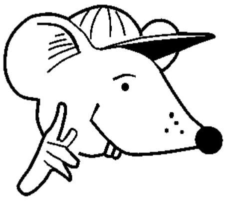
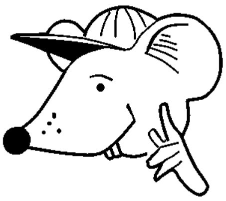


MATHEMATICS



Y6 Number and Place Value
6140

Revise estimating and approximating numbers.

Equipment

Paper, pencil, ruler, calculator, real pennies, real 2p pieces, stop watch

MathSphere

Concepts

Children should be familiar with numbers up to 1 000 000 and be able to estimate simple proportions of 10 000 and multiples of this number, both on a number line and in practical situations. They should be able to deal with simple negative numbers in the same context. They should also be able to say how they arrived at their estimate.
They should be able to say how accurate their estimates are.

Children should be able to estimate large numbers of items that are often not uniformly spread such as leaves on a branch or bricks all round a house.

Children should also be familiar with the meanings and spellings of these words:

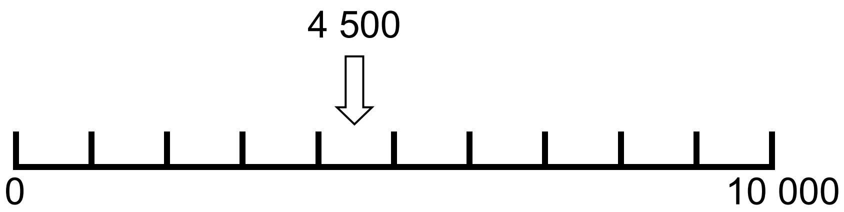
guess, estimate, approximate, roughly, nearly, approximately, too many, too few, enough, not enough, round, nearest.

And the symbol for "approximately equal to" $\approx$ ( ) .

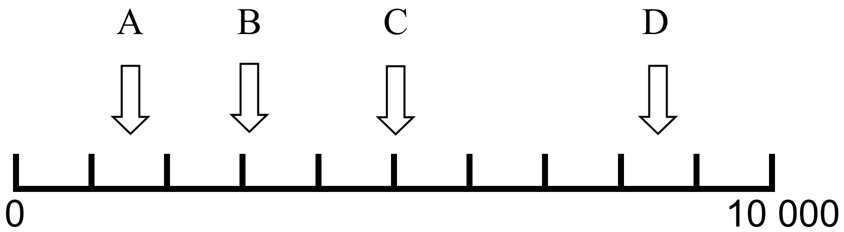
With these questions be prepared to say how you got your answers.

1. This line shows the numbers up to 10 000 divided into thousands.
Draw an arrow to show the following numbers (the first has been done for you).

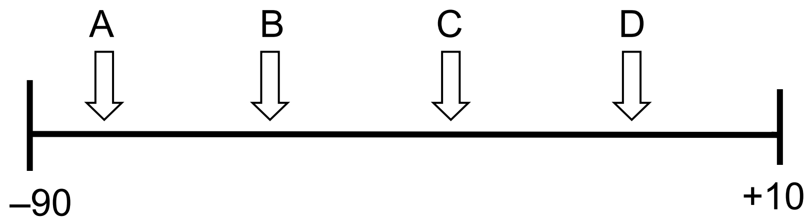
5 000, 7 500, 3 200, 1 000, 9 900



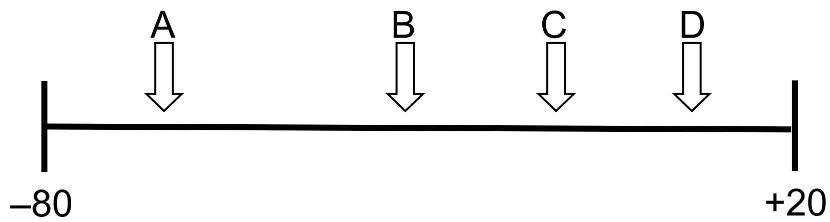
2. Where are the arrows pointing on this line?



3. Where are the arrows pointing on this line?



4. Where are the arrows pointing on this line?

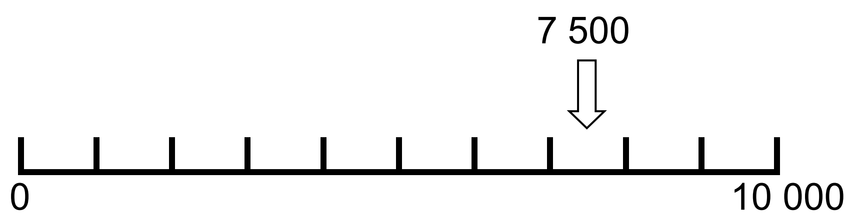


With these questions be prepared to say how you got your answers.

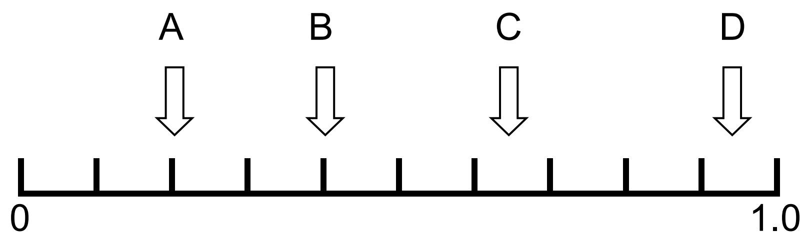
1. This line shows the numbers up to 10 000 divided into thousands.

Draw an arrow to show the following numbers (the first has been done for you).

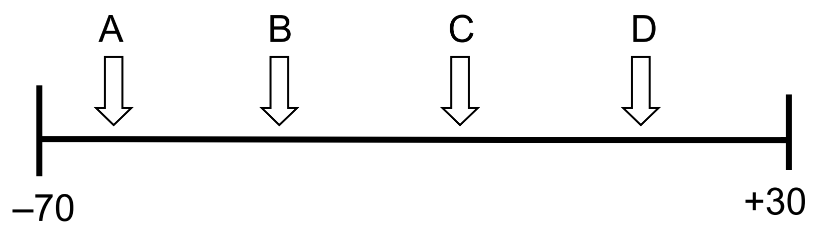
6 000, 1 500, 2 800, 7 000, 5 600



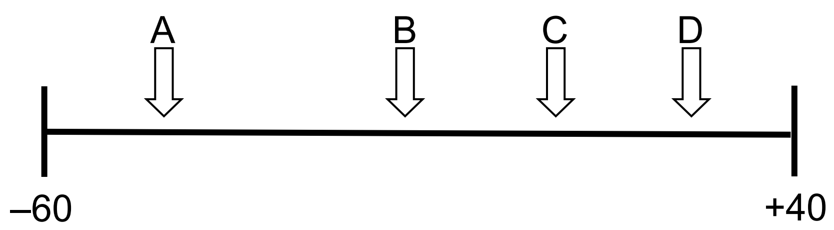
2. Where are the arrows pointing on this line?



3. Where are the arrows pointing on this line?



4. Where are the arrows pointing on this line?



With these questions be prepared to say how you got your answers. Use a calculator if you need to.

1. Is 100 000 seconds more or less than one whole day?
How did you work this out?

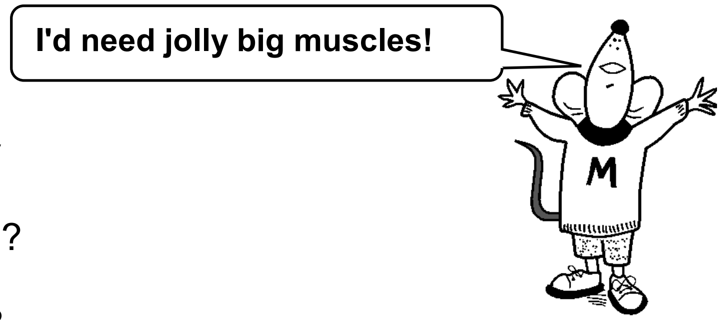
Write down three things that would take you less than half a day, but more than a tenth of a day.

2. Which of these could you do in 1 000 000 seconds or less?

a) have a week's holiday
b) run a 10 Km race
c) have a 20 day cruise
d) swim 100 lengths of your local swimming pool
e) walk from Manchester to London.

How did you decide?

3. If you wanted to transport 1 000 000 marbles, all at the same time, would you need



a) a paper bag
b) a bucket
c) a shopping trolley
d) a lorry
e) a large aeroplane?

How did you decide?

4. How many one penny coins would you need to reach 1Km when placed side by side?

Explain how you worked it out?

5. How many one penny coins would you need to reach from the Earth to the Moon (400 000 Km) when placed side by side?

Explain how you worked it out.

With these questions be prepared to say how you got your answers.
Use a calculator if you need to.

1. Is 600 000 seconds more or less than one whole week?
How did you work this out?

Write down three things that would take you more than 300 000 seconds, but less than 500 000 seconds.

2. Which of these could you do in 16 000 000 seconds or less?

a) walk 160 Km at 1 Km per day
b) swim the English Channel (20 Km approximately)
c) have a skiing holiday of one month
d) say all your tables 10 000 times
e) watch the Moon go round the Earth 10 times.

How did you decide?

3. If you wanted to transport 1 000 000 two penny coins, all at the same time, would you need

a) a paper bag
b) a bucket
c) a shopping trolley
d) a lorry
e) a large aeroplane.

How did you decide?

4. How many two penny coins would you need to reach 1Km when placed side by side?

Explain how you worked it out?

5. How many two penny coins would you need to reach from the Earth to the Sun (150 000 000 Km) when placed side by side?

Explain how you worked it out.

Mini Investigations

In these investigations make sure you write down your results very carefully. Use a calculator if you need to.

1. Estimate how many blades of grass there are in a square metre of grass.

Use this to estimate how many blades of grass there are in your lawn or playing field.

If each blade of grass is 3cm long, what is the total length of all the grass in the lawn or field?

2. How many leaves are there on a small branch of a nearby tree?

How many on a larger sector of the tree (say a large branch)?

How many leaves are there in the tree?

Draw round a leaf and find its area in square centimetres.

What is the area of all the leaves in the tree in cm^2 ?

What is this area in m^2 ? Is this bigger than the floor area of a room?

3. Look at a set of encyclopaedias.

Estimate how many words are on one page.

Estimate how many words there are in one volume of the encyclopaedia.

Estimate how many words there are in the complete set.

Mini Investigations

In these investigations make sure you write down your results very carefully. Use a calculator if you need to.

1. Estimate how many names there are in a telephone directory page.

How many are there in the whole directory?

How many centimetres does each name take up if you include the telephone number?

What is the total length of all the names in the directory in centimetres.

How long is this in metres?

How long is this in kilometres?

2. Look at a set of encyclopaedias.

How many pages are there altogether in all the volumes?

How much does this paper weigh?

A company produces 200 sets of encyclopaedias each day. How much does this weigh?

Seventeen trees are needed to make a tonne of paper. How many trees are needed for these 200 sets of encyclopaedias?

3. Plan an investigation to calculate how many bricks were used when your school or street was built.

Answers

Page 3

2. A 1 500	B 3 100	C 5 000	D 8 500
3. A –80	B –58	C –34	D –10
4. A –63	B –32	C –12	D 6

Page 4

2. A 0.2	B 0.4	C 0.65	D 0.94
3. A –60	B –38	C –14	D 10
4. A –43	B –12	C 8	D 27

Page 5

1. More. 1 day = 86 400 seconds.
2. a) b) d) (given a good swimmer) e) (given a good walker)
because 1 000 000 seconds = 11.57 days
3. Assume marbles are roughly 1cm diameter, 1 000 000 marbles is a cubic metre.
Therefore lorry needed.
4. 50 000 1 coin is 2cm diameter
5. 50 000 x 400 000 = 20 000 000 000

Page 6

1. Less (6.94 days)
2. a) b) (given a good swimmer) c) d) (26.6 mins each set non-stop)
because 16 000 000 seconds is approx. 185 days.
(Moon takes more than 270 days for 10 orbits of Earth)
3. One coin is 2.6 cm diameter and 1.2 mm thick.
The pile could be 100 x 100 x 100 coins.
This would be approx. 2.6m x 2.6m x 12cm, so lorry required.
4. Approx 38 per metre. So 38 000 per Km.
5. 150 000 000 x 38 000 = 5 700 000 000 000 (Five trillion, seven hundred billion).
As this number will not fit onto a calculator, children may need some help with this one. Try 150 x 38 on calculator and add nine zeroes!