Check-Up

45

Bar charts for comparing two sets of data

Percentage of pupils gaining level 4 or above
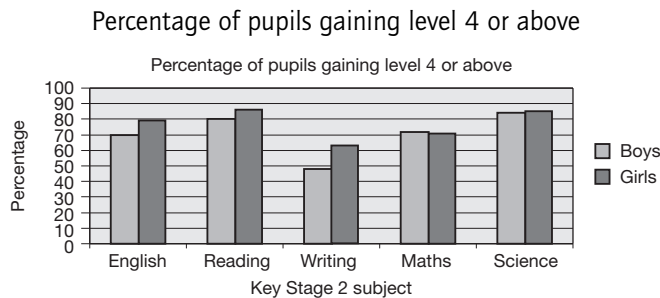
The graph shown compares the performances of boys and girls in terms of achievement at level 4 or above in the Key Stage 2 tests in the year 2000.

a) In which area was the proportion of boys reaching level 4+ higher than that of girls?

b) In which area was the disparity between the proportions of boys and girls the greatest?

c) What was the difference in percentage points between boys and girls in this area?

d) Approximately, what was the ratio of the percentages of boys to the percentage of girls achieving level 4+ in this area?

Answers to check-up 45

a) Only in maths.

b) Writing.

c) 15 percentage points.

d) About 3:4.

Discussion and explanation of check-up 45

As shown in the graph for this check-up, we can use bar charts to make comparisons between two sets of data. In this case we have data for boys and girls separately, for five areas of the Key Stage 2 curriculum. The variable represented by the heights of the columns is the percentage of boys or girls achieving level 4 or above in the Key Stage 2 tests in the year 2000. When we particularly want to make comparisons it makes sense to draw the columns side by side, as shown, using different colours or shadings. We can then see at a glance where one group is above or below the other. In this case it is clear that the proportions of girls exceed the proportions of boys in all subjects except mathematics. In mathematics and science the difference between the proportions of boys and girls is relatively small. The disparity in writing stands out very clearly. Only 48% of boys reached level 4+, compared with 63% of girls. The difference in the heights of the columns is the difference in percentage points, namely 15%.

Because the vertical axis starts at zero, we can also compare the heights of the columns by ratio. The height of the column for boys for writing looks to me to be only about three-quarters of the height of the column for girls. So, we could deduce from a quick glance at the graph that the ratio of the boys' proportion to the girls' proportion is about 3:4.

The diagram below shows an alternative form of bar chart that is sometimes used to represent two sets of data of this kind. This is not so useful for making quick comparisons between boys and girls. This kind of representation is probably more useful if what you are interested in mainly is how the boys and girls did separately in the various subjects. But in that case, you might as well just draw two separate bar charts!

You will also sometimes see bar charts for two sets of data drawn with 'stacked columns', as in Further Practice 45.1. This form of graph is used only when the purpose is first to show the overall totals in each category, and then, secondly, to compare the contributions of each of two or more components (e.g. values for boys and girls) to the total in each category.

Girls	Boys	
		English
		Reading
		Writing
		Maths
		Science
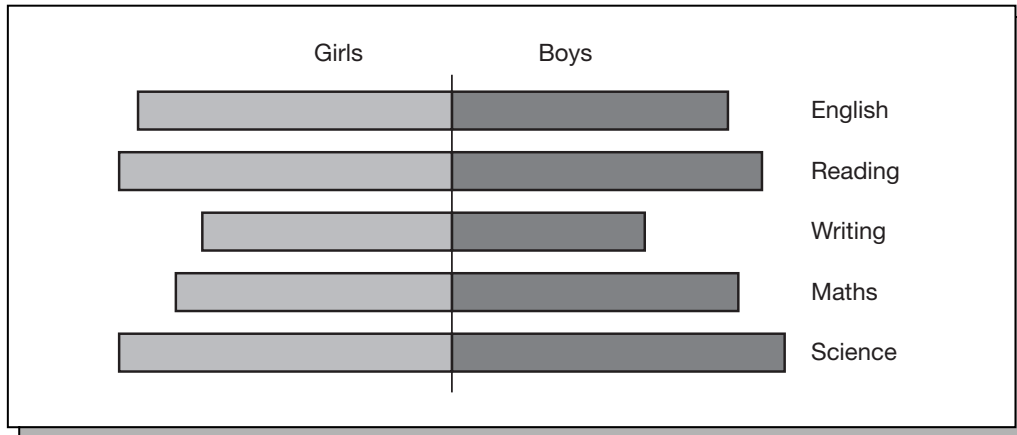
Summary of key ideas

◆ A bar chart can be used to make comparisons between two sets of data (such as results in various subjects for boys and girls separately), by drawing columns side by side.

◆ Comparisons between the heights of columns might be made in terms of difference or (provided the vertical axis starts at zero) ratio.

◆ Stacked-column bar charts are used to show the contributions of two or more components to an overall total in each category.

Further practice

45.1
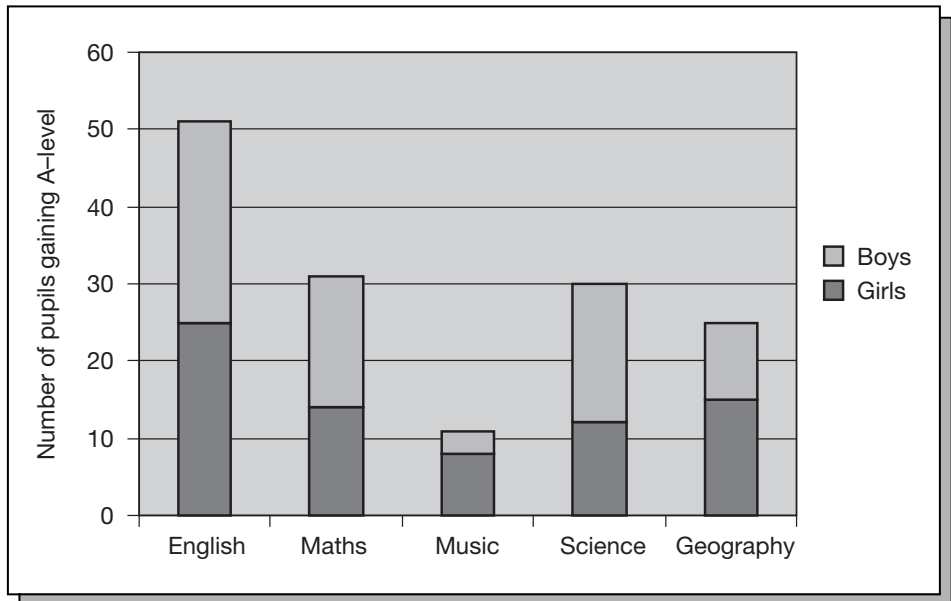
This graph displays the numbers of pupils in a sixth form gaining A-levels in various subjects, showing also how these numbers are split between boys and girls. What are the particular reasons for using a stacked-column graph here, rather than having the columns for girls and boys alongside each other?