

Statistics



Interpreting Graphs.



Scattergraphs & Codes



Stem and Leaf Diagram



Drawing Graphs



Mean, Median, Mode and Range of a Data Set



Line of best fit



Constructing Frequency Tables (Tally Tables)



Range Mode & Median from Frequency Table



Mean from a Frequency Table

Interpreting Graphs

Learning Intention

1. To explain how to interpret various graphs.

Success Criteria

1. Understand key information on various graphs.
2. Solve problems involving graphs.



Interpret

You have 1 minute to come up with a question

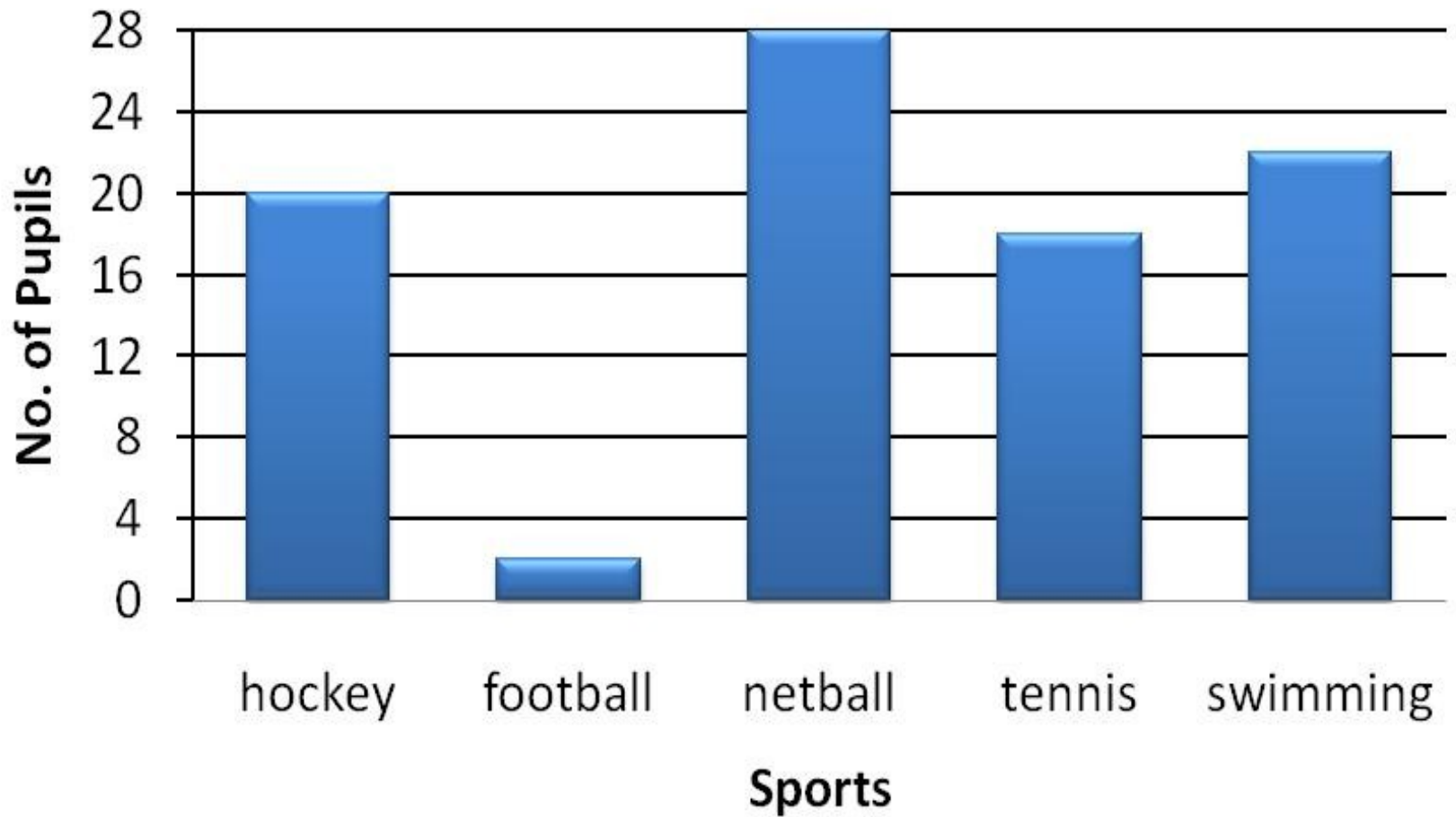
Web pages visited	
Austin	     
Chad	       
Stephen	  

Each  = 10 web pages

Each  = 5 web pages

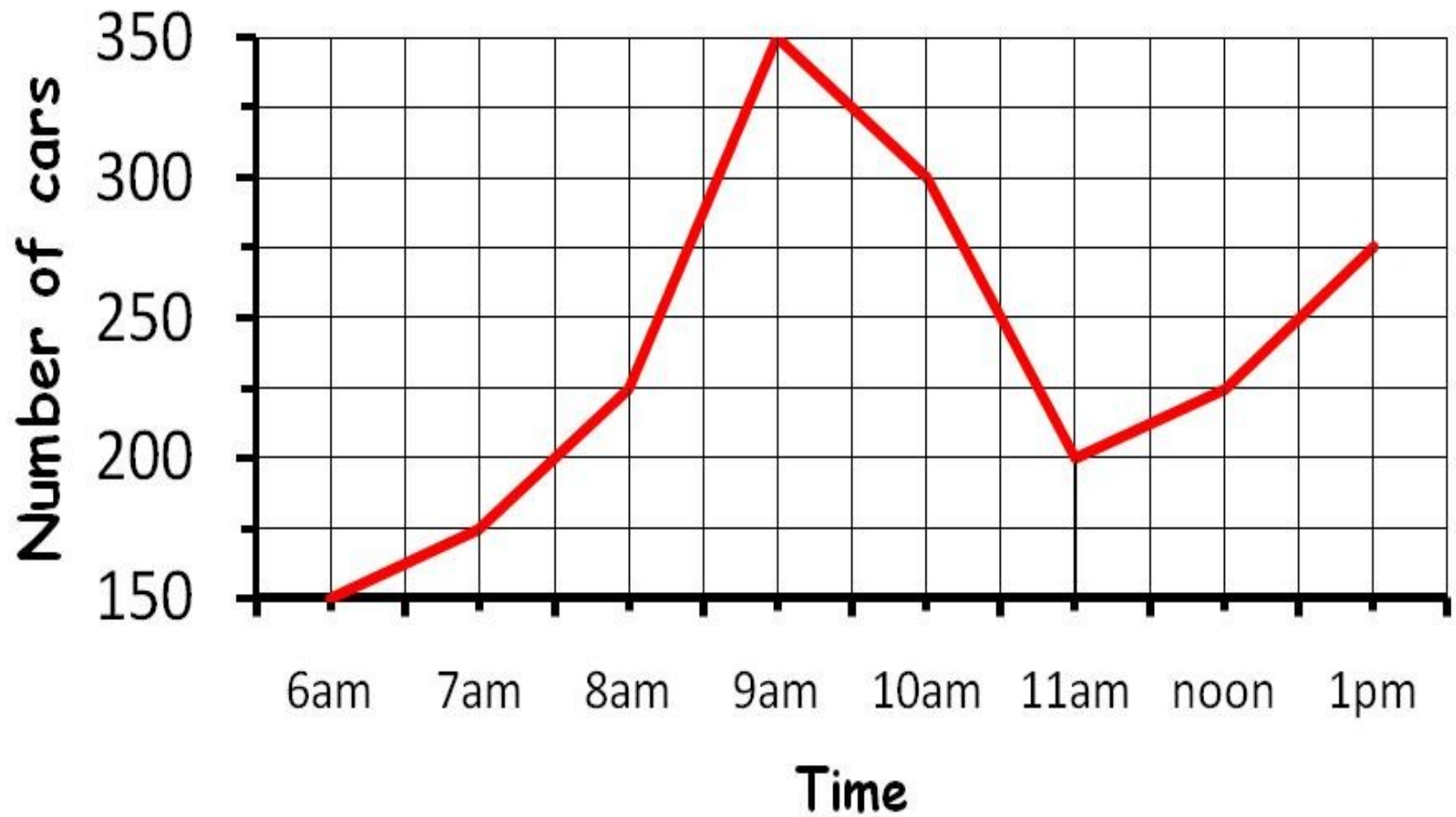


Interpreting Graphs



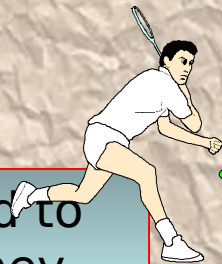


Interpreting Graphs





Drawing Pie Charts



Favourite Sport	
Rugby	75
Football	90
Cricket	45
Ice Hockey	60
Squash	30
Total	300

In a survey, 300 people were asked to indicate which one of five sports they liked best. Using the graph calculate the number people who liked each sport.



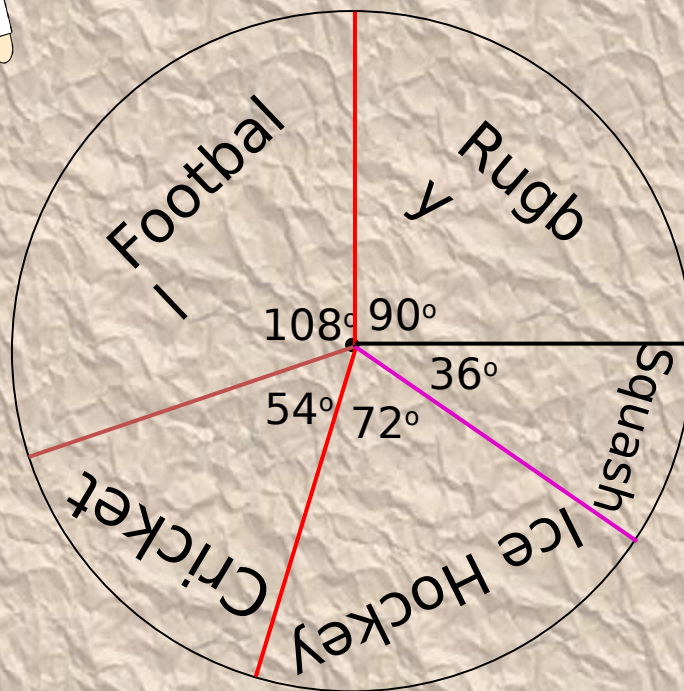
$$\text{Rugby angle} = \frac{90}{360} \times 300 = 75$$

$$\text{Football angle} = \frac{108}{360} \times 300 = 90$$

$$\text{Cricket angle} = \frac{54}{360} \times 300 = 45$$

$$\text{Ice Hockey angle} = \frac{72}{360} \times 300 = 60$$

$$\text{Squash angle} = \frac{36}{360} \times 300 = 30$$



Constructing Graphs

Learning Intention

1. To construct various graphs accurately.

Success Criteria

1. Understand how to construct various graphs from given information.

Bar Graphs

A survey of S1 pupils asked what their favourite pet was. The results are shown below

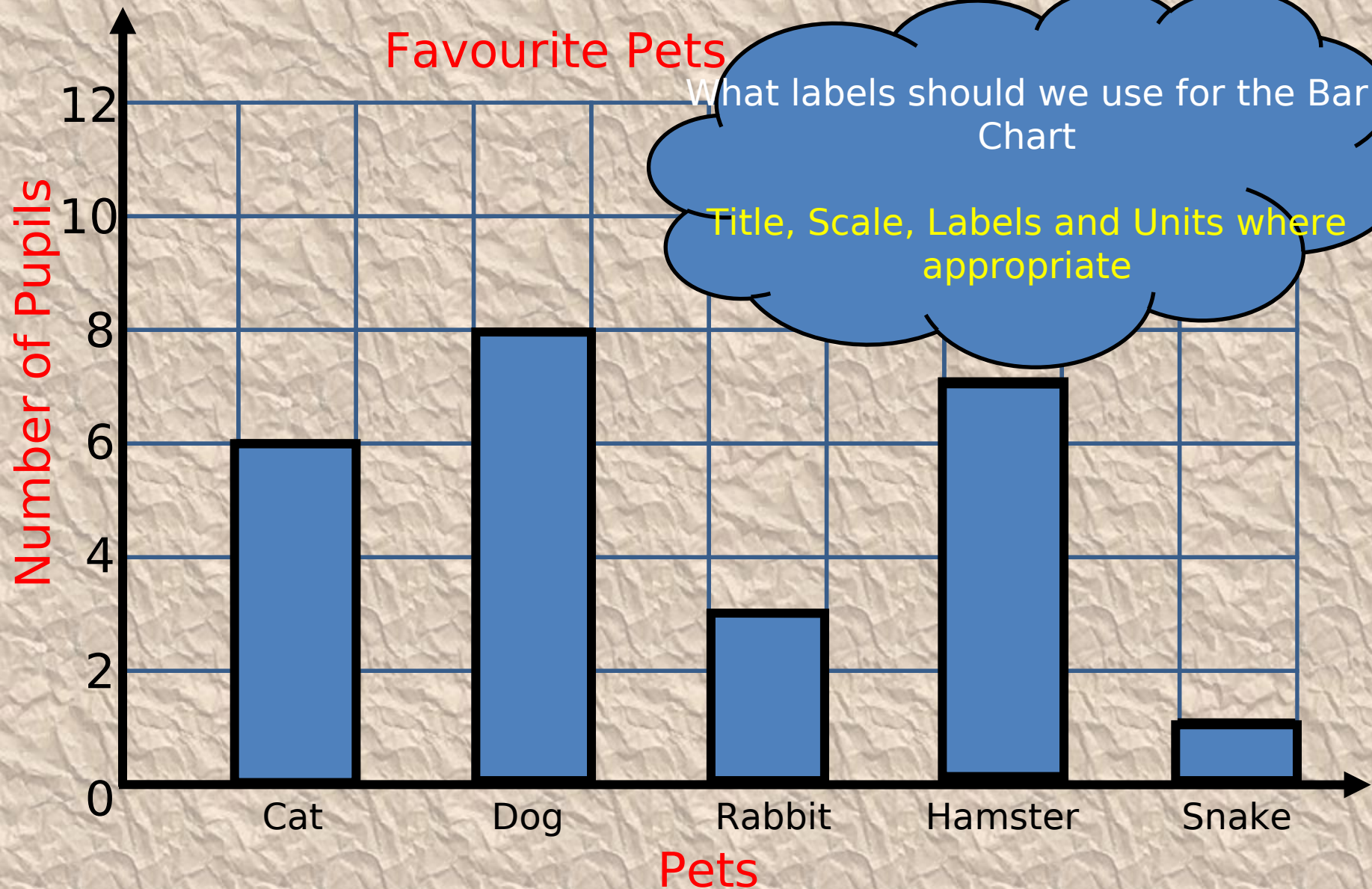
cat	dog	rabbit	hamster	snake
6	8	3	7	1

Lets construct a Bar graph for the following table

Remember graph has to be labelled and neat !

cat	dog	rabbit	hamster	snake
6	8	3	7	1

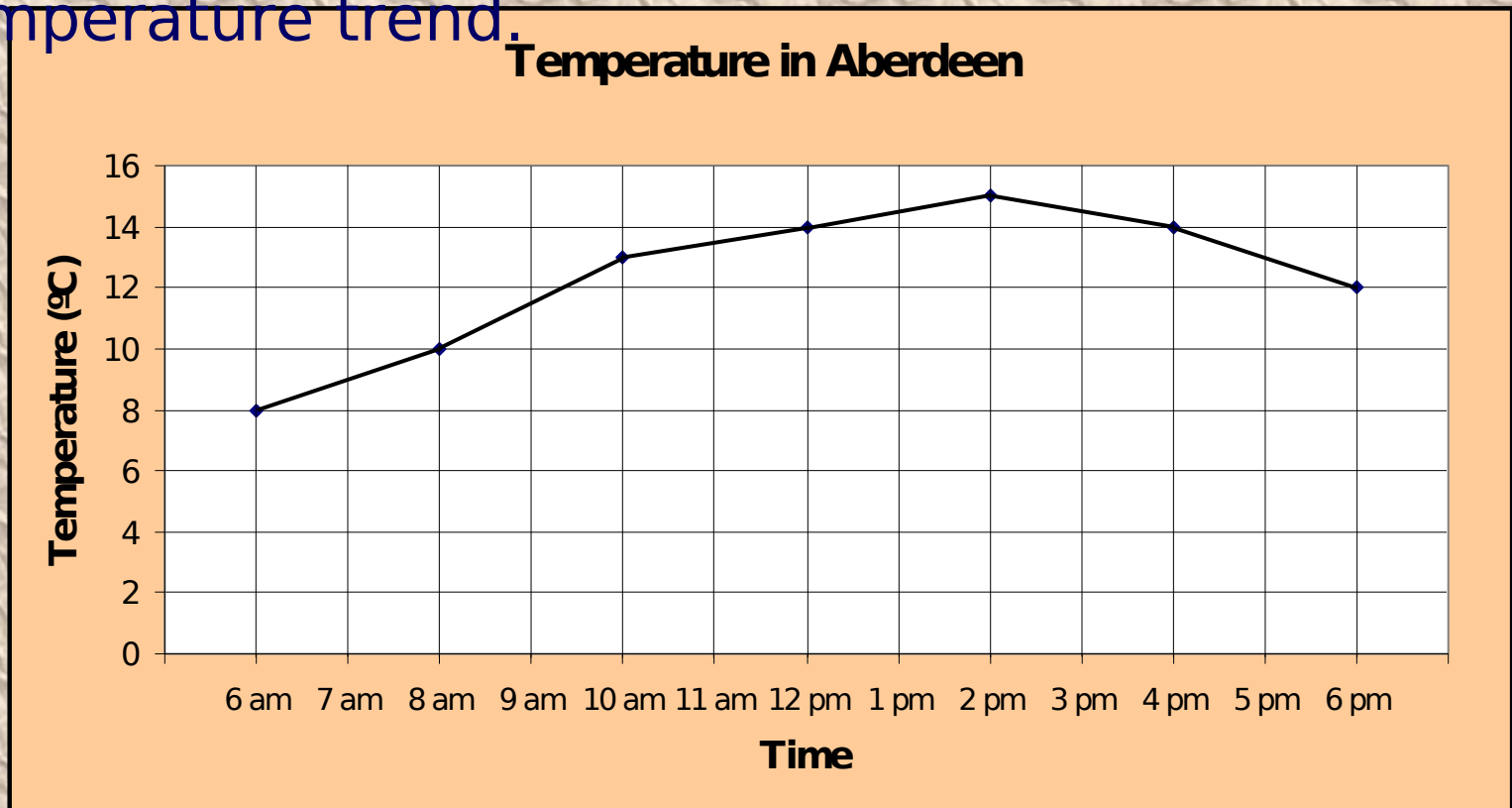
Favourite Pets



Line graphs

Line graphs are most often used to show trends over time.

If the temperature in Aberdeen, in $^{\circ}\text{C}$, over a 12-hour period is plotted, the line graph shows the temperature trend.

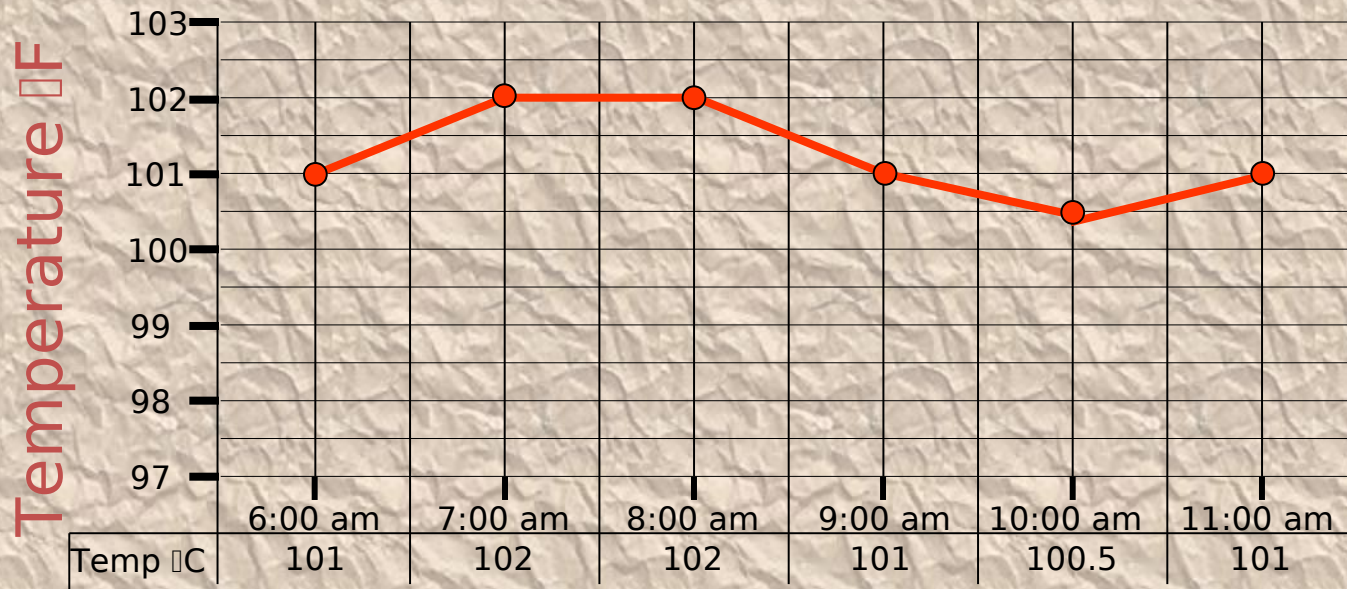


Constructing a Line Graph

A hospital nurse recorded a patient's temperature every hour

Time	6am	7am	8am	9am	10am	11am
Temp	101	102	102	101	100.5	101

Temperature versus Time



Time Hours

Different Averages

Learning Intention

1. To define the terms Mean Median, Mode and Range for a set of data.

Success Criteria

1. Know the terms Mean, Median, Mode and Range.
2. Work out values of Mean, Median, Mode and Range.

Mean (Average)

$$\text{The Mean} = \frac{\text{Sum of all the data values}}{\text{how many data values}}$$

Find the mean of the set of data 1, 1, 1, 1, 2, 3, 26

$$\text{The Mean} = \frac{1+1+1+1+2+3+26}{7} = 5$$

Can you see that this is not the most suitable of averages since five out of the six numbers are all below the mean of 5

Different Averages

An average should indicate a
“measure of central tendency”
but should also indicate
what the distribution of data looks like.

This is why we have 3 different types of averages to consider

1. The Mean
2. The Median (put the data in order then find the MIDDLE value)
3. The Mode (the number that appears the most)

For the above data the Median or Mode is a better average = 1

Different Averages

Example :

Find the mean, median, mode and range for the set of data

Range = Highest number - Lowest Number

10, 2, 14, 1, 14, 7

$$\text{Mean} = \frac{48}{6} = 8$$

$$\text{Mode} = 14$$

$$\text{Range} = 14 - 1 = 13$$

$$\text{Median} = 1, 2, 7, 10, 14, 14$$

$$\text{Median} = \frac{7 + 10}{2} = \frac{17}{2} = 8.5$$

Aims of the Lesson

1. Understand the term Frequency Table.
2. Construct a Frequency Table.
3. Interpret information from Frequency Tables.

Frequency tables

Raw data can often appear untidy and difficult to understand. Organising such data into frequency tables can make it much easier to make sense of (interpret) the data.

Data	Tally	Frequency

 represents a tally of 5

Sum of Tally is the Frequency

Frequency tables

Example 1. A tomato grower ideally wants his tomatoes to have diameters of 60mm, but a diameter ranging from 58mm to 62mm will be acceptable. Organise the diameters given below into a frequency table.

58	56	59	57	60	56	62	62	58	56	58	59
56	59	56	59	57	58	60	62	61	58	59	62
60	58	60	59	56	59	60	61	56	60	62	59
61	58	60	61	62	58	57	62	59	61	58	60

Lowest number 56

Highest number 62

Frequency tables

~~58~~	~~56~~	~~59~~	~~57~~	~~60~~	~~58~~	62	60	58	60	58	59
57	59	56	59	57	58	60	59	61	58	59	62
60	58	60	59	59	60	59	61	59	60	62	59
61	58	60	61	59	58	57	62	59	61	58	60

Diameter	Tally	Frequency
56	II	
57	I	
58	I	
59	I	
60	I	
61		
62		

Frequency tables

~~58~~	~~56~~	~~59~~	~~57~~	~~60~~	~~56~~	~~62~~	~~60~~	~~58~~	~~60~~	~~58~~	~~58~~
~~57~~	~~59~~	~~56~~	~~59~~	~~57~~	~~58~~	~~60~~	~~59~~	~~61~~	~~58~~	~~59~~	~~62~~
~~60~~	~~58~~	~~60~~	~~59~~	~~59~~	~~60~~	~~59~~	~~61~~	~~59~~	~~60~~	~~62~~	~~58~~
~~61~~	~~58~~	~~60~~	~~61~~	~~59~~	~~58~~	~~57~~	~~62~~	~~59~~	~~61~~	~~58~~	~~60~~

Diameter	Tally	Frequency
56	III	3
57	IIII	4
58	~~IIII~~ IIII	9
59	~~IIII~~ ~~IIII~~ III	13
60	~~IIII~~ ~~IIII~~	10
61	~~IIII~~	5
62	IIII	4

Frequency Tables

Range, Mode & Median

Learning Intention

1. To explain how to work out the range , mode & median from a frequency table.

Success Criteria

1. Understand how to work out the range, mode and median from a frequency table.
2. Solve problems using a frequency Table.

Frequency Tables

Range, Mode & Median

Reminder !

Range : The difference between highest and Lowest values. It is a measure of spread.

Median : The middle value of a set of data.
When there are two middle values
the median is half way between them.

Mode : The value that occurs the most in a set
of data. Can be more than one value.

Different Averages

Example :

Find the median and mode for the set of data.

10, 2, 14, 1, 14, 7

Median = 1, 2, 7, 10, 14, 14

Range = $14 - 1 = 13$

$$\text{Median} = \frac{7 + 10}{2} = \frac{17}{2} = 8.5$$

Mode = 14

Range, Mode, Median from Frequency

val High - Low
= 6 - 0
= 6

$20 + 17 = 37$
 $20 + 17 + 15 = 52$

Here
General

ity Stat

Numbers of sports played

Frequency

0

20

1

17

2

15

3

10

4

9

5

3

6

2

Range = 6

Mode = 0

Median harder to calculate

$20 + 17 + 15 + 10 + 9 + 3 + 2 = 76$

Middle value of 76 is 38

38 lies in here

Median = 2

Range, Mode, Median from Frequency

Here are

Mode
value that occurs the
most
= 5

$$25 + 29 = 54$$

$$25 + 29 + 20 = 74$$

among 1000 High School students.

Grade scored in exam	Frequency
1	25
2	29
3	20
4	20
5	31
6	10
7	5

Range = 6

Mode = 5

Median harder to calculate

$$25 + 29 + 20 + 20 + 31 + 10 + 5 =$$

Middle value of 130 is 70

70 lies in here

Median = 3

Frequency Tables

Working Out the Mean

Learning Intention

1. To explain how to work out the mean by adding in a third column to a Frequency Table.

Success Criteria

1. Add a third column to a frequency table.
2. Work out the mean from a frequency Table.

Frequency Tables

Working Out the Mean

Example : This table shows the number of coins in the pockets of some children.

Adding a third column to this table will help us find the total number of coins and the 'Mean'.

$$\text{Mean Number of coins} = \frac{40}{16} = 2.5 \text{ coins}$$

No of Coins (c)	Freq. (f)	f x C
1	5	5 x 1 = 5
2	5	5 x 2 = 10
3	1	1 x 3 = 3
4	3	3 x 4 = 12
5	2	2 x 5 = 10
Totals	16	40

Frequency Tables

Working Out the Mean

Example : This table shows the number of brothers and sisters of pupils in an S2 class.

Adding a third column to this table will help us find the total number of siblings and the 'Mean'.

Mean Number of siblings

$$= \frac{33}{30} = 1.1 \text{ siblings}$$

No of Siblings (S)	Freq. (f)	$S \times f$
0	9	$0 \times 9 = 0$
1	13	$1 \times 13 = 13$
2	6	$2 \times 6 = 12$
3	1	$3 \times 1 = 3$
5	1	$5 \times 1 = 5$
Totals	30	33