Year 6 progression to Year 7

Using and applying mathematics

- Solve problems by breaking down complex calculations into simpler steps, choose and use operations and calculation strategies appropriate to the numbers and context; try alternative approaches to overcome difficulties; present, interpret and compare solutions

Josh thinks of a number. He adds 4. He multiplies his result by 3. Then he takes away 9. His final answer is 90.

What number did Josh start with?

KS2 2005 Paper B level 4

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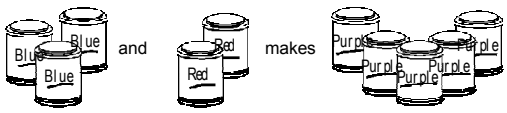
50 000 people visited a theme park in one year.

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?

KS2 2003 Paper B level 5

Purple paint is made by mixing blue and red paint.



Use the picture to work out the missing numbers.

For 25 tins of purple paint you need … tins of blue paint and … tins of red paint.

Y5 optional test Paper B level 5

Screenwash is used to clean car windows. To use Screenwash you mix it with water.

Winter mixture	Summer mixture
Mix **1** part Screenwash with **4** parts water.	Mix **1** part Screenwash with **9** parts water.

In summer, how much Screenwash should I mix with 450ml of water?

25% of winter mixture is Screenwash.

Is this correct? Tick (✓) Yes or No.
Explain your answer.

KS3 2002 Paper A level 5

Every 100g of brown bread contains 6g of fibre.

A loaf of bread weighs 800g and has 20 equal slices. How much fibre is there in one slice?

KS2 2004 Paper B level 5

- Represent information or unknown numbers in a problem, for example in a table, formula or equation; explain solutions in the context of the problem

n stands for a number. Complete this table of values.

n	5*n* – 2
20	☐
☐	38

KS2 2000 Paper B level 5

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p and q each stand for whole numbers.

p + q = 1000

p is 150 greater than q.

Calculate the numbers p and q.

KS2 2001 Paper B level 5

Write the largest whole number to make this statement true.

50 + ☐ < 73

KS2 2004 Paper B level 5

---

k, m and n each stand for a whole number. They add together to make 1500.

k + m + n = 1500
m is three times as big as n.
k is twice as big as n.

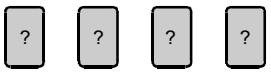
Calculate the numbers k, m and n.

KS2 2003 Paper B level 5

- Develop and evaluate lines of enquiry; identify, collect, organise and analyse relevant information; decide how best to represent conclusions and what further questions to ask

Debbie has a pack of cards numbered from 1 to 20

She picks four different number cards.

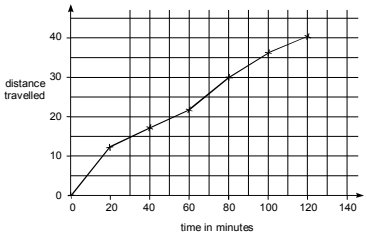


Exactly three of the four numbers are multiples of 5.
Exactly three of the four numbers are even numbers.
All four of the numbers add up to less than 40.
Write what the numbers could be.

Write two further questions that you could ask about the cards.

KS2 2003 Paper A level 5 [adapted]

Carol went on a 40-kilometre cycle ride. This is a graph of how far she had gone at different times.



How many minutes did Carol take to travel the last 10 kilometres of the ride?

Use the graph to estimate the distance travelled in the first 20 minutes of the ride.

Carol says, 'I travelled further in the first hour then in the second hour'. Explain how the graph shows this.

Write two further questions that you could ask about the graph.

KS2 2000 Paper B level 5 [adapted]

This sequence of numbers goes up by 40 each time.

40 80 120 160 200 …

This sequence continues.

Will the number 2140 be in the sequence?
Circle Yes or No. Explain how you know.

KS2 2000 Paper A level 5

---

30 children are going on a trip. It costs £5 including lunch.

Some children take their own packed lunch. They pay only £3.

The 30 children pay a total of £110. How many children are taking their own packed lunch?

KS2 2003 Paper A level 5

---

6 green apples cost 75p.
10 red apples cost 90p.

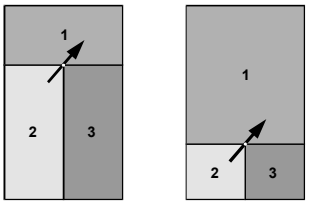
Jason bought some bags of green apples and some bags of red apples. He spent £4.20. How many bags of each type of apples did he buy?

Nika says, 'I bought more apples than Hassan, but I spent less money.'

Explain how this is possible.

KS2 2002 Paper A level 5

Katie made two spinners, A and B.



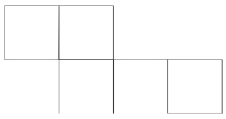
spinner A spinner B

She says, 'Scoring a 1 on spinner A is just as likely as scoring a 1 on spinner B'.

Explain why Katie is correct.

KS2 2000 Paper B level 5

This shape is made by joining five identical squares edge to edge.



How many different shapes can you make by joining five identical squares edge to edge?

- Generate sequences and describe the general term; use letters and symbols to represent unknown numbers or variables; represent simple relationships as graphs

The rule for this sequence of numbers is 'add 3 each time'.

1 4 7 10 13 16 …

The sequence continues in the same way.

Mary says, 'No matter how far you go there will never be a multiple of 3 in the sequence' .

Is she correct? Circle Yes or No.
Explain how you know.

KS2 2001 Paper B level 5

A sequence starts at 500 and 80 is subtracted each time.

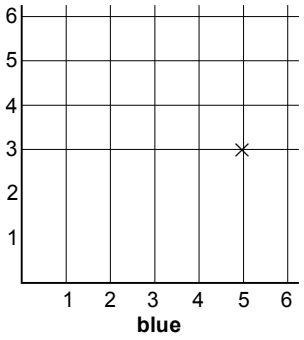
500 420 340 ...

The sequence continues in the same way. Write the first two numbers in the sequence which are less than zero.

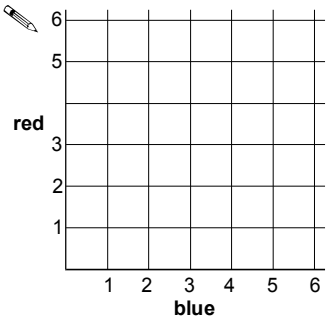
KS2 2002 Paper A level 5

Some pupils throw two fair six-sided dice. Each dice is numbered 1 to 6. One dice is blue. The other dice is red.

Anna's dice show blue 5, red 3. Her total score is 8
The cross on the grid shows her throw.



Carl's total score is 6. What numbers could Carl's dice show? Put crosses on the gird to show all the different pairs of numbers Carl's dice could show.



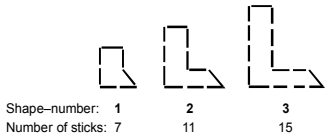
KS3 2003 Paper A level 4

Here are five number cards.

A and B stand for two different whole numbers. The sum of all the numbers on all five cards is 30. What could be the values of A and B?

KS2 2004 Paper B level 5

Ann makes a pattern of L shapes with sticks.



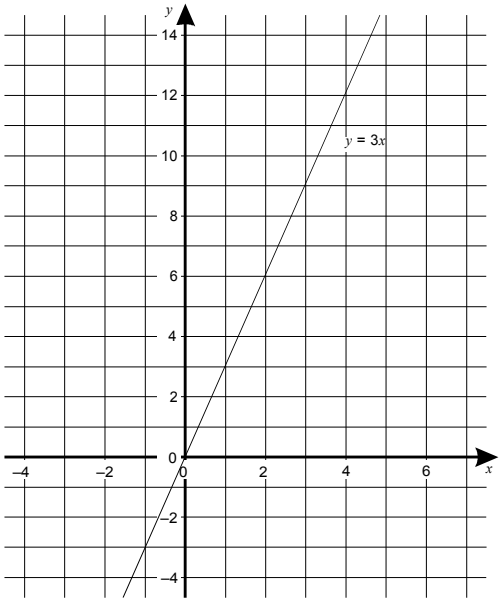
Ann says : 'I find the number of sticks for a shape by first multiplying the shape-number by 4, then adding 3.'

Work out the number of sticks for the shape that has shape-number 10.

Ann uses 59 sticks to make another L shape in this pattern. What is its shape-number?

KS2 1995 Paper B level 5

The graph shows a straight line. The equation of the line is y = 3x.



Does the point (25, 75) lie on the straight line y = 3x?

Tick (✓) Yes or No.
Explain how you know.

KS3 2002 Paper A level 6

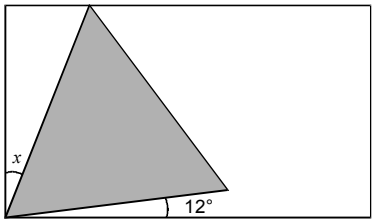
- Explain and justify reasoning and conclusions, using notation, symbols and diagrams; find a counter-example to disprove a conjecture; use step-by-step deductions to solve problems involving shapes

Amit says: 'When you add three odd numbers the answer is always even.'

Is he correct? Tick Yes or No.
Explain how you know.

Y7 progress test 2005 Paper B level 4

Here is an equilateral triangle inside a rectangle.



Not to scale

Calculate the value of angle *x*.
Do not use a protractor (angle measurer).

KS2 2001 Paper B level 5

A drink and a box of popcorn together cost 90p.
2 drinks and a box of popcorn together costs £1.45.
What does a box of popcorn cost?
Explain how you got your answer.

KS2 1996 Paper A level 5

Ling says: 'Number words never contain a letter a.'

Find a counter-example to show that Ling is wrong.

Which is larger, $\frac{1}{3}$ or $\frac{2}{5}$? Explain how you know.

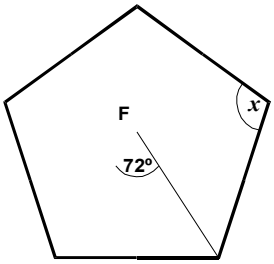
KS2 2002 Paper A level 5

An isosceles triangle has a perimeter of 12cm. One of its sides is 5cm. What could the length of each of the other two sides be?

Two different answers are possible. Give both answers.

KS2 2003 Paper A level 5

F is the centre of a regular pentagon.



Work out the value of angle *x*.

KS2 1996 Paper C level 6

Susan says: 'When you cut a piece off a shape, you reduce its area and perimeter.'

Is Susan's conjecture sometimes true, always true or never true? Explain how you know.

Counting and understanding number

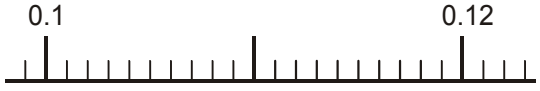
- Compare and order integers and decimals in different contexts

Write these temperatures in order, coldest first.

3°C –10°C 0°C 20°C –1°C

KS3 1997 Paper A level 3

Here is a number line. Draw an arrow to show the position of 0.111



KS2 1998 Paper C level 6

Write a decimal which is greater than 0.7 and less than 0.71.

KS2 1996 Paper C level 6

Place these numbers in order of size, starting with the smallest.

0.19 0.9 0.091 0.109

smallest

KS2 1995 Paper C level 6

Write these numbers in order of size, starting with the smallest.

1.01 1.001 1.101 0.11

smallest

KS2 1997 Paper C level 6

- Order a set of fractions by converting them to decimals

Write these fractions in order of size starting with the smallest.

$\frac{3}{4}$ $\frac{3}{5}$ $\frac{9}{10}$ $\frac{17}{20}$

smallest

KS2 2005 Paper A level 5

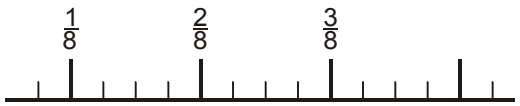
Place these fractions in order of size starting with the smallest.

$\frac{1}{2}$ $\frac{1}{3}$ $\frac{5}{12}$ $\frac{5}{6}$

smallest

KS2 1995 Paper C level 6

Here is a number line. Draw an arrow to show the position of $\frac{7}{16}$.



KS2 1998 Paper C level 6 [adapted]

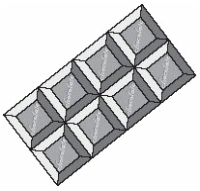
$^{5}/_{11}$ = 0.454545 ...

Find a fraction that is equal in value to 0.0454545 ...

KS2 1999 Paper C level 6

- Recognise approximate proportions of a whole and use fractions and percentages to describe and compare them, for example when interpreting pie charts

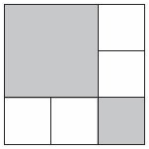
Here is a chocolate bar.



William eats 3 pieces and Amber eats 2 pieces. What fraction of the chocolate bar remains?

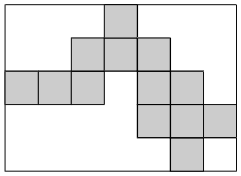
Y5 optional test 2003 Paper A level 4

The diagram is made of squares. What fraction of the diagram is shaded?



KS2 2005 Paper A level 4

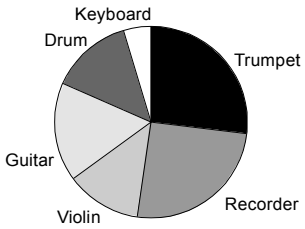
Here is a rectangle with 13 identical shaded squares inside it.



What fraction of the rectangle is shaded?

KS2 2003 Paper A level 5

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



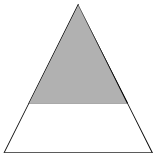
Estimate what fraction of the children chose a drum.

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?

KS2 1995 Paper A level 5

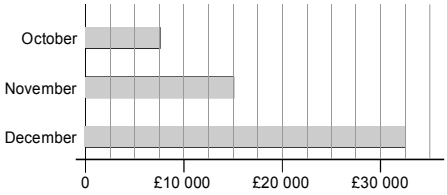
The diagram shows a shaded triangle inside a larger triangle.



The area of the shaded triangle is 52 cm^2.The area of the shaded triangle is $\frac{4}{9}$ of the area of the larger triangle. Calculate the area of the larger triangle.

KS2 1999 Paper C level 6

This chart shows the amount of money spent in a toy shop in three months.



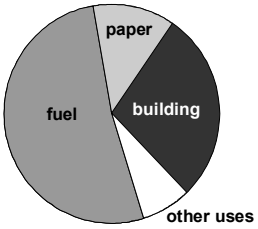
How much more money was spent in the shop in December than in November?

Stepan says, 'In November there was a 100% increase on the money spent in October'.

Is he correct? Circle Yes or No. Explain how you can tell from the chart.

KS2 2001 Paper A level 5

This pie chart shows the different ways that wood is used in the world.

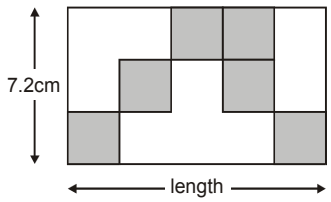


Use the pie chart to estimate the percentage of wood that is used for paper.

KS2 1997 Paper C level 6

- **Use ratio notation, reduce a ratio to its simplest form and divide a quantity into two parts in a given ratio; solve simple problems involving ratio and direct proportion (e.g. identify the quantities needed to make a fruit drink by mixing water and juice in a given ratio)**

Here is a rectangle with six identical shaded squares inside it.

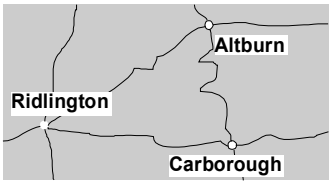


Not actual size

The width of the rectangle is 7.2 centimetres.
Calculate the length of the rectangle.

KS2 2004 Paper B level 5

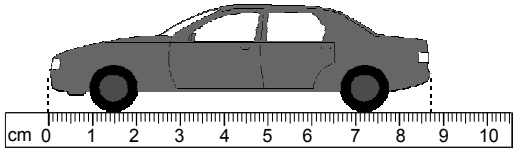
This map has a scale of 1 cm to 6 km.



The road from Ridlington to Carborough measured on the map is 6.6 cm long. What is the length of the road in kilometres?

KS2 1995 Paper B level 5

Here is a drawing of a model car.

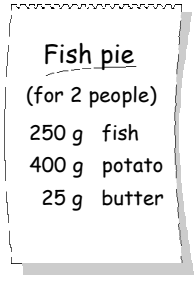


What is the length of the model? Give your answer in centimetres, correct to one decimal place.

The height of the model is 2.8 centimetres.
The height of the real car is 50 times the height of the model. What is the height of the real car?
Give your answer in metres.

KS2 1999 Paper B level 5

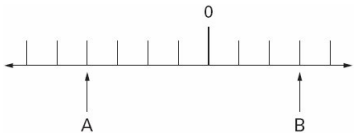
Here are the ingredients for fish pie for two people.



Omar makes fish pie for 3 people.
How many grams of fish should he use?

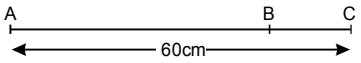
KS2 1997 Paper B level 5

A and B are two numbers on the number line below.



The difference between A and B is 140. Write the values of A and B.

KS2 2005 Paper A level 5



The distance from A to B is three times as far as from B to C.

The distance from A to C is 60 centimetres.
Calculate the distance from A to B.

KS2 2002 Paper B level 5

Sapna makes a fruit salad using bananas, oranges and apples. For every one banana, she uses 2 oranges and 3 apples. Sapna uses 24 fruits. How many oranges does she use?

KS2 2005 Paper B level 5

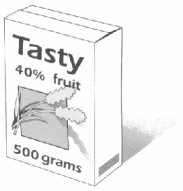
Nigel pours 1 carton of apple juice and 3 cartons of orange juice into a big jug. What is the ratio of apple juice to orange juice in Nigel's jug?

Kay pours 1 carton of apple juice and 1 $\frac{1}{2}$ cartons of orange juice into another big jug. What is the ratio of apple juice to orange juice in Kay's jug?

Tandi pours 1 carton of apple juice and 1 carton of orange juice into another big jug. She wants only half as much apple juice as orange juice in her jug. What should Tandi pour into her jug now?

KS3 1999 Paper A level 5

A packet of Tasty contains fruit and cereal.
Altogether, the mass of fruit and cereal is 500 g.
40% of it is fruit. 60% is cereal.



How many grams of fruit does this packet of Tasty contain?

How many 60 gram servings can you get from one packet of Tasty?

The ratio of fruit to cereal in a packet of Tasty is 40 : 60. Write this ratio in its simplest form.

Y7 optional test Paper A level 5

Knowing and using number facts

- Consolidate rapid recall of number facts, including multiplication facts to 10 × 10 and the associated division facts

Six times a number is three thousand. What is the number?

KS2 2005 Mental test level 5

What is thirty times forty times ten?

KS2 2005 Mental test level 5

What is three thousand divided by twenty?

KS2 2002 Mental test level 5

Write in the two missing digits.

□0 × □0 = 3000

KS2 2002 Paper A level 5

Circle two different numbers which multiply together to make 1 million.

10 100 1000 10 000 100 000

KS2 2000 Paper A level 5

- Recognise the square roots of perfect squares to 12 × 12

A number multiplied by itself gives the answer 49. Circle the number.

2 3 4 5 6 7 8 9

KS2 1997 Paper A level 3

What is the square root of sixty-four?

KS2 2002 Mental test level 4

This four digit number is a square number. Write in the missing digits.

9□□9

KS2 2001 Paper C level 6

- Recognise and use multiples, factors, divisors, common factors, highest common factors and lowest common multiples in simple cases

Write all the factors of 30 which are also factors of 20.

KS2 2005 Paper B level 4

Write a factor of seventy-five that is bigger than twenty and smaller than thirty.

Y7 2004 progress test Mental test level 4

Write two factors of twenty-four which add to make eleven.

KS2 2005 Mental test level 5

This three-digit number has 2 and 7 as factors.

294

Write another three-digit number which has 2 and 7 as factors.

KS2 1996 Paper A level 5

Write down a number that is both a multiple of four and a multiple of six.

KS3 2002 Mental test level 4

What is the smallest whole number that is divisible by five and by three?

KS3 2004 Mental test level 4

Complete this three-digit number so that it is a multiple of 9.

2□□

KS2 1996 Paper B level 4

Write the three missing digits.

□□ × □ = 371

KS2 1997 Paper B level 5

The same number is missing from each box. Write the same missing number in each box.

□ × □ × □ = 1331

KS2 1999 Paper B level 5

- **Make and justify estimates and approximations to calculations**

Which two of these numbers, when multiplied together, have the answer closest to 70?

7.4 8.1 9.4 10

KS2 2005 Paper B level 5

Estimate the value of nine point two multiplied by two point nine.

KS3 2005 Mental test level 6

A bus company has 62 minibuses.
On average, each minibus travels 19 miles on a gallon of fuel and goes 284 miles each day.
The Company says it needs about 1000 gallons of fuel every day.

Approximate these numbers and make an estimate to show whether what the company says is about right.

KS2 1995 Paper C level 6

Calculating

- Understand how the commutative, associative and distributive laws, and the relationships between operations, including inverse operations, can be used to calculate more efficiently; use the order of operations, including brackets

Write the correct sign >, < or = in each of the following.

(10 + 5) – 9 ☐ (10 + 9) – 5

3 × (4 + 5) ☐ (3 × 4) + 5

(10 × 4) ÷ 2 ☐ 10 × (4 ÷ 2)

KS2 2005 Paper A level 4

Calculate 900 ÷ (45 × 4).

KS2 2004 Paper A level 5

Put a tick (✓) in the correct box for each calculation. Use a calculator.

	less than 1000	equal to 1000	more than 1000
8.9 × 9.9 × 11.9			✓
(786 – 387) ÷ 0.41			
95.4 + (91 × 9.95)			
12.5 × (21.1 + 58.9)			

KS2 2000 Paper B level 5

Leila knows that

65 × 3 = 195

Explain how she can use this information to find the answer to this multiplication:

165 × 3

KS2 2000 Paper A level 5

Kim knows that

137 × 28 = 3836

Explain how she can use this information to work out this multiplication.

138 × 28

KS2 1997 Paper A level 5

Liam thinks of a number. He multiplies the number by 5 and then subtracts 60 from the result.

His answer equals the number he started with.
What was the number Liam started with?

KS2 2004 Paper A level 5

- Consolidate and extend mental methods of calculation to include decimals, fractions and percentages

What is fifteen multiplied by eleven?
KS2 2003 Mental test level 4

What is eighteen multiplied by nine?
KS3 2005 Mental test level 5

Multiply thirty-nine by seven.
KS2 2005 Mental test level 5

What is twenty-five multiplied by two hundred?
KS2 2002 Mental test level 5

A rectangle measures eleven centimetres by twenty centimetres. What is its area?
KS2 2004 Mental test level 5

Calculate ten minus four point three five.
KS2 2001 Mental test level 5

Subtract nought point seven five from six.
KS3 2003 Mental test level 4

What is one and a half added to four and a half?
KS2 2000 Mental test level 3

What is one-half added to three-quarters?
KS2 2003 Mental test level 4

What is two thirds of sixty-six?
KS2 2004 Mental test level 5

What is three-quarters of five hundred?
KS2 2003 Mental test level 5

Three-quarters of a number is 48. What is the number?
KS2 2003 Mental test level 5

What is three-fifths of forty pounds?
KS3 2003 Mental test level 5

Tariq won one hundred pounds in a maths competition. He gave two-fifths of his prize money to charity. How much of his prize money, in pounds, did he have left?
KS3 2004 Mental test level 5

What is one point three multiplied by four?
KS2 2004 Mental test level 5

Multiply eight point seven by two.
KS3 2004 Mental test level 5

Divide thirty-one point five by ten.
Y5 optional test 2003 Mental test level 5

What is seven point five divided by one hundred?
KS2 2004 Mental test level 5

Ten times a number is eighty-six. What is the number?
KS2 2002 Mental test level 5

What is nought point two six divided by ten?
KS2 2001 Mental test level 5

A tile is nought point two metres long.
One hundred tiles are placed end to end in a row.
How long is the row?
Y5 optional test 1998 Mental test level 5

What is half of six point three?
KS3 2001 Mental test level 5

What is three point nine divided by two?
KS3 2003 Mental test level 6

What is fifty per cent of twenty pounds?
KS3 2003 Mental test level 4

What is two percent of three hundred?
KS2 2000 Mental test level 5

What is ninety-nine per cent of two hundred?
KS2 2002 Mental test level 5

What is twenty per cent of sixty pounds?
KS3 2005 Mental test level 5

Increase one pound fifty by fifty per cent.
KS3 2004 Mental test level 5

- Use standard column procedures to add and subtract integers and decimals, and to multiply two-digit and three-digit integers by a one-digit or two-digit integer; extend division to dividing three-digit integers by a two-digit integer

Calculate 417 × 20.

KS2 2002 Paper A level 4

Calculate 143 × 37.

KS2 2005 Paper A level 5

Calculate 509 × 24.

KS2 2001 Paper A level 5

Calculate 268 × 53.

KS21999 Paper A level 5

Calculate 431 × 23.

KS2 1998 Paper A level 5

Calculate 924 ÷ 22.

KS2 2002 Paper A level 5

Write in the missing digit. The answer does not have a remainder.

$$3\overline{)\square\,8} \quad 2\ 6$$

KS2 1995 Paper A level 5

Write in the missing number.

$$50 \div \square = 2.5$$

KS2 2003 Paper A level 5

Calculate 4.65 × 9.

Calculate 13.6 × 8.

Calculate 157 ÷ 5.

Calculate 1.75 ÷ 5.

Calculate 37.2 ÷ 8.

Write in the missing digit.

$$\square 92 \div 14 = 28$$

KS2 1995 Paper A level 5

Write in the missing digits.

$$323 \times \square 7 = 1518\square$$

KS2 1995 Paper A level 5

- Calculate percentage increases or decreases and fractions of quantities and measurements (integer answers)

Calculate $\frac{1}{5}$ of 325.

Y5 optional test Paper B 2003 level 5

Calculate $\frac{3}{8}$ of 980.

KS2 2003 Paper B level 5

Calculate $\frac{5}{12}$ of 378.

KS2 2001 Paper B level 5

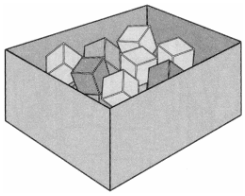
Calculate $\frac{7}{8}$ of 5000.

KS2 1999 Paper B level 5

Three-quarters of a number is 48.
What is the number?

KS2 2003 Paper A level 5

There are 24 coloured cubes in a box. Three-quarters of the cubes are red, four of the cubes are blue and the rest are green.



How many green cubes are in the box?

One more blue cube is put into the box. What fraction of the cubes in the box are blue now?

KS2 2002 Paper B level 5

Calculate 5% of £3600.

KS2 2004 Paper A level 5

Calculate 15% of 460.

KS2 2001 Paper A level 5

Calculate 24% of 525.

KS2 1998 Paper B level 5

Write in the missing numbers.

30% of 60 is ☐

30% of ☐ is 60

KS2 2005 Paper B level 5

A larger bottle of juice will hold 30% more than this bottle. How much will the larger bottle hold?

Y5 optional test 1998 Paper B level 4

The population of the world is approximately 6200 million people.

It is increasing by approximately 93 million people each year.

Use this information to calculate the percentage increase in the population over a year.

KS2 2001 Paper C level 6

- **Use bracket keys and the memory of a calculator to carry out calculations with more than one step; use the square root key**

Write in what the missing numbers could be.

170 + □ = 220 – □

KS2 2002 Paper B level 5

Write the missing number.

10 233 ÷ □ = 379

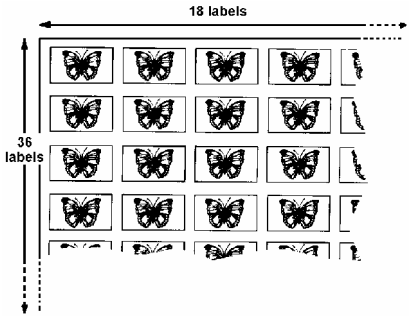
KS2 1997 Paper B level 5

2753 people go to a sports event. Each person pays £2.30 for a ticket. What is the total amount of ticket money collected?

Programmes cost 65p each. The total money from programme sales is £612.95. How many programmes are sold?

KS2 1998 Paper B level 5

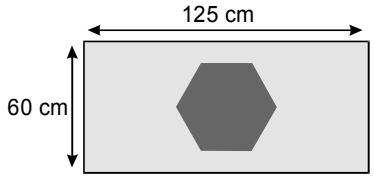
A shop sells sheets of sticky labels.
On each sheet there are 36 rows and 18 columns of labels.



How many labels are there altogether on 45 sheets?

KS2 1999 Paper B level 5

Here is a flag.



What is the area of this flag?

20% of the flag is blue. What area of the flag is blue?

KS2 1995 Paper B level 5

Write in the missing number.

32.45 × □ = 253.11

KS2 2002 Paper B level 5

Write in the missing number.

404.09 ÷ □ = 8.5

KS2 2001 Paper B level 5

Write in the missing number.

□ ÷ 21.7 = 37.5

KS2 2004 Paper B level 5

Write the answer..

100 – (22.75 + 19.08) =

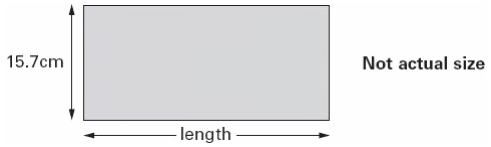
KS2 2004 Paper B level 5

Use a calculator to work out

49.3 × (2.06 + 8.5)

KS2 2002 Paper B level 5

Here is a rectangle with a width of 15.7 centimetres.



The perimeter of this rectangle is 85 centimetres. Calculate the length of the rectangle.

KS2 2005 Paper B level 5

Every day a machine makes 100 000 paper clips which go into boxes. A full box has 120 paper clips. How many full boxes can be made from 100 000 paper clips?

Each paper clip is made from 9.2 centimetres of wire. What is the greatest number of paper clips that can be made from 10 metres of wire?

KS2 1998 Paper B level 5

Write three decimals, each greater than zero, which add together to make a total of 0.01

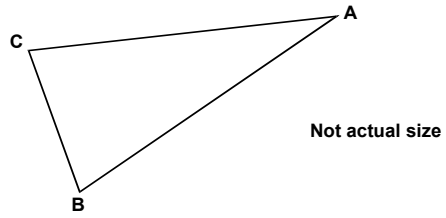
□ + □ + □ = 0.01

KS2 1999 Paper C level 6

Understanding shape

- Use correctly the vocabulary, notation and labelling conventions for lines, angles and shapes

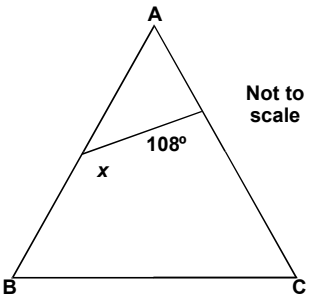
Triangle ABC is isosceles and has a perimeter of 20 centimetres. Sides AB and AC are each twice as long as BC.



Calculate the length of the side BC.
Do not use a ruler.

KS2 2001 Paper A level 5

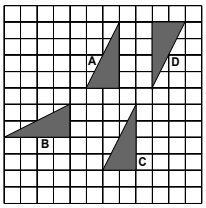
Triangle ABC is equilateral.



Calculate the size of angle *x*.
Do not use an angle measurer (protractor).

KS2 1999 Paper C level 6

- Extend knowledge of properties of triangles and quadrilaterals and use these to visualise and solve problems, explaining reasoning with diagrams

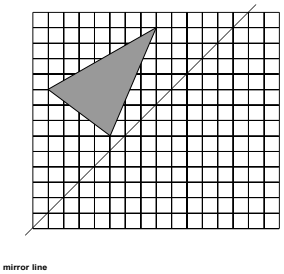


Write the correct letter in this sentence:

Shape … is a reflection of shape A.

KS2 1997 Paper B level 5

Draw the reflection of the shaded triangle in the mirror line.



Sarah draws a quadrilateral. It has these properties:

it has 2 long sides the same length; it has 2 short sides the same length; it does NOT have any right angles; it does NOT have reflective symmetry.

Write the mathematical name for Sarah's quadrilateral.

KS2 1996 Paper B level 5

Here are four statements.

For each statement put a tick (✓) if it is possible.
Put a cross (×) if it is impossible.

☐ A triangle can have 2 acute angles.

☐ A triangle can have 2 obtuse angles.

☐ A triangle can have 2 parallel sides.

☐ A triangle can have 2 perpendicular sides.

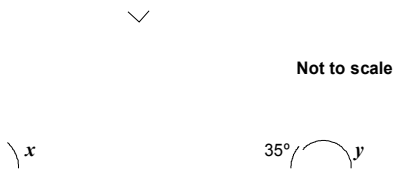
KS2 2005 Paper A level 5

- **Know the sum of angles on a straight line, in a triangle and at a point, and recognise vertically opposite angles**

Use a dynamic geometry system. Construct a triangle with a line through one vertex parallel to the opposite side.

Observe the angles as the triangle is changed by dragging any of its vertices. What conjecture can you make?

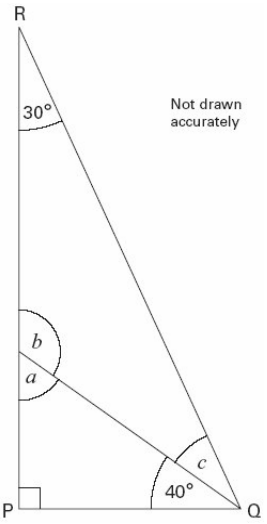
Look at this diagram.



Calculate the size of angle *x* and angle *y*.
Do not use a protractor (angle measurer).

KS2 2002 Paper A level 5

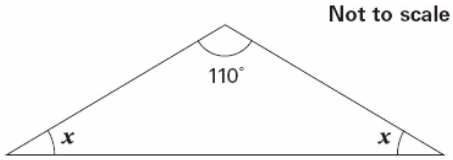
The diagram shows triangle PQR.



Work out the sizes of angles a, b and c

KS3 2005 Paper A level 5

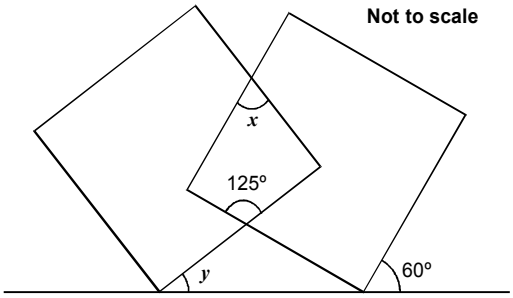
Here is an isosceles triangle.



Calculate the size of angle *x*.
Do not use a protractor (angle measurer).

KS2 2005 Paper B level 5

The diagram shows two overlapping squares and a straight line.



Calculate the value of angle *x* and the value of angle *y*.
Do not use a protractor (angle measurer).

KS2 2000 Paper C level 6

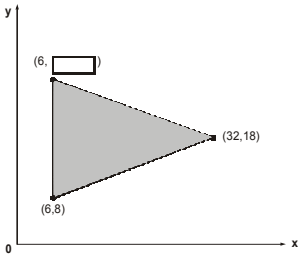
Use a dynamic geometry system. Construct a parallelogram by drawing two line segments sharing a common point and then using parallel lines for the two opposite sides.

Draw the two diagonals.

Observe the sides, angles and diagonals as the parallelogram is changed by dragging its vertices. What conjectures can you make?

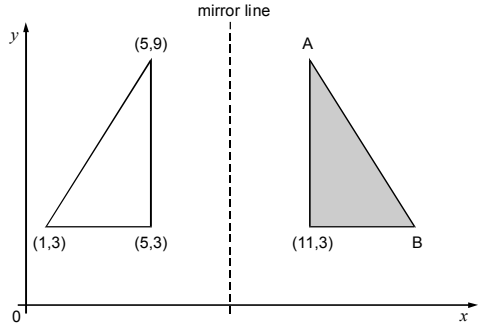
- Use all four quadrants to find coordinates of points determined by geometric information

The shaded shape is an isosceles triangle. Write in the missing co-ordinate.



KS2 1998 level 5

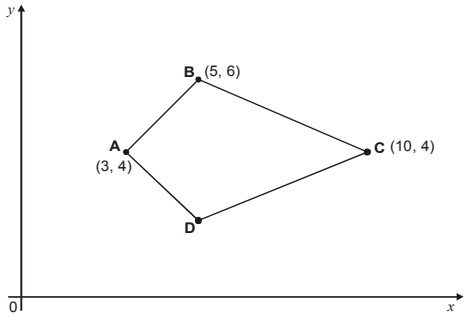
The shaded triangle is a reflection of the white triangle in the mirror line.



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

KS2 2000 level 5

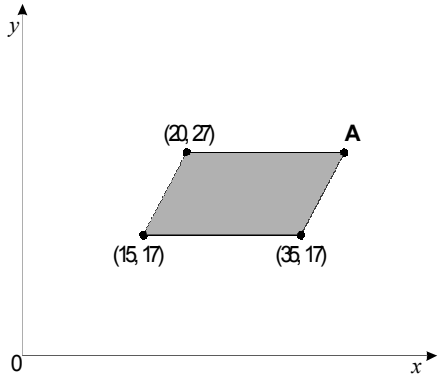
Here is a kite.



Write the coordinates of point D.

KS2 2004 Paper A level 5

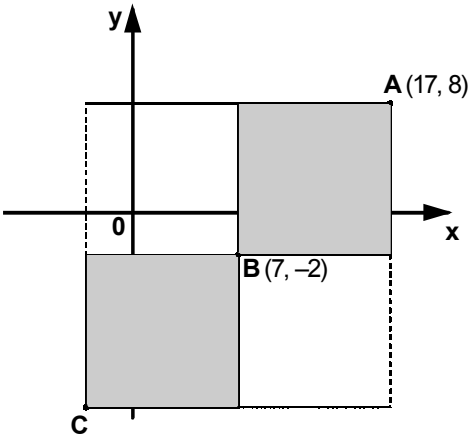
The shaded shape is a parallelogram.



Write in the coordinates of point A.

KS2 2002 Paper A level 5

The two shaded squares below are the same size.



A is the point (17,8). B is the point (7,–2).
What are the co-ordinates of the point C?

KS2 1998 Paper C level 6

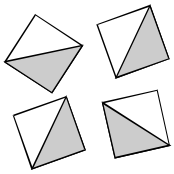
- Identify all the symmetries of 2-D shapes; transform images using ICT

Use a dynamic geometry system. Construct a triangle and a line to act as a mirror. Construct the image of one vertex by drawing a perpendicular to the mirror and finding a point at an equal distance on the opposite side.

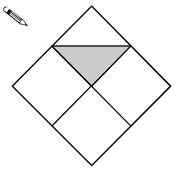
Repeat for the other vertices and draw the image triangle.

Observe the effect of dragging vertices of the triangle. What conjecture can you make?

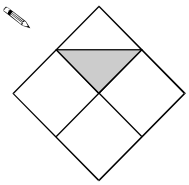
I have four identical square tiles.



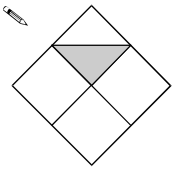
Show how the four tiles can fit together to make a pattern with 4 lines of symmetry.



Now show how the four tiles can fit together to make a pattern with no lines of symmetry.

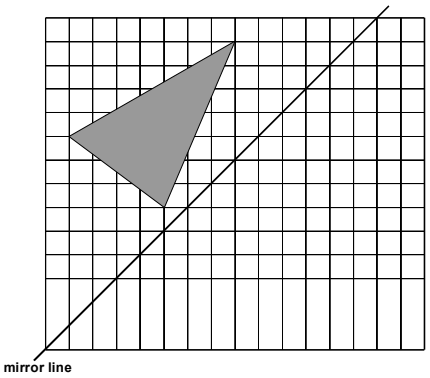


Show how the four tiles can fit together to make a pattern with rotation symmetry of order 2



Y8 optional test 1999 Paper B level 5

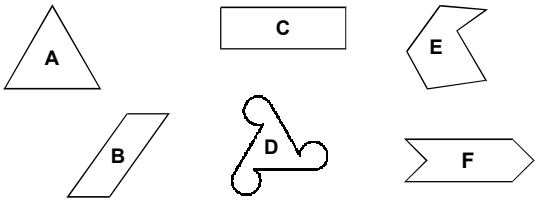
Draw the reflection of the shaded triangle in the mirror line.



KS2 1997 Paper C level 6

An equilateral triangle has 3 lines of symmetry. It has rotational symmetry of order 3

Write the letter of each shape in the correct space in the table below. You may use a mirror or tracing paper to help you. The letters for the first two shapes have been written for you.



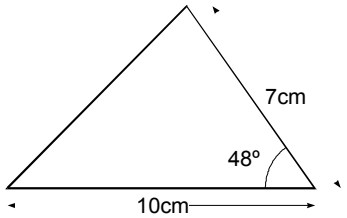
Number of lines of Symmetry

Order of Rotational Symmetry	0	1	2	3
1				
2	B			
3				A

KS3 1999 Paper A level 5

- Construct a triangle given two sides and the included angle

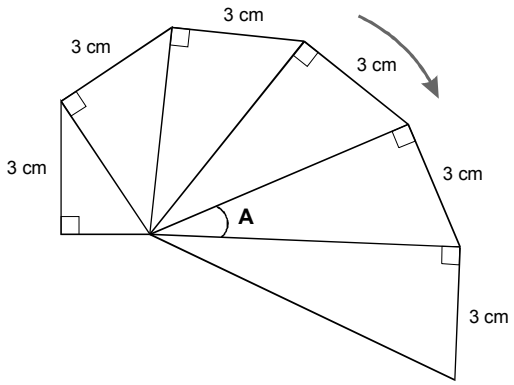
Here is a sketch of a triangle.
It is not drawn to scale.



Draw the full size triangle accurately, below. Use an angle measurer (protractor) and a ruler.

KS2 1999 Paper A level 5

Here is the start of a spiral sequence of right-angled triangles. Draw accurately the next right-angled triangle on the diagram. You may use an angle measurer.



Use an angle measurer to find the size of angle A.

KS2 1996 Paper A level 5

Measuring

- Convert between related metric units using decimals to three places (e.g. convert 1375 mm to 1.375 m, or vice versa)

How many grams are there in twelve kilograms?

KS2 2003 Mental test level 5

How many metres are there in one point five kilometres?

KS2 2000 Mental test level 5

How many millilitres are there in two and a half litres?

KS2 1999 Mental test level 5

How many millilitres are there in one and a quarter litres?

KS2 2005 Mental test level 5

A bottle holds a quarter of a litre. Write this amount in millilitres.

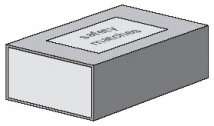
Y5 optional test 2003 Mental test level 5

There is 60 g of rice in one portion. How many portions are there in a 3 kg bag of rice?

Y5 optional test Paper B level 5

A packet contains 1.5 kilograms of guinea pig food. Remi feeds her guinea pig 30 grams of food each day. How many days does the packet of food last?

KS2 2003 Paper A level 5



A box contains 220 matches and weighs 45 grams.
The empty box weighs 12 grams.
Calculate the weight of one match.

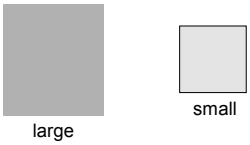
KS2 2005 Paper B level 5

Cheddar cheese costs £7.50 for 1 kg.
Marie buys 200 grams of cheddar cheese.
How much does she pay?

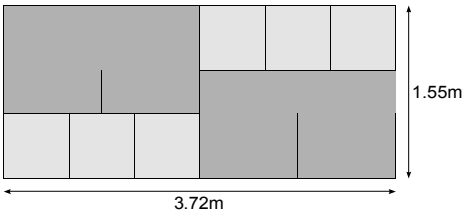
Cream cheese costs £3.60 for 1 kg.
Robbie buys a pot of cream cheese for 90p.
How many grams of cream cheese does he buy?

KS2 2003 Paper B level 5

Mr Jones has two sizes of square paving stones.



He uses them to make a path.



The path measures 1.55 metres by 3.72 metres.
Calculate the width of a small paving stone.

KS2 1999 Paper B level 5

- **Solve problems by measuring, estimating and calculating; measure and calculate using imperial units still in everyday use; know their approximate metric values**

Write the correct whole number in the box.

5 miles is approximately ☐ kilometres.

Y5 optional test 1998 Paper B level 4

How many pints are about the same as one litre? Ring the best answer.

1 2 3 4 5

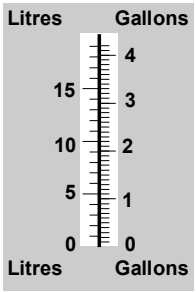
KS3 2003 Mental test level 5

A man measures his height as six feet. About how many metres high is that? Ring the best answer.

0.6 1 1.4 1.8 2.2

KS3 2003 Mental test level 5

Here is a scale for converting litres and gallons.

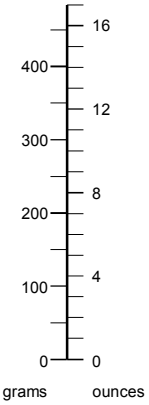


Approximately how many litres are there in 3 gallons? Give your answer to the nearest litre.

Approximately how many gallons are there in 7 litres? Give your answer to 1 decimal place.

KS2 1996 Paper B level 4

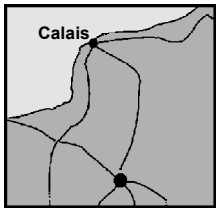
A scale measures in grams and in ounces.



About how many ounces is 400 grams?

KS3 2002 Paper A level 5

Here is a map of part of France.



The map shows that the distance from Calais to Paris is 320 kilometres. 5 miles is approximately 8 kilometres. Use these facts to calculate the approximate distance in miles from Calais to Paris.

KS2 2000 Paper B level 5

A glass holds 225 ml.

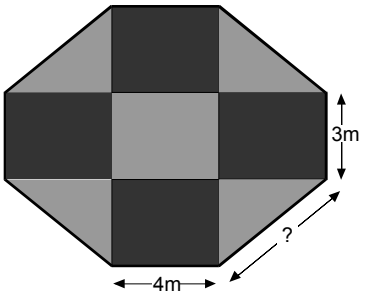
An adult needs about 1.8 litres of water each day to stay healthy. How many glasses is that?

An adult weighs 80 kg. 60% of his total mass is water. What is the mass of this water?

KS3 2003 Paper A level 5

- Calculate the area of right-angled triangles given the lengths of the two perpendicular sides, and the volume and surface area of cubes and cuboids

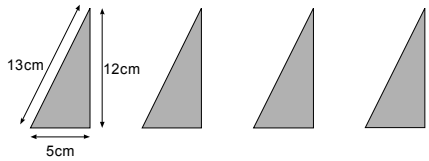
This plan of a garden is made of rectangles and triangles. The area of each rectangle is 12 square metres. What is the area of the whole garden?



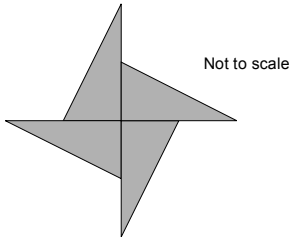
The perimeter of the garden is 34 metres. What is the length of the longest side of each triangle?

KS2 1997 Paper A level 5

Lindy has 4 triangles, all the same size.



She uses them to make a star.

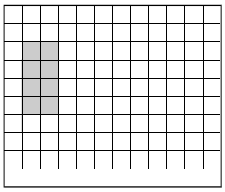


Calculate the perimeter of the star.

Calculate the area of the star.

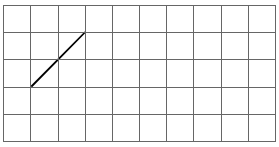
KS2 1999 Paper B level 5 [adapted]

On the grid draw a triangle with the same area as the shaded rectangle. Use a ruler.



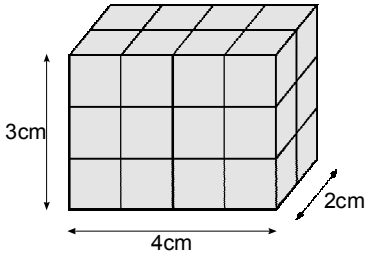
KS2 1999 Paper A level 5

This is a centimetre grid. Draw 3 more lines to make a parallelogram with an area of 10 cm^2. Use a ruler.



KS2 2001 Paper A level 5

This cuboid is made from centimetre cubes.

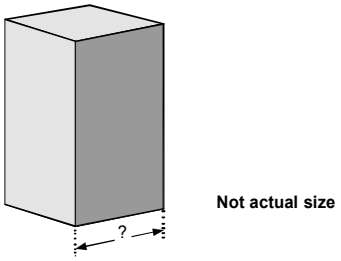


It is 4 centimetres by 3 centimetres by 2 centimetres. What is the volume of the cuboid?

Another cuboid is made from centimere cubes. It has a volume of 30 cubic centimetres. What could the length, height and width be?

KS2 1999 Paper A level 4

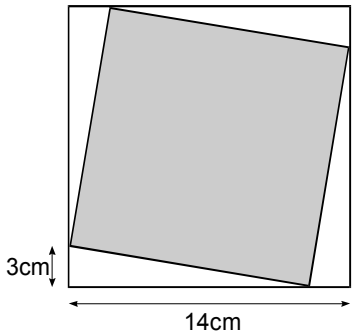
A cuboid has a square base. It is twice as tall as it is wide. Its volume is 250 cubic centimetres.



Calculate the width of the cuboid.

KS2 2001 Paper C level 6

The diagram shows a shaded square inside a larger square.



Calculate the area of the larger square.

Calculate the area of the shaded square.

KS2 1999 Paper C level 6

Handling data

- **Understand and use the probability scale from 0 to 1; find and justify probabilities based on equally likely outcomes in simple contexts**

Gill puts 4 counters in a bag. 3 counters are black. 1 counter is white.

Gill is going to take a counter out of the bag without looking.

What is the probability that the counter will be white? Put a ring round the correct answer.

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

Sam puts 20 counters in a different bag. She is going to take a counter out of the bag without looking.

The probability that the counter will be red is $\frac{1}{2}$. How many red counters are in her bag?

Y7 progress test Paper B level 4

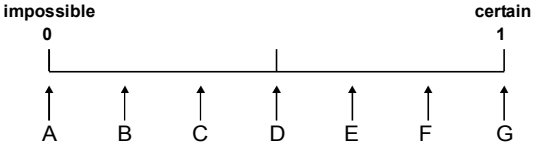
Dan has a bag of seven counters numbered 1 to 7. Abeda has a bag of twenty counters numbered 1 to 20. Each chooses a counter from their own bag without looking.

For each statement, put a tick (✓) if it is true. Put a cross (✗) if it is not true.

Dan is more likely than Abeda to choose a '5'.
They are both equally likely to choose a number less than 3.
Dan is more likely than Abeda to choose an odd number.
Abeda is less likely than Dan to choose a '10'.

KS2 2002 Paper A level 5

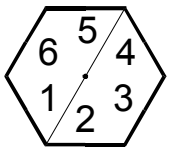
A fair dice has the numbers 2, 2, 2, 2, 5 and 5 on it. The dice is rolled. Circle the arrow which shows the probability of getting a 2.



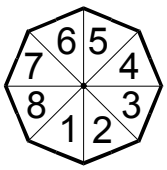
Y5 optional test 1998 Paper B level 5

Here are two spinners.

Jill's spinner



Peter's spinner



Jill says, 'I am more likely than Peter to spin a 3.' Give a reason why she is correct.

Peter says, 'We are both equally likely to spin an even number.' Give a reason why he is correct.

KS2 1996 Paper A level 5

There are six balls in a bag. The probability of taking a red ball out of the bag is 0.5

A red ball is taken out of the bag, and put to one side. What is the probability of taking another red ball out of the bag?

KS2 2000 Paper C level 6

- Explore hypotheses by planning surveys or experiments to collect small sets of discrete or continuous data; select, process, present and interpret the data, using ICT where appropriate; identify ways to extend the survey or experiment

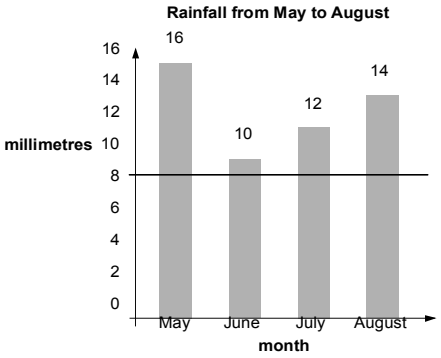
On Monday all the children at Grange School each play one sport. They choose either hockey or rounders.

There are 103 children altogether in the school. 27 girls choose hockey. Write all this information in the table. Then complete the table.

	hockey	rounders	Total
boys	22		
girls			53
Total			

KS2 2005 Paper B level 5

Here is a bar chart showing rainfall.



Kim draws a dotted line on the bar chart. She says,

'The dotted line on the chart shows the mean rainfall for the four months.'

Use the chart to explain why Kim cannot be correct.

What is the mean rainfall for the four months?

KS2 1998 Paper B level 5

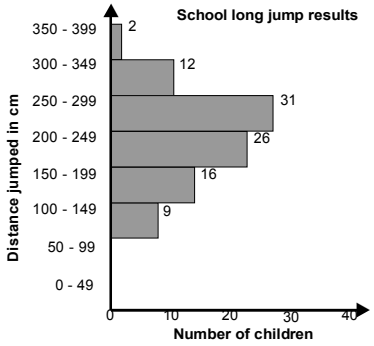
Carol counts the matches in 10 boxes. She works out that the mean number of matches in a box is 51. Here are her results for 9 boxes.

Number of matches in a box						
48	49	50	51	52	53	54
	✓ ✓ ✓	✓ ✓	✓	✓		✓ ✓

Calculate how many matches are in the 10th box.

KS2 2001 Paper C level 6

Here are the long jump results for a school. They are measured to the nearest centimetre.



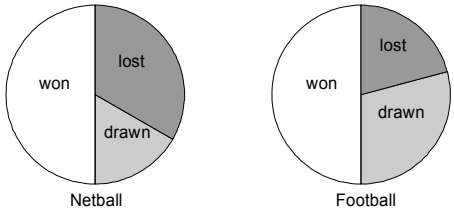
Steve jumped 315cm. He says, 'Only 2 people jumped further than me.' Could he be correct? Circle Yes or No. Explain your answer.

Ruby says, 'The median jump was 275cm.' She is not correct. Explain how the graph shows that she is not correct.

KS2 1997 Paper C level 6

- Construct, interpret and compare graphs and diagrams that represent data; for example compare proportions in two pie charts that represent different totals

The pie charts show the results of a school's netball and football matches.



The netball team played 30 games. The football team played 24 games. Estimate the percentage of games that the netball team lost.

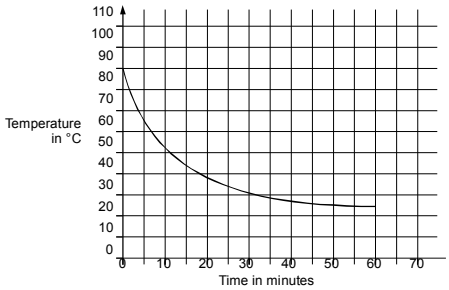
David says, 'The two teams won the same number of games'.

Is he correct? Circle Yes or No. Explain how you know.

KS2 2003 Paper A level 5

A hot liquid is left to cool in a science experiment.

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.

Read from the graph how many minutes the temperature is above 60°C.

KS2 2001 Paper B level 5

- Write a short report of a statistical enquiry and illustrate with appropriate diagrams, graphs and charts, using ICT as appropriate; justify the choice of what is presented

A machine in a youth club sells snacks.

Crisps:	20p
Chocolate bars:	35p
Drinks:	40p
Rolls:	75p
Sandwiches:	£1.00

a Len writes down the amounts of money which different people spend one evening during each hour that the club is open:

Amounts of money spent during each hour		
5 pm to 6 pm	6 pm to 7 pm	7 pm to 8 pm
40p	75p	£1.75
60p	55p	£1.40
55p	60p	£1.60
20p	40p	75p
40p	£1.25	£1.40
60p	40p	£1.10
55p	75p	60p
40p	40	£1.50

Len says: '40p is the mode of the amounts of money spent.' Explain why Len is right.

b Len groups the amounts and starts to make a tally chart. Fill in Len's chart for 7 pm to 8 pm. Then fill in the column for the total number of people who spent each amount.

Amount of money spent	Time			Total number of people who spend each amount
	5 pm to 6 pm	6 pm to 7 pm	7 pm to 8 pm	
under 60p	IIII	III		7
60p to 99p	IIII	IIII		
£1.00 to £1.49		I		
over £1.49				

Len says: 'Now 50p to 99p is the mode.' Is Len right? Explain your answer.

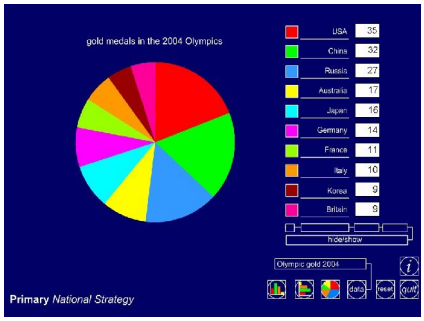
c Look at where the tally marks are on the chart. What do you notice about the amounts of money people spent at different times in the evening?

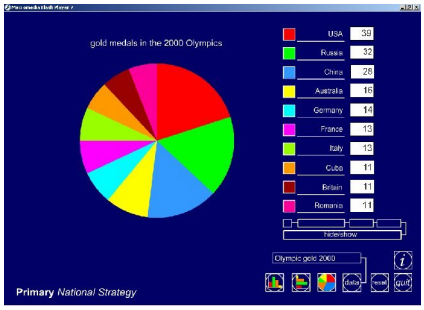
Give a reason which could explain the difference you notice.

KS3 1996 Paper A level 4

Pie charts comparing the number of gold medals achieved by the top countries in the 2000 and 2004 Olympics

http://www.standards.dfes.gov.uk/primary/teachingresources/mathematics/nns_itps/data_handling/





Line graph accompanying a report on temperature in a room over 24 hours

http://www.standards.dfes.gov.uk/primary/teachingresources/mathematics/nns_itps/line_graph/