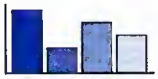
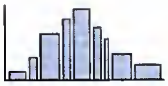
27 Graphs and diagrams

A Types of diagrams

 pie chart

 bar chart

 histogram

Number	Amount
1	10
2	5
3	20

table

cross-section

flowchart

Diagrams are visual ways of **presenting** data concisely. They are often also called **figures**. In an academic article they are usually **labelled** Fig. (Figure) 1, Fig. 2, etc.

A **pie chart** is a circle divided into **segments** from the middle (like slices of a cake) to show how the total is divided up. A **key** or **legend** shows what each segment **represents**.

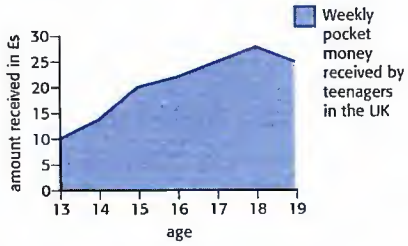
A **bar chart** is a diagram in which different amounts are represented by thin vertical or horizontal bars which have the same width but **vary** in height or length. A **histogram** is a kind of bar chart but the bar width also varies to indicate different values.

A **table** is a grid with **columns** and rows of numbers.

A **cross-section** is something, or a model of something, cut across the middle so that you can see the inside. A cross-section of the earth's crust, for example, shows the different layers that make it up. A **label** gives the name of each part of the cross-section. Cross-section can also be used to mean a small group that is representative of all the different types within the total group (e.g. *the survey looked at a* ***cross-section*** *of society*).

A **flowchart** is a diagram which indicates the **stages** of a process.

B A graph



The **graph presents** data relating to teenagers and pocket money. A **random sample** of 1,000 teenagers were **surveyed** and the average pocket money received at each age has been **plotted** on the graph. The x **axis** or **horizontal axis indicates** age and the y **axis** or **vertical axis shows** the amount of money received per week. The **graph shows** that 15-year-olds receive twice as much pocket money as 13-year-olds. **From the** graph **we can see** that the amount received **reaches a peak** at the age of 18 and then starts to **decline**. This **decline** can perhaps **be explained by the fact that** many teenagers start earning and stop receiving pocket money at the age of 18.

Graphs are drawn by **plotting** points on them and then drawing a line to join **adjacent** points. If there are two lines on a graph – separate lines, for example, to indicate boys' and girls' pocket money – then the lines would probably **cross** or **intersect** at various points. Lines that **run parallel** to one another never intersect.

Graphs show how numbers **increase** or **decrease**. The nouns **increase** and **decrease** have the stress on the first syllable, but the verbs have the stress on the second syllable. Numbers can also be said to **rise** or **grow** and **fall, drop** or **decline**. The nouns **rise, growth, fall, drop** and **decline**, like **increase** and **decrease** are followed by **in** (to explain what is rising) or **of** (to explain the size of the change), e.g. *a* ***rise*** *of 10% in the number of cars*. Other verbs used about growth include **double**[1], **soar**[2], **multiply**[3], **appreciate**[4] and **exceed**[5].

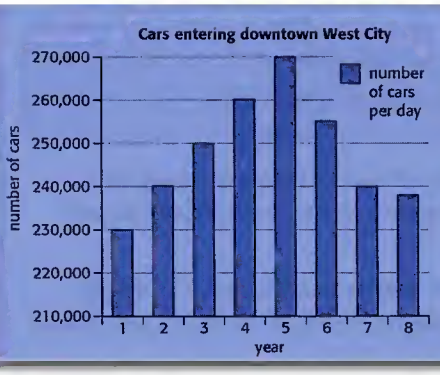
[1] grow to twice the size; opposite = **halve** [2] (dramatic word) rapid movement upwards; opposite = **plummet** [3] grow rapidly to a very large number [4] used about the value of something, e.g. a painting or car; opposite = **depreciate** [5] go over, expresses a number in relation to another number; opposite = **fall below**

ERROR WARNING

Note that **graph** is a noun and **graphic** [relating to drawing: vivid, especially when describing something unpleasant] is usually an adjective. *The economics textbook contains a lot of fascinating* ***graphs****. My nephew studied* ***graphic*** *design. The book contains some very* ***graphic*** *descriptions of the massacre.* **Graphics** can be used as a plural noun to refer to pictorial material, e.g. *The* ***graphics*** *in that computer game are brilliant.*

Exercises

27.1 Look at the chart. Complete the commentary with words from the opposite page.



The chart _____ the number of cars entering the downtown area of West City each day over an eight-year period (years 1–8). The totals are listed on the _____ axis (*give two answers*), while the years are listed on the _____ axis (*give two answers*). To the right of the graph we see the _____ . The number of cars _____ over the period. The total rose in the first few years and _____ a _____ in year 5, after which the numbers started to _____ . This can be _____ by the _____ that a new mass transit railway was opened in year 6, which is a _____ illustration of how good public transport can dramatically affect car use.

27.2 Answer the questions.

1 Draw examples of a pie chart and a bar chart.
2 What would be the best type of diagram to present the different layers of rock in the Grand Canyon?
3 In a table, what is the difference between columns and rows?
4 What would be the best type of diagram to present the different stages in a research project you did?
5 How many segments are there in the pie chart opposite?
6 If you look at two adjacent columns in a table, are they next to each other or separated?
7 What is another name for a legend in a diagram?
8 What type of data collection are you doing if you survey the first 50 people you come across?
9 What do two lines on a graph do if (a) they intersect and (b) they run parallel to each other?

27.3 Make the rather informal words in bold sound more precise and academic.

1 The different **bits** of the pie chart show the numbers of people in each age group.
2 She kept a record by **marking** the midday temperature on a graph for a month.
3 People's salaries usually reach their **highest point** when they are in their late 40s.
3 This flowchart shows the different **bits** of our project over the next five years.
5 The two lines on the graph **cross each other** at point A.
6 Draw a line connecting the points that are **next** to each other.
7 The government's popularity in the opinion polls is beginning to **fall**.
8 If you look along the top **line** of the table you can see the figures for the 1950s.

27.4 Change the sentences using words with the same meanings as the words in bold.

1 Populations of some bird species in South Asia have **crashed** by 97% in recent years.
The **number of cases** of death by poisoning has **increased** sharply.
2 In 2007 the child mortality rate was **lower than** 60 deaths per 1,000.
3 The average family car in the UK goes **down in value** by 20% per year. This means its value has **fallen by more than half** after just three years.
4 A typical piece of land on the edge of the city will **go up in value** by 15% per year, and house prices have **gone up rapidly** in the last six months.
5 Business courses have **increased greatly in number** while science programmes have **gone down**.
6 The temperature was **higher than** 45°C in some parts of the country during the heatwave.
7 Between 1983 and 2006, the number of this species of condor* **went up** from 22 pairs to 273. Other bird populations have **gone up by two times** in the same period.
8 The numbers of old soldiers attending regimental reunions are **becoming smaller** each year.

* large birds from South America