Year 9 Autumn 1 Knowledge Organiser

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Language	Meaning	Example
Bias	An in-built error caused by choosing an unrepresentative sample so that that some outcomes are more likely than others.	Choosing fifty students from the same year group will not give an accurate representation of the homework set in other year groups.
Two-way table	A table that links information about two different categories.	<table><tr><th></th><th>Own a pet</th><th>Don't own a pet</th></tr><tr><td>Year 10</td><td>73</td><td>67</td></tr><tr><td>Year 11</td><td>59</td><td>81</td></tr></table>
Bar-chart	A way of displaying data where the height of each bar represents the frequency.	See next page
Bar-line chart	A way of displaying data where the length of each line represents the frequency.	See next page
Pie chart	A circular chart divided into sectors. Each sector represents one category. The size of the angle of each sector is proportional to the frequency.	See next page
Mean	An average found by adding all the values together and dividing by the number of values.	Data: 1, 1, 2, 2, 4, 5, 7, 8, 8, 8, 9 Mean = (1 + 1 + 2 + 2 + 4 + 6 + 6 + 8 + 8 + 8 + 9) ÷ 11 = 55 ÷ 11 = 5 Mode = 8 Median = 6 Range = 9 − 1 = 8
Mode	The value that occurs most often	
Median	The middle value when the data is arranged in order of size. If there is an even number of data, the median is the mean of the middle two values	
Range	The difference between the largest value and the smallest value.	

Outliers are values that lie outside most of the other values of a set of data.

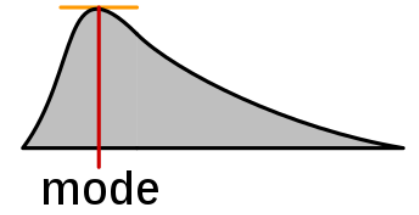
In this data set

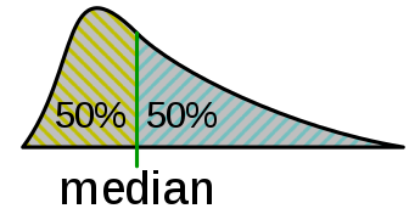
1, 1, 2, 2, 3, 4, 4, 4, 16

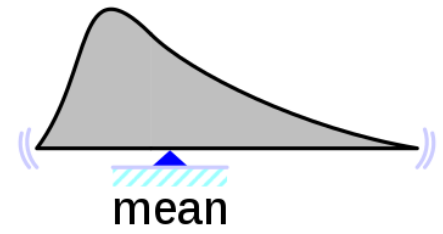
16 is an outlier.

The mean and range are both affected by outliers.

- The **mean** of a set of data is the total of all the values divided by the number of values.
- The **mode** is the value that occurs most often.
- The **median** is the middle value when the data is arranged in order.
- The **range** is the highest value – lowest value.







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- You can use a **stem-and-leaf diagram** to display numerical data.

A stem-and-leaf diagram shows

- the shape of the distribution
- each individual value of the data.

This stem-and-leaf diagram is **ordered**, as the data is in numerical order.

stem	leaf
13	5
12	0 6 9
11	2 2 6 8
10	3 7

This means 135.

This means 120.

Key: 11 | 2 means 112

Always give a key.

- You can use a data collection sheet to collect **data** from a questionnaire or experiment.
- You can use a **two-way table** to collate the two sets of results.

EXAMPLE

Two questions on a questionnaire are:

'Are you male or female?' and 'How old are you?'

Design a two-way table to collect this data.

	Under 10	10—19	20—29	30—40	40+	Total
Male						
Female						
Total						

You can use a **pie chart** to display data.

Pie charts use a circle to give a quick visual picture of all the data.

The size of each **angle** shows the size of each **category**.

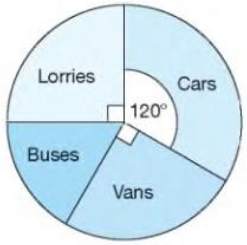
- A pie chart shows the **proportion** or fraction of each category compared to the whole circle.

EXAMPLE

60 vehicles are shown on the pie chart.

Calculate the numbers of cars, vans, buses and lorries.

Vehicles parked in the High St.



60 vehicles represents 360°.

1 vehicle represents $360° \div 60 = 6°$

The angle for buses is $360° - (90° + 90° + 120°) = 60°$

Number of cars $= 120 \div 6 = 20$

Number of vans $= 90 \div 6 = 15$

Number of buses $= 60 \div 6 = 10$

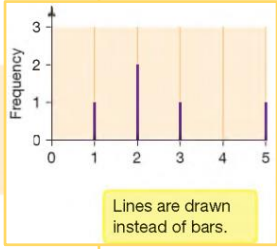
Number of lorries $= 90 \div 6 = 15$

Total number of vehicles $= 60$

You can use a **bar chart** to display data.

Bar charts give a visual picture of the size of each category.

- A bar chart shows
  - how each category compares with the others
  - all the data, but in categories.



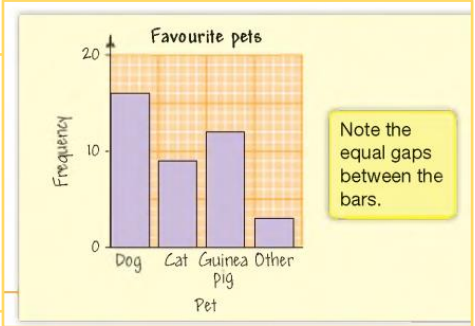
The bars can be horizontal or vertical.

- **Bar-line charts** are a good way to display (discrete) numerical data.

A class are asked to name one favourite pet.
The results are shown in the table.

Pet	Dog	Cat	Guinea pig	Other
Number of students	16	9	12	3

Draw a bar chart to show this information.



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Week 1 – Census, sampling and bias (clip 394)

Quiz 1	**Quiz 2**
Quiz 3	**Quiz 4**

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Week 2 – Averages and the range (clips 404-410)

Quiz 1	**Quiz 2**
Quiz 3	**Quiz 4**

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Week 3 – Bar charts and vertical line charts (clip 425)

Quiz 1	**Quiz 2**
Quiz 3	**Quiz 4**

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Week 4 – Pie charts (clip 427)

Quiz 1	**Quiz 2**
Quiz 3	**Quiz 4**

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Week 5 – Averages from a table (clip 414-417)

Quiz 1	**Quiz 2**
Quiz 3	**Quiz 4**

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Week 6 – Estimating the mean (clip 418)

Quiz 1	**Quiz 2**
Quiz 3	**Quiz 4**