This part of the task gives you the chance to try out your skills and check your progress with some typical questions from the Level 2 National Test.

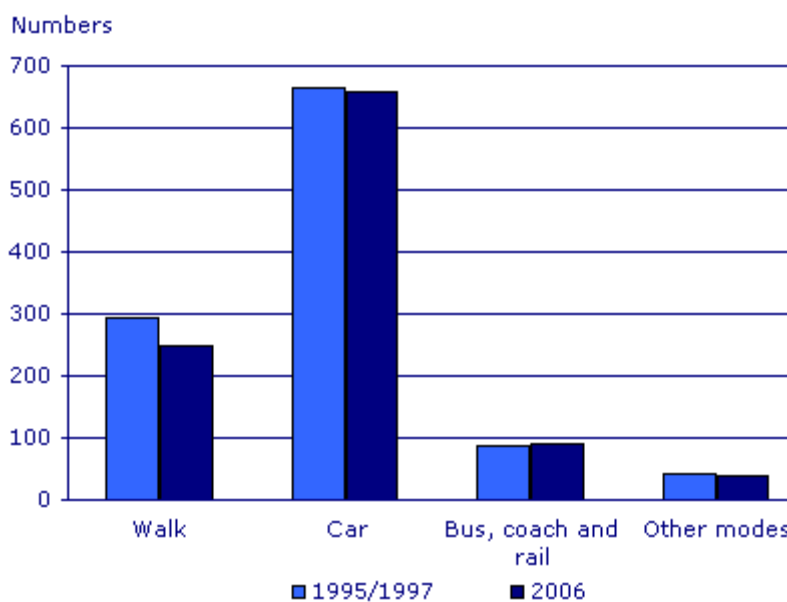It also contains the answers to all the activities in Part 1 and Part 3.

Try it out

Now try out your skills by doing the following two tasks.

Task 1

Driving Force
Four fifths of annual distance travelled is by car

Trips per person per year, Great Britain

Source: National Statistics web site: www.statistics.gov.uk, adapted from data provided by the National Travel Survey, Department for Transport.
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Look at the bar chart on the previous page, showing the number of trips per person per year in Britain between 1995/7 and during 2006.

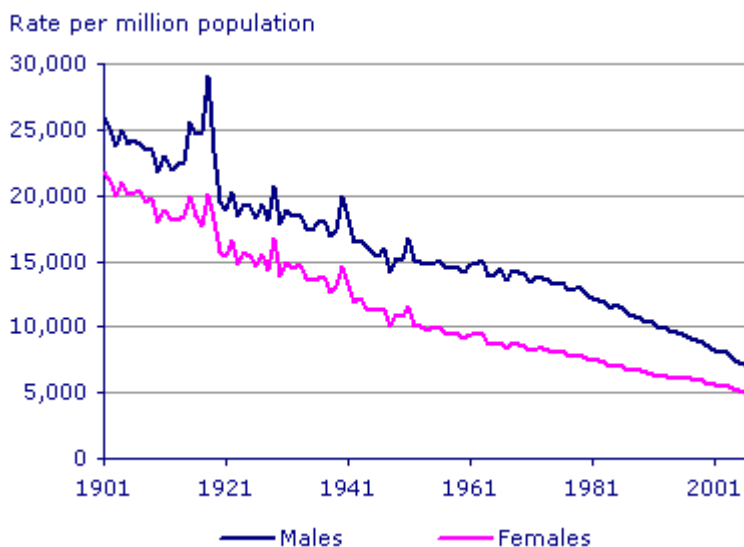**Write two or three key statements outlining what the chart tells you.**

....

....

....

Task 2

Death registrations
504,052 in England and Wales in 2007

Age-standardised mortality rate for all causes by sex, England and Wales

*Source: National Statistics web site: www.statistics.gov.uk*
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1   **Use the graph above to** *estimate* the rate of deaths **(per million population)** of males in each of the years 1901, 1921, 1941, 1961, 1981 and 2001.

Tip: Use a ruler placed vertically up the graph at the appropriate position for each of the years and read off the corresponding rate at the point the ruler meets the (blue) 'male' line. As an example, this is marked for 1921 by the red arrow below:

Rate per million population

Age-standardised mortality rate for all causes by sex, England and Wales
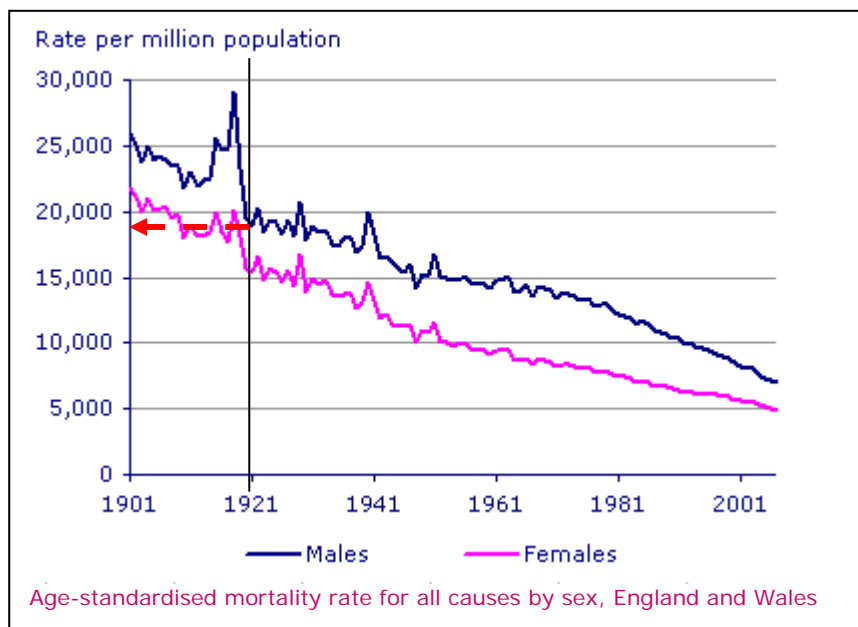
2   Use these estimates to work out a rough **mean for the number of male deaths per year** (for each million males in the population).

Tip: Although the period covered is 1901–2001 (one hundred years), remember that you are only working out the mean for six values. So the 'number of values' you use to work out your mean will be 6.

3   **Repeat the two steps above** for the rates of death **for females**.
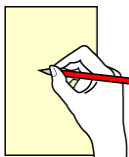
Questions to check on your progress

These questions are taken from the Progress Checks – confidence-building tests from the Learner Route.

Progress check G, Q12

The table shows the highest and lowest recorded temperatures in five towns in Spain.

What is the median of the highest recorded temperatures?

City	Lowest recorded temperature (°C)	Highest recorded temperature (°C)
Madrid	-15	42
Barcelona	-10	38
Seville	-5	50
Bilbao	-9	42
Ibiza	-1	37
Melilla	-4	39

A. ☐ 40.5°C

B. ☐ 42°C

C. ☐ 46°C

D. ☐ 50°C

Progress check G, Q15

A man and a woman want to take a week's holiday at the Gardenia hotel during the summer.

How much will they save in total by picking the cheapest time to go rather than the most expensive time?

Holiday prices						(£ per person)
Hotel	Venus		Beach		Gardenia	
Number of days	7	10	7	14	7	14
Day of departure	Thurs	Sun	Fri	Mon	Sat	Wed
30 May - 15 Jun	395	495	429	675	470	710
16 Jun - 29 Jun	405	505	439	685	490	720
30 Jun - 11 Jun	415	515	449	695	510	730
12 Jul - 1 Aug	425	545	459	705	540	740
2 Aug - 15 Aug	445	565	480	720	560	760
16 Aug - 28 Aug	480	580	500	740	580	780
29 Aug - 11 Sep	460	565	450	770	490	740
12 Sep - 31 Sep	425	525	439	685	480	720

A. ☐ £110

B. ☐ £220

C. ☐ £470

D. ☐ £940

Progress check G, Q37

Company profits at Norwich and Cardiff sites					
Year	1	2	3	4	5
Profit at Norwich (£)	2 010	3 450	4 200	5 970	7 250
Profit Cardiff (£)	-4 800	-3 580	1 005	8 000	14 190

This table shows the profits of two sites of a company over a 5-year period. A manager puts the information from the table into charts to compare the profits of the two sites.

Which of the charts are accurate ways to represent the information?

A. ☐ Charts 1 and 2

B. ☐ Charts 2 and 3
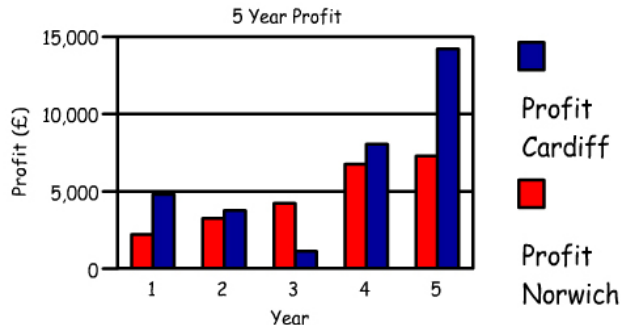
C. ☐ Charts 3 and 4

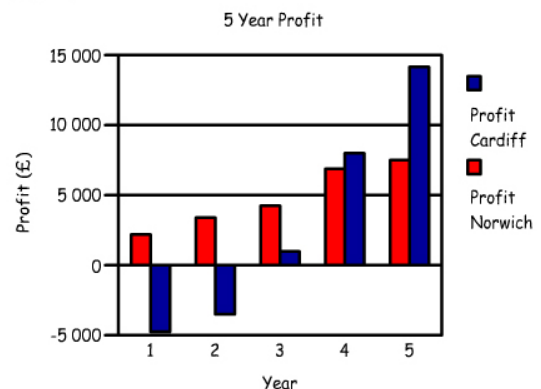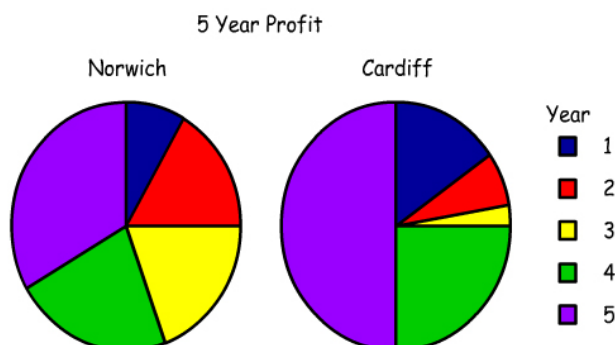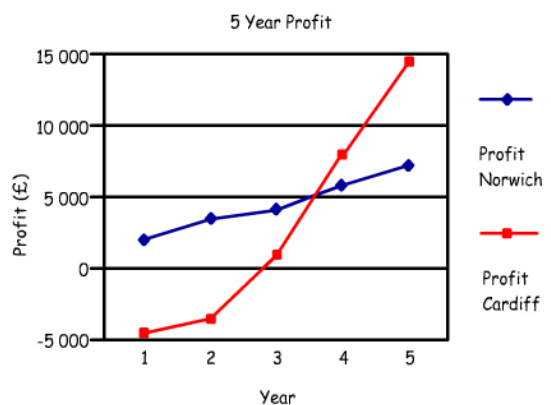D. ☐ Charts 2 and 4

Chart 1

Chart 2

Chart 3

Chart 4

Progress check F, Q22

A company wants to compare the wages of its male and female employees. A new manager gathers the following data:

The manager works out that the mean wage for males is £265. How much less than this is the mean wage for females?
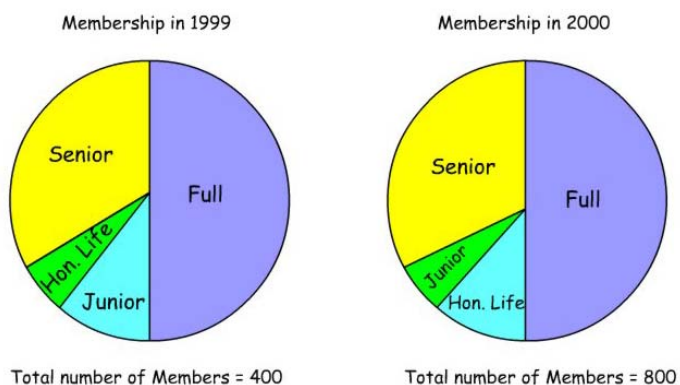
Male wages (£ per week)	Female wages (£ per week)
160, 170, 200, 200, 210, 220, 220, 240, 260, 280, 500, 520	180, 190, 200, 220, 220, 220, 230, 240, 310, 340

A. ☐ £25

B. ☐ £30

C. ☐ £35

D. ☐ £36

Progress check F, Q36

The following charts show the membership of a club for 1999 and 2000.

Compared with 1999, the number of full members in 2000

Membership in 1999

Senior
Full
Hon. Life
Junior

Total number of Members = 400

Membership in 2000

Senior
Full
Junior
Hon. Life

Total number of Members = 800

A. ☐ stayed the same

B. ☐ increased by 100%

C. ☐ increased by 400

D. ☐ increased by a third

Progress check F, Q38

The bar chart shows the number of members in the Association of Darts Players over six years.
A member looks at the bar chart. He says, 'The number of members in 2000 was approximately double the number of members in 2001, because the bar is twice as long'.

Why is the member wrong?

Membership of the Association of Darts Players from 1996 to 2001
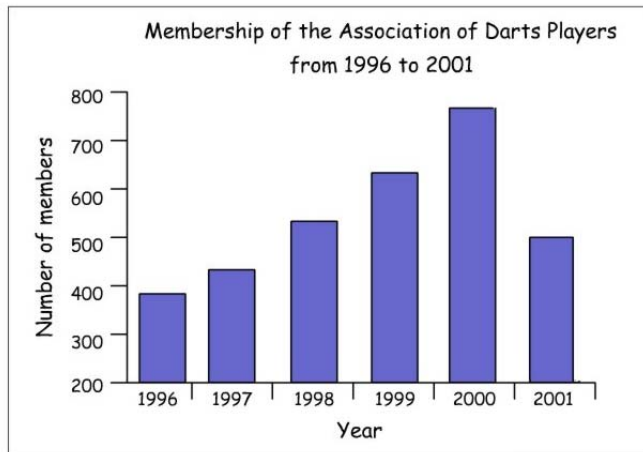
A. ☐ The years on the horizontal axis do not increase evenly.

B. ☐ The numbers on the vertical axis do not increase evenly.

C. ☐ The bars are the wrong width.

D. ☐ The vertical scale does not start at zero.

Answers to questions in Part 1

Activity 1

1   **If the total number of members is 200**, the approximate numbers of each type of member are:

men	women	boys	girls
50	50	33	67

Note: You may not have got exactly these numbers, but should have got something close to them.

The number of men is ¼ of the total:	*¼ of 200 is*	*50*
The number of women is about the same:		*50*
The number of girls + boys is about half the total:		*100*
The boys are about a third of this:	*1/3 of 100*	*33*
The girls are those left:		*67*

2   **If the number of girls is 200**, the approximate numbers of each type of member are:

men	women	boys	girls
150	150	100	200

The number of boys is about ½ the number of girls: ½ of 200 is		*100*
The number of girls + boys is about the same as the number of men + women, so men + women is also about:		*300*
The men are about half of this:	*½ of 300*	*150*
The women are the other half:		*150*

3   **If the total number of members is 48**, the approximate numbers of each type of member are:

men	women	boys	girls
12	12	8	16

4   **If the number of boys is 25**, the approximate numbers of each type of member are:

men	women	boys	girls
38	37	25	50

Note: You may not have got exactly these numbers, but should have got something close to them

Activity 2

Charts A and E show the same data:

	men	women
2006	50	50
2007	100	75

Charts B and C show the same data:

	2006	**2007**
men	75	120
women	50	80

Charts D and H show the same data:

	2006	**2007**
men	50	100
women	50	75

Charts F and G show the same data:

	men	women
2006	75	50
2007	120	80

Note: In fact, charts A and E and D and H all show the same data, but the data is differently organised in A and E, and in D and H, respectively.

Charts A and E (and D and H) present the same data organised in the same way – and the only difference between them is the change in scale used – on B (and F), the scale on the y axis does not start at zero. (Similarly with charts B and C, and charts F and G.)

✓ **Activity 3**

1   The number of female members was greater than the number of male members each year.

     FALSE – *In 2007 there were fewer women members.*

2   In 2006 the numbers of male and female members was equal.

     TRUE – *In 2006 the bars for men and women are the same height on the bar chart; on the line graph the lines showing 'men' and 'women' respectively cross.*

3   The number of members who are men has gradually increased over the years.

     TRUE – *In 2005 and 2006 the number is the same, but over the four-year period overall, it gradually increases.*

4   There were more female members in 2007 than there were in 2005.

     TRUE – *The (purple) line showing the 'women' is higher in 2007 than the same line in 2005.*

5   There were more male members in 2006 than there were in 2005.

     FALSE – *There is the same number of men in 2005 and 2006.*

6   The balance of male and female members has changed over the years.

     TRUE – *In 2005 there were more women than men; by 2007 there are more men than women.*

✅ **Activity 4**

1 **Mean cost:** **£1.20**

$$\frac{£1.25 + £1.15 + £1.19 + £1.21 + £1.17 + £1.23}{6} = \frac{7.2}{6} = 1.2$$

Median cost: **£1.20**

The middle values are the 3rd and 4th (when in order of size), i.e. £1.19 and £1.21. Midway between these is $\frac{£1.19 + £1.21}{2} = £1.20$

Mode: **There isn't one as no value appears more than once.**

2 **Mean number of houses:** **84**

$$\frac{74 + 83 + 72 + 94 + 97 + 88 + 81 + 79 + 92 + 80}{10} = \frac{840}{10} = 84$$

Median: **82**

The middle values are the 5th and 6th (when in order of size), i.e. 81 and 83. Midway between these is $\frac{81 + 83}{2} = 82$

Mode: **There isn't one as no value appears more than once.**

3 **Mean number of passes:** **5**

$$\frac{3 + 5 + 6 + 4 + 7 + 8 + 4 + 3 + 5 + 5}{10} = \frac{50}{10} = 5$$

Median: **5**

The middle values are the 5th and 6th (when in order of size), i.e. 5 and 5.

Mode: **5**

The value 5 appears three times (which is more than any other).

4   **Mean time:**   **20 mins**

$$\frac{10 + 30 + 45 + 20 + 15 + 25 + 5 + 10}{8} = \frac{160}{8} = 20$$

Median: **17.5 mins**

The middle values are the 4th and 5th (when in order of size), i.e. 15 and 20.
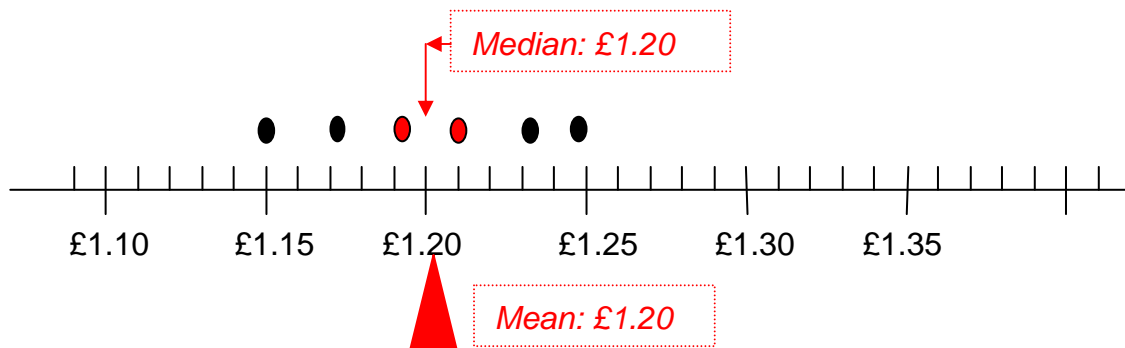*Midway between these is* $\frac{15 + 20}{2} = \frac{35}{2} = 17.5$

Mode: **10 mins**

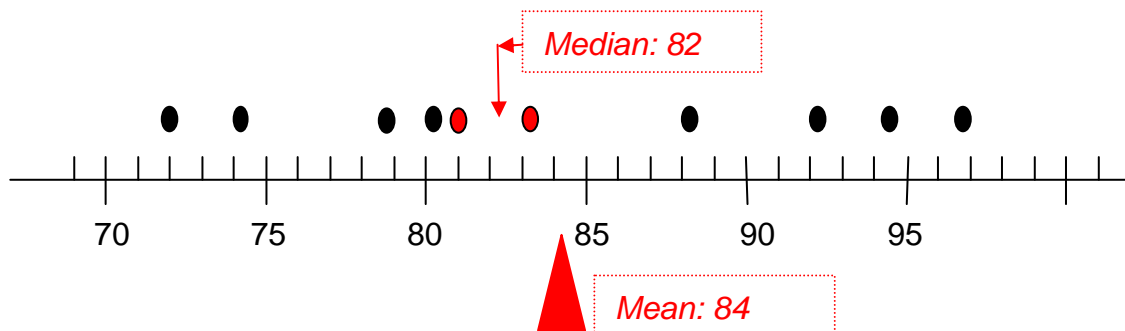*The value 10 appears two times (which is more than any other).*
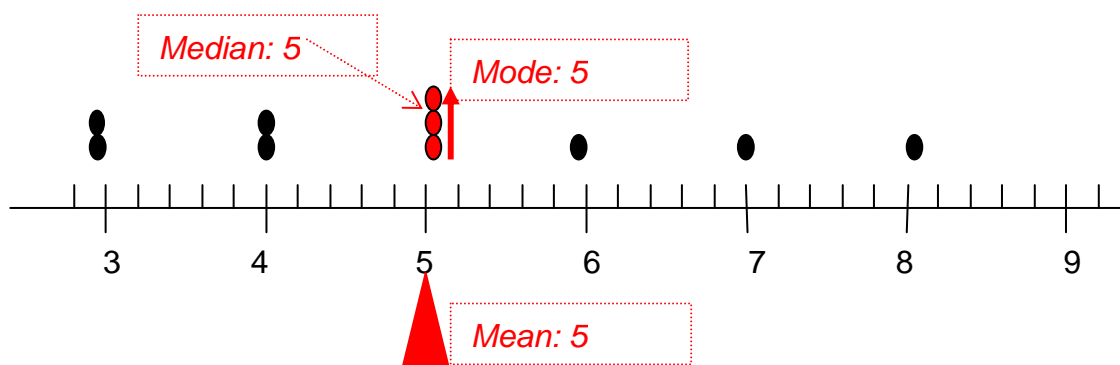
Activity 5

1

2

3

Median: 5

Mode: 5

Mean: 5

3   4   5   6   7   8   9

4

Mode: 10

Median: 17.5

0   30   60

Mean: 20
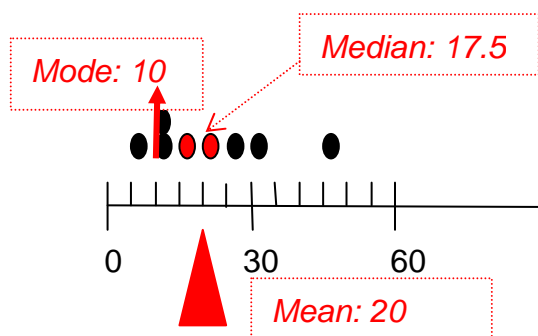
Note: The scale here shows times in intervals of 5 minutes

Activity 6

1(a)   A tally of the number of children in the families in the street is:

Children	Households
0	I I
1	I I
2	I I I
3	I
4	I
5	I

(b)

Number of children in households in the street
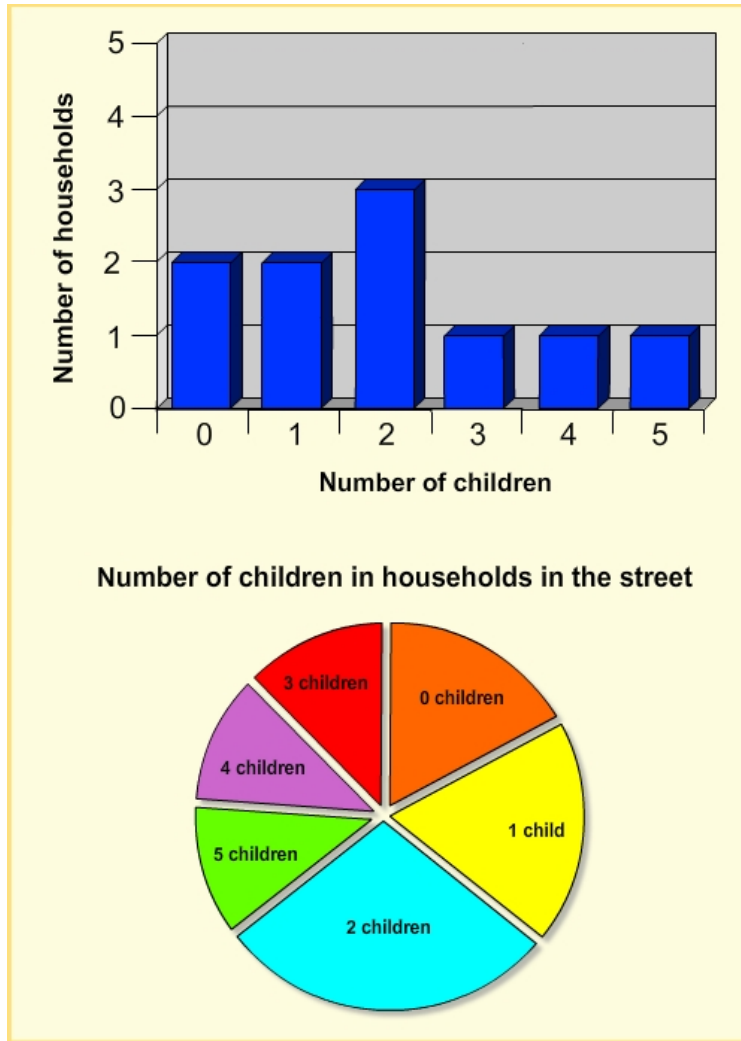
(c)   **Mean** number of children per family is: **2**

Number of children in families in the street:

Number of children	0	1	2	3	4	5	Total
Number of households	2	2	3	1	1	1	10
Total numbers of children	0	2	6	3	4	5	20

Total number of families is 10: 2 + 2 + 3 + 1 + 1 + 1   = 10

Total number of children is 20: 0 + 2 + 6 + 3 + 4 + 5= 20

Mean is   *Total number of children*   =   *20*   =   *2 children*
                    Number of families   *10*

(d) The **median** of the number of children is: **2**.

The middle values in a data set of 10 will be the 5th and 6th values.
The first two values (values 1 and 2 in the first column) are 0.
The next two (values 3 and 4 in the second column) are 1.
The following three (values 5, 6 and 7 in the third column) are all 2.
*So, the **5th and 6th values are both 2**.*

(e) The **mode** is **2** – more households had two children than any other value (shaded in yellow).

2

No. of computers	0	1	2	3	4	*Total*
1998	10	7	3	0	0	*20*
Total computers (1998)	0 ×10 = **0**	1 × 7 = **7**	2 × 3 = **6**	3 × 0 = **0**	4 × 0 = **0**	*13 (0+7+6+0+0)*

No. of computers	0	1	2	3	4	*Total*
2008	3	10	4	2	1	*20*
Total computers (2008)	3 × 0 = **0**	1 × 10 = **10**	2 × 4 = **8**	3 × 2 = **6**	4 × 1 = **4**	*28 (0+10+8+6+4)*

a **The mean for 1998 is:** **0.65 computers per household**

$$\frac{13}{20} = 0.65$$

The mean for 2008 is: **1.4 computers per household**

$$\frac{28}{20} = 1.4$$

b   **The median value(s) for this data set will be the 10th and 11th values.**

So, the median for 1998 is: 0.5.
The first ten values are all 0, and the next (11th value) is 1.
Midway between 0 and 1 is 0.5.

The median for 2008 is: 1.
The first three values are 0.
The next ten values are all 1 (these are values 4–13, so the 10th and 11th values will fall in this batch).

The mode for 1998 is: 0 (the value with the largest frequency – shaded in yellow below).
More households had 0 computers than any other value.

The mode for 2008 is: 1 (the value with the largest frequency – shaded in blue below).
More households had 1 computer than any other value.

The number of computers owned by households in street X

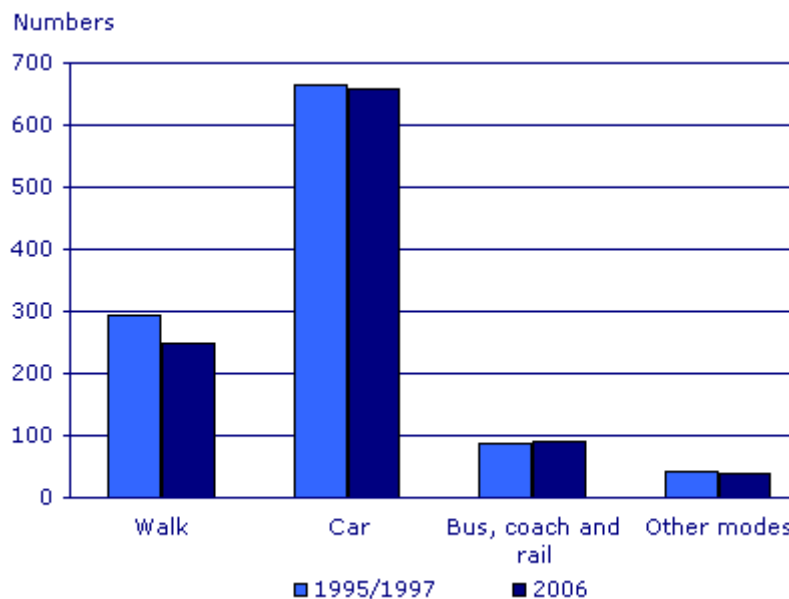| No. of computers	0	1	2	3	4
1998	10	7	3	0	0
2008	3	10	4	2	1

Try it out (answers)

Task 1

Driving force
Four fifths of annual distance travelled is by car

Trips per person per year, Great Britain

Source: National Statistics web site: www.statistics.gov.uk, adapted from data provided by the National Travel Survey, Department for Transport.

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You may have chosen a variety of key statements about what the chart tells you, which might include:

- Most trips were made by car in both 1995/7 and in 2006.

- The order of the different forms of transport stayed the same between the two years shown (i.e. starting with the most popular: car, walking, bus/coach/rail, other).

- The only form of transport that increased its popularity from 1995/7 to 2006 was travelling by bus/coach/rail.

- The biggest change between the two periods is in the number of trips made by walking (which dropped by a greater percentage than the other forms of transport increased/decreased).
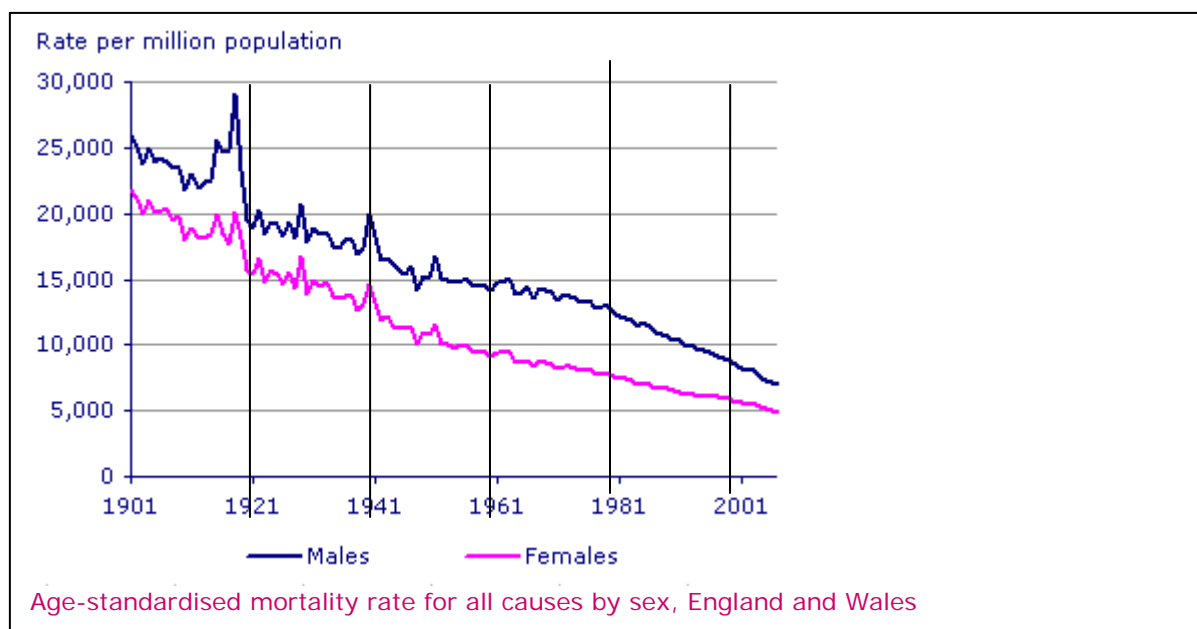
Note: You may have identified other key statements than these.

*If there is someone with whom you can discuss the chart and your statements, talk with them about what **they** think the chart shows and about the statements you wrote.*

Task 2

Death registrations
504,052 in England and Wales in 2007

Age-standardised mortality rate for all causes by sex, England and Wales

1 **Rates for males and females respectively for the relevant years are *approximately*:**
(Rates per million of population)

	1901	**1921**	**1941**	**1961**	**1981**	**2001**
Males	26 000	19 000	20 000	15 000	13 000	8 000
Females	22 000	16 000	15 000	9 000	8 000	5 000

Note: You may not have got exactly these figures.
As they are only estimates, your figures may vary (based the exact point at which you read the graph and how you rounded your estimate) but should be of roughly the same size as these.

Based on the figures above, the means for males and females will be:

2   **Males:**   **16 800**

$$\frac{26 + 19 + 20 + 15 + 13 + 8}{6} \quad = \quad \frac{101}{6} \quad = \quad 16.8 \text{ (thousand)}$$

Actually 16.833 but as the figures were only estimates anyway, it doesn't make sense to worry about giving too accurate an answer!

3   **Females:**   **12 500**

$$\frac{22 + 16 + 15 + 9 + 8 + 5}{6} \quad = \quad \frac{75}{6} \quad = \quad 12.5 \text{ (thousand)}$$

Note: Again, your means may vary slightly from these depending on what figures you got in the section above.

✓ **Progress check (answers)**

Progress check G, Q12: **A**   40.5

This question asks for the median.
The values in order are: *37   38   39   42   42   50.*
So the middle two values are: *39 and 42.*
The mid-point between these is: $\underline{39 + 42} \quad = \quad 40.5$
                                                    2

Progress check G, Q15: **A**   £110

The most expensive week in the Gardenia 7-day column is £580 and the cheapest is £470.
So, they would save: *580 – 470   =   £110.*

Progress check G, Q37: **D**   Charts 2 and 4.

These two charts show the negative amounts of money.

Progress check F, Q22: **B**   £30 less.

This question asks for the difference in the means.
The mean for the women is:

$$\frac{180 + 190 + 200 + 220 + 220 + 220 + 230 + 240 + 310 + 340}{10} \quad = \quad \frac{2350}{10} \quad = \quad £235$$

The mean for the men is £265, so the difference in the two means is: £265 – £235 = £30.

Progress check F, Q36: **B**   increased by 100%.

The full members are the same proportion of the whole membership, but note that the number of members in 1999 was 400, whilst in 2000 it was 800.

Progress check F, Q38: **D**   The vertical scale does not start at zero.