Year 8 Knowledge Organiser
TYPES OF DATA AND GRAPHS

Key Concepts

Qualitative data: data collected that is described in words **not** numbers.
e.g. race, hair colour, ethnicity.

Quantitative data: this is the collection of numerical data that is either <u>discrete</u> or <u>continuous</u>.

Discrete data: numerical data that is categorised into a finite number of classifications.
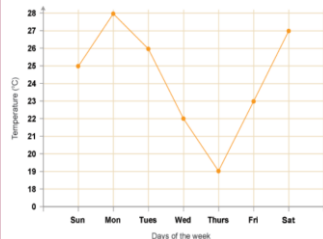e.g. number of siblings in a family, shoe size, .

Continuous data: numerical data that can take any value. This data is usually measured on a large number scale.
e.g. height, weight, time, capacity.
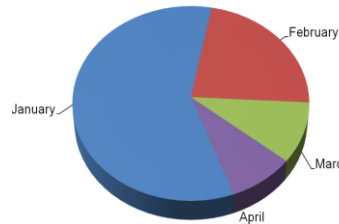
Examples

Comparative bar charts

Comparison between various cars
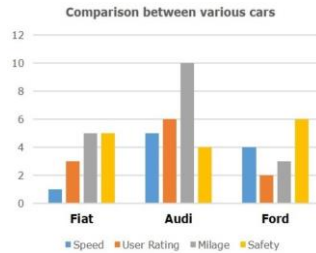
Line graphs

Tally charts

Colour	Tally	Frequency
Red	|||| |||| |||	13
Blue	|||| ||||	9
White	|||| |||| |||| |||| ||||	24
Black	|||| |||| ||	12
Other	|||| ||||	9

Pie charts

Sales split month wise

Composite bar charts

Pictograms

= 6 cupcakes
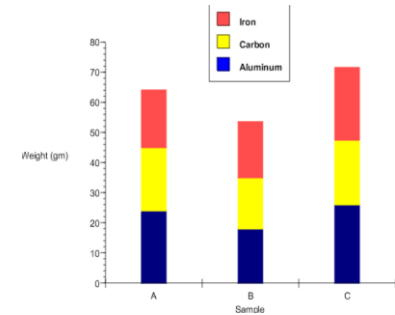
Key Words
Data
Discrete
Continuous
Qualitative
Quantitative
Graph

What types of data is each of the following?

1) Eye colour
2) Time it takes to run 100m
3) Number of goals scored in a match
4) Length of a car (to the nearest cm)
5) Number of pets a person owns

ANSWERS: 1) Qualitative 2) Continuous, quantitative 3) Discrete, quantitative 4) Continuous, quantitative 5) Discrete, quantitative

Year 8 Knowledge Organiser
PRESENTING AND INTERPRETTING DATA

Key Concept
Pie Charts

There are 360 degrees in a pie chart. So you need angles that add to 360°.

Eye colour	F	
Blue	15	× 4 = 60
Brown	43	× 4 = 172
Other	32	× 4 = 128

$\frac{360}{90} = 4$ = 90   = 360

Key Words

Frequency: Total.
Mean: Total of data divided by the number of pieces of data.
Mode: The value that occurs most frequently.
Median: Middle number when they are in order.
Range: Difference between the largest and smallest values.

Tips

- There can be more than one mode.
- Range is a measure of spread, not an average.
- Bar charts have gaps between the bars.

Examples

5, 9, 9, 9, (11) 12, 13, 15, 16

Averages

$$Mean = \frac{5 + 9 + 9 + 9 + 11 + 12 + 13 + 15 + 16}{9} = \frac{99}{9} = 11$$

Median = 11   (The middle number shown above)

Mode = 9   (This number occurs most often)

Measure of Spread

Range = 16 – 5 = 11
  (A bigger range means the data is more spread out)

Questions

1) Find the mean, mode, median and range of:
   a)   3, 12, 4, 6, 8, 5, 4   b) 12, 1, 10, 1, 9, 3, 4, 9, 7, 9
2) For the table:
a)   Draw a pie chart to show the data.
b)   Draw a bar chart to show the data.
c)   Work out the mean of the data.

Age	Frequency
11	17
12	11
13	8

ANSWERS: 1) a) Mean = 6, Mode = 4, Median = 5, Range = 9   b) Mean = 6.5, Mode = 9, Median = 8, Range = 11   2) a) Angles 170°, 110 °, 80 °   c) 11.75

Year 8 Knowledge Organiser
AVERAGES FROM A TABLE

Key Concepts

Modal class (mode)
Group with the highest frequency.

Median group
The median lies in the group which holds the $\frac{total\ frequency+1}{2}$ position. Once identified, use the cumulative frequency to identify which group the median belongs from the table.

Estimate the mean
For grouped data, the mean can only be an estimate as we do not know the exact values in each group. To estimate, we use the midpoints of each group and to calculate the mean we find $\frac{total\ fx}{total\ f}$.

Examples

Length (L cm)	Frequency (f)	Midpoint (x)	fx
$0 < L \leq 10$	10	5	10 × 5 = 50
$10 < L \leq 20$	15	15	15 × 15 = 225
$20 < L \leq 30$	23	25	23 × 25 = 575
$30 < L \leq 40$	7	35	7 × 35 = 245
Total	55		1095

a) Estimate the mean of this data.
step 1: calculate the total frequency
step 2: find the midpoint of each group
step 3: calculate $f \times x$
step 4: calculate the mean shown below

$$\frac{Total\ fx}{Total\ f} = \frac{1095}{55} = 19.9 cm$$

b) Identify the modal class from this data set. *" the group that has the highest frequency "*
Modal class is $20 < x \leq 30$

c) Identify the group in which the median would lie. Median $= \frac{Total\ frequency+1}{2} = \frac{56}{2} =$
$28th\ value$

" add the frequency column until you reach the 28th value " Median is the in group $20 < x \leq 30$

414-418

Key Words
Midpoint
Mean
Median
Modal

Cost (£C)	Frequency	Midpoint	
$0 < C \leq 4$	2		
$4 < C \leq 8$	3		
$8 < C \leq 12$	5		
$12 < C \leq 16$	12		
$16 < C \leq 20$	3		

From the data:
a) Identify the modal class.
b) Identify the group which holds the median.
c) Estimate the mean.