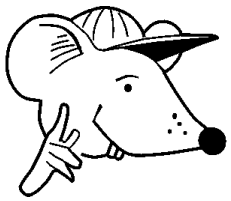
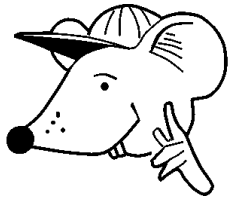
Back to Menu



MATHEMATICS



N.S. Yr. 6 P.117

Collect and organise data.
Use tables, graphs and charts (contd.).

Equipment

Paper, pencil, ruler, squared paper,
computer with database program

MathSphere

Concepts

Children should be able to collect data and record their results systematically.

They should be able to use an increasing range of tables, charts, graphs and diagrams including conversion graphs.

They should be able to make predictions based on data collected and be able to discuss their results and predictions.

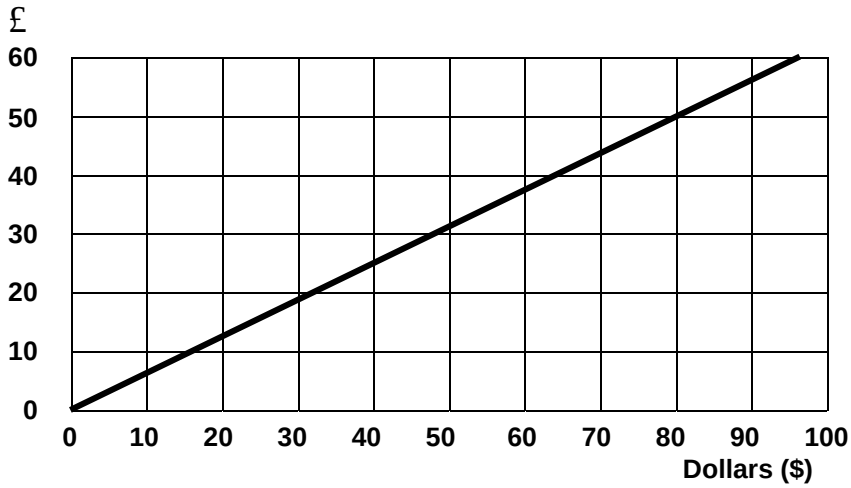
They should be able to test predictions and write down or discuss how accurate their predictions were.

They should be able to transfer data to a simple computer database program and be able to draw line graphs, understanding whether intermediate points do or do not have meaning. They should be able to make simple comparisons between different computer displays of the same data.

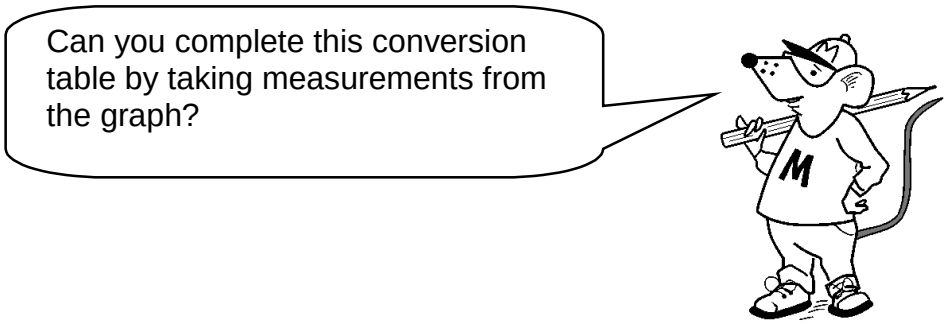
They should realise that the word 'average' can refer to either mean, median or mode, although in everyday language, use of the word 'average' nearly always refers to the mean.

The intended syllabus for this Numeracy Hour module contains much work related to examining graphs and tables in newspapers etc and interrogating pre-prepared databases that schools would need to purchase from appropriate sources. This is not the type of work that may be included in this written module and teachers should refer to the Numeracy Hour document for further details.

1. Here is conversion graph that converts dollars to pounds :



a)



Dollars	Pounds
80	
40	
	60
	10
45	
	25
0	

b) How many dollars are equivalent to £120 ?

c) How many pounds are equivalent to $160 ?

d) How many dollars are equivalent to £1 ?

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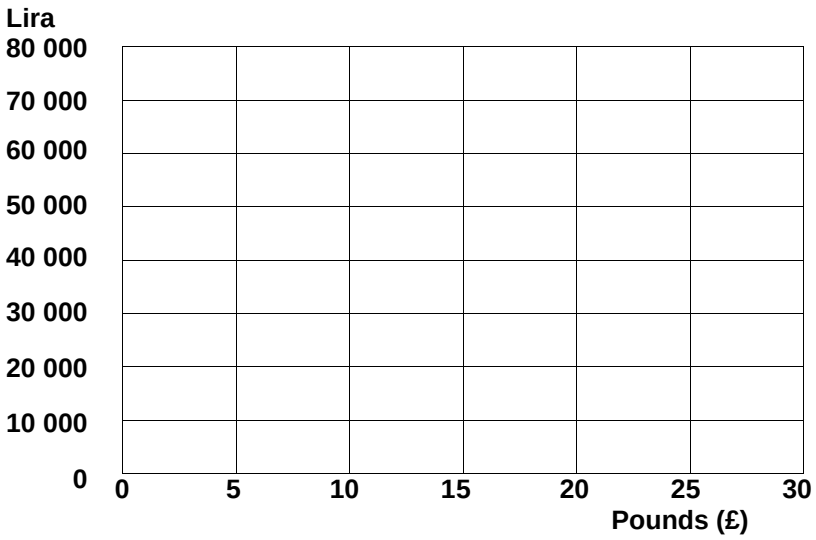
1. Here is a table that converts pounds (£) to lira. The exchange rate is about 2 500 lira to the pound.

Complete the spaces in the table.

Pounds (£)	Lira
1	2 500
5	12 500
10	
15	
20	
25	
30	

Now draw the graph of the conversion from pounds to lira.



2. How many lira could you get for **a)** £22 ?

b) £13

c) £28

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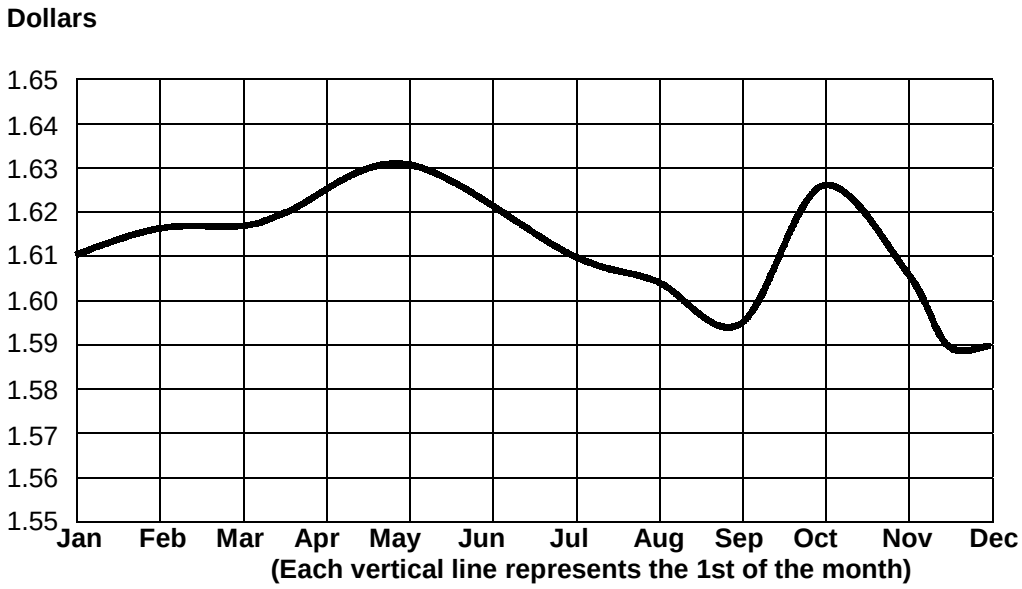
1. Here is a graph showing how the value of the US Dollar changed over one year compared to the value of the pound (£).



Now answer the following questions:

a) What was the value of the pound in dollars on 1st January?

b) What was the value of the pound in dollars on 1st July?

c) What was the value of the pound in dollars on 1st May?

d) How many dollars would you have received for one pound on 15th June?

e) How many dollars would you have received for one pound on 15th March?

f) What was the value of the pound on 1st September?

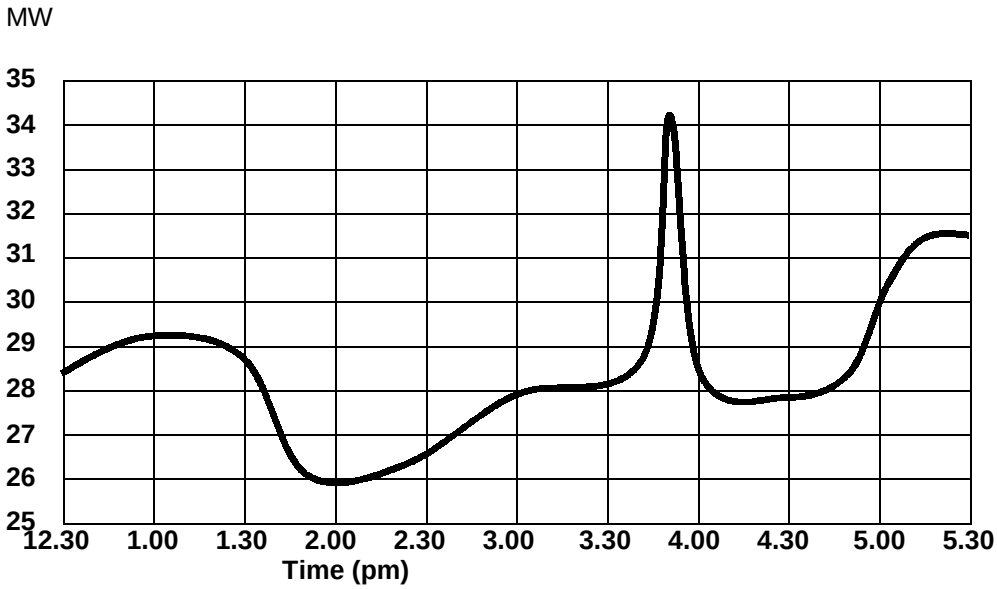
g) What was the value of the pound on 1st April?

h) Mike wanted to buy a telescope from America. He had £100 to spend. What was this in dollars on 1st October?

i) Jane had £200. How much **more** was this worth in dollars on 1st October than it was on 1st September.

1. This graph shows the amount of electricity being used in a town in England during part of cup final day. The match started at 3.00pm.

The amount of electricity being used is measured in **megawatts** (MW).



Answer these questions:

a) How much power was being used at 12.30 pm?

b) How much power was being used at 2.00 pm?

c) How much power was being used at the peak at about 3.45 pm?

d) Why was quite a lot of power being used between about 12.30 and 1.30 pm?

e) Why did the amount of power used drop at about 2.00 pm?

f) If no extra time was played after the first half, what happened in the match at 3.45 pm?

g) Why did the power used suddenly increase dramatically at 3.45 pm?

h) Why did the amount of power used rise steadily again from about 4.45 pm?

Here is some data for different situations. For each one, draw a suitable line graph and then prepare a worksheet for your friends like the ones on pages 5 and 6. Think very carefully about what is happening in each situation and ask some interesting questions about them. Some hints are given.

1. A party of hikers walks in a straight line from Puddle Town to Splash Point. They measure the height they are above sea level every ten minutes. The table shows the results.

Time (Mins)	Height (m)
0	40
10	57
20	80
30	103
40	114
50	120
60	118
70	110
80	82
90	62
100	64
110	75

Time (Mins)	Height (m)
120	100
130	109
140	108
150	100
160	70
170	49
180	50
190	55
200	96
210	135
220	138
230	100

Ask questions about the heights at different times, about how many hills the hikers walked over and where did they climb the greatest distance in the shortest time.

2. Some warm water was put into a container and allowed to cool. A little while later some ice was dropped into the water and stirred. Later still some hot water was poured in and mixed. This table shows the temperature at different times.

Time (Mins)	Temp ^{o}C
0	60.0
$^{1}/_{2}$	55.5
1	53.5
$1^{1}/_{2}$	52.0
2	51.0
$2^{1}/_{2}$	50.2
3	49.6
$3^{1}/_{2}$	49.0
4	48.8
$4^{1}/_{2}$	45.0
5	44.6
$5^{1}/_{2}$	44.3

Time (Mins)	Temp ^{o}C
6	44.1
$6^{1}/_{2}$	44.0
7	43.7
$7^{1}/_{2}$	43.5
8	50.0
$8^{1}/_{2}$	49.2
9	48.6
$9^{1}/_{2}$	48.0
10	47.3
$10^{1}/_{2}$	46.8
11	46.5

Ask questions about the temperatures at different times, about when the ice and hot water were put into the container and about how fast or slow the water was heated or cooled.

Here is some data. Draw a suitable line graph and then prepare a worksheet for your friends like the ones on pages 5 and 6. Think very carefully about what is happening in this situation and ask some interesting questions about it. Some hints are given.

1. A rocket is launched and the speed recorded every half minute. The rocket is in two stages. This means that a large engine fires first and gets the rocket going and then this and its fuel tank falls back to earth and a second engine takes over, pushing the rocket into its final orbit. This table shows the speed every half minute.

Time (Mins)	Speed (mph)
0	0
$^1/_2$	500
1	1 000
$1^1/_2$	1 500
2	2 000
$2^1/_2$	6 000
3	9 000
$3^1/_2$	9 500
4	10 200
$4^1/_2$	10 500
5	10 900
$5^1/_2$	11 100
6	11 400
$6^1/_2$	11 600
7	11 900
$7^1/_2$	12 100
8	12 300
$8^1/_2$	12 500
9	12 700
$9^1/_2$	12 800
10	13 000
$10^1/_2$	13 000

Ask questions about how fast the rocket was travelling at different times, about when the first stage engine finished firing and the second stage engine took over and when the rocket had the greatest acceleration.

If a rocket needs to travel at least as fast as 17 000 mph to stay in space , was this rocket able to stay in orbit?

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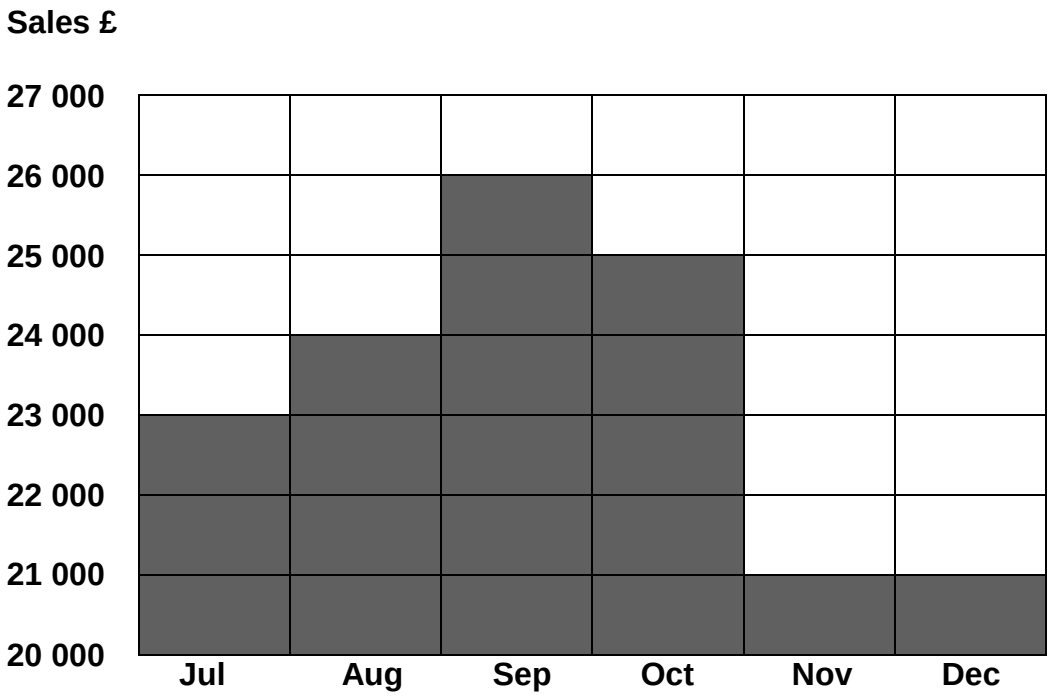
1. This graph shows the sales of clothes in a shop during the last six months of the year.



Say whether these statements are true or false:

a) The sales in September were twice as much as in July.

b) More was sold in October than in November and December together.

c) Sales in September were six times as much as in November.

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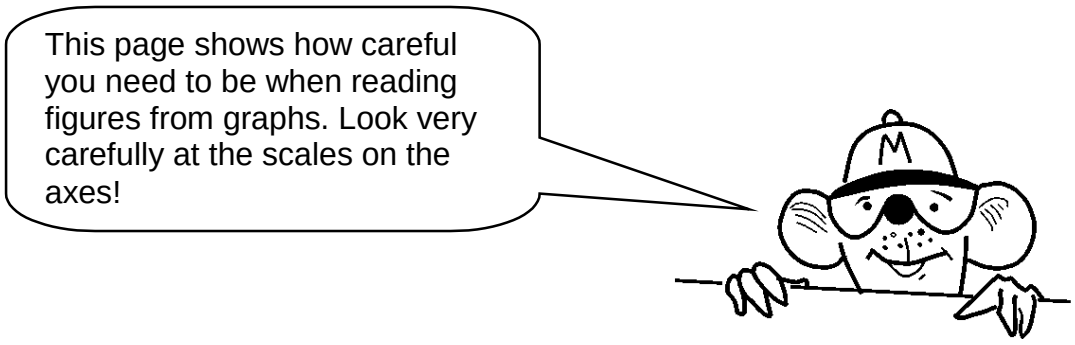
d) Now draw the graph again, this time starting at £0 on the sales axis. How is your graph different to the one above?



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Ideas Page

Here are some examples of what pupils can do to fulfil the rest of the work covered in this module:

Graphs

1. Find examples of graphs in newspapers and magazines. Which ones show just the top of the graph? How does this affect the way we view the graph?

2. Can you find any graphs in which the axes are not labelled or the scales not clearly marked?

3. Can you find any block graphs in which greater values are indicated not only by taller columns, but also by wider columns, thus creating the appearance of artificially enlarged values?

4. Find examples of pictograms in which symbols represent quantities. Are these easy to read and interpret?

Computer Work

1. Use some of the data found on the MathSphere CD about pupil dimensions. Hints for its use are also given, but the analysis and manipulation of this data can be done with a database or spreadsheet program.

2. Purchase professional databases such as a full census return for a Victorian village. Use a database or spreadsheet program to analyse this data, draw graphs etc.

3. Collect your own data and enter this onto a database. There are many possibilities, but one is a database on cars. Fields could include registration number, make, model, colour, miles driven, age and miles per litre.

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Answers

Page 3

1. a)

80	**50**
40	**25**
Approx 96	60
Approx 16	10
45	**Approx 28**
40	25
0	**0**

b) Approx $192

c) £100

d) $1.6 are equivalent to £1.

Page 4

1.

£	**Lira**
1	2 500
5	12 500
10	**25 000**
15	**37 500**
20	**50 000**
25	**62 500**
30	**75 000**

2. a) 55 000 **b)** Approx 32 500 **c)** Approx 70 000

Page 5

1. a) $1.61 **b)** $1.61 **c)** $1.63 **d)** Approx $1.615 **e)** $1.62
f) $1.595 **g)** $1.625 **h)** $162.50 **i)** $6.00 ($325.00 – $319.00)

Page 6

1. a) Approx 28.5 MW
b) Approx 26 MW
c) Approx 34.3 MW
d) People preparing midday meal.
e) Cooking finishes/people relaxing.
f) It was half time.
g) People put kettles on for tea/coffee.
h) People preparing evening meal/heating if weather cold.

Page 9

1. a) , **b)** and **c)** all false. The heights of the bars gives a false impression because the **sales** axis does not begin at £0.

d) The new graph gives a much clearer impression of the relative sales for each month. The technique of showing only the tops of columns is common when a false impression is called for.