

DELVING INTO DATA...

Collecting, representing and interpreting

What do I need to be able to do?

By the end of this unit you should be able to:

- Construct and interpret frequency tables and polygon two-way tables, line, bar, & pie charts
- Find and interpret averages from a list and a table
- Construct and interpret time series graphs, stem and leaf diagrams and scatter graphs

Keywords

Population: the whole group that is being studied

Sample: a selection taken from the population that will let you find out information about the larger group

Representative: a sample group that accurately represents the population

Random sample: a group completely chosen by chance. No predictability to who it will include

Bias: a built-in error that makes all values wrong by a certain amount

Primary data: data collected from an original source for a purpose

Secondary data: data taken from an external location. Not collected directly

Outlier: a value that stands apart from the data set

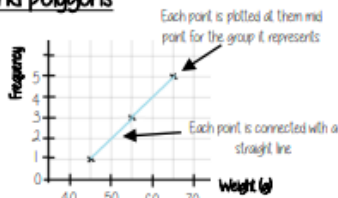
Frequency tables and polygons

x Weight(g)	Frequency
$40 < x \leq 50$	1
$50 < x \leq 60$	3
$60 < x \leq 70$	5

We do not know from grouped data where each value is placed so have to use an estimate for calculations

MI-POINTS

Mi-points are used as estimated values for grouped data. The middle of each group

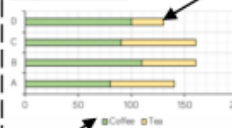


The data about weight starts at 40. So the axis can start at 40

Mi-point
Start point - End point
2

Bar and line charts

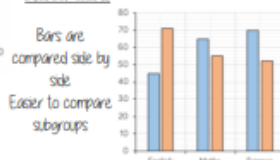
Composite bar charts



Categories clearly indicated

Compare the bars green compared to yellow. The size of each bar is the frequency. Overall total easily comparable

Dual bar charts



Categories clearly indicated

Two way tables

60 people visited the zoo one Saturday morning. 26 of them were adults. 13 of the adults' favourite animal was an elephant. 24 of the children's favourite animal was an elephant.

Extract information to input to the two-way table

	Adult	Child	Total
Elephant	13	24	37
Other	13	10	23
Total	26	34	60

Needs subgroup totals

Overall total

Draw and interpret Pie Charts

Type of pet	Dog	Cat	Hamster
Frequency	32	25	3

There were 60 people asked in this survey (Total frequency)

$$\frac{32}{60}$$

"32 out of 60 people had a dog"

This fraction of the 360 degrees represents dogs

$$\frac{32}{60} \times 360 = 192^\circ$$



Use a protractor to draw. This is 192°

Multiple method
As 60 goes into 360 - 6 times
Each frequency can be multiplied by 6 to find the degrees (proportion of 360)

Comparing Pie Charts
You NEED the overall frequency to make any comparisons

Averages from a table

Non-grouped data

Number of Siblings	0	1	2
Frequency	6	8	6
Subtotal	0	8	12

Overall Frequency 20

Total number of siblings 20

The data in a list: 0,0,0,0,0,1,1,1,1,1,1,2,2,2,2,2,2

$$\text{Mean} = \frac{\text{total number of siblings}}{\text{Total frequency}} = 1$$

Grouped data

x Weight(g)	Frequency	Mi Point	MP x Freq
$40 < x \leq 50$	1	45	45
$50 < x \leq 60$	3	55	165
$60 < x \leq 70$	5	65	325

Overall Frequency 9

Overall Total 565

Mean 62.8g

The data in a list: 45, 55, 55, 55, 65, 65, 65, 65, 65

Averages from lists

The Mean

A measure of average to find the central tendency... a typical value that represents the data

$$24, 8, 4, 11, 8$$

Find the sum of the data (add the values)

55

Divide the overall total by how many pieces of data you have

$$55 \div 5$$

Mean = 11

The Mode (The modal value)

This is the number OR the item that occurs the most (it does not have to be numerical)

$$24, 8, 4, 11, 8$$

This can still be easier if the data is ordered first

Mode = 8

The Median

The value in the center (in the middle) of the data

$$24, 8, 4, 11, 8$$

Put the data in order

$$4, 8, 8, 11, 24$$

Find the value in the middle

$$4, 8, 8, 11, 24$$

Median = 8

NOTE: If there is no single middle value find the mean of the two numbers left

For Grouped Data

The modal group - which group has the highest frequency