

## SECTION 10

An ogive is a specialised line graph which shows how many items there are which are below a certain value.

The horizontal axis shows the upper class boundaries marked on the scale, just like a histogram.

The vertical axis shows the cumulative frequency, which is just a fancy name for a running total.

Some line graphs are actually ogives!

### Example 10a

Here are the monthly amounts of money donated to a church roof appeal fund during a 6-month period.

Month	Mar	Apr	May	Jun	Jul	Aug
Donations (£)	740	970	1300	1700	1020	1480

The church would like display the total amount donated to date, month by month, thus showing what the grand total is by the end of any period of time.

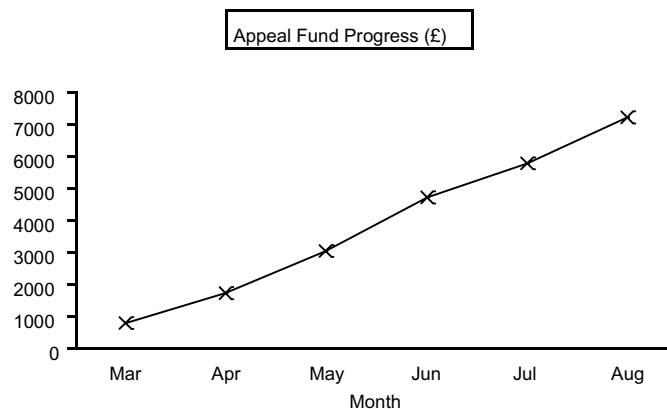
The table showing this data looks like this:

Last day of month	Mar	Apr	May	Jun	Jul	Aug
Total raised so far	740	1710	3010	4710	5730	7210

Draw an ogive to illustrate this.

### Solution:

A line graph showing the cumulative totals looks like this:



You may find it useful to look back at pages 38 to 41 of Numeracy Outcome 1 pack at this stage.

### Example 10b

The following table shows the ages of people on a commuter train one morning. Draw an ogive to show this information.

Age	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89
No. of People	37	59	156	172	143	75	22	10

#### Solution:

If we look at the first interval, 10-19, this will include people up to the day before their 20th birthday, so the class boundary between this class and the next one is 19 years 364 days 23 hours 59 minutes and counting ...

This is splitting hairs far too much, so we make the upper boundary of the first class 20.

The next upper class boundary (UCB) will be 30 and so on.

That explains the 'UCB of Age' column in the table alongside.

Next, we calculate the cumulative frequency. We start at 37.

Next line:  $37 + 59 = 96$   
(there are 96 people altogether below the age of 30)

Next line:  $96 + 156 = 252$  (there are 252 people altogether below the age of 40)

Next line:  $252 + 172 = 424$  (there are 424 people altogether below the age of 50)

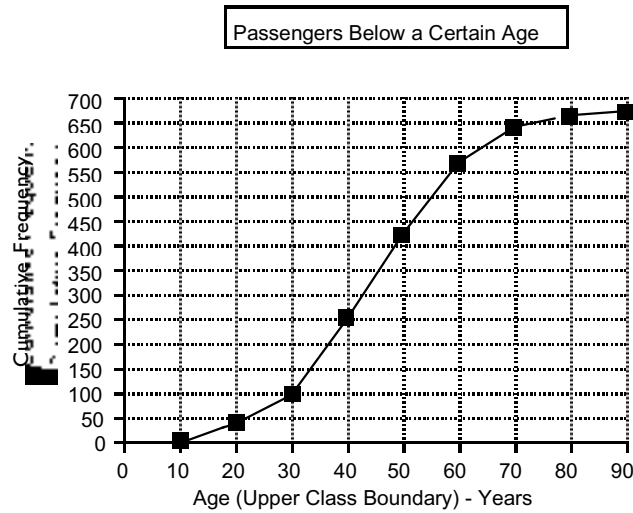
And so on.

Age	UCB of Age	No. of People	Cum. Freq.
10-19	20	37	37
10-29	30	59	96
30-39	40	156	252
40-49	50	172	424
50-59	60	143	567
60-69	70	75	642
70-79	80	22	664
80-89	90	10	674

Note also that there is no-one below the age of 10. So the first point on the graph will be at 10 years with a 0 cumulative frequency.

The last line gives us the grand total of commuters on the train: 674

The ogive appears below.



? 10

1. This table shows the weights of 40 schoolchildren.

Add a cumulative frequency column and an upper class boundary column to the table.

Then draw the ogive.

Weight (kg)	Frequency
30-32	17
32-34	25
34-36	43
36-38	52
38-40	39
40-42	10
42-44	8

2. This table shows the wages paid to a sample of workers in a large factory.

Add the necessary columns, and draw the ogive.

Wage (£)	Frequency
100-120	21
120-140	47
140-160	95
160-180	73
180-200	62
200-220	50
220-240	31
240-260	19
260-280	10