

Words to learn

average (n)
calculate (v)
divide by (*phrasal v*)
formula (n) **AWL**

fraction (n)
majority (n) **AWL**
mean (n)
minority (n) **AWL**

per cent (n) **AWL**
percentage (n) **AWL**
proportion (n) **AWL**
statistics (n)

total (n)
value (n)

Describing proportions

A The study found that the **majority** (56%) of those questioned were non-smokers. These **statistics** show that the number of smokers varies significantly by city. The highest **percentage** of smokers was found in Naples (49.5%).

B According to one study of Italian smoking habits, Naples has the highest **proportion** of smokers (Ficarra *et al.* 2011).

C Today only two **per cent** of the US population works on farms, while another three per cent works in the food processing and food service industries. This small **fraction** of the population (five per cent) is able to grow, process and serve enough food to meet the needs of the whole country.

D Perhaps surprisingly, only a small **minority** of US workers (around 5%) are employed in food production, yet they produce enough food for the whole population (Bowles *et al.* 2005).

1 Match the phrases from the academic texts, A and C, to phrases with the same meaning from the student citations, B and D.

- 1 the highest percentage of smokers _____
- 2 this small fraction of the population _____

2 Do the underlined phrases refer to a large quantity (L) or a small quantity (S)?

- 1 This type of treatment is appropriate in only a minority of cases. ___
- 2 Fuel costs make up a tiny fraction of the firm's total operating costs. ___
- 3 The majority of students at the college speak English as a second language. ___
- 4 A high proportion of their income is spent on food and accommodation. ___
- 5 This disease affects a relatively small percentage of the population. ___

Usage note *per cent, percentage and proportion*

Use **per cent** or % after a number:

*five **per cent** of the population*
*inflation rose by two **per cent***

Use **percentage** or **proportion** to talk more generally about a quantity:

*the **highest percentage** of smokers* *only a **small percentage** of students*
*a **high/large proportion** of patients* *a **relatively small proportion** of total spending*

3 Complete the sentences using the word in CAPITALS. Add any other words needed.

- EXAMPLE: A high percentage of employees (74%) work more than 45 hours. PERCENTAGE
- 1 These examples represent only _____ the total number of cases (less than 4%). FRACTION
 - 2 The survey found that _____ customers (82%) are satisfied with the service. MAJORITY
 - 3 _____ patients (approximately 10%) suffer more severe symptoms. PROPORTION
 - 4 In 1900, only 20 _____ American women worked outside the home. PER CENT
 - 5 In _____ people (less than 3%), the problem may continue into adulthood. MINORITY

Talking about averages

E When looking at data, it is useful to have some idea of a typical **value** for the data. This is usually called an **average**. When you know the average for a set of data, you have some idea of what value or values you might expect from other data from the same source. If the data is from a sample, you can use the average of the sample to estimate the average for the whole population.

When people talk about averages they are usually talking about the **mean**. The mean is obtained by **calculating the total** of all the data values and then **dividing by** the number of data values. This can be shown in a **formula**:

$$\text{mean} = \frac{\text{total of all the data values}}{\text{number of data values}}$$

Source: Adapted from Procter-Green & Winters. (2009). *AQA Statistics GCSE*. Cheltenham: Nelson Thornes.

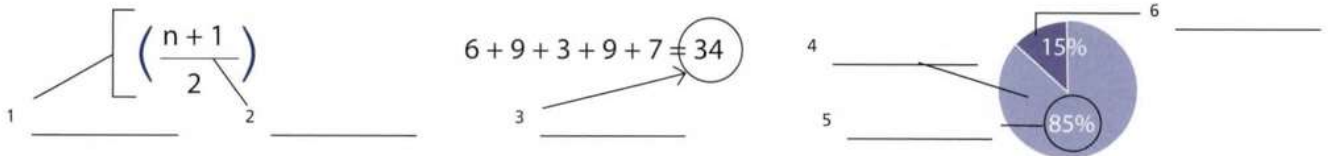
4 Read text E and complete the statements using words from the box.

average calculate divide formula mean total value

- You can use an _____ to represent a typical _____ for a set of data.
- The most common way of measuring an average is called the _____.
- You can _____ the mean using the _____ shown in the text.
- You work out the _____ of all the values, then you _____ that by the number of values in the set.

5 Label the pictures using words from the box.

divide by formula majority minority percentage total



6 Complete the text describing the table.

If we look at the table showing the weather conditions for the island of Madeira, we can see that October to March are the wettest months. To ¹_____ the ²_____ rainfall for this whole period, we first work out the ³_____ of the rainfall ⁴_____ for these six months: $76 + 89 + 84 + 64 + 74 + 79 = 466$. Then we _____ this by the number of months: $466 \div 6 = 77.66$. So 77.66 mm is the ⁶_____ amount of rain during the winter months. Looking at these ⁷_____, we can also say that throughout the year, the ⁸_____ of wet days each month is relatively low. The table also shows that for the ⁹_____ of the year, the maximum temperature is above 19°C and for a large ¹⁰_____ of the year, the temperature does not drop below 15°C .

| | Jan | Feb | Mar | Apr | May | Jun | July | Aug | Sept | Oct | Nov | Dec |
|-----------|-----|-----|-----|-----|-----|-----|------|-----|------|-----|-----|-----|
| Rain (mm) | 64 | 74 | 79 | 33 | 18 | 5 | 0 | 0 | 25 | 76 | 89 | 84 |
| Wet days | 6 | 6 | 7 | 4 | 2 | 0 | 0 | 0 | 3 | 7 | 6 | 7 |
| Max temp | 19 | 18 | 19 | 19 | 21 | 22 | 24 | 24 | 24 | 23 | 22 | 19 |
| Min temp | 13 | 13 | 13 | 14 | 16 | 17 | 19 | 19 | 19 | 18 | 16 | 14 |

Figure 1: Weather conditions in Madeira

Words to learn

decline (n) **AWL**
decrease (v)
dramatic (adj) **AWL**

fall (v)
grow (v)
growth (n)

increase (v)
increasingly (adv)
peak (v)

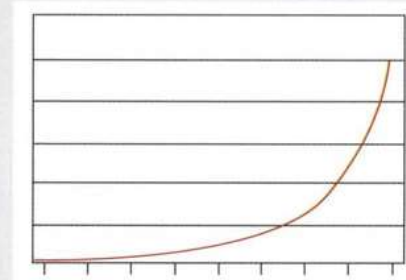
rapid (adj)
rate (n)
reduce (v)

rise (v)
trend (n) **AWL**
variable (adj) **AWL**

Upward trends

A In 2011 the world's population reached seven billion people. Since about 1900 the world's population has **grown** exponentially. This means that the **rate of growth** has become **increasingly rapid**. Between AD 1 and AD 1000 growth was slow, but in the last thousand years it has been **dramatic**. By 2000, there were ten times as many people living as there had been 300 years before in 1700. Not only is population **increasing**, but the rate of increase is becoming greater.

Growth is predicted to continue, but now the rate is slowing down. Population is likely to **rise** to 8.92 billion by 2050 and finally **peak** at 10.8 billion a century later in 2150.



Exponential growth curve

Source: Durman & Ross. (2014). *AQA Certificate in Geography (iGCSE)*. Oxford: Oxford University Press.

Glossary

exponentially (adv): used to say that a rate of increase is getting faster and faster

1 Read text A. Tick the paraphrases which are correct according to the text.

- a Since 1900, the global population has increased very rapidly.
- b Between 1900 and 2011, the population continued to grow at the same rate.
- c During the period from 1000 to 2000, the population grew dramatically.
- d In the future, experts believe that the global population will increase more quickly.
- e After 2150, the world's population is expected to stop increasing.

Usage note describing trends

Verb + adverb: *increase dramatically rise rapidly*

Adjective + noun: *rapid growth a dramatic increase growth was slow*

Adverb + adjective: *increasingly rapid*

Describing rates: *the rate of growth the rate is slowing down*

Describing levels: *the population reached seven billion population is likely to peak*

2 Match the sentence halves.

- | | |
|--|---|
| 1 The population has grown | a was relatively slow. |
| 2 During the summer, there is a dramatic | b rapidly over the past hundred years. |
| 3 The number of hospital admissions rose | c at around 32°C in July. |
| 4 The increase in temperature over the period | d large proportion of the population. |
| 5 There are several ways to measure the rate | e of growth of a country's economy. |
| 6 People over 65 make up an increasingly | f dramatically last month. |
| 7 Daytime temperatures peak | g increase in the number of visitors. |

Downward trends

B Many freshwater plants and animals are particularly sensitive to low pH (i.e. high levels of acid in the water). Studies generally show that as pH levels **fall**, there is a **decline** in species diversity. Within a single site, acidification of water can significantly **reduce** the number of species present.



C Analysing the long-term trends of precipitation (i.e. the amount of rain and snow) and temperature can help in understanding climate patterns. According to records for the past century, temperatures in this region have varied considerably, showing no clear overall trend. The long-term trend of precipitation is less **variable** than temperature. A few years of heavy snowfall occurred in the early 1990s, but otherwise annual precipitation **decreased** slightly during the 20th century.

Glossary

pH (n): a measure of the level of acid in a substance; a substance with a low pH value contains more acid

diversity (n): a range of different things, e.g. different types of animals

3 Tick which things the writer talks about in terms of a downward trend in texts B and C.

a pH levels ___ b the number of species ___ c average temperatures ___ d rain and snowfall ___

4 a Complete the table using the correct verb and noun forms. Use the language reference section on pp.108–114 to help you.

| Verb: infinitive | Verb: past simple | Verb: past participle | Noun |
|------------------|-------------------|-----------------------|------------|
| to decrease | decreased | decreased | a decrease |
| to grow | grew | grown | a growth |
| to fall | 1 _____ | 2 _____ | a fall |
| to rise | 3 _____ | 4 _____ | a rise |
| to reduce | reduced | reduced | 5 _____ |
| to decline | declined | 6 _____ | a decline |

b Complete the sentences using the best form of the word in CAPITALS.

- The value of the dollar _____ dramatically after yesterday's announcement. FALL
- Wages and prices have _____ at roughly the same rate in recent years. RISE
- There has been a long-term _____ in electoral participation across many countries. DECLINE
- A factor behind the _____ of international trade is improved transport methods. GROW
- Trends indicate a significant _____ in the number of people smoking since 1980. REDUCE

Usage note using prepositions to describe trends

increase/decrease + to + level: *population is likely to **rise to** 8.92 billion*

increase/decrease + by + size of change: *costs **fell by** 6%*

an increase/a decrease + in + the thing being measured: *a **decline in** species diversity*

reach + a level (no preposition): *the world's population **reached** seven billion*

5 Choose the best preposition to complete the sentences. Choose '-' if no preposition is needed.

- The latest figures show a decrease *in / to* the unemployment rate.
- China's economy grew *by / in* 6.9% last year.
- The new charge led directly to a reduction *in / -* the number of car journeys.
- At the last election, the proportion of women in the parliament fell *by / to* 33%, from 45 to 30.