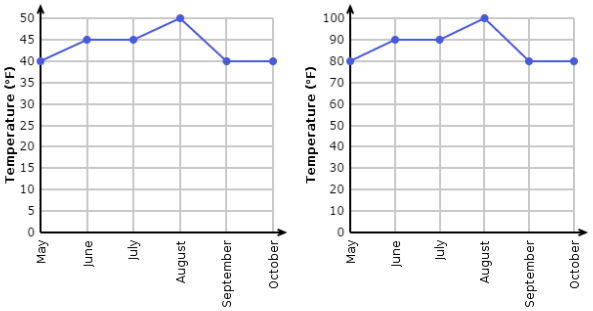
A meteorologist kept track of the average temperature in Minneapolis for a full year.



How much higher is the average temperature in August than in September?

A London travel company cited record high temperatures in hopes of attracting more visitors.

Record high temperature in London (°F)	
Month	**Temperature (°F)**
May	80
June	90
July	90
August	100
September	80
October	80

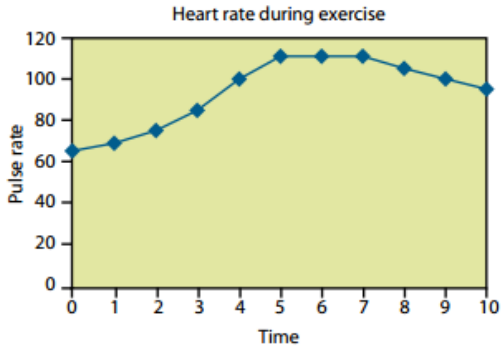


Graph A **Graph B**

Look at the table and the graphs above and make questions about them.

Heart rate and pulse rate

Look together at the line graph below. Talk about what the points on the graph represent.



Agree they show pulse rates or heartbeats per minute, taken every minute. The points are joined up to show the changes in heart rate during the exercise.

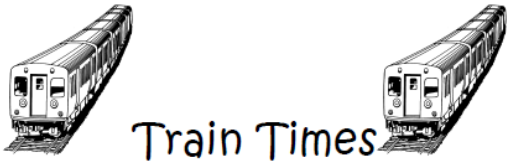
Ask questions such as:

- How long did it take for the pulse rate to reach its highest level?
- What was the pulse rate at the start of the experiment?
- What was the pulse rate likely to have been after 2½ minutes?
- When do you think the person stopped exercising?
- When was the heart rate increasing most?
- Carry out your own exercise experiment together and draw a line graph showing your heart rates. How do they compare?

	complete, read and interpret information in tables, including timetables	Look at the following schedule:

Train schedule					
Pleasant River Campground	09:30	10:30		21:30	
Magician Village	10:15	11:15	17:15	22:15	22:30
Floral Gardens	11:00			23:00	23:15
Comfy Pillows Resort	12:00	12:30	18:00	00:00	00:15
Snowy Mountain	12:45	13:15	18:45		
Rollercoaster Land	13:30	14:00	19:30	01:00	
Skyscraper City		14:30		01:30	01:45
Happy Cow Farm	14:00	15:00	20:15	02:00	02:15
City of Green Trees	14:30	15:30	20:45		

Harry just missed the 09:30 train at Pleasant River Campground. What time is the next train?



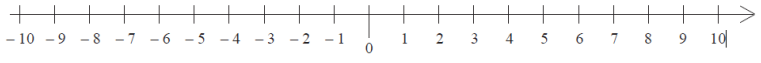
Station	Train 1	Train 2	Train 3
Cricklewood	10:00	10:40	11:08
King's Cross	10:15	10:55	11:23
East Croydon	10:45	11:40	12:06
Brighton	11:30	12:27	12:52

1) Which train arrives in Brighton before 12:00?
2) Which train takes 1 hour 47 minutes fronm Cricklewood to Broghton?
3) How long does it take train 2 to travel from East Croydon to Brighton?
4) Which train takes 43 minutes to travel from King's Cross to East Croydon?
5) If you missed train 2 from Cricklewood how long would you have to wait for the next train ?
6) How much quicker is the fastest train from Cricklewood to Brighton than the slowest?
7) Which train takes 46 minutes to travel from East Croydon to Brighton?
8) If train 1 is running 18 minutes late, at what time would it arrive in Brighton?
9) If you needed toi arrive in East Croydon by 12:00, which train would you take?
10) If you m issed the 10:55 train from King's Cross to Brighton, how long would you have to wait for the next train?

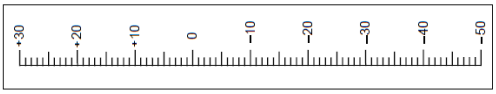
Look at the timetable below of buses from Shotton to Alton. Can you make five questions using the time table? E.g. A bus leaves Shotton at 7:30. What time should it arrive at Alton?

The table shows part of a bus timetable from Shotton to Alton.

Shotton	07 30	08 00	09 00	10 00	11 00
Crook	07 45	08 15	09 15	10 15	11 15
Prudhoe	07 58	08 28	09 28	10 28	11 28
Hexham	08 15	08 45	09 45	10 45	11 45
Alton	08 30	09 00	10 00	11 00	12 00

Y6	**Numbers** **Number and place value** Pupils should be taught to: read, write, order and compare numbers up to 10 000 000 and determine the value of each digit	Each digit has a value depends on its place in the number. For example, 9 hundred and eighty five thousand, three hundred and seventy two(in figure : 985372). 985372 can also be written in expanded form like this: 900000 + 80000 + 5000 + 300 + 70 + 2 Write each number in figure/numeral. Eighty eight thousand and twelve. Five hundred and forty thousand, seven hundred and twenty one. Thirty five thousand and five. One million, four hundred and forty six thousand, five hundred and two. Write the number that made up of: 7 units, 9 tens and 728 thousands. 2 units, 6 tens and 24 thousands. 8 hundreds, 1 tens , 1 units and 23 thousands Write these numbers in expanded form (partitioning form): 7628414 872045 What is the value of the digit underlined? 504675 4081 999993 157 396714 125098 What is the largest number can you make with the digits 1 0 2 4 5 and 6 ? Arrange each set of number in order from smallest to largest. 712, 187, 531, 901, 101, 416, 201 19872, 1092, 23010, 72010, 20192, 1090000, 90872, 1007310, 98765,
	round any whole number to a required degree of accuracy	To round to tens, look at the unit digit, 121→120 127→130 To round to hundreds, look at the ten digit, 143→ 170 186→200 To round to thousands, look at the hundred digit. 4397→ 4000 4786→ 5000 3491→3000 Round each number to the nearest ten. 8045 123456 4004 457 64 76 Round each number to the nearest hundred. 12131 7278 606 152462 12765 432 Round each number to the nearest thousand. 1567 5607 53097 91032 15672
	use negative numbers in context, and calculate intervals across zero	If a number that is less than zero, we call it a negative number and we write it with minus sign like this – 5. If a number has no sign, then we accept it as a positive number. Negative number can be shown on a number line: 

Hundred thousands	Ten thousands	Thousands	Hundreds	Tens	Units
9	8	5	3	7	2



On Friday the temperature on a thermometer was 15^0 C. Write what the temperature would be if it were:

3^0C hotter, 3^0 colder, 20^0 colder , 18^0 hotter, 15^0 colder

solve number and practical problems that involve all of the above.

Here are the prices of five cards:

a) £8765 b) £3456 c) 9050 d) £12999 e) £10500

The salesman estimates the prices for a customer. Are his estimates correct?

a) 8000 b) £3000 c) £9000 d) £12000 e) 10000

The temperature was +3°C at midday. By evening, the temperature was −5°C. Underline the correct answer.

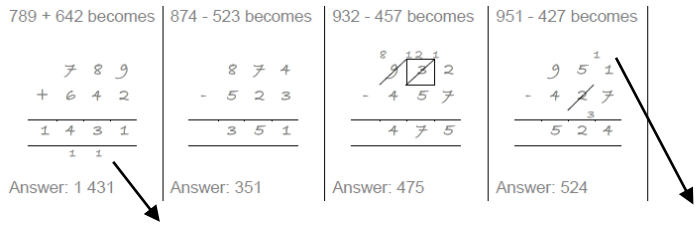
3 − 5 3 + (−5) (−5) – 3 (−5) + 3

At midday, the temperature was 5°C. The temperature then fell by 11°C. What was the final temperature?

Addition, subtraction, multiplication and division

Pupils should be taught to:

Addition and subtraction using formal written methods:

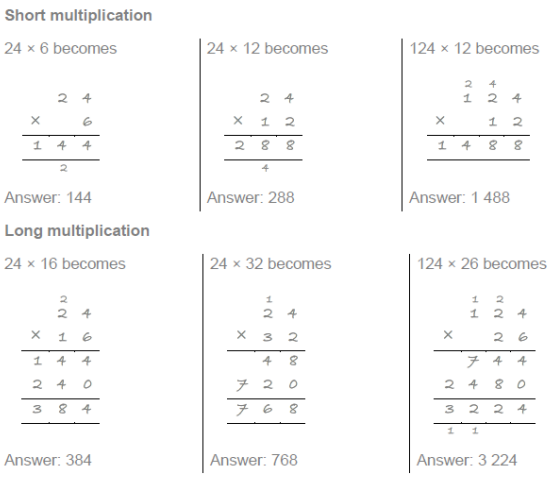


Carry on at the bottom at the top

It is better to carry on the digit at the top so it is consistent with subtraction.

$$\begin{array}{r} {\scriptstyle 1\ \ 1\ \ 1} \\ 8\ 7\ 1\ 9 \\ +\ 6\ 5\ 8\ 7 \\ \hline 1\ 5\ 3\ 0\ 6 \end{array} \qquad \begin{array}{r} {\scriptstyle 6\ \ 12\ \ \ 1} \\ 8\ \not{7}\ \not{3}\ 2 \\ -\ 5\ 4\ 8\ 3 \\ \hline 3\ 2\ 4\ 9 \end{array}$$

multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication



	divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context	A truck carries 2436 boxes each time it makes a delivery. How many boxes it carry in 29 deliveries? Calculate : 876 x 35 985 x 63 1234 x 78 2041 x 48 3456 x 27 6702 x 39 Salim bought 36 rugs for £145 each. He sold them for £259 each. How much did the rugs cost him altogether? How much money would he get if he sold them all? Calculate the difference between the total cost of the rugs and the money he made if he sold them all. A school donates £375 each month to charity. How much would they donate in a year? **Short division** 432 ÷ 5 becomes Answer: 86 remainder 2 574 ÷ 15 becomes Answer: 38 4/15 511 ÷ 35 becomes Answer: 14.6 **Long division** 432 ÷ 15 becomes Answer: 28 remainder 12 432 ÷ 15 becomes Answer: 28 4/5 432 ÷ 15 becomes Answer: 28.8 *Division involves working out how many times one number goes into another.* There are 1356 children in a school. I want to put them into 6 equal groups. How many children will there be in each group? Mrs. Cyan paid £504 for flower boxes. Each flower box cost £9. How many flower boxes did she buy? Egg trays hold 36 eggs each. How many trays will be needed for 2700 eggs? Calculate: 3195 ÷ 6 8461 ÷ 9 3408 ÷ 5 5061 ÷ 7 60312 ÷ 12 49080 ÷ 15 74625 ÷ 88 8426 ÷23 9706 ÷ 53

	perform mental calculations, including with mixed operations and large numbers.	What is 45 multiplied by 9? What is 1550 divide by 5? Calculate: 105 x 8 0.982 x 100 2854 x 100 8721 x1000 73092 ÷ 100 1470 ÷ 7 5436 ÷ 9 I am thinking of a number, I multiplied it by 15 then divided by 5. The answer is 27. What is the number that I am thinking of? 123 multiplied by 5 and then divided by 3.
	identify common factors, common multiples and prime numbers	***A number that divides exactly into another number without a remainder is called a factor of that number***. e.g. Here are the factors of 12 12: 1, 12; 2, 6; 3, 4 You can find the original number by multiplying each pair of factors: 1 x 12 = 12, 2 x 6 = 12, 3 x 4 = 12 Factors of 12: 1 2 3 4 6 12 factors 0f 20: **1** **2** **4** 5 10 20 1, 2 and 4 are factors of both numbers. We say they are common factors. Factors of 2: 1 and 2 Factors of 3 : 1 and 3 Factors of 5 : 1 and 5 Factors of 7: 1 and 7 Each of these numbers has only two factors. The factors are 1 and the number itself. Therefore a prime number is a number which is divisible by 1 and itself. The number 1 is not a prime number because it has only one factor. To find out if a two digit number is a prime number you need to work out if it is divisible by one of the first four prime numbers; 2.3.5.and 7. Examples: 28 is divisible by 7. So 28 is not a prime number. 29 is not divisible by 2, 3.5 or 7. So 29 is a prime number. 30 is divisible by 2,3 and 5. So 30 is not a prime number. 31 is not divisible by 2,3,5,or 7. So 31 is a prime number. Explain why 1038 is not a prime number? Which of these are prime numbers? 103, 139, 111, 116, 181, 127, 133, 182, 197, and 153. Find three prime numbers to multiply together to give a product of : a) 105 b) . 385 ***A multiple is a number made by multiplying together two other numbers.*** Examples: 12 is a multiple of 3, because 3 × 4 = 12 -6 is a multiple of 3, because 3 × -2 = -6 24 is multiple of 6, because 4 x 6 = 24 But 7 is NOT a multiple of3 There are less than 40 chocolates in a box. The number of chocolates is a multiple of 4. One chocolate is eaten. The number of chocolates is now a multiple of 5. How many chocolates might there be in the box?

		Look at the following list of numbers:**2, 36, 9, 8, 24** Which number is a factor of 12? Look at the following list of numbers: **2, 36, 9, 8, 24** Which number is a multiple of 18? Look at the following list of numbers: **2, 36, 9, 8, 24** Which number is a factor of 2 and a multiple of 2? Look at the following list of numbers: **2, 36, 9, 8, 24** Which number is a factor of 18, but not a multiple of 2? Look at the following list of numbers:**2, 36, 9, 8, 24** Which number is the highest common factor of 24 and 40? There are 60 people on a coach trip. The number of boys is a multiple of 5. The number of adult is a multiple of 4 and the number of girls is a multiple of 9. There are seven possible combinations of boys, girls and adults. Can you find them all?
	use their knowledge of the order of operations to carry out calculations involving the four operations	Operations of numbers: If a calculation involves more than one operation, then it must be done in the following order: ( ) Brackets : work out any brackets first ^{2} $\sqrt{}$ indices or powers: Work out squares, cubes or their roots ÷ Division or x multiplication: Whatever comes first (left tp right) + addition or – subtraction: Whatever comes first (left to right). $(4 + 5) + 100 – 5^2$ (4 +5) = 9, worked out the brackets first $= 9 + 100 – 25$ $5^2 = 5 \times 5 = 25$, worked out the indices next. $= 109 – 25 = 84$ and then + and – ½ (13 +11) x 64 ÷ (23 – 15) + 4 = ½ x 24 x 64 ÷ 8 + 4 = 12 x 64 ÷ 8 + 4 = 786 ÷ 8 + 4 = 96 + 4 = 100 Complete the following calculations: 15 + 8 x 5 – 21 54 ÷ 9 + 32 – 17 120 ÷ 10 + 17 – 5 x 7 $(180 \div 6) + 49 – 5^2$ 9 x 7 – 75 ÷ 5 (6 x 2 – 8) + (12 ÷ 4 + 10) (23 x 14) + (12 x 17) 243 + (172 + 278) ÷ 25 Using only the digits 2, 4, 5, 7 and 9 and any operation (+, – , x, ÷), make each of the numbers below: 41 59 93 and 120
	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why	A greengrocer has seven boxes each containing 40 red apples. He also has five boxes of green apples. Each green apple box contains 44. How many apples does he have altogether? 20% of apples are rotten, how many apples are good? The price of a drink and a packet of crisp is 90p. The price of two drinks and a packet of crisp is £140. What is the price of one packet of crisp?

	solve problems involving addition, subtraction, multiplication and division	Maths textbooks are sold in a pack of 15. A school orders 24 packs. How many books are there in 24 packs? The school paid £162 for the order. How much does a book cost? One bus carries 52 passengers. How many passengers could be carried on 23 buses? If a passenger needs to pay £2.50, how much money is needed to rise to hire 23 buses? A bottle of orange juice holds 0.75 litres. Mrs jones wants 9 litres of juice for a party. How many bottles does she need? Mali needs to order 4000 plastic cups for a party. If the cups come in boxes of 75, how many boxes should Mali order? Sasha's dog eats 1.2 kilograms of dog food each day. How much dog food will Sasha's dog eat in 5 days?
	use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.	A card factory puts 928 greeting cards in each shipment. About how many greeting cards will there be in 9 shipments? Choose the better estimate. Use written methods to check your answer. ☐ 8100 ☐ 810 A biscuit factory makes 9 types of biscuits. Each day, the factory makes 6,868 of each type of biscuit. About how many biscuits does the factory make each day? Choose the better estimate. Check your answer. ☐ 63000 ☐ 6300 A poultry company owned 6,142 egg-laying chickens. To produce more eggs, it bought 9,087 more chickens. About how many chickens are there now? Choose the better estimate. ☐ 20000 ☐ 15000 Estimate the sum by rounding each number to the nearest thousand and then adding. 9892 + 7186 = ☐ 6209 + 15102 = ☐ 86201 – 9100 = ☐ 17698 – 8799 = ☐ Compare your estimate to the exact answer. Estimate the sum by rounding each number to the nearest hundred thousand and then adding. 928+ 222, 313 + 324 Estimate the sum by rounding each number to the nearest ten thousand and then adding. 25504 + 38938 Estimate. Which sign makes the statement true? 2585 ☐ 5 = 517

	Fractions (including decimals and percentages) Pupils should be taught to: use common factors to simplify fractions; use common multiples to express fractions in the same denomination	Equivalent Fractions have the same value, even though they may look different. E.g ½ = 5/10 = 20/40 Simplifying fractions means to make the fraction as smaller as possible. For example, the simplest form of 3/12 is ¼. *To simplify a fraction, divide the top and bottom by the **highest number** that can divide into both numbers exactly, e.g* $\frac{3 \div 3}{12 \div 3} = \frac{1}{4}$ Simplify the following fractions: Find the simplest form of the fraction 10/24 and 17/85. Write 18/36 and 18/24 in their simplest form. Rewrite each pair of fractions with a common denominator. 1/3 1/6 2/3 1/5 3/8 ¼ 5/8 3/12 5/12 2/5 5/9 2/3 5/7 5/6 2/3 7/12
	compare and order fractions, including fractions >1	When you compare or order fractions it is easier to write them with the same denominator. When fractions have the same denominator we say they have a common denominator. Look at the following example how to write fractions with a common denominator: write these fractions in order from smallest to largest. 5/9 2/3 7/9 1/6 2/18 10/18 12/18 14/18 3/18 2/18 (equivalent fractions) **2/18 3/18 10/18 12/18 14/18** Find the fraction that is exactly half way between: ¾ and 5/6. 1/6 and ½ Which fraction is larger? 2/3 or 3/5 Put these fractions in order, smallest first. 3/8 2/3 ¾ 5/6 Jan has spent 5/8 of his pocket money and James has spent 7/12 of his. Which boy has spent the largest part of his money? Circle the two fractions that are greater than ½. 3/20 7/10 4/8 10/15 2/5
	add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions	Find five equivalent fractions of ¾ . Harry makes a fraction with two number cards. He says, “My fraction is equivalent to a quarter. One of the number cards is eight.” What could Harry’s fraction be? How many answers can you find? Which of these fractions is the same as 4/5? 16/20 12/18 8/10 20/25 24/30 12/16

		Add $\frac{3}{5}$ to $\frac{2}{7}$ $\frac{3}{5} + \frac{2}{7} = \frac{21}{35} + \frac{10}{35} = \frac{21+10}{35} = \frac{31}{35}$ Subtract $\frac{2}{7}$ from $\frac{3}{5}$ $\frac{3}{5} - \frac{2}{7} = \frac{21}{35} \quad \frac{10}{35} = \frac{21-10}{35} = \frac{11}{35}$ $6\frac{1}{5} - 1\frac{8}{15} = \frac{31}{5} - \frac{23}{15}$ $= \frac{93}{15} - \frac{23}{15} = \frac{70}{15} = 4\frac{10}{15} = 4\frac{2}{3}$ $4\frac{1}{5} + \frac{8}{15} = \frac{21}{5} + \frac{8}{15} = \frac{63}{15} + \frac{8}{15} = \frac{71}{15} = 4\frac{11}{15}$ Work out : $2\frac{4}{7} + 5\frac{2}{3}$ $3\frac{1}{8} + 2\frac{5}{4}$ $\quad$ $7\frac{2}{3} + 3\frac{7}{9}$ $4\frac{3}{8} - 2\frac{5}{6}$ $\quad$ $8\frac{3}{5} - 5\frac{4}{9}$ Lili and Julian each start with the same number. Lili works out half of the number. Julian works three quarters of the number. The sum of their answer is 275. What was the number they started with?
	multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. $^1/_4 \times {}^1/_2 = {}^1/_8$)	$\frac{1}{\cancel{5}} \times \frac{\cancel{4}^1}{\cancel{15}} = \frac{1 \times 1}{2 \times 3} = \frac{1}{6}$ $\frac{\cancel{7}^1}{\cancel{9}} \times \frac{\cancel{18}^2}{\cancel{35}} = \frac{1 \times 2}{1 \times 5} = \frac{2}{5}$ To avoid cancelling : $\frac{5}{8} \times \frac{4}{15}$ $\frac{5 \times 4}{8 \times 15} = \frac{20}{120}$ $\frac{20 \div 20}{120 \div 20} = \frac{1}{6}$ $\frac{7}{9} \times \frac{18}{35}$ $= \frac{7 \times 18}{9 \times 35} = \frac{126}{315}$ $\frac{126 \div 9}{315 \div 9} = \frac{14 \div 7}{35 \div 7} = \frac{2}{5}$

Try these:

1) $\frac{3}{10} \times \frac{2}{3}$

2) $\frac{2}{4} \times \frac{1}{2}$

3) $\frac{3}{10} \times \frac{2}{4}$

4) $\frac{2}{5} \times \frac{2}{10}$

5) $\frac{2}{4} \times \frac{2}{3}$

6) $\frac{1}{2} \times \frac{1}{4}$

7) $\frac{1}{2} \times \frac{3}{5}$

8) $\frac{7}{10} \times \frac{2}{5}$

9) $\frac{2}{3} \times \frac{1}{2}$

10) $\frac{2}{3} \times \frac{1}{10}$

I am thinking of a number, multiply it by ½ then and ¾ . I double it and add 8. The answer is 10. What is the number that I am thinking of?

divide proper fractions by whole numbers (e.g. $^1/_3 \div 2 = {}^1/_6$)

$\frac{4}{9} \div 6$

$\frac{4}{9} \div \frac{6}{1}$

$\frac{\cancel{4}^{2}}{9} \times \frac{1}{\cancel{6}_{3}}$

$= \frac{2 \times 1}{9 \times 3} = \frac{2}{27}$

$\frac{1}{3} \div 2$

$= \frac{1}{3} \div \frac{2}{1}$

$= \frac{1}{3} \times \frac{1}{2}$

$= \frac{1 \times 1}{3 \times 2} = \frac{1}{6}$

To avoid cancelling:

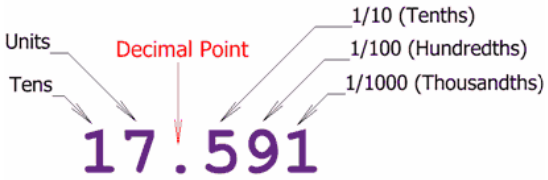
$\frac{4}{9} \div 6$

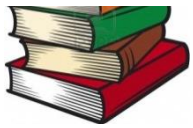
$= \frac{4}{9} \div \frac{6}{1}$

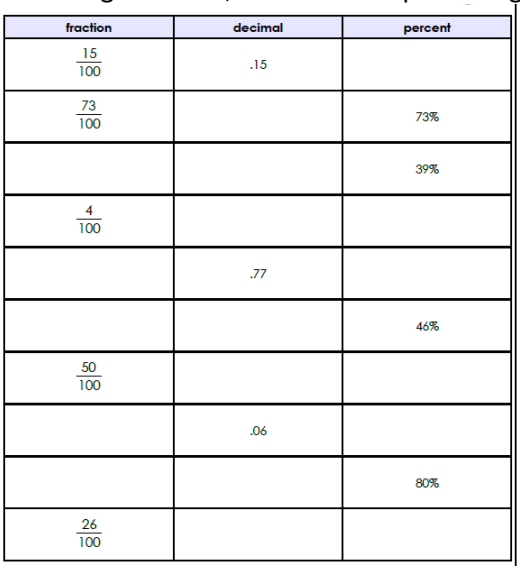
$= \frac{4}{9} \times \frac{1}{6}$

$= \frac{4 \times 1}{9 \times 6}$

$= \frac{4}{54} = \frac{2}{27}$

		Try these: 1) $\frac{1}{3} \div 7$ 2) $6 \div \frac{1}{3}$ 3) $\frac{1}{10} \div 2$ 4) $6 \div \frac{1}{3}$ 5) $5 \div \frac{3}{4}$ 6) $\frac{1}{2} \div 6$: 7) $\frac{1}{3} \div 3$: 8) $9 \div \frac{1}{2}$: 9) $4 \div \frac{4}{10}$: 10) $\frac{1}{4} \div 5$: Work out 1/8 ÷ 5/6 . Give the answer in its simplest form. How many $2\frac{1}{5}$ metre strips of tape can be cut from a roll of tape that is 66 metres long?
	associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $^3/_8$)	$\frac{3}{5}$ means 3÷ 5 = 0.6, $\frac{3}{8}$ = 0.375 Relate fractions to division: Finding one half is equivalent to dividing by 2, therefore ½ of 6 is equivalent to 16 ÷ 2 = 8. one whole cake is divided equally into 4 persons, each person gets one quarter, which is 1 ÷ 4 = ¼ . What is ¼ of 8, 16, 40 and 92? What is 1/10 of 50, 10 and 80? 15 red, 7 green and 3 black balls are in a bag. What fraction is red ball in the bag? Write your answer decimal. What is one fifth of £1?
	identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places	 Multiplying a number by 10/100/100, the digits move one/two/three places to the left. Dividing a number by 10/100/1000, the digits move one/tow/three places to the right. 25 x 10 = 250 25 ÷ 10 = 2.5

		0.2658 x 10 = 2.658 265,800. ÷ 10 = 26,580. 0.2658 x 100 = 26.58 265,800. ÷ 100 = 2,658. 0.2658 x 1000 = 265.8 265,800. ÷ 1000 = 265.8 0.2658 x 10000 = 2,658. 265,800. ÷ 10000 = 26.58 Write down two possible calculations that will give the 0.64. How many times larger is 26000 than 26? Tins of dog food are out in packs of 10. One tin costs 42p. How many does one pack cost? What is 4.25 times 10?  Work out: 83 x 100 = 700 x 1000 = 0.8 x 100 = 72000 ÷ ☐ = 72 0.08 ÷ 100 = 297 ÷ 10 = 342.7 x 100 = ☐ x 10 = 3427 23.45 ÷1000 = Jess has £45.50 in her saving account. Leen has 100 times more. How much does Leen have? Round these number up to two decimal places: 76.671 1.475 3098.149 0.976
	multiply one-digit numbers with up to two decimal places by whole numbers	multiply decimal number up to places by a whole e.g 2.04 x 5 = 10.20 Calculate: 2.47 x 5= 3.92 x 7 = 7.17 x 4 = 9 × 0.36 = 6 × 0.87 = 9 × 8.14 =     Crayons £2.99 pencils £0.45 Pens £1.35 Books £9.81 Use the prices above to find: a) the cost of 4 boxes of Crayons b) the cost of 6 books c) the cost of 8 pens d) the cost of 9 pencils. A peach costs £0.27. Nick bought 9 peaches. How much did Nick spend in all? Kylie bikes 0.4 kilometres each school day. In total, how far will Kylie bike over 13 school days? Lamar buys 23 red bandanas. Each red bandana costs £0.71. How much does Lamar spend?

	use written division methods in cases where the answer has up to two decimal places	An orchard produced 296 litres of fresh-squeezed orange juice over the course of 5 days. How much orange juice was produced each day? Write your answer as a decimal. Give the exact answer, written as a decimal. 326 ÷ 5. 4672 ÷ 9 509 ÷ 8 Round your answer to the nearest tenth. 71 ÷ 6 163 ÷ 5 8761 ÷ 8
	solve problems which require answers to be rounded to specified degrees of accuracy	Estimate the difference by rounding each number to the nearest whole number and then check. 734.508 – 134.92 504.472 – 349.67 Estimate the answer by rounding each number to the nearest whole number and then check. 198.99 + 201.45 9874.51 + 175.08 309.76 x 5 49.65 x 19.508 993 x 9.4 10.8 x 22 524.65 ÷ 5 630.36 ÷ 6 Round your answer to the nearest tenth. 86 ÷ 6 386 ÷ 5 2987 ÷ 8
	recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.	Write the following fractions as decimals: $\frac{3}{10}$ $\frac{3}{100}$ $\frac{3}{1000}$ $\frac{23}{100}$ $\frac{3}{5}$ $\frac{45}{90}$ $\frac{8}{24}$ $\frac{5}{25}$ Write the following decimal numbers as a fraction in simplest form: 0.75 0.25 0.05 0.15 0.375 0.45 0.65 Converting fractions, decimals and percentages. 

fraction	decimal	percent
$\frac{15}{100}$	.15	
$\frac{73}{100}$		73%
		39%
$\frac{4}{100}$		
	.77	
		46%
$\frac{50}{100}$		
	.06	
		80%
$\frac{26}{100}$		

RATIO AND PROPORTION

Pupils should be taught to:

solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts

Ratio and proportion: Ratio compares a part to a part. E.g the ratio of boys to girls is 2o to 10, which can be written as 2:1. The proportion of the boys in the class is 20 out of 30.

Complete the ratio tables:

2	1
4	2
	3
8	4
10	5

2	1
4	2
6	3
8	4
	5

4	5
8	
12	15
16	20
20	25

Write these ratios in simplest form:

15 : 5 21 : 42 27 : 81 25 : 125 24 : 36

Are these ratios equivalent?

$\frac{2}{3}$ and $\frac{12}{18}$ **2 to 5** and **10 to 20** $\frac{3}{4}$ and $\frac{6}{20}$

1 to 2 and **5 to 10**

Fill in the missing numbers to complete the proportion:

$\frac{1}{\square} = \frac{3}{6}$ $\frac{2}{\square} = \frac{8}{20}$ $\frac{\square}{4} = \frac{3}{12}$

Find the missing value in each ratio:

$\square$: 19 = 2 : 38 $\square$: 28 = 6 : 7 2 : 7 = 20 : $\square$

James has a recipe that says spinach and flour are to be mixed in the ratio 2 : 7. James has 16kg od spinach. How much flour will be need?

Divide 3000g of sugar in the ratio 21 : 9.

In a zoo there are 30 monkeys and some gorillas and chimpanzees. The ratio of monkeys to gorillas is 6 to 1. The ratio of monkeys to chimpanzees is to 5 to 2. How many gorillas/ monkeys are there? Twelve monkeys are moved to another zoo. What are the new ratios of: monkeys to chimpanzees and monkeys to gorillas?

Complete this table to compare miles to kilometres:

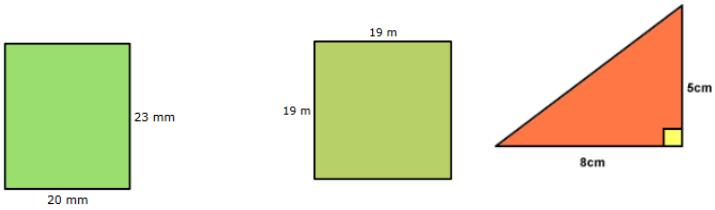
Miles	1	2	3	4	5	6	7
Kilometres					8		

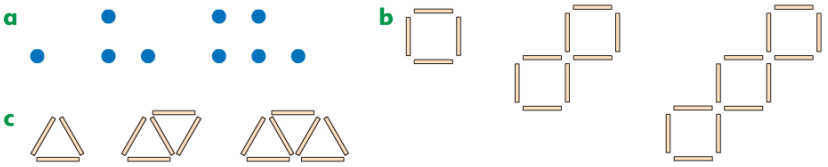
Zafor bought 50m of climbing rope for £80. How much would 150m of climbing rope cost? How much rope could he get for £100?

	solve problems involving the calculation of percentages (e.g. of measures) such as 15% of 360 and the use of percentages for comparison	What is 20% of £320. **Method 1**: or 20% of £320 = $\frac{20}{100}$ x £320 = 320 ÷ 100 x 20 = 3.20 x 20 = £64.00 $\frac{20}{100} \times 320$ = $\frac{1}{5}$ x 320 = 320 ÷ 5 x 1= £64 **Method 2** 10% of £320 = £32 so 20% = £32 x 2 = £64. What is 70% of 70? What is 40% 0f £340? Add 15% of £225 to 10% of £520 The price of a new washing machine is £370. This is discounted by 15% in a sale. What is the sale price? Yesterday, there were 15 problems assigned for maths homework. Marie did 40% of them correctly. How many problems did Marie get right? **250 000** people visited a theme park in one year.**15%** of the people visited in April and **40%** of the people visited in August. How many people visited the park in the rest of the year? For a company picnic, Kira ordered a box of fresh-baked gingerbread biscuits and sugar biscuits. The box included a total of 78 biscuits, and 50% of them were gingerbread. How many gingerbread biscuits did Kira get? 75% of the tickets sold at a water park were child tickets. If the park sold 64 tickets in all, how many child tickets did it sell? Which is **greater**? ○ 20% of 35 ○ 70% of 10 ○ neither; they are equal Which is **greater**? ○ 25% of 44 ○ 25% of 20 ○ neither; they are equal Which is **less**? ○ 20% of 40 ○ 20% of 70 ○ neither; they are equal Which is **less**? ○ 25% of 8 ○ 25% of 72 ○ neither; they are equal Write a fraction in the boxes to complete the sentence. $\frac{1}{2} < \frac{\square}{\square} < \frac{2}{3}$ Increase: a) £14 by 10% b) £150 by 20% Decrease: a) £25 by 5% b) £64 by 12%

		Nishat got the following marks in her test. 8 out of 10 in Science, 15 out of 25 in Geography, 45 out of 60 in Mathematics and 35 out of 50 in English. Put them in percentage order, starting with smallest one. On Friday lunch time in a school 54% of the pupils bring packed lunches, 9% of the pupils go home for lunch and rest of the pupils have school dinners. If 216 bring packed lunch, how many have school dinners? How many pupils go home for lunch? Navid has a box of celebration that contains 530 sweets. He gives 20% to his brothers and sisters, ¼ of left over to his friend. What percentage of the sweets does he have left? The usual price of a shirt is £32.50. In a sale, the shirt is reduced to £29.25. What is the percentage reduction? Naim buys a house £270000 and sells it two yesr later for £318000. What is his percentage profit? Give you answer up to two decimal places. A clothes shop is having a sale. All clothes are reduced by 20%. What is the sale price of a jacket normally priced at £60? What is the sale price of a shirt normally priced at £32? On the last day of the sale, the sale priced is reduced by a further 10%. Which of the following is the last day price of a pair of boots normally priced at £100? £60 ☐ £70 ☐ £72 ☐ £85 ☐ £90 ☐
	solve problems involving similar shapes where the scale factor is known or can be found	Lamont measured the town library and made a scale drawing. He used the scale 1 millimetre = 3 metres. The car park is 24 millimetres in the drawing. How wide is the actual car park? Eve made a scale drawing of a swimming pool. The pool, which is 20 metres wide in real life, is 10 centimetres wide in the drawing. What scale did Eve use for the drawing? Anne drew a scale drawing of a city park. In real life, the football field is 112 metres long. It is 56 centimetres long in the drawing. What is the scale of the drawing?

	solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.	Two-thirds of the 15 people at the beach are wearing sunglasses. How many people are wearing sunglasses? One-half of the 14 people in a restaurant are eating pasta. How many people are eating pasta? Year 6 children collect £2000.80 for charity. They shared the money among four charity organisations in this way: ¼ to Save the Children, 40% to Working for Clean Water, 1/5 to BBC Children in Needs and 15% to Human Relief. Work out how much money each charity received. There are 585 paper clips in the boxes in the supply cabinet. If each box contains the same number of paper clips, how many boxes could be there? 6 ☐ 5 ☐ 4 ☐ 2 ☐ Carson has 20 rose bushes to plant in rows. He wants to put the same number of bushes in each row with no bushes left over. How many rows of bushes could Carson make? 9 ☐ 6☐ 3☐ 5☐ Bob's cup contains ½ litre of water. Jane has one quarter of the amount of water that is in Bob's cup. How much water is in Jane's cup? How much water would have to be added to Jane's cup so that she had the same amount of water as Bob?
	ALGEBRA Pupils should be taught to: express missing number problems algebraically	Algebra is a part of mathematics in which mathematical thinking generalised by using letters or symbols to represent unknown values. E.g. I am thinking of a number and I call it a. I multiplied it by 3 and then add 4. The expression will be **3a + 4**. 3a means 3 x a. **Expression:** An expression is a statement containing numbers, letters and symbols. **Such as 3a + 4** 3a and 4 are called terms. A is the unknown value and 3 is the coefficient (A coefficient is the number in front of a letter). **Equation**: An equation connects two expressions. It must have an equal sign to show that left side is the same to the right side. E.g I am thinking of a number and I call it a. I multiplied it by 3 and then add 4 the answer is 7. The equation will be**: 3a + 4 = 7** Write an expression for 86 greater than *y*. Write an expression for 391 reduced by *c*. Write an expression for 353 minus *a*. Tom has **m** cakes. If he gave two away. How many cakes does he have left? Write an equation for the following problem: I am thinking of a number and I call it a. I double it and add 6. The answer is 12. What was the number I thought of? Jemma thinks of a number. She says, ***'Add 3 to my number and then multiply the result by 5. The answer is 35'.*** What is Jemma's number? Riaz thinks of a number. He says,***'Halve my number and then add 17 The answer is 23'.*** What is Riaz's number?

	use simple formulae expressed in words	A **formula** is a special type of equation that shows the relationship between different **variables (Formula is a** procedure, technique, or way of doing something)**.Formulae** can be written using letters. The formula for a daily wages, w pounds, for working h hours at a rate of r pound per hour, with travel cost t pounds, is w = rh + t. To use a formula you need to substitute in the values of the letters you are given and then use the correct order of operations. E.g if h = 35 hours, r = £5.30 and t= £25.98 for a person in a week. So the person's weekly wages will be: W = £5.30 x 35 + £25.98 = £185.5 + £25,98 = £211.48 Area of a rectangle / square= Length x width. Area of a triangle = ½ (base x height) Work out the area of these shapes using the correct formula:  The ABC Minibus Company work out the cost of journeys using the formula: Cost (£) : 5 x number of miles + 8. What is the cost of each of these journeys? a) 5 miles b) 8 miles and c) 23 miles . It cost £35 per day to hire a car, plus cleaning cost £15. The cost of hiring a car is given by the formula below. **C = 35d + 15**, where d is the number of days. John wants to hire a car for 5 days. **a)** Calculate total cost of hiring a car. Write down a formula for this statement: The change (c) received from £10 after buying y stamps at 30p each. It cost £45 per day to hire a car, plus cleaning cost £15. The cost of hiring a car is given by the formula below. C = 45d + 15, where d is the number of days. John wants to hire a car for 7 days. **a**) Calculate total cost of hiring a car. **b**) if Sam pays £510, how many days does he hire the car for?

	generate and describe linear number sequences	What is the next number in this pattern? **Rule: multiply by 5, then subtract 5**. 2, 5, 20, 95, 470, 2345 Here are sequences: 500 420 340 …… 500 420 340 260 180 …….. ……. 1, 9, 49, 249, 1249 ……. …….. Write the **first two numbers** in the each sequence. Can you find the rule for the sequences? Kang is stacking cups; he put 1 plastic cup in the first stack, 3 plastic cups in the second stack, 9 plastic cups in the third stack, and 27 plastic cups in the fourth stack. If this pattern continues, how many plastic cups will Kang put in the fifth stack? The flower shop displays a different number of roses in the front window every month. It displayed 44 roses in March, 55 roses in April, 66 roses in May, and 77 roses in June. If this pattern continues, how many roses will the flower shop window display in July? Draw the next pattern in each of these sequences. Count the number of dots or sticks in each pattern. Write these as a number sequence for each pattern. Use the sequence to check that the number of dots or sticks in your pattern is correct. 
	find pairs of numbers that satisfy number sentences involving two unknowns	p = u – 2 q = w + 12 If u = 7, what is p? if w = 9, what is q? a = b- 2 x = m – 3 If b = 8, What is a? if m = 5, What is x? Does (3, 7) make the equation $y = x + 4$ true? Does the point (8, 8) satisfy the equation $y = x – 1$? Does (5, 1) make the equation $y = 2x – 2$ true? Find the value of each letter: 6 + a = 15 b + 11 = 44 n – 12 = 36 m – 12 = 40 3x + 4 = 19 5a – 4 = 96
	enumerate all possibilities of combinations of two variables.	Red ribbon is 1cm longer than the blue ribbon. Complete the table to show how the length of the red ribbon **r** , depends on the length of the blue ribbon **b**. Function: $r = b + 1$ **b** | **r** 1 | 2 2 | 3 | 4 | The number of white buttons is 9 fewer than 3 times the numbers of black buttons. Complete the table to show how the number of white buttons w, depends on the number of black buttons. Function: $w = 3b - 9$ **b** | **w** 6 | 7 | 12 8 | 9 |

MEASUREMENT

Pupils should be taught to:

- solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate

Which is more, 6 cm or 60 mm ?or 9 km?

6 cm
☐ 60 mm
☐ they are equal
☐

Which is less, 9999 metres

9999 m
☐ 9 Km
☐ they are equal
☐

Which is more, 9990g or 10kg?

9990 g
☐ 10 kg
☐ they are equal
☐

Which is less, 700ml or 7 litres ?

700 ml
☐ 7 litres
☐ they are equal
☐

Change these weights to grams:

5kg 6.35 kg 0.525kg 1.4kg 7.9kg

Change these lengths to centimetres:

2 m 3.5 m 2.1 km 20mm

Harry buys a bag of potatoes weighing 1.5kg, a bunch of bananas weighing 900g, a bag of sugar weighting 1kg and a packet of coffee weighing 227g. What is the weight his shopping, in kilograms?

use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places

Which is more, 1 mile or 2520 yards? (1 mile = 1,760 yards)

3 inches = yard (1 yard = 36 inches)

Which is more, 3 feet or 1 yard ? ☐

Rewrite each mass as a decimal in kilograms:

2000 g 3500 g 5250 g 9375 g
3345 g 90000 g 4650 g 12345 g

Write true or false for each statement:

12 km < 15000m 600 g = 0.6kg 2.5kg > 2600g
2.5 L = 250ml 0.5m > 500 2000g > 1.9kg
1 litre = 100 centilitres 400 centilitre > 4 litres

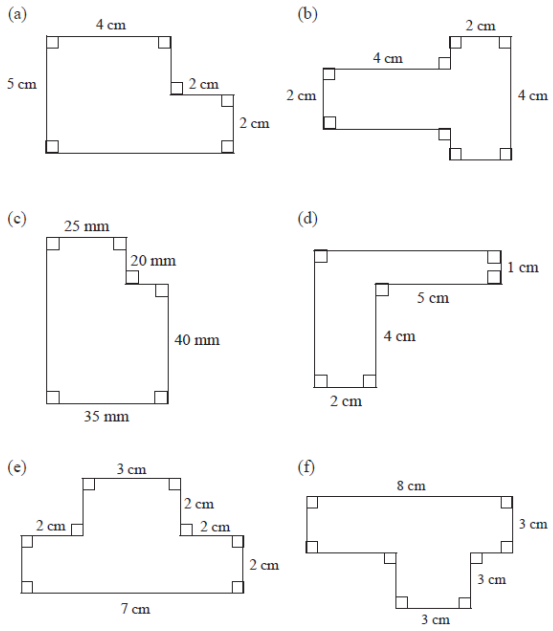
Which is more, 3,001 litres or 3 kilolitres?

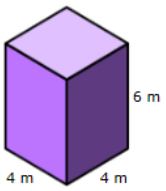
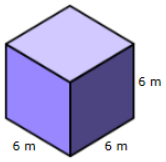
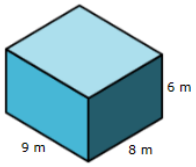
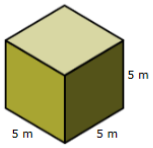
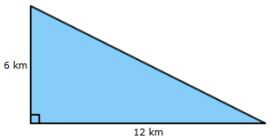
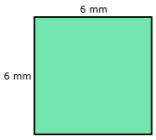
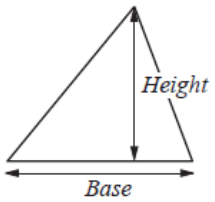
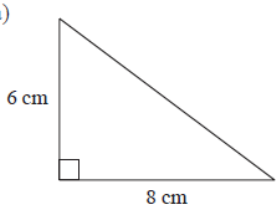
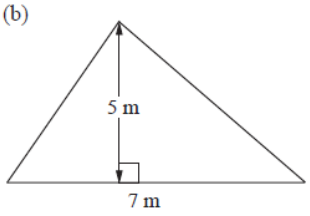
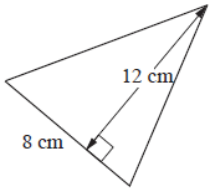
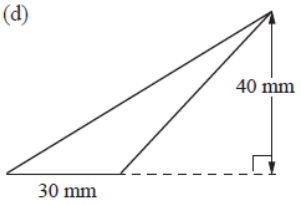
- ○ 3,001 litres
- ○ 3 kilolitres
- ○ neither; they are equal

Which is more, 200 centilitres or 2 litres?

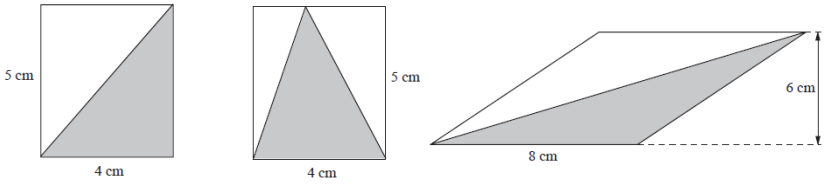
- ○ 200 centilitres
- ○ 2 litres
- ○ neither; they are equal

Imran went on a diet for four weeks. At the end of the time he had lost 3800 g and his mass was 72.4 kg. How much did he lose in kg? What did he weigh when he started the diet? What was his average loss per week in grams?

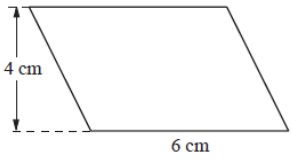
	convert between miles and kilometres	**1 Yard = 36 inches 1 meter = 39.37 inches 1 mile = 5,280 feet** **1 inch = 2.54 centimetres 1 kilogram = 2.2 pounds** **1 Gallon = 3.78 Litres 1 kilometre = 0.62 miles** Which is about equal to 30 centimetres? Which is about equal to 1 inch? Which is about equal to 8 kilometres? Which is about equal to 1 kilogram? Which is about equal to 4.5 litres? A horse is trotting along at a constant speed of 10 miles per hours. How many kilometres will it travel in 45 minutes? James drives 320 miles in 8 hours. Jane drives 512 km in 8 hours. Calculate their per hour speed in kilometres? A bus and a car leave the same place and travelled in opposite directions. If the bus is traveling at 80 km per hour and the car is traveling at 55 miles per hour, in how many hours will they be 210 miles apart?
	recognise that shapes with the same areas can have different perimeters and vice versa	**Same Area, Different Perimeter; Same Perimeter, Different Area** The area of a square is 36cm^2 . How long are its sides? The area of a rectangle is 48 cm^2 . Find two different rectangles that have the same area but different perimeter. How many different rectangles can you make with the area of 24cm^2 ? The perimeter of a shape is 36 cm. How many shapes can you make with the same perimeter but have different areas? **Find the area and perimeter of each of these shapes.** 

	recognise when it is possible to use formulae for area and volume of shapes	What is the volume?  What is the volume?  What is the volume?  What is the volume?  What is the area?  What is the area? 
	calculate the area of parallelograms and triangles	The formula to calculate the area of a triangle is : $\text{Area} = \frac{1}{2} \times \text{base} \times \text{perpendicular height}$  Find the area of each of these triangles. (a)  (b)  (c)  (d) 

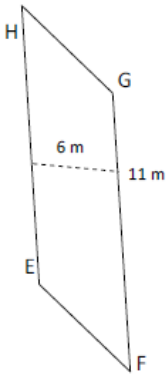
Find the area of these shaded triangles:

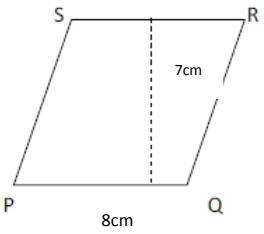


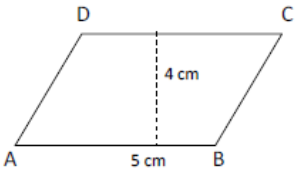
The formula to calculate the area of a parallelogram is length x height.
e.g. Find the area of this parallelogram:
Length = 6cm
height = 4 cm
The area = 6 x 4 = 24 cm^2

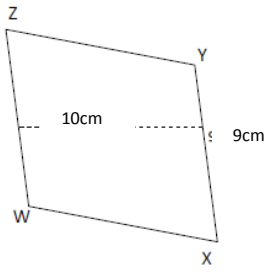


Find the area of the following parallelograms:



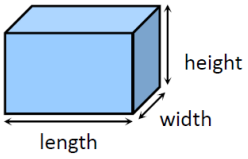






calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm^3) and cubic metres (m^3), and extending to other units

Volume = length × width × height



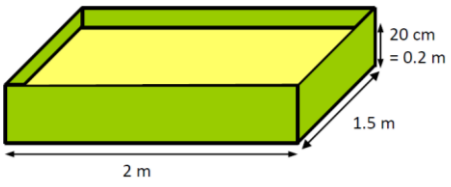
A sand pit is 2 metres long and 1.5 metres wide.
How much sand will it take to fill the sandpit to a depth of 20 centimetres?

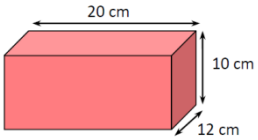
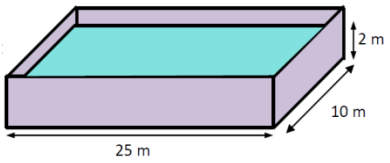
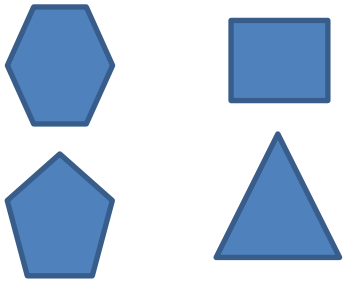
In this case, two of the dimensions, the length and width, are in metres.
Converting the height to metres: 20 cm = 20 ÷ 100 = 0.2 m

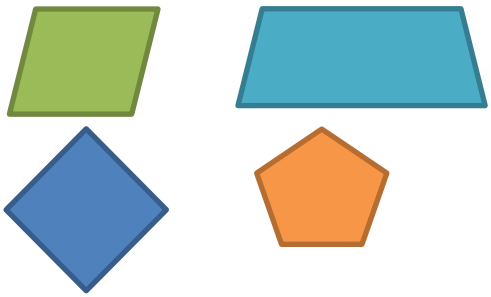
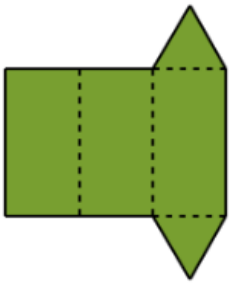
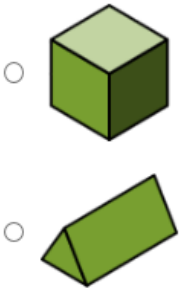
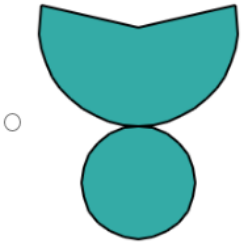
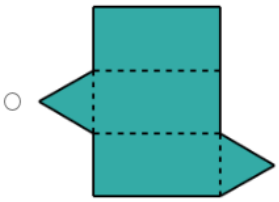
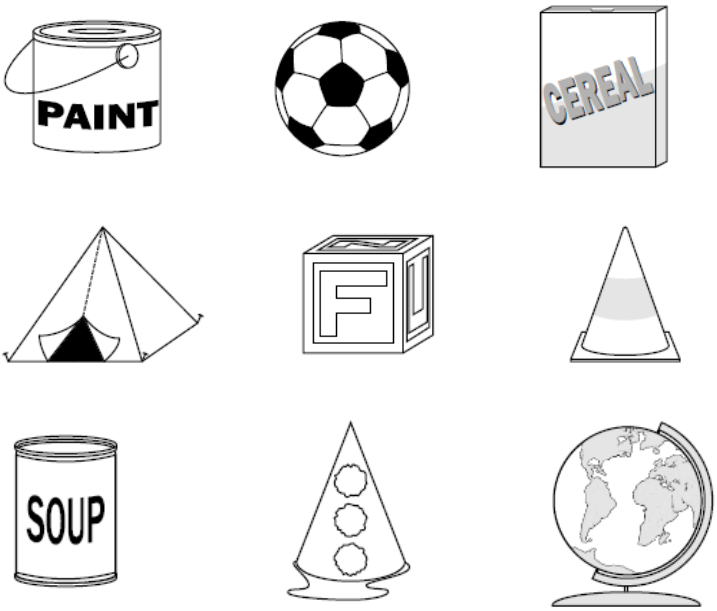
Volume of sand needed
= 2 × 1.5 × 0.2
= 3 × 0.2

Volume of sand needed = 0.6 m^3

(Check the calculation on your calculator.)

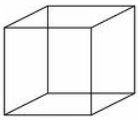


		A shoe box has dimensions 30 cm by 20 cm by 60 cm. Calculate the volume of the shoe box. A box has a volume of 360 cm³. Find four different sets of dimensions the box could have. A light bulb box has dimensions 10 cm by 5 cm by 6 cm. A larger box has dimensions10 cm by 15 cm by 10 cm. Find the number of light bulb boxes that will fit into the larger box. All the edges of this dice are 10 mm long. What is its volume?  A brick is 20 cm long, 12 cm wide and 10 cm high. What is its volume?  A rectangular swimming pool is 25 m long and 10 m wide. How many litres of water do you need to fill it to a depth of 2 m? 
	GEOMETRY **Properties of shapes** Pupils should be taught to: draw 2-D shapes using given dimensions and angles	Milly drew a shape that had 4 corners. Which shape could she have drawn?  Draw a three sided shape with one right angle. A shape has five sides and all sides are the same in length. Its angles are the same in size. What is the name of the shape? Kenneth drew a shape that had 4 sides, with exactly 1 pair of sides parallel. Which shape could Kenneth have drawn? ○ rhombus ○ octagon ○ trapezium ○ parallelogram

	recognise, describe and build simple 3-D shapes, including making nets	Draw a shape that has based angles are the same in size. Sima drew a shape that has two acute angles and two obtuse angles. Which shape could Sima have drawn?  Which figure will this net make?   Which net will make this figure?    Write the mathmetical name of these solid figures that each object looks like: 

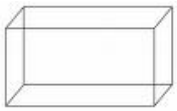
Match the description to the correct shape by drawing a line.

It has 1 circular face,
1 curved face,
1 vertex and
1 curved edge.



It has 6 square faces,
12 edges and 8 vertices.

It has 6 faces and two of them square faces and other 4 faces are rectangular faces, 12 edges and 8 vertices.

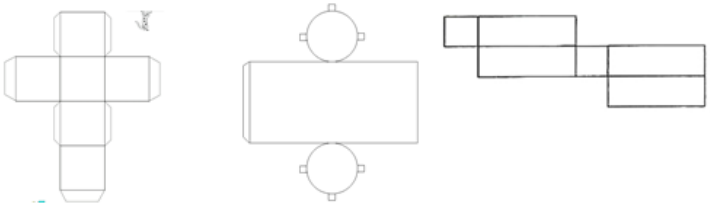


It has 2 circular faces, 1 curved face, 2 curved edges and no vertex.

It has 5 vertices, 4 triangular faces and 1 square face,
8 edges.

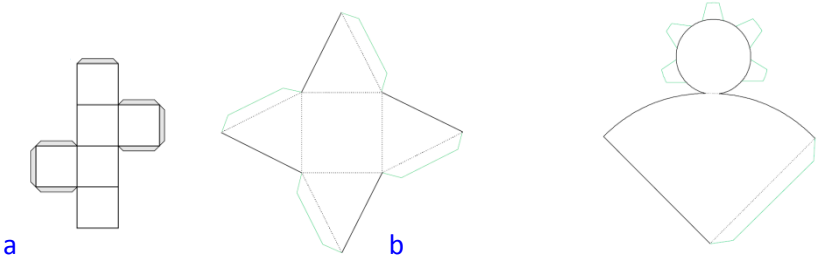
It has 1 curved face, no edge and no vertex.

Which one is the correct net of a cuboid?



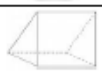
a b c

Which one is the correct net of a pyramid?

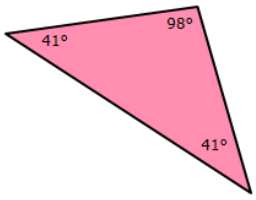


a b

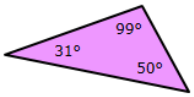
compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons

Name	Shape	Edges	Faces	Vertices	2D shape
Cube		12	6	8	6 x squares
Cuboid		12	6	8	4 x rectangle 2 x square
Cylinder		2	3	0	2 circles 1 rectangle
Sphere		0	1	0	N/A
Cone		1	2	0	1 circle 1 semi-circle
Triangular Prism		9	5	6	3 x rectangle 2 x isosceles triangle
Square based pyramid		8	5	5	4 x isosceles triangle 1 x square
Hexagonal Prism		18	8	12	2 x hexagon 6 x square or rectangle
Trapezium Prism		12	6	8	2 x trapezium 4 x rectangle
Tetrahedron		6	4	4	4 x equilateral triangles
Hemisphere		1	2	0	N/A
Octahedron		12	8	6	8 x equilateral triangles
Dodecahedron		30	12	20	12 x pentagon
Octagonal Prism		16	10	24	8 x rectangles 2 x octagons

Is this triangle scalene?

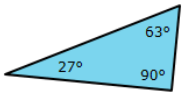


What kind of triangle is this?



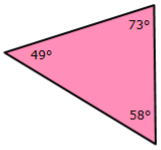
- ○ acute
- ○ right
- ○ obtuse

What kind of triangle is this?



- ○ acute
- ○ right
- ○ obtuse

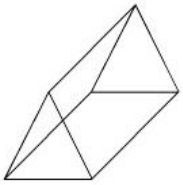
What kind of triangle is this?



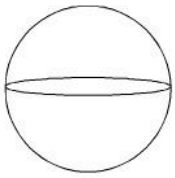
- ○ acute
- ○ right
- ○ obtuse

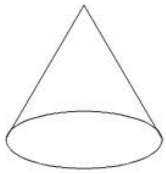
Write the letter of the shape that matches each name.

A I

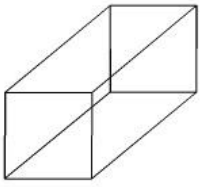


C

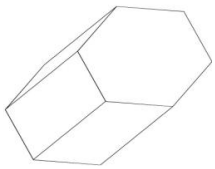


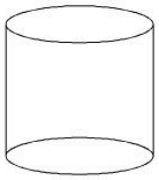


DE



F



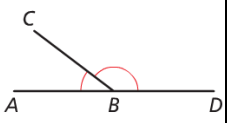


a) Triangular Prism
b) cube
c) Cuboid
d) Sphere
e) Cylinder
f) hexagonal prism

$\angle ABC$ and $\angle CBD$ join together to make a straight line.

a From the list below, choose two angles which could be the angles shown in the diagram.
38° 143° 39° 153° 37° 152°

b Explain why you chose these two angles.



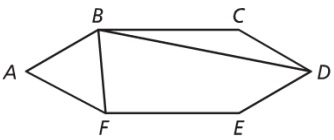
a One of the angles is 95°. Without using a protractor, decide which one.

b Estimate the size of $\angle BAF$.

c Estimate the size of $\angle FED$.

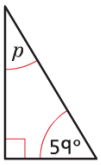
d Which angles look less than 25°?

e Which of the angles you have estimated is obtuse?

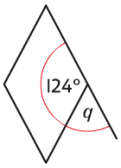


Calculate the missing angle in each diagram.

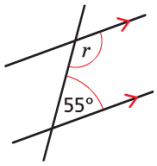
a



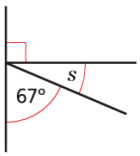
b



c

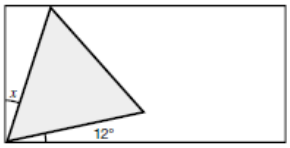


d

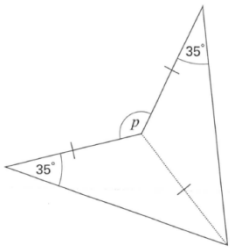


Calculate the size of angle x and y.

Here is an equilateral triangle inside a rectangle. Calculate the value of x.

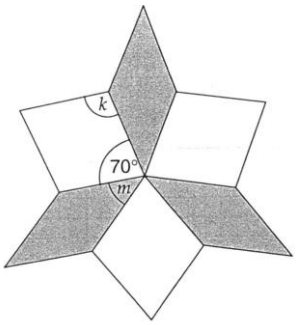


This shape has been made from two congruent isosceles triangles.
What is the size of angle *p* ?

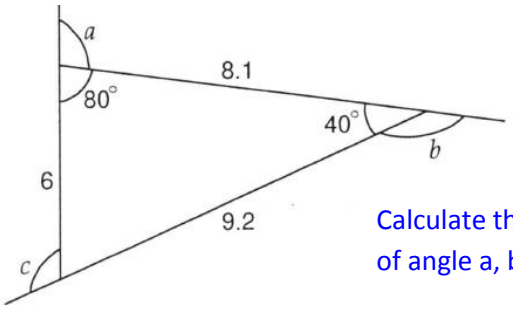


The shape below has **3 identical white** tiles and **3 identical grey** tiles.
The sides of each tile are all the same length.
Opposite sides of each tile are parallel.

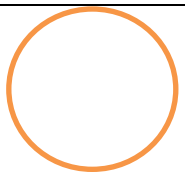
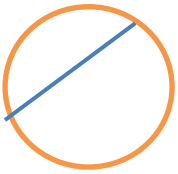
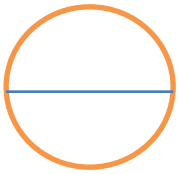
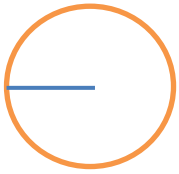
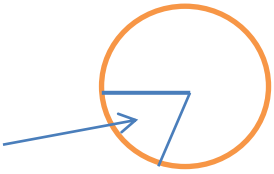
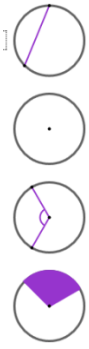
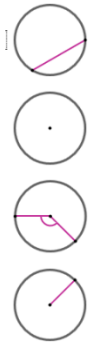
One of the angles is 70°

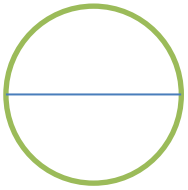
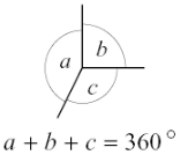
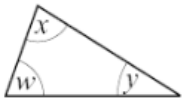
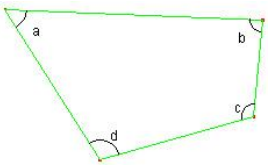
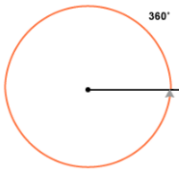
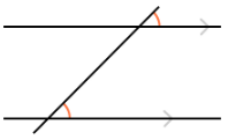
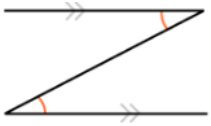
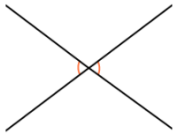


Calculate the size of angle k and m.

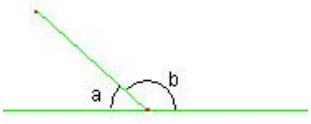


Calculate the size of angle a, b and c.

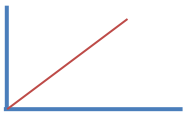
	illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius	**Circumference:** The circumference of a circle is the distance around the circle.  **Chord:** A straight line which joints two points on a circumference of a circle.  **Diameter** : Diameter is a straight line which passes through the centre of a circle from one side to the other.  The diameter is always twice the radius **Radius:** The distance from the centre of a circle to the circumference.  **Sector:** A sector is the area between two radius. sector  If you divide the circumference of any circle by its diameter, the answer is always approximately 3. This is given by a Greek letter called pi (**π).** **π = 3.14** (a constant value) The circumference (C) = pi x diameter = π x d = πd The diameter is always twice the radius, therefore C = 2πr The formula to work out an area of a circle is πr^2 Which figure shows the centre?  Which figure shows a sector?  Which figure shows a chord 

	recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.	Find the circumference and the area of a circle which has a diameter of 5cm, using π = 3.14.  **Angle facts:** Angles around a point add up to 360^0  $a + b + c = 360°$ Angles on a straight line add up to 180^0  $e + f = 180°$ Angles in a triangle add up to 180^0  $w + x + y = 180°$ Angles in quadrilateral add up to 360^0 **a + b + C + d = 360^0**  A full turn in an angle of 360^0 (angle in a circle).  **Corresponding angles:** The two angles marked in this diagram are called corresponding angles and they are equal in size.  **Alternate angles**: The two angles marked in this diagram are called alternate angles and they are equal in size.  **Vertically opposite**: The two angles marked in this diagram are vertically opposite and they are equal in size. 

Supplementary angles: Any two angles that add up to 180 degrees are known as supplementary angles.
a + b = 180^0

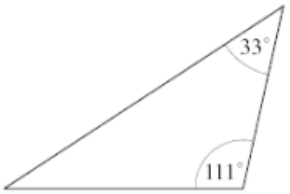


Complementary angles:
Two angles, which add up to 90^0

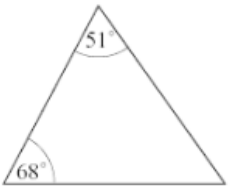


Calculate the size of the unknown angles in the following diagrams:

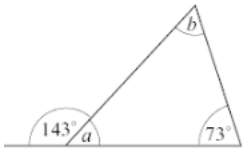
(a)



(b)

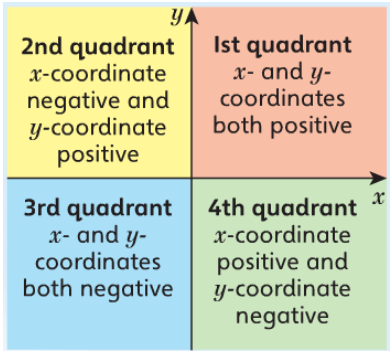


Calculate the size of the angles marked ***a*** and ***b*** in this diagram.

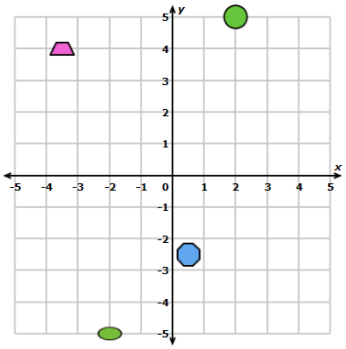


Position and direction
Pupils should be taught to:
- describe positions on the full coordinate grid (all four quadrants)

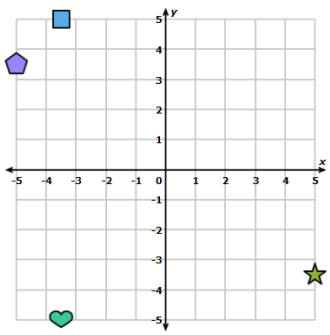
The X and Y axes divide the plane into 4 parts and call each part a quadrant.

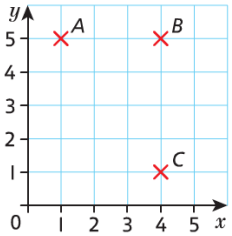
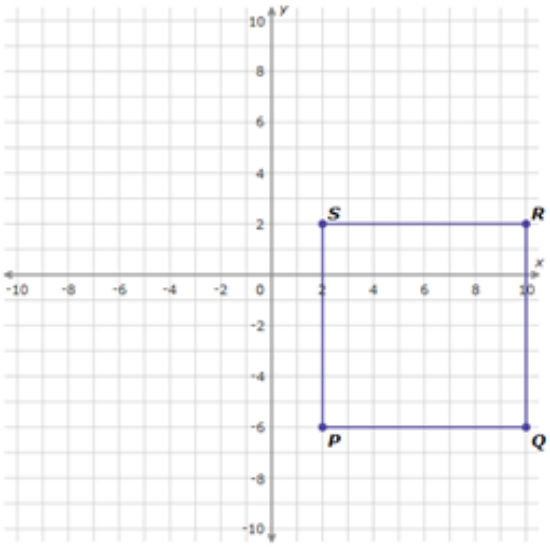
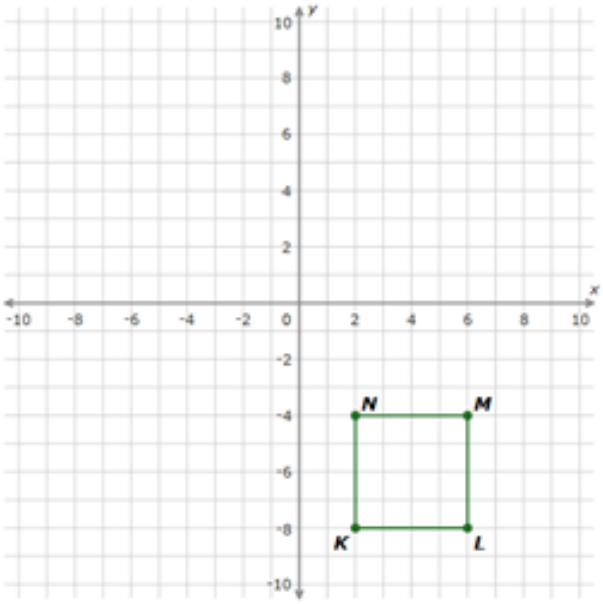


Which shape is at (2,5)?



Which shape is at (-5, 3.5) ?



	draw and translate simple shapes on the coordinate plane, and reflect them in the axes.	**a** Write down the coordinates of points A, B and C. **b** A, B and C are three vertices of a rectangle. Write down the coordinates of the fourth vertex, D.  Draw the new image of PQRS after a translation of 5 units left and give the name ABCD.  Draw the new image of KLMN after a translation of 2 units down. 

Copy this grid.

a What number is at (−3, −1)?

b What are the coordinates of the number 5?

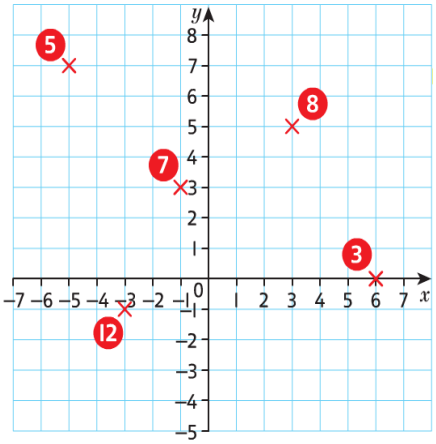
c Plot the number 4 at (3, −1), the number 10 at (−1, −3) and the number 2 at (1, −3).

d Work out the answer to these calculations, using the coordinates to find the numbers.

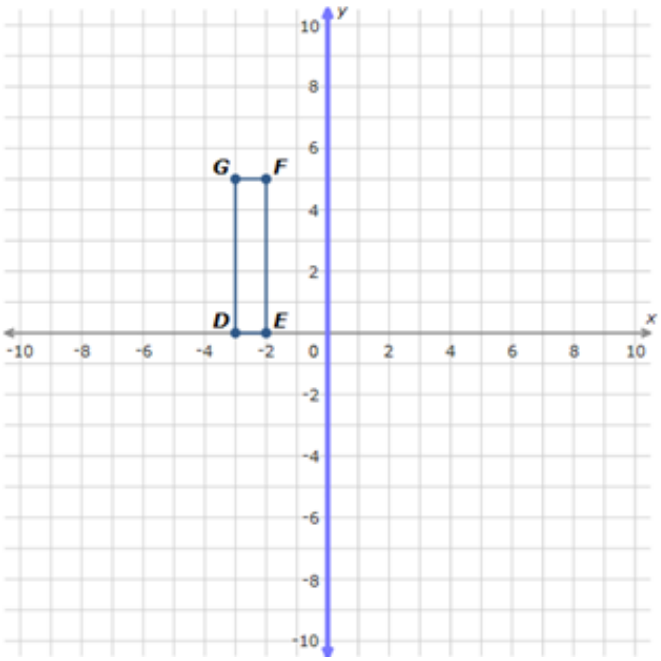
i (−1, 3) + (6, 0)

ii (−1, −3) × (3, 5)

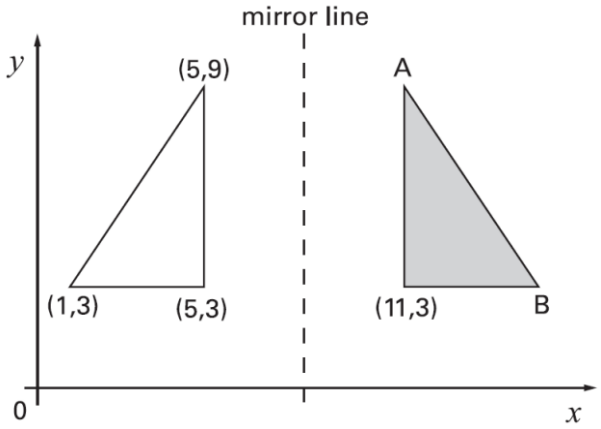
iii (−3, −1) ÷ (3, −1)



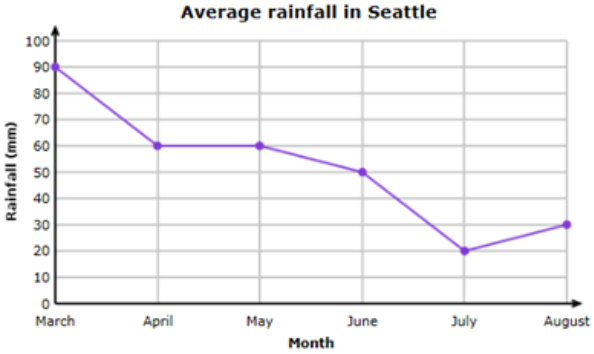
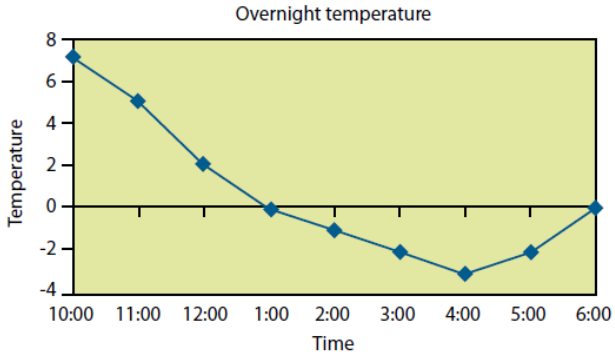
Graph the image of rectangle *DEFG* after a reflection over the *y*-axis.



The shaded triangle is a reflection of the white triangle in the mirror line.



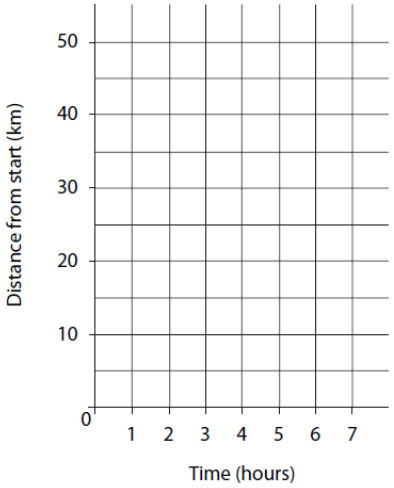
Write the co-ordinates of point A and point B.

	STATISTICS Pupils should be taught to: ▯ interpret and construct pie charts and line graphs and use these to solve problems	A farmer in Kant carefully recorded the rainfall in order to decide which crops to plant, and when.  How much total rainfall does Kant receive, on average in June and July? Can you make two more questions about this line graph? ● Look at this 'Overnight temperature' graph for a desert area.  It shows the outside temperatures in °C. Ask questions such as those below. – What were the highest and lowest temperatures? When did these occur? – When was the temperature at freezing point (0 °C)? – How far did the temperature fall from 11:00 pm to 3:00 am? – How long did the temperature stay below zero? – Roughly what temperature was it at 11:30 pm? ● Use the Internet to research temperatures in different parts of the world. ● Collect the temperatures of a cooling liquid or melting ice cubes over a period of time. Create your own graphs and questions.

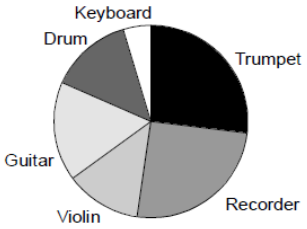
Cycle journey

Use the data in the table to produce a line graph of the total distance travelled over the seven-hour cycle journey.

Time (hours)	0	1	2	3	4	5	6	7
Distance (km)	0	8	15	21	21	28	32	43



The Year 6 children in a school were asked to choose a musical instrument. This is a pie chart of their choices.

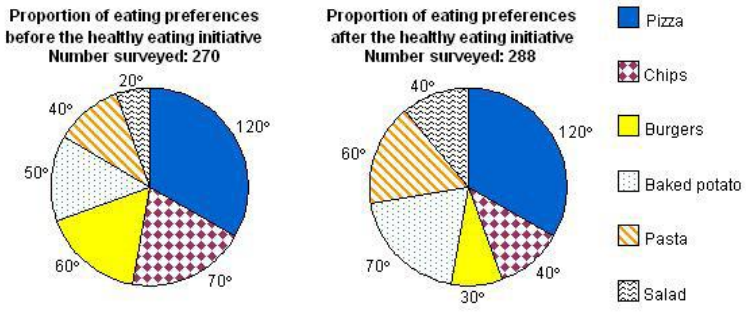


Estimate what fraction of the children chose a drum.

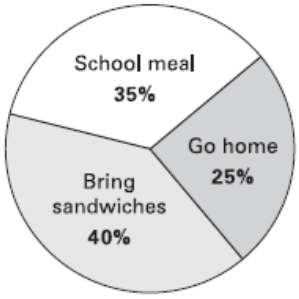
There are 80 children in Year 6. Estimate the number of children who chose a violin. Explain how you decided.

15% of the 80 children chose a guitar. How many children is this?

For a food technology project, a teacher used pie charts showing pupils' eating preferences before and after a school's healthy eating initiative.



How many more pupils chose pasta after the school's healthy eating initiative than before?



28 Children in year 6 have a school meal. How many go home for lunch?

The favourite cartoon programmes of 480 children are given in the table below. Draw a pie chart to show this information.

Cartoon	No. of children
The Simpsons	266
Family Guy	66
South Park	90
Futurama	30
Other	28

calculate and interpret the mean as an average.

Calculate the mean of the following set of numbers:

25, 28, 31, 35, 43, 48

How many numbers are there? 6. So, add together all of the numbers and divide the total by 6 in order to get the mean.

mean = (25 + 28 + 31 + 35 + 43 + 48)/6

mean = 210/6

mean = 35

Ruth scores in mathematics tests last year were:
83, 86, 98, 87, and 96. Calculate Ruth's mean (Average) score.

Calculate the mean of the following sets of number.
2.1, 3.2, 4.3, 1.5, 6

Find five difference numbers that have a mean of 58.