

Graphs and diagrams

A Types of diagrams



pie chart



bar chart



histogram

Number	Amount
1	10
2	5
3	20

table



cross-section



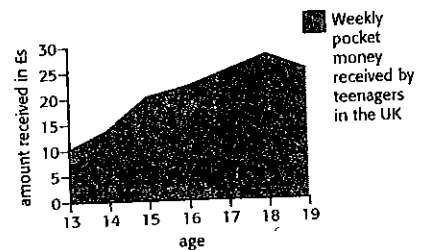
flowchart

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 widths 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 double¹, soar², multiply³, appreciate⁴ and exceed⁵.

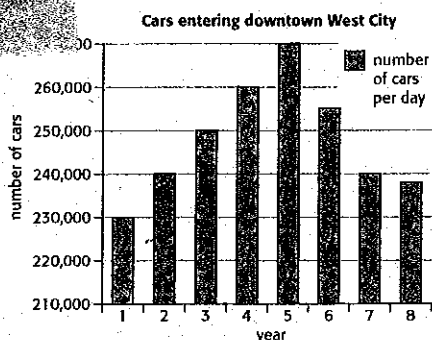
¹ grow to twice the size; opposite = halve ² (dramatic word) rapid movement upwards; opposite = plummet ³ grow rapidly to a very large number ⁴ used about the value of something, e.g. a painting or car; opposite = depreciate ⁵ go over, expresses a number in relation to another number; opposite = fall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



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.

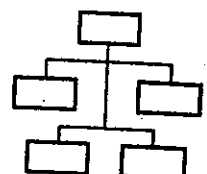
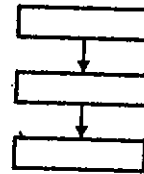
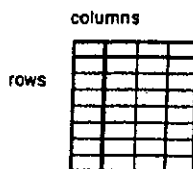
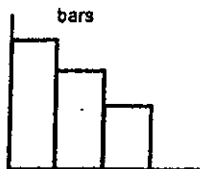
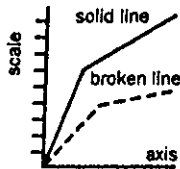
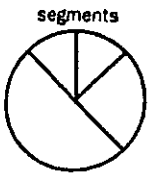
- 1 Populations of some bird species in South Asia have **crashed** by 97% in recent years. The **number of cases** of death by poisoning has **increased sharply**.
- 2 In 2007 the child mortality rate was **lower than** 60 deaths per 1,000.
- 3 The average family car in the UK **goes down in value** 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

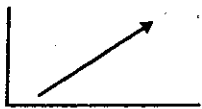
Interpreting graphs

A) Match the types of chart and their names

table flow chart pie chart line graph organigram bar chart

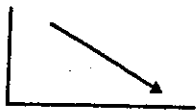


B) Match the phrases with the pictures



Our sales rose last year.

Upward movement



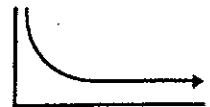
Profits have fallen recently.

Downward movement



Sales have remained constant.

No change



Sales have flattened out.

An end to movement

*to decrease/fall/drop/
decline/go down
to contract
to slump/collapse*

to flatten out/level off

*to remain constant/stable
to stay the same/at the
same level*

*to increase/rise/go up
to grow/expand
to rocket/boom*

To fluctuate a fluctuation
To bottom out
To reach a low point
To hit a low a low

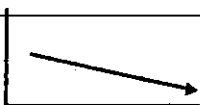


To reach a peak
To peak a peak

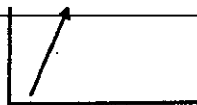


Speed of change

rapidly/quickly/suddenly/gradually/steadily/slowly



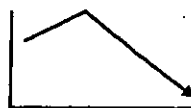
*Absenteeism had
dropped slowly.*



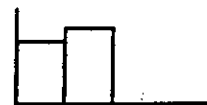
Sales went up rapidly.

Degree of change

*dramatically/considerably/significantly/moderately/
slightly*



*Sales have fallen
considerably.*



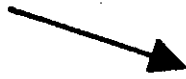
Profits rose slightly.

C) Complete the verbs by adding vowels a,e,i,o,u



1. _ncr_ _s_

2. r_s_



3. d_cr_ _s_

4. f_ll



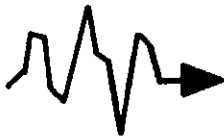
5. sh_ _t_ _p

6. t_k_ _ff



7. pl_ng_

8. sl_mp



9. fl_ct_ _t_



10. r_c_v_r

11. p_ck_ _p



12. st_b_l_z_

13. l_v_l_ _ff



14. r_m_ _n st_ _dy

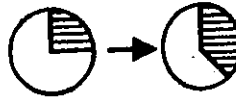


15. p_ _k



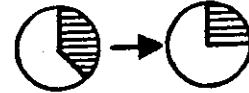
16. h_t_ _l_w

17. b_tt_m_ _t



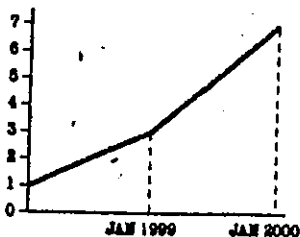
18. gr_w

19. _xp_nd



20. shr_nk

21. d_cl_n_



Sales rose from 3 million to 7 million.
 Sales rose by 4 million.
 There was an increase of 4 million over last year.
 Sales stood at 3 million in January.

D) Draw a graph, then work in pairs and ask your partner to interpret it, then swap

elaborated by M. Paolozza

nearly the same (water content) as

approximately twice (two times) as much water as

three times higher (water content) than

four times more (water) than

much more

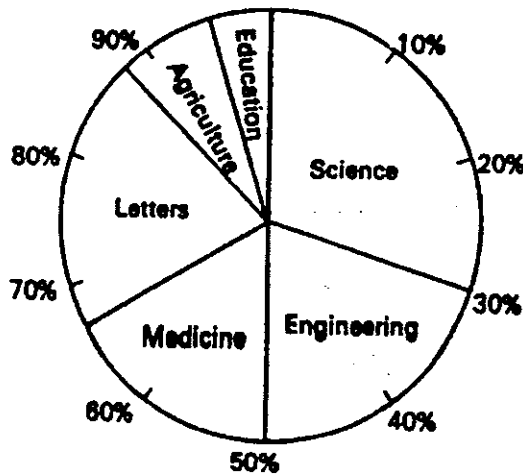
considerably less than

slightly higher

lower

E.g. Beef contains approximately the same amount of water as eggs.

Task 10 Look and read:



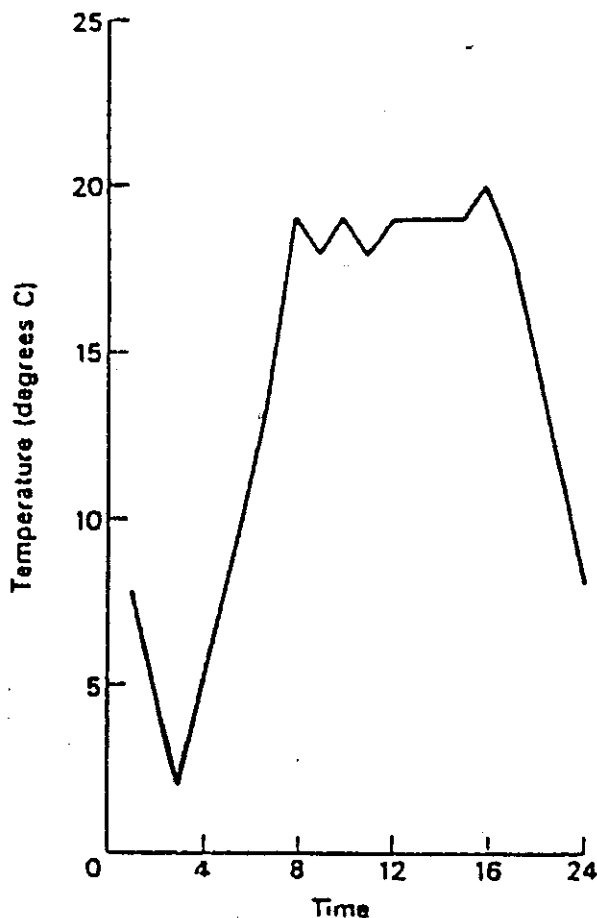
This **pie chart** shows the relative numbers of students in different faculties of university. You can see that **the majority** (the greater part) of students study scientific subjects, whereas students of letters are **in the minority**. The proportions are approximate. They can be expressed as **percentages**. Thus, science students **constitute** approximately 30% (thirty per cent) of all students.

Now complete these statements, using the above expressions written in bold, and also the expressions: **relatively, compared with**.

1. Engineering students of all students.
2. 50% of all students study or
3. The ... of students in the faculties of engineering and letters are approximately the same.
4. There are few students of education.
5. the percentage of science students, the percentage of agriculture students is relatively small.
6. In the faculty of science, 70% of the students are men and 30% are women; that is, the are men and women are in the
7. Approximately 15% of all students study

Task 11 Look and read:

Task 3 Use some of the above words and expressions to fill in the gaps in the next passage about *temperatures on 24 September*.



Temperatures on 24 September

Temperature readings were taken each hour and plotted on a graph. The temperatures were marked on 1 and the time of readings on the 2 The graph shows that the temperature 3 after one o'clock and reached a 4 of two degrees at 3 o'clock. The temperature then 5 until eight o'clock. For the next four hours temperatures 6 between 18° and 19°. Temperatures 7 in the afternoon at a 8 of 19° before 9 again and reaching a 10 of 20° at 1600 hours. After 1600 hours temperatures again 11

Task 4 Fill in the missing words in the diagram *describing trends*.

