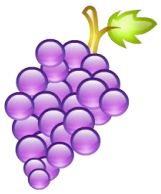
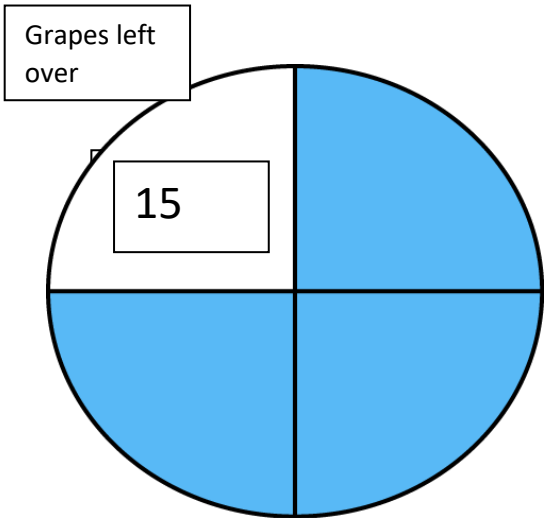
Using pictures, jottings and models to support mathematical thinking.

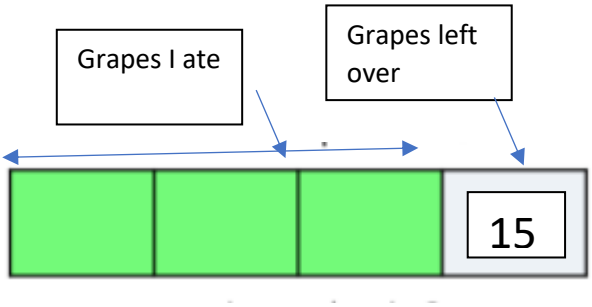
When you are tackling a mathematical problem or calculation, starting to draw and image or picture to represent the problem can be a very useful way to help you understand it and see the structure of the mathematic within the problem.

Look at this problem:

> "I eat ¾ of a bunch of grapes and have 15 grapes left. How many grapes did I eat?"
>
> 

You could start by drawing an image to represent "three quarters". Then, read the questions again and put some information in your picture:





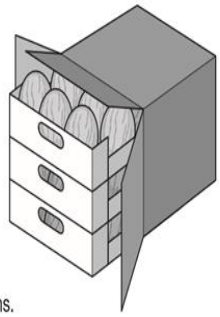
Does this now help to solve the problem?

Here is another example of a question, with some resources and images that could help you to solve it:

15 A box contains trays of melons.

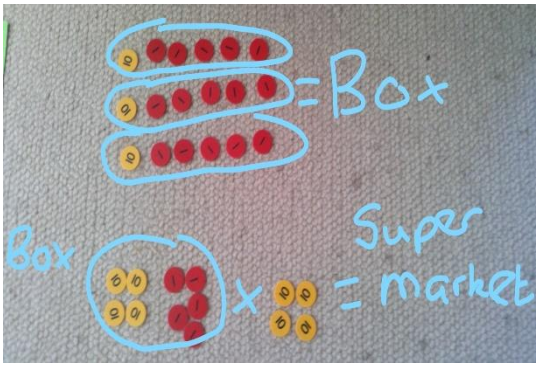
There are 15 melons in a tray.

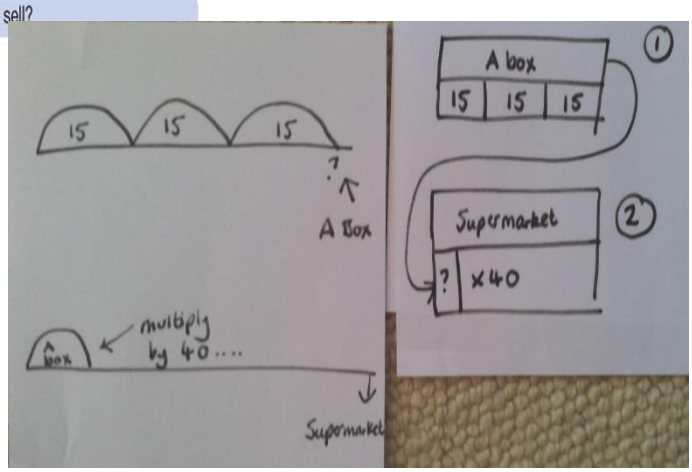
There are 3 trays in a box.



A supermarket sells **40** boxes of melons.

How many melons does the supermarket sell?





Even though you won't have resources to use in a test, you can do some jottings or drawings to help "bring to life" the problem.

Look at the next two problems – and how some quick jottings helped with solving them:

1 The numbers in this sequence increase by 14 each time.

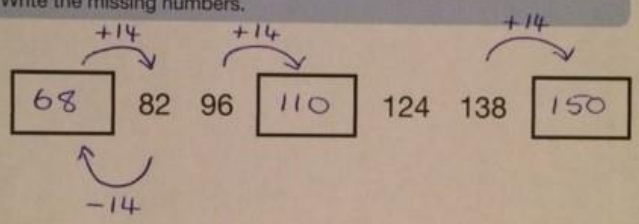
Write the missing numbers.

☐ 82 96 ☐ 124 138 ☐

2 marks

1 The numbers in this sequence increase by 14 each time.

Write the missing numbers.



2 marks

2 This table shows the temperature at 9am on three days in January.

1st January	8th January	15th January
+ 5°C	− 4°C	+ 1°C

What is the difference between the temperature on 1st January and the temperature on 8th January?

°C

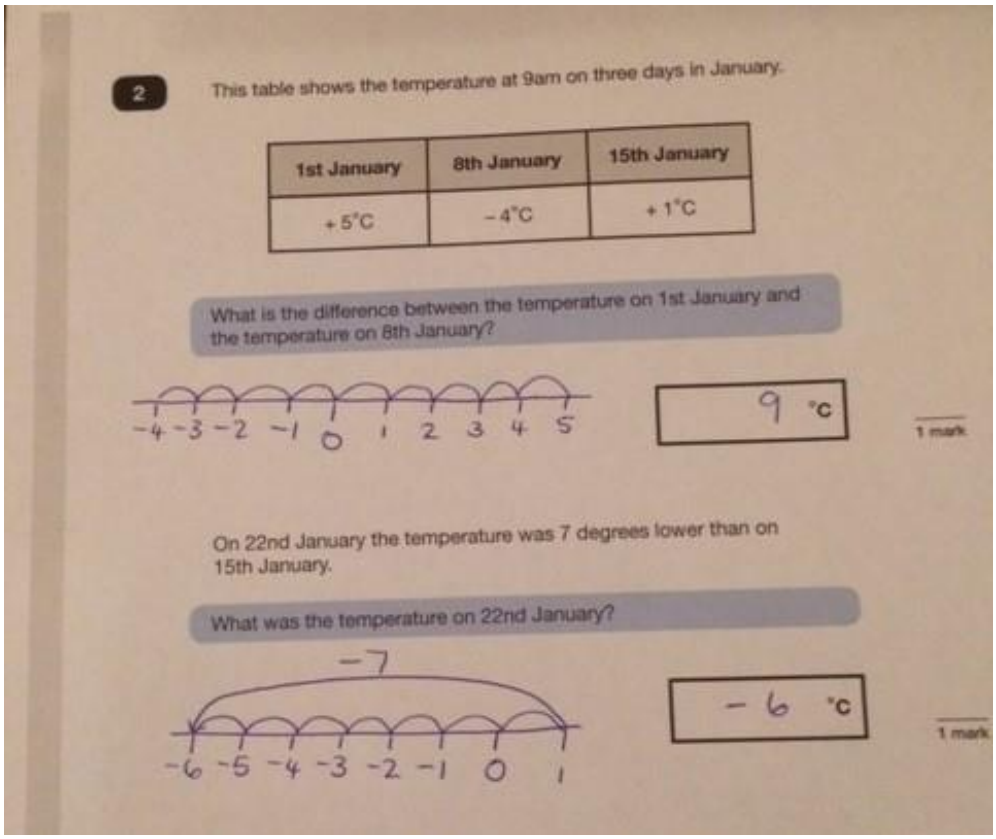
1 mark

On 22nd January the temperature was 7 degrees lower than on 15th January.

What was the temperature on 22nd January?

°C

1 mark



2 This table shows the temperature at 9am on three days in January.

1st January	8th January	15th January
+5°C	−4°C	+1°C

What is the difference between the temperature on 1st January and the temperature on 8th January?

−4 −3 −2 −1 0 1 2 3 4 5

9 °C

1 mark

On 22nd January the temperature was 7 degrees lower than on 15th January.

What was the temperature on 22nd January?

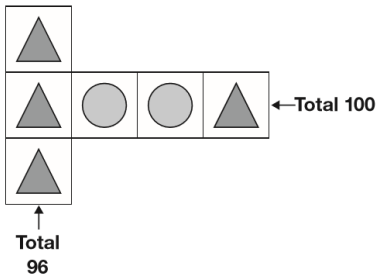
−7

−6 −5 −4 −3 −2 −1 0 1

−6 °C

1 mark

On the next pages are some questions that might be easier to solve with pictures or jottings. Have a go at them, deciding on the problem-solving strategies that help you solve them – including maybe drawing an image or doing a jotting.

1.	Each shape stands for a number.  Work out the **value** of each shape. △ = _____ 1 mark ○ = _____ 1 mark

2.

6 Jacob cuts **4** metres of ribbon into **three** pieces.

The length of the first piece is **1.28** metres.

The length of the second piece is **1.65** metres.

Work out the length of the third piece.

Show your method

metres

2 marks

3.

20 Lara had some money.

She spent £1.25 on a drink.

She spent £1.60 on a sandwich.

She has **three-quarters** of her money left.

How much money did Lara have to **start with**?

Show your method

£

4.

Ali puts these five numbers in their correct places on a number line.

511 499 502 555 455

Write the number **closest** to 500

Write the number **furthest** from 500

5.

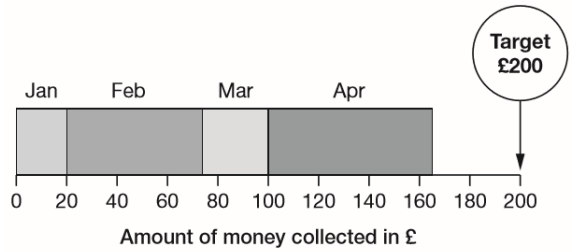
20 On Saturday Lara read $\frac{2}{5}$ of her book.

On Sunday she read the **other** 90 pages to finish the book.

How many pages are there in Lara's book?

Show your method

pages

6.	**4** A school plans to collect £200 between January and May. This chart shows how much they collected by the end of April.  Write the name of **each** month where they collected more than £50 How much money did they collect in February and March **altogether**? £
7.	Here are four fraction cards. $\frac{3}{4}$ $\frac{5}{8}$ $\frac{6}{12}$ $\frac{7}{16}$ Use any **three** of the cards to make this correct. □ < □ < □
8.	John's book is 312 pages long. He read 48 pages on Saturday and 67 pages on Sunday. How many pages does he have left to read? Is he halfway through the book yet? 
9.	The perimeter of a rectangle is 34m. If the rectangle has a width of 5 metres then what would its length be?
10.	Grandma always sends a cheque for Christmas. This year, she sent a cheque for £108 to be shared equally among her 6 grandchildren. What fraction of the money will each grandchild get?

	How much money does each child get?
11.	There are 30 children in a class. 2/5 of them are girls. How many boys are in the class? 
12.	There are 32 pieces of fruit in a large fruit bowl. ½ are apples, ¼ are oranges and the rest are pears. How many pears are in the fruit bowl?