House prices – Teacher notes

Activity description

There are two versions of this activity. Both involve large data sets of house prices which show how they have changed in different locations over long and short periods of time.

In **Version A** of the students' sheets, students are asked to draw and interpret statistical diagrams and calculate statistical measures by hand.

Version B requires the use of a spreadsheet to create the statistical diagrams and calculate the statistical measures before students interpret them.

Suitability

Level 1 (Foundation)

Time

2–3 hours

Resources

Information sheet, worksheet
*S*preadsheet for spreadsheet version of activity

Equipment

Graph paper and calculators or computers with Excel
Optional/Extension: graphic calculators

Key mathematical language

Bar chart, line graph, mean, median, mode, range, axes, scale, labels.

Notes on the activity

The first sheet in the spreadsheet could be used to introduce this activity. You will then need to make sure that your students understand the tables of data before they attempt any of the 'Try these' section.

The information sheet gives a summary of statistical measures and diagrams which your students should have met – you may also like to revise this with them before they start work on the questions.

During the activity

Students could work individually or in pairs to encourage discussion.

Points for discussion

The main aim of the 'Think about …' questions on the information sheet is to encourage students to consider which statistical measures and diagrams are appropriate.

Discuss advantages and disadvantages of different statistical measures and diagrams. Ensure students know that the mean and range are both affected by outliers, and that there may be no mode or more than one mode.

Also ensure that students realise that a pie chart is not an appropriate diagram to use in this context, and why.

If students are using Version B, discuss the use of the line graph and scatter graph options in Excel. Emphasise that using a scatter graph gives a better result when there are numerical values (such as years) on the horizontal axis.

Extensions

Students could also use graphic calculators to draw statistical diagrams and calculate statistical measures.

They could search the internet for more recent house price data, and write a short report on what has happened to house prices recently.

Answers: Statistics version of activity

The graphs which follow are given as examples of what students may produce – other scales and styles are acceptable.

1 This is intended to be used as a discussion question.

a The line graph shows trends in the data more clearly whereas the bar chart makes it easier to find the difference in prices for individual months.

bi The trend is similar with the maximum price occurring in April and the minimum in December.
ii The average price for first time buyers is consistently lower (by about £40 000) than that for all houses.
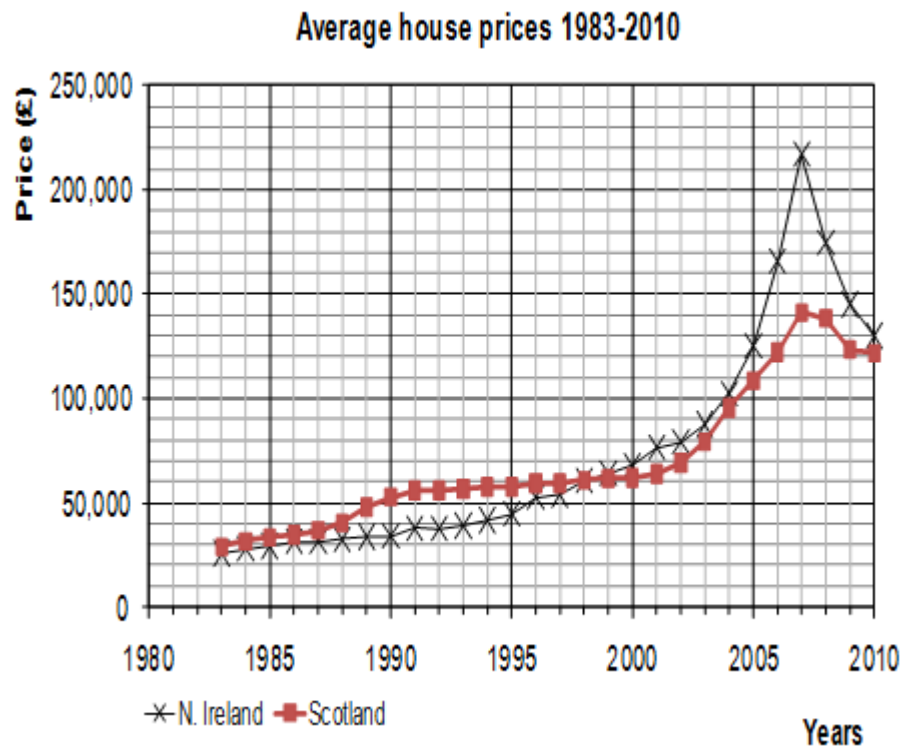
2a

	First-time buyers	All houses
Range	£127 808 − £119 960 = £7848	£170 772 − £161 498 = £9274
Median	£(123 717 + 124 971)/2 = £124 344	£(165 997 + 166 395)/2 = £166 196
Mean	£124 377	£166 383

b The average price of all house prices is more variable than that of houses bought by first-time buyers.

c Possible answers:
Median because it is not affected by very high or low values.
Mean because it includes all the values.

3a A graph produced in Excel is given on the right.

b Slow growth, followed by more rapid growth, with both reaching a peak in 2007, followed by a decline in prices.

Initially house prices in Scotland were higher than in Northern Ireland, but then the house prices in Northern Ireland rose much more quickly after 1998 and reached a much higher peak.

Average house prices 1983-2010

4a

	Northern Ireland	Scotland
Range	£217 180 − £25 715 = £191 465	£141 229 – £28 927 = £112 302
Median	(£52 577 + £54 153)/2 = £53 365	(£59 212 + £59 272)/2 = £59 242
Mean	£ 73 141	£69 851

b House prices in Northern Ireland varied more than those in Scotland.

The median shows that in the middle of the range, house prices were higher on average in Scotland.

However, the mean was higher in Northern Ireland – it was affected by the extremely high prices in Northern Ireland between 2006 and 2008.

5ai Yorks & Humb, North, and North West in ascending order.

ii Yes, but the North West and North had interchanged in the order.

bi South West, London and South East in ascending order.
ii Yes, but London and the South East had interchanged in the order.

c Houses are more expensive in the south or near London.

6a)	1983	2010
Range	£40 590– £23 090 = £17 500	£262 741– £124 274 = £138 467
Median	£28 223	£155 095
Mean	£ 30 202	£168 422

b House prices varied much more between the regions in 2010 than in 1983.

On average house prices were more than five times as big in 2010 than in 1983.

7a In 1989, the London prices reached a local maximum before falling again.

bi In the North of England, prices were fairly stable between 1990 and 2000.
ii In London house prices fell then rose again.

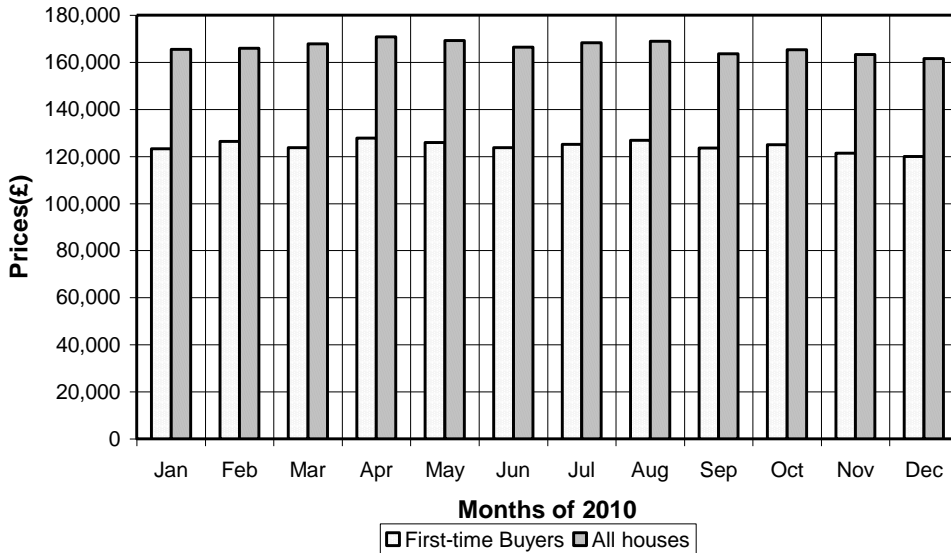**ci** House prices in both areas reached a maximum in 2007.
ii approximately £310 000 in London
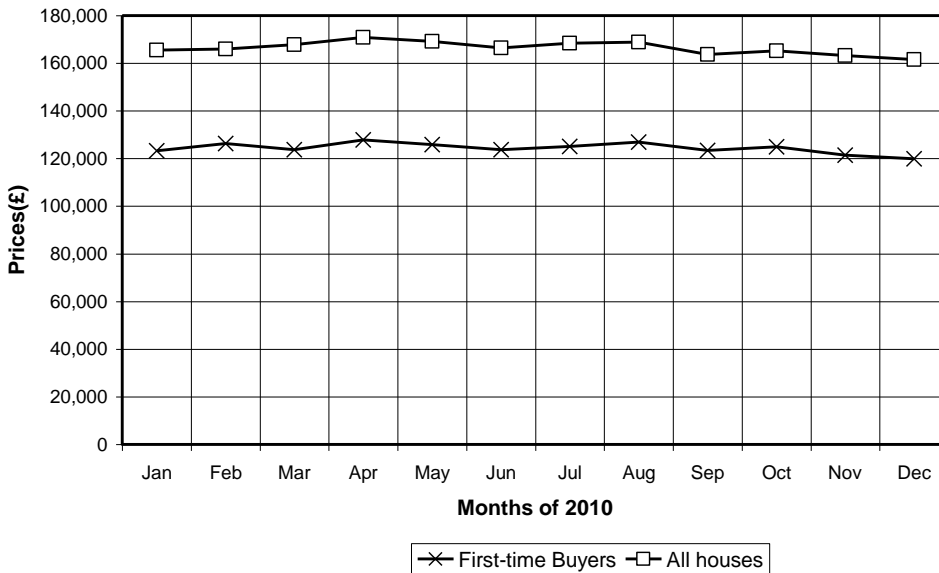**iii** approximately £150 000 in the North of England.

Answers: Spreadsheet version of activity

The graphs which follow are given as examples of what students may produce – other scales and styles are acceptable.

1a

Monthly average house prices in UK 2010

1b

Monthly average house prices in UK 2010

1c The line graph shows trends in the data more clearly, whereas the bar chart makes it easier to find the difference in prices for individual months.

d I The trend is similar, with the maximum price occurring in April and the minimum in December.

ii The average price for first time buyers is consistently lower (by about £40 000) than that for all houses.

2

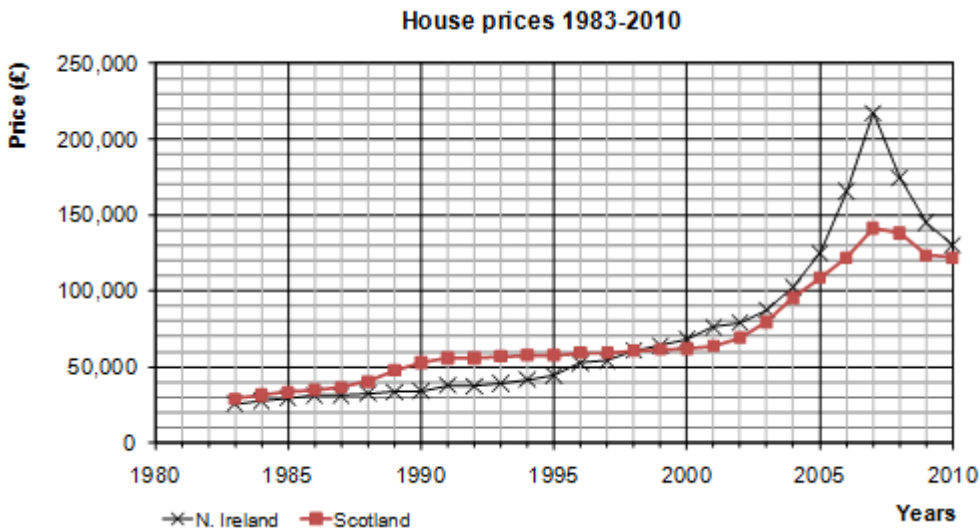| a	First-time buyers	All houses
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Mean	£124 377	£166 383

b All house prices are more variable than those paid by first-time buyers.

c Possible answers:
Median because it is not affected by extremely high or low values.
Mean because it includes all the values.

3a

House prices 1983-2010

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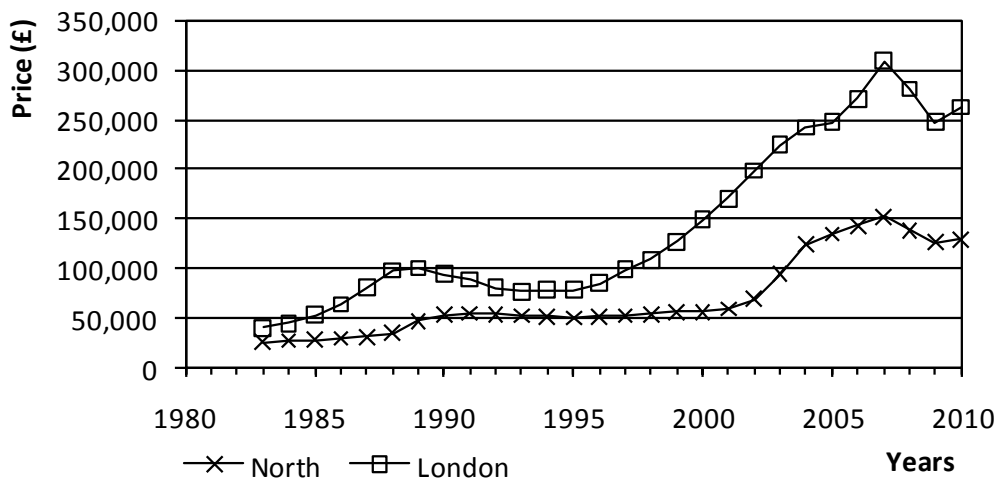
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Average house prices 1983-2010

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