

STATISTICS

1) Data

When we ask questions like “How many students in my class have a mobile phone?” and “how many of these phone are Nokia phones?” we are collecting information about mobile phones. This information is called data. Statistics is the study of data.

Data can be collected in a number of ways:

- by interviewing people
- by observing something happening
- by using questionnaires

When collected data, the data should be sorted and presented in a user-friendly format.

2) Presenting data

2.1) Tables of distribution

Example : The information from the class survey can be laid out in a distribution table. The size means how often something occurs. As we can see, the table makes the information easier to understand.

Number of sisters and brothers	0	1	2	3	4	5	6
Number of students / size	2	4	7	4	3	0	0

This survey works with discrete values between 0 and 6. The total number or number of values is 20.

2.2) Graphs

- **BAR CHARTS** are a very useful way of presenting data because we can see the information by looking at the height of the columns. To draw a bar chart, we put one element of the information on the vertical axis and the other on the horizontal axis. The height of each bar is proportional to the number of students of each column.
- **PIE CHARTS** are circles which are divided into sectors. The full circle represents the total number, and each sector represents a portion of the total number.

To draw a pie chart, use the following steps:

Step 1 : Find out the total number. Then calculate the angle in each sector. To do this, use the formula for

$$\text{each sector} : \frac{\text{Number}}{\text{Total}} \times \frac{360}{1}$$

Step 2 : Draw a circle, mark in the centre and draw a line from the centre to the radius.

Step 3 : Use your protractor to mark in the various angles for each sector.

Step 4 : Give a name to each sector

- **TREND GRAPHS**

Trend graphs are used to show how data change over time.

When drawing a trend graph, use the following steps.

Step 1 : Draw a horizontal and vertical axis, each representing an element of the data. Always put the period of time on the horizontal axis.

Step 2 : Plot the points on this and join the points with straight lines.

3) Working with data

3.1) Mean

The mean of a set of numbers is the sum of all numbers divided by the number of numbers. The mean is also known as the average.

3.2) Weighted average of a distribution of values

A weighted average of a group gives more weight to one in the group if it occurs more than once.

The weighted average of a distribution of values is the sum of all the values multiplied by the corresponding numbers, divided by the number of values.

Example : The table below shows the mark (from 1 to 10) scored by the 20 pupils in the class of the first part.

Marks	1	2	3	4	5	6	7	8	9	10
Number of pupils	1	1	1	3	5	3	2	2	1	1

This table is called a value distribution table. The average mark is found by dividing the total number of marks by the total number of pupils. To find the total number of marks we multiply each mark (or value) by the number of pupils who received that mark. The mean is usually denoted by x .

Therefore the weighted average =

$$x = \frac{1 \times 1 + 2 \times 1 + 3 \times 1 + 4 \times 3 + 5 \times 5 + 6 \times 3 + 7 \times 2 + 8 \times 2 + 9 \times 1 + 10 \times 1}{1 + 1 + 1 + 3 + 5 + 3 + 2 + 2 + 1 + 1}$$

$x = 5.5$ marks

The average mark is 5.5

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Cross words

DATA ! If you want to do statistics, the first thing to do is to collect ????

SORTED Once we have collected data, it is useful to classify them (for example from the smallest to the biggest one), then we say data are ??????

TABLE The information from a survey can be laid out in a distribution ??????

SIZE The ???? means how often something occurs.

GRAPH A table makes the information easier to understand, but if you want to make it even easier to understand, you should use ??????

BAR CHARTS On a ???_?????, you can see the information by looking at the height of the columns

PIE CHARTS On a ???_?????, each sector of the circle represents a portion of the total number.

PROTRACTOR To draw a pie chart, you have to use your ?????????? to mark in the various angles for each sector.

TREND GRAPHS To show how data change over time, you should use ?????_?????

AXIS When drawing a trend graph, you have to draw horizontal and vertical ????

AVERAGE The mean is also called the ????????

WEIGHTED If you want to give more importance to one value in a group of values, you should calculate ???????? average.