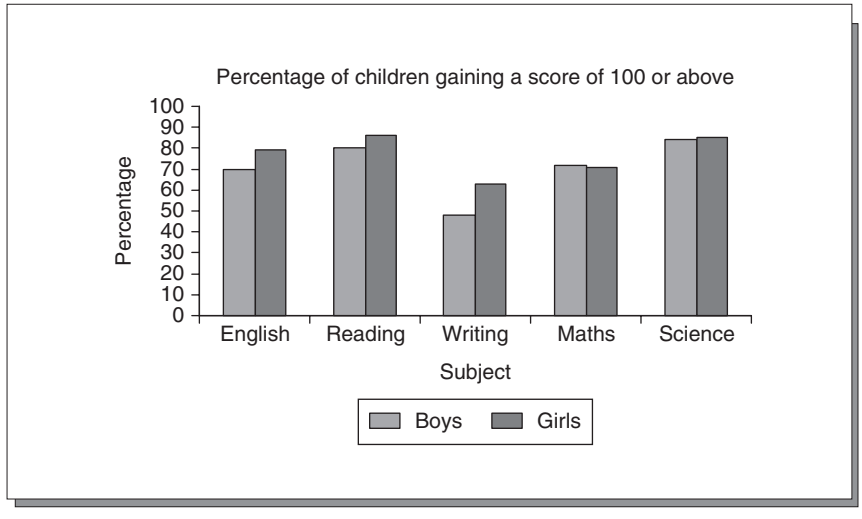
KNOWLEDGE CHECK

45

BAR CHARTS FOR COMPARING TWO SETS OF DATA



This question refers to a set of assessments across a number of subjects in each of which children are given scores up to 150. The graph provides data related to the proportions of boys and girls scoring 100 or more in each subject.

a) In which area was the proportion of boys reaching a score of 100 or above higher than that of girls?

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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 a score of 100 or above in this area?

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ANSWERS TO KNOWLEDGE CHECK 45

a) Only in maths.

b) Writing.

c) 15 percentage points.

d) About 3:4.

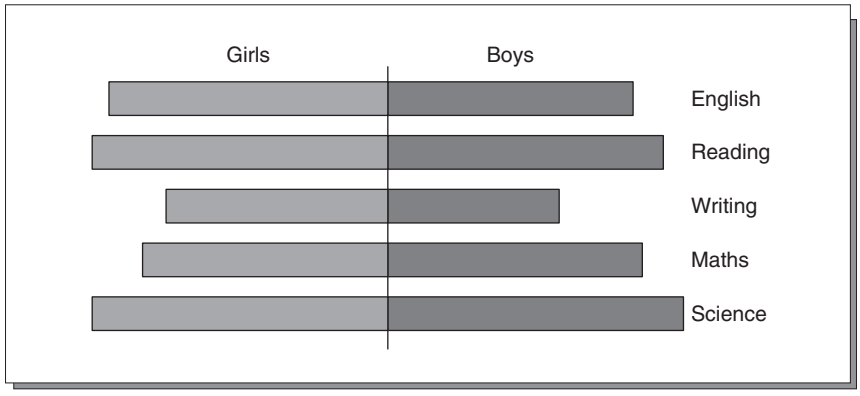
DISCUSSION AND EXPLANATION OF KNOWLEDGE CHECK 45

As shown in the graph for this knowledge check, 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 curriculum. The variable represented by the heights of the columns is the percentage of boys or girls achieving a score of 100 or above in the tests in that particular year. 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 a score of 100 or above, 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.

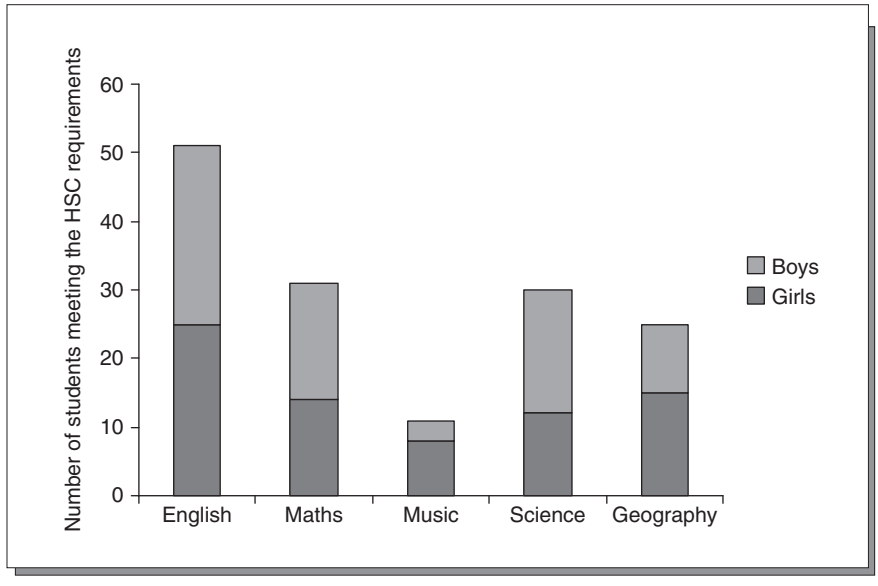

Girls
Boys
English
Reading
Writing
Maths
Science

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 Year 12 students in a secondary school who met the requirements for various subjects to count towards their HSC award, 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?

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