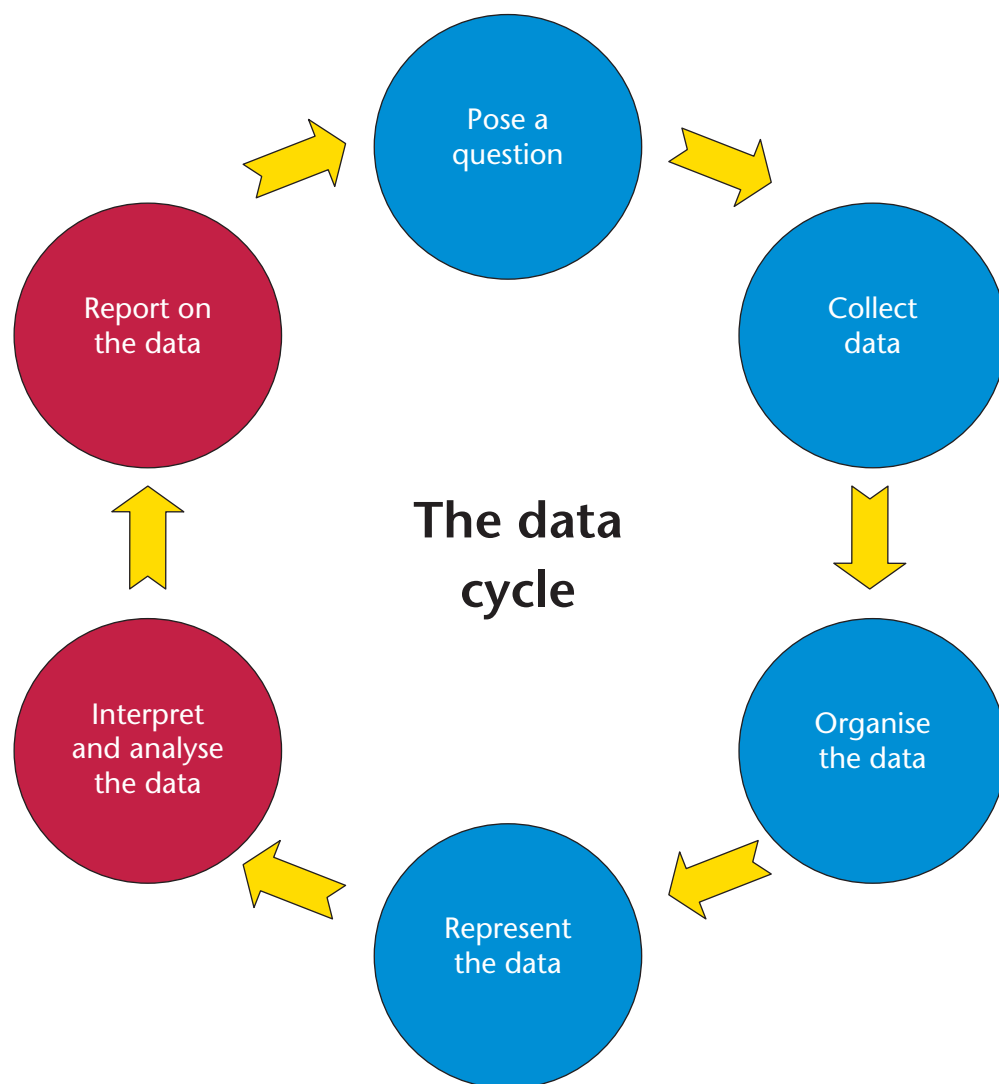


# CHAPTER 15

## Interpret, analyse and report on data

By now you should be able to read and interpret data represented in words, bar graphs, double bar graphs, pie charts and histograms. The activities in this chapter will give you more practice in interpreting and analysing such data. At the same time, you will be asked to think critically about the data, especially how the ways in which data is presented can mislead the reader into drawing inaccurate conclusions. You will also practise reporting on data by writing short paragraphs to summarise the data presented to you.

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# 15 Interpret, analyse and report on data

## 15.1 Interpreting and reporting on data

### CRITICALLY READING AND REPORTING ON DATA

1. Read the following paragraph and answer the questions that follow.

In 2009, a sample of 2 500 schools from about 26 000 schools across South Africa took part in a survey to provide data about learners and schools. The sample included schools from each province as follows: 415 schools from the Eastern Cape, 238 from the Free State, 265 from Gauteng, 386 from KwaZulu-Natal, 326 from Limpopo, 248 from Mpumalanga, 129 from the Northern Cape, 275 from North West and 218 from the Western Cape.

Adapted from: *Census @ School Results 2009*, Statistics South Africa

- (a) What was the population of the survey? .....
- (b) What was the sample of the survey? .....
- (c) Which province were most of the schools from? .....
- (d) Which province were the fewest schools from? .....
- (e) Complete the first two columns of the table by listing the provinces in order from the province that had the most schools to the province that had the fewest schools participating in the survey.

Province	Number of schools	Percentage of all schools

- (f) Complete the last column by working out the percentage of the whole that the schools in each province make up. You may use your calculator for this question. (Round off to one decimal place.)
- (g) Write three to five lines as a summary report of the data described in the paragraph on the previous page. The summary should give an idea of the highest and lowest data items, as this indicates the range of the data.

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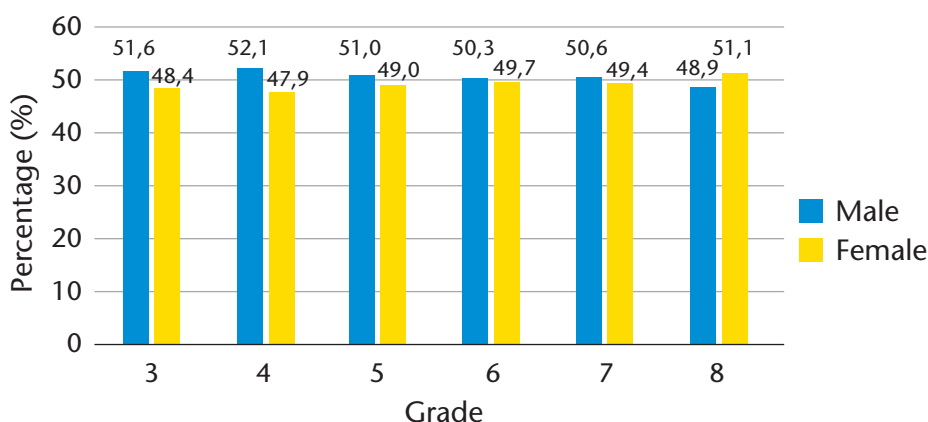
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2. The graph below shows the percentage of male and female learners at schools in Grades 3 to 8 in 2009.

**Percentage of male and female learners in Grades 3 to 8**



(Source: *Census @ School Results 2009*, Statistics South Africa)

- (a) Which grade has the highest percentage of females? .....
- (b) Which grade has the lowest percentage of females? .....
- (c) Which grade has the highest percentage of males? .....
- (d) Which grade has the lowest percentage of males? .....
- (e) If 150 000 Grade 6 learners took part in the survey, how many girls and how many boys were there in Grade 6? You may use your calculator.

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- (f) Complete the following summary report:

The graph shows that the number of male learners seems to (decrease/increase) the higher the grade. For example, in Grade 3, .....% learners were male compared to .....% in Grade 8. The number of female learners seems to (decrease/increase) the higher the grade. For example, in Grade 3, .....% learners were female compared to .....% in Grade 8.

- (g) Based on the graph, would you expect there to be more or fewer males in Grade 10? Explain your answer.

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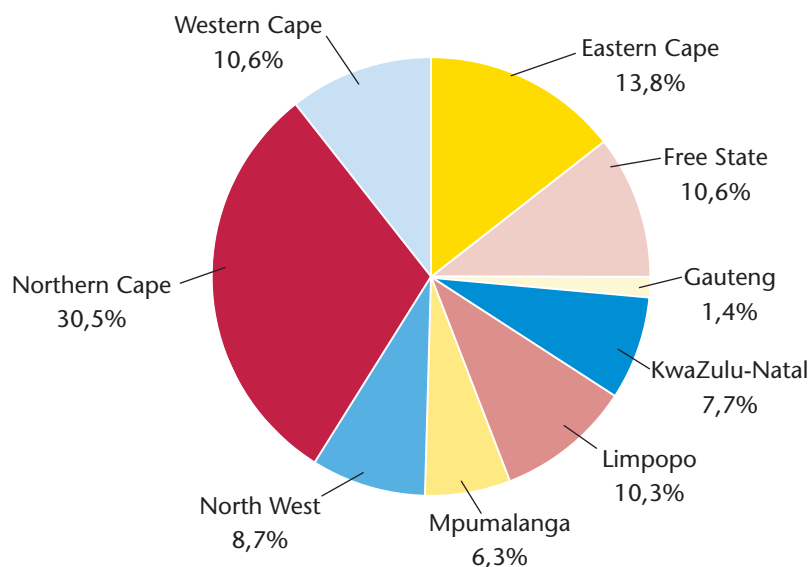
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- (h) Based on the graph, would you expect there to be more or fewer females in Grade 10? Explain your answer.

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3. The following pie chart shows the land area of each province in 2011.



(Source: *Census 2011: Census in brief*, Statistics South Africa)

- (a) Which province has the largest land area? .....
- (b) Which province has the smallest land area? .....
- (c) Which three provinces have more or less the same land area?

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(d) How much bigger is the Northern Cape than Gauteng? (Use a calculator.)

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(e) Are we able to tell from the pie chart which province has the largest population? Explain your answer.

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(f) If the total land area of South Africa is 1 200 000 km<sup>2</sup>, how many square kilometres are the largest and the smallest provinces?

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(g) Write a short paragraph to summarise the data shown in the pie chart.

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## 15.2 Identifying bias and misleading data

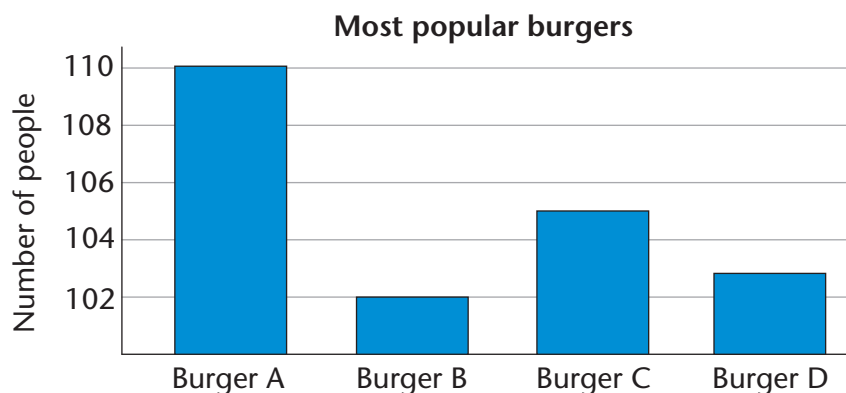
Sometimes the ways in which data is presented could be intentionally or unintentionally **biased** or misleading. As you work through the following activities, think carefully about:

- data that is not necessarily shown by the graph
- when, how and where the data was collected
- which scales are used on the graphs
- which summary statistics (mean, median and mode) are used to summarise the data.

**Bias** means that a person prefers a certain idea and possibly does not give equal chance to a different idea.

## CRITICALLY ANALYSING DATA

1. Look at the bar graph below and answer the following questions:



(a) Which burger is the clear favourite? .....

(b) The height of the bars indicate that burger A is liked by five times as many people as burger B. Is this true? Look at the vertical scale.

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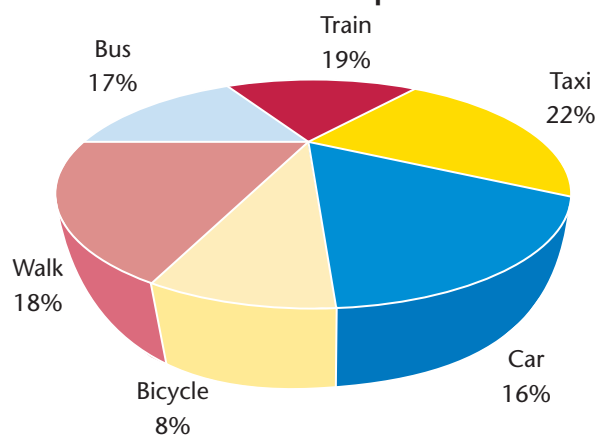
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(c) In your exercise book, redraw the bar graph, but show the full vertical scale.

2. Look at the pie chart.

**Learners' modes of transport to school**



(a) What is the second most common mode of transport that learners use?

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(b) Which mode of transport is the least common one?

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(c) Is the pie chart misleading in any way? Explain.

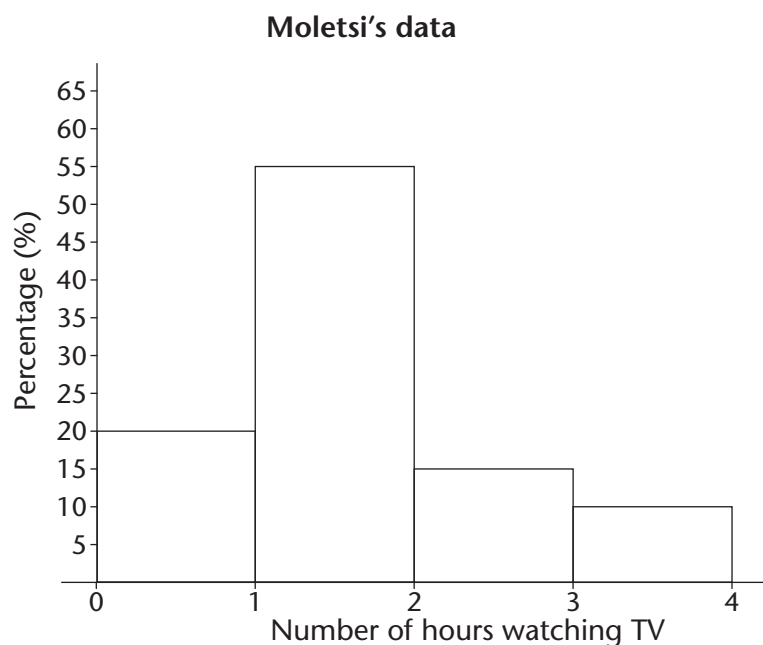
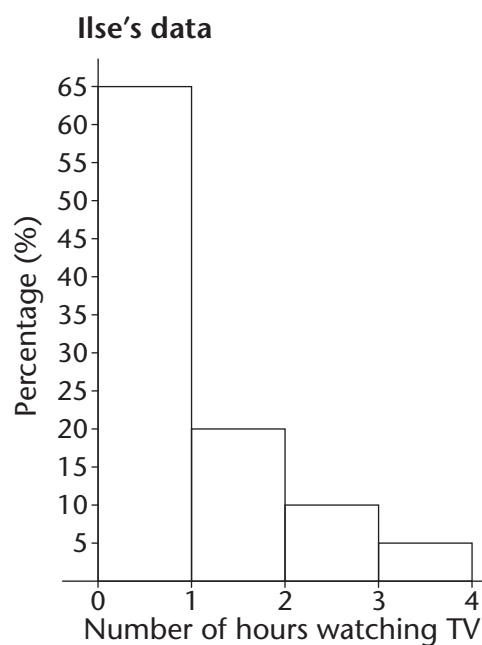
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3. Ilse and Moletsi wanted to find out more about the number of hours people spend watching TV on a particular public holiday. Ilse did her survey on the public holiday from 13:00 to 15:00. She visited a supermarket and asked adult respondents to complete her questionnaire. Moletsi did his survey on the same day from 17:00 to 19:00. He went from door to door in his neighbourhood and asked the children to complete his questionnaire.





(a) According to Ilse's data, how long did most people spend watching TV on the public holiday?

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(b) According to Moletsi's data, how long did most people spend watching TV on the public holiday?

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(c) Write a paragraph to summarise and compare Ilse's data and Moletsi's data.

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(d) How could the time when the data was collected have affected the data?

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(e) How could the place where the data was collected have affected the data?

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(f) How could the people from whom data was collected have affected the data?

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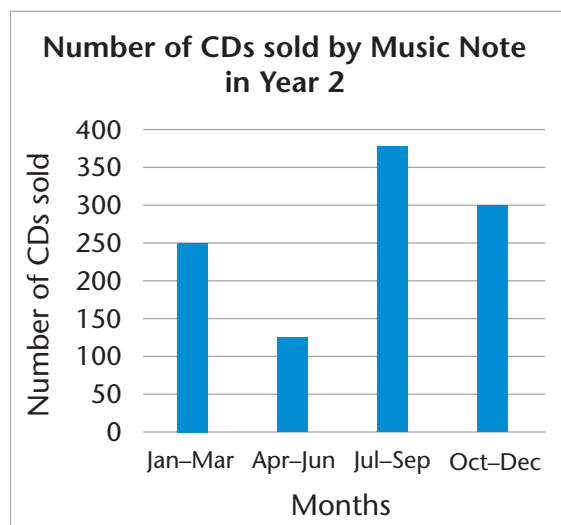
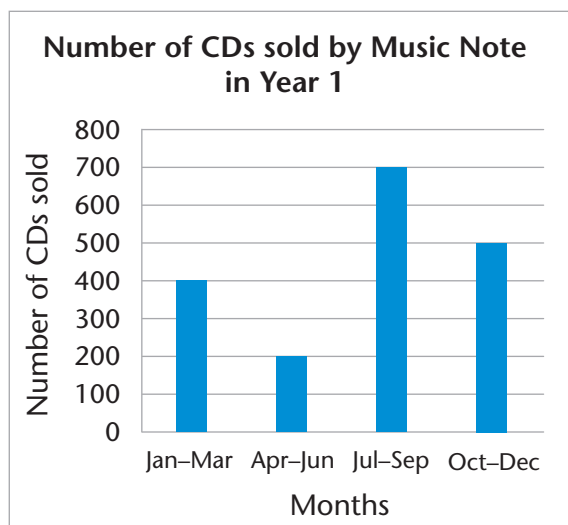
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4. Look at the following graphs and answer the questions that follow:



(a) What does each of the graphs show?

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(b) How many CDs were sold in July to September of Year 1? .....

(c) How many CDs were sold in July to September of Year 2? .....

(d) The heights of the bars indicate that Music Note sold more CDs in October to December of Year 2 than in the same months of Year 1. Is this the case?

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(e) How many CDs were sold altogether in Year 1?

.....

(f) How many CDs were sold altogether in Year 2?

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(g) Explain why the heights of the bars seem to indicate that Music Note sold more or less the same number of CDs in both years, which is not true.

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5. The following table shows the Mathematics marks of Class A and Class B.

<b>Class A</b>	94, 42, 23, 67, 67, 68, 13, 53, 44, 34, 64, 69, 50, 31, 91, 40, 10, 30, 49, 61
<b>Class B</b>	74, 26, 65, 45, 71, 77, 58, 35, 39, 45, 68, 45, 57, 62, 29, 55, 23, 56, 38, 36, 50, 64, 58, 32, 42

(a) Find the range of each set of data.

Class A: ..... Class B: .....

(b) What can you say about the two classes by looking at the range of marks?

.....

(c) Calculate the mean (average) Mathematics mark for each class. You may use your calculator.

<b>Class</b>	<b>Total marks</b>	<b>Number of marks</b>	<b>Mean</b>
Class A			
Class B			

(d) Compare the two sets of data using the means.

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(e) Find the median for each class.

<b>Class</b>	<b>Marks from highest to lowest</b>	<b>Middle position</b>	<b>Median</b>
Class A			
Class B			

(f) Compare the two sets of data using the medians.

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(g) Find the mode for each class.

Class	Highest frequency	Mode
Class A		
Class B		

(h) Compare the two sets of data using the mode.

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(i) Which of the following do you think best represents each set of data: mean, median or mode? Explain your answer.

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