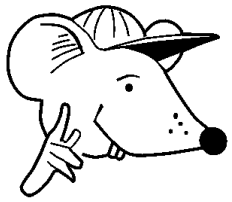
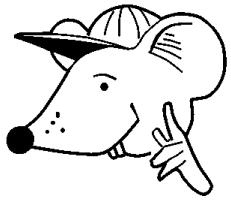


MATHEMATICS



Y5 Statistics

5720

Further data handling
Use median and mode

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.

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 interrogate a prepared database and decide which is the best form of presentation of the data for the purpose in hand.

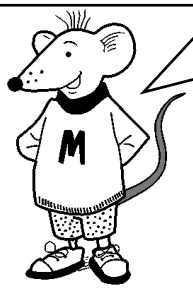
Note There are some very difficult concepts in this module for young children (eg. why it is that points between plotted points sometimes have meaning and sometimes do not?). It is essential that much of the work in this module is based on discussion and that the same important concepts are discussed as often as possible. The examples given here should provide a skeleton around which much practical and 'real life' work can be based. Examples from real life situations (often found in newspapers) should be noted and discussed with pupils.

Children will also need much help with the database work and guidance on how to use the programs.

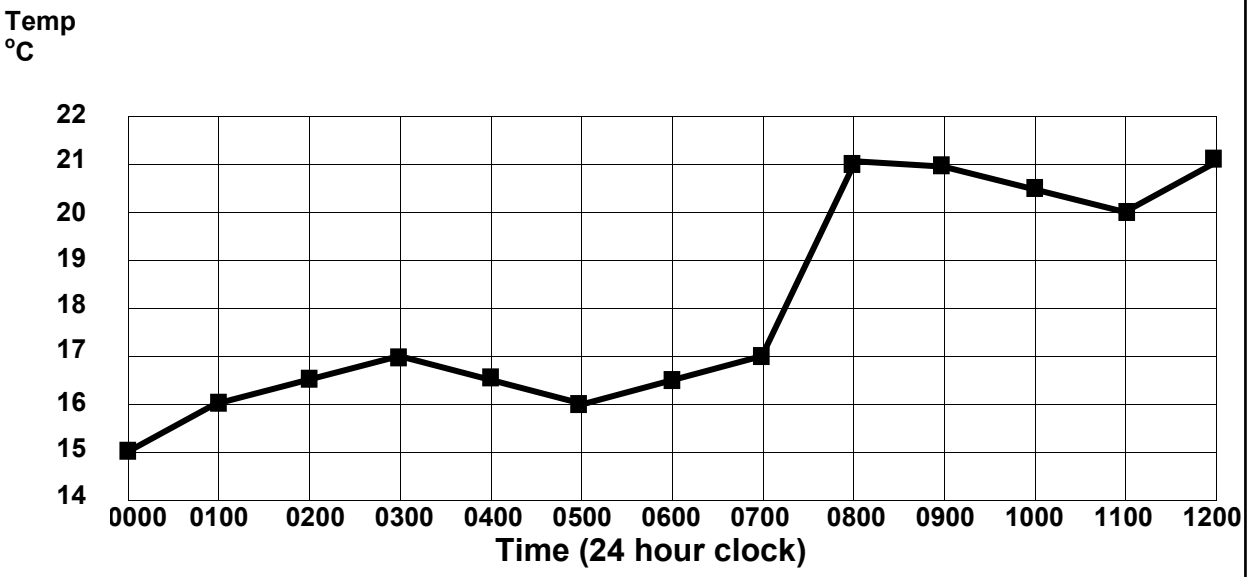
1.

Try to find some graphs to look at from real life. You will often find them in newspapers or magazines. You may see some in a science book or perhaps your teacher or parent will have some for you to look at.

Try to understand what the graph is about and what information it is giving you.



2. Here is a graph of the temperature in a bedroom over a twelve hour period.



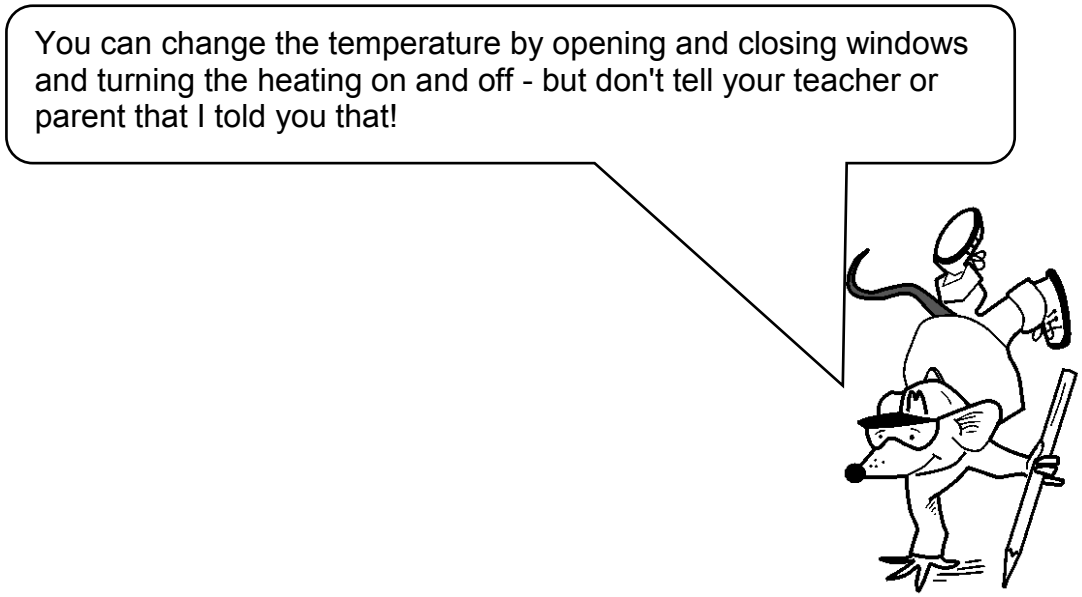
a) What was the temperature at 0300 and at 0800?

b) Estimate the temperature at 0730.

c) At what time do you think the central heating was switched on?

d) Explain why the points between the plotted points have real meaning.

1. Record the temperature in a room every half hour for several hours. Draw a line graph of the temperature like the one on page 3.



a) What was the highest temperature you recorded?

b) What was the lowest temperature you recorded?

c) What was the range of temperatures you recorded?

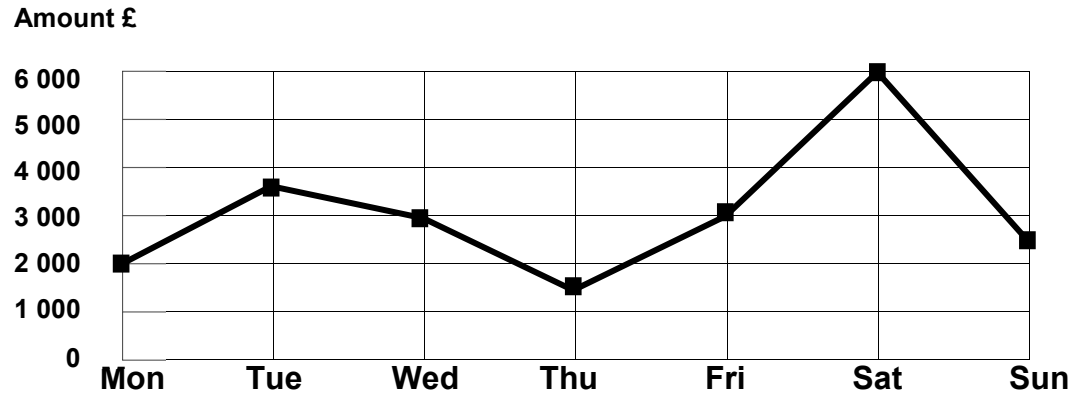
d) Are there any places on your graph when the temperature stayed roughly the same? Why do think that was?

e) When did the temperature rise or fall very quickly? Why do you think that was?

Estimate the temperature on the quarter hours between your measurements and write them down in a table.

Now put your data into a computer database and tell the computer to draw a line graph of the results. How is it different to your graph?

1. This graph shows the amount of money collected by a charity in one week in a town in Sussex.

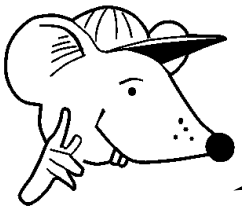


a) Explain why the points between the plotted points have no real meaning.

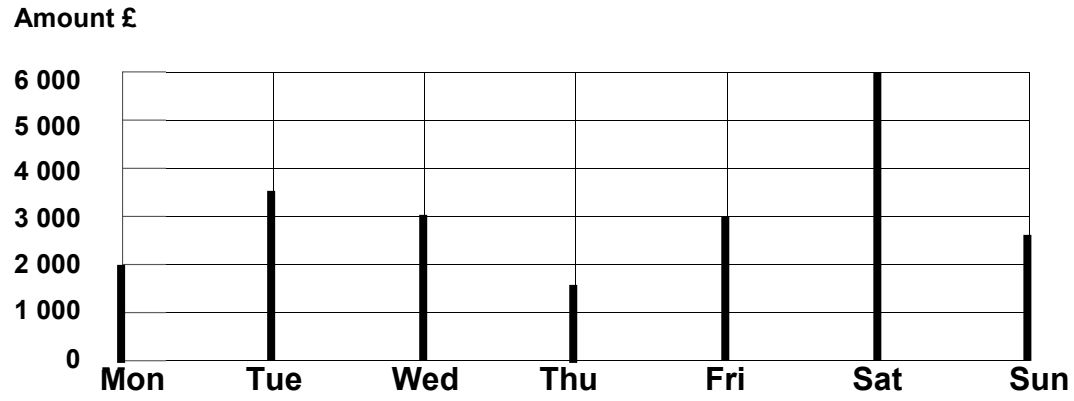
b) What was the smallest amount of money raised?

c) What was the largest amount of money raised?

d) How much was raised on Tuesday?



Line graphs in which the points between the plotted points have no real meaning are often confusing. It is generally better to draw block graphs or column graphs like the one below:



1. Here is a table showing the speed of a car every ten seconds.

Time (Secs)	Speed (Km/Hr)
0	20
10	40
20	50
30	50
40	40
50	60
60	65
70	70
80	70
90	60
100	30
110	40
120	50
130	70
140	75

Draw a line graph showing the speed of the car over this time.

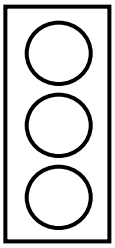
Now answer the following questions:

a) What was the fastest recorded speed of the car?

b) What was the slowest recorded speed of the car?

c) Estimate the speed of the car after 85 seconds.

d) Estimate the speed of the car after 125 seconds.



e) During the journey the car passed through two sets of traffic lights. What can you say about the colour of the lights as the car passed through?

f) Can you put this information into a database program and tell the computer to draw the graph for you? How is the computer's graph different to your graph?

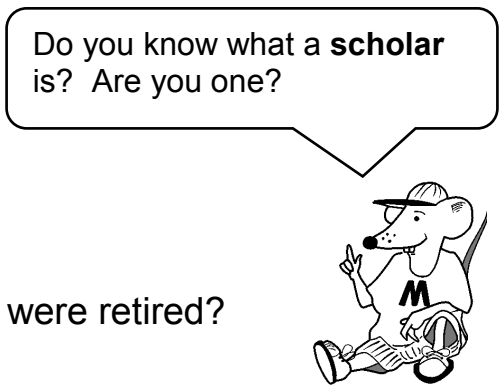
1. Here is some data collected in the census of 1891 in a village in Suffolk.

House Number	Name	Relation to Head of Household	Marital Status	Age	Occupation
1	Fred Whittaker	Head	Married	48	Farmer
1	Winifred Whittaker	Wife	Married	44	Housewife
1	John Whittaker	Son	Single	20	Farmer
1	Thomas Whittaker	Son	Single	18	Blacksmith
3	Mary White	Head	Widow	67	Retired
3	Joan Thomas	No relation	Single	26	Servant
5	John Samuels	Head	Married	36	Teacher
5	Rachel Samuels	Wife	Married	32	Teacher
5	Patrick Samuels	Son	Single	8	Scholar
5	Julie Samuels	Daughter	Single	6	Scholar
7	Kenneth Smith	Head	Married	49	Farmer
7	Henrietta Smith	Wife	Married	49	Housewife
7	Kenneth Smith	Son	Married	24	Farmer
7	Evelyn Smith	Daughter-in-law	Married	23	Cleaner
9	Jack Simmons	Head	Married	45	Vicar
9	Joan Simmons	Wife	Married	38	Vicar's wife
9	Jennifer George	No relation	Single	25	Servant
11	Sidney Wallace	Head	Married	41	Farmer
11	Margaret Wallace	Wife	Married	39	Housewife
11	Joyce Wallace	Daughter	Single	19	Dressmaker
11	George Wallace	Son	Single	17	Farmer
11	Prudence Wallace	Daughter	Single	9	Scholar
13	Henry Tomkins	Head	Married	68	Retired
13	Patricia Tomkins	Wife	Married	66	Retired

Put this information into a computer database. Do not forget to save it!

Sort the information in as many ways as you can. Here are some suggestions:

Put the people in age order.
Draw a graph of their ages.



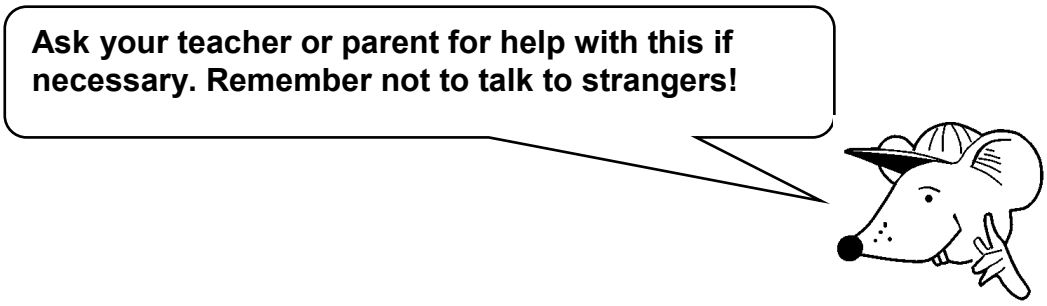
Find all the people over 40 years old.

Put everyone in order of occupation.
How many were farmers? How many were retired?

Put everyone in order of marital status.
How many were married? How many were widowed?

1. Carry out a survey of your own similar to the one on page 7.

Choose a few houses in your road or people in your class and try to find out about the people who live there. Complete the table below:



House Number	Name	Relation to Head of Household	Marital Status	Age	Occupation

Now you can put this information on a computer and see how the street you have chosen is different from the one in Suffolk in 1891. For example, how many of your houses have servants?

When there is an even number of data items, there will be two middle numbers, so finding the **median** can be a little tricky.

If there is an even number of data items, to find the median we work out the average of the middle two numbers**.**

e.g. Find the median of these numbers: **16, 23, 26, 30, 34, 40.**

The middle two numbers are **26** and **30**, so the median of the set of numbers is the average of **26** and **30**, which is **28** !

1. Find the mode, median and range of each of these sets of numbers:

a) 7, 4, 3, 10, 9, 12, 15, 4, 9, 14, 9

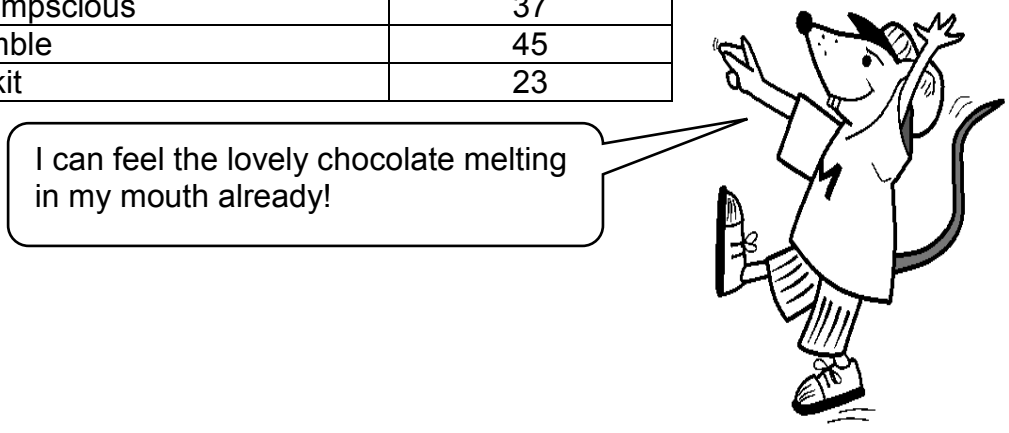
b) 12, 23, 13, 15, 12, 14, 22, 12, 15, 13

c) 45, 46, 47, 46, 48, 49

2. Now collect some real data and find the mode, median and range of your figures. You can do this by weighing people or measuring their heights, for example.

3. Enter this data about favourite chocolate bars into a computer database program and tell it to draw a pie chart of the data.

Chocolate Bar	**Number of votes**
Fizzchoc	35
WhackoBar	56
Melt in the Mouth	24
Scrumpscious	37
Tremble	45
Sockit	23



Answers

Page 3

2. a) 17°C and 21°C **b)** 19°C

c) 0700 (as it is followed by a sudden rise in temperature)

d) Because each point represents a real time.
Eg. half way between 0600 and 0700 is 0630.

Page 4

1. Results obtained will depend on data collected and plotted.

Page 5

1. a) Because each day is entirely represented by a plotted point and there are no gaps between the days. **b)** £1 500 **c)** £6 000 **d)** £3 500

Page 6

1. a) 75 Km/hr

b) 20 Km/hr

c) 65 Km/hr

d) 60 Km/hr

e) They were probably green as the car did not appear to stop on its journey.

f) The graph should be essentially the same, but may differ in detail such as the scaling of the axes.

Page 9

1. a) Mode = 9, median = 9, range = 12

b) Mode = 12, median = 13.5, range = 11

c) Mode = 46, median = 46.5, range = 4