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
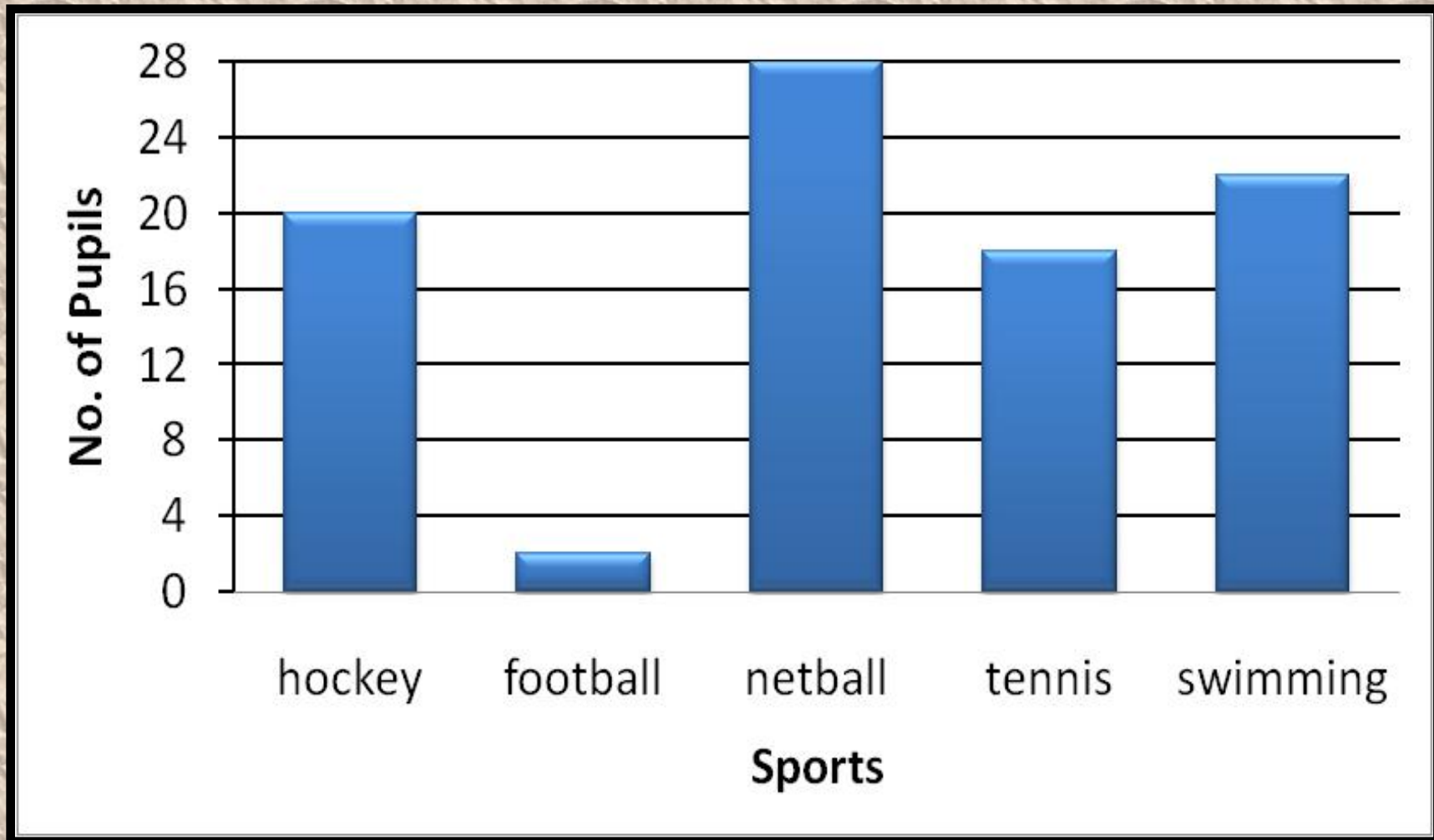
Web pages visited	
Austin	💻💻💻💻💻▪
Chad	💻💻💻💻💻💻💻▪
Stephen	💻💻💻

Each 💻 = 10 web pages

Each ▪ = 5 web pages

Interpreting Graphs

Interpreting Graphs
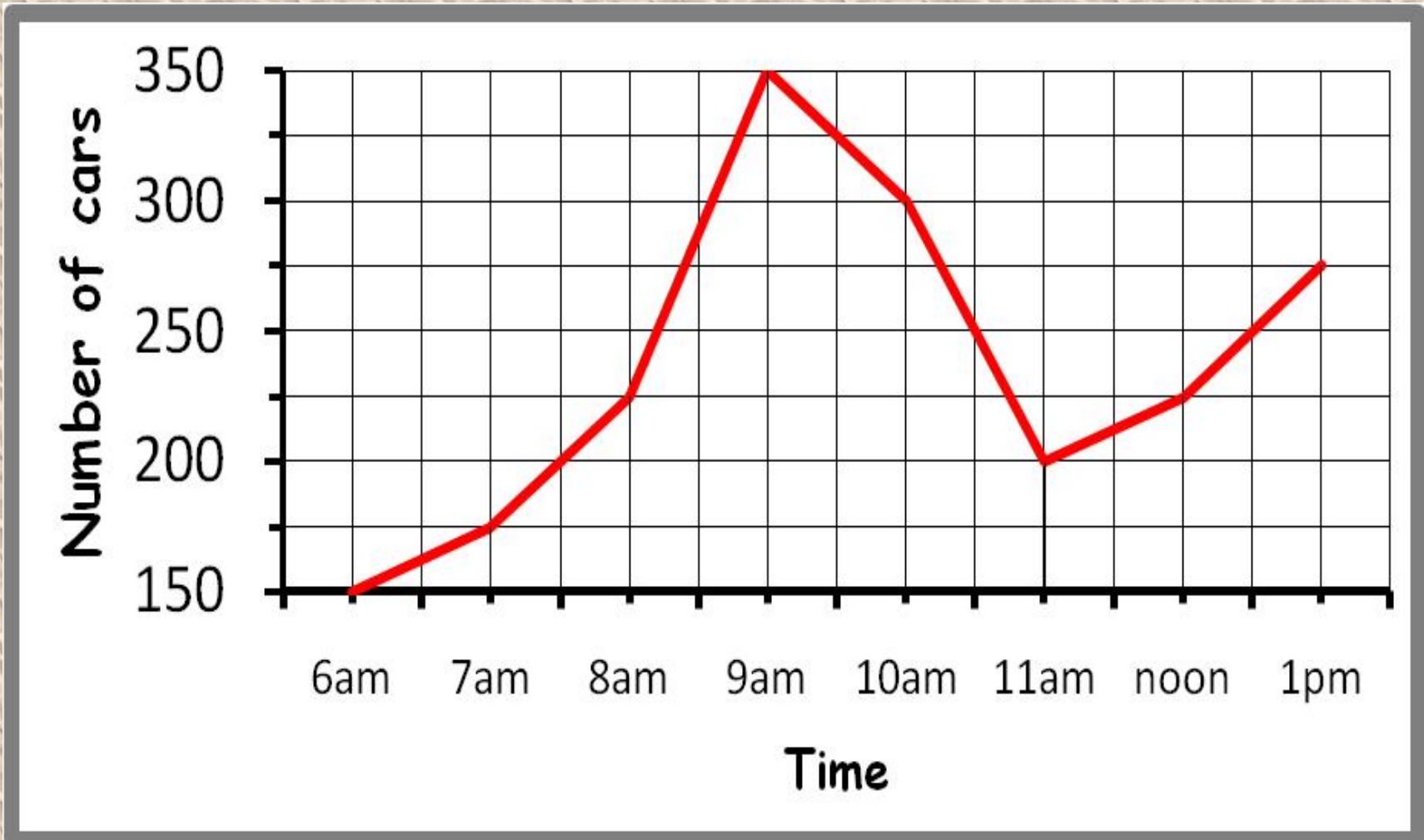
Drawing Pie Charts
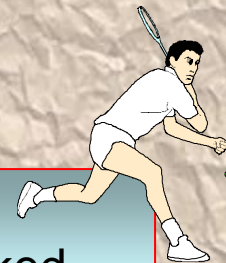
Favourite Sport	
Rugby	75
Football	90
Cricket	45
Ice Hockey	60
Squash	30
Total	**300**

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.

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

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

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

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

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

Football 108° 90° Rugby

36°

54° 72°

Cricket

Ice Hockey

Squash
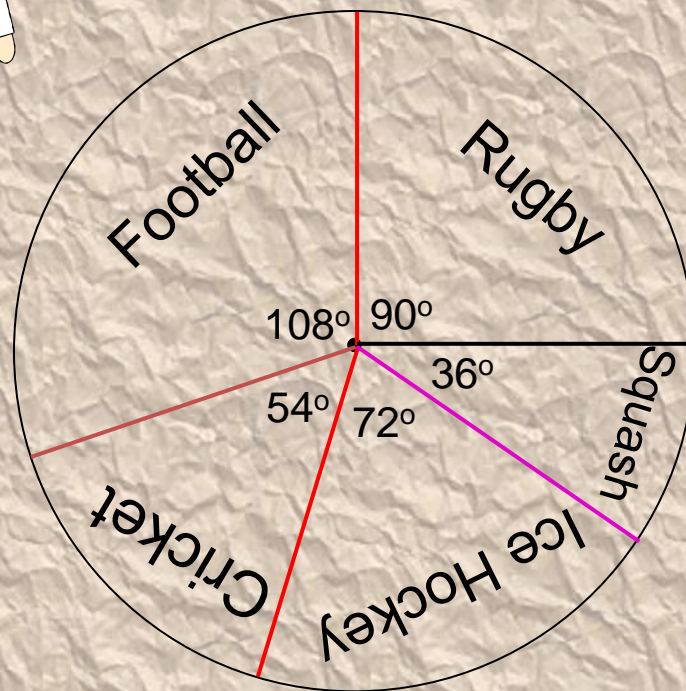
Constructing Graphs

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
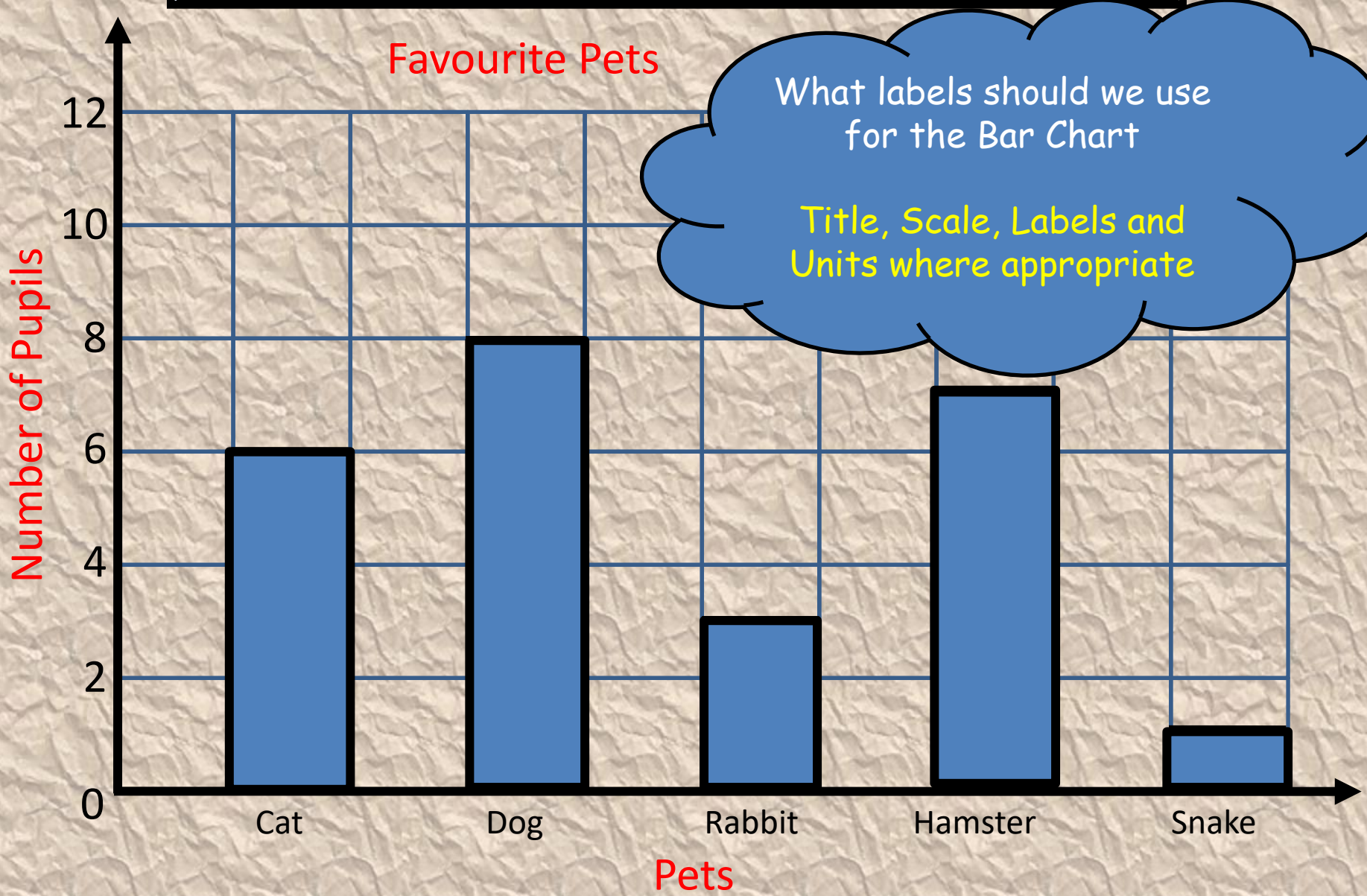
What labels should we use for the Bar Chart

Title, Scale, Labels and Units where appropriate

Number of Pupils

Pets

Cat   Dog   Rabbit   Hamster   Snake

Line graphs

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

If the temperature in Aberdeen, in °C, over a 12-hour period is plotted, the line graph shows the temperature trend.

Temperature in Aberdeen
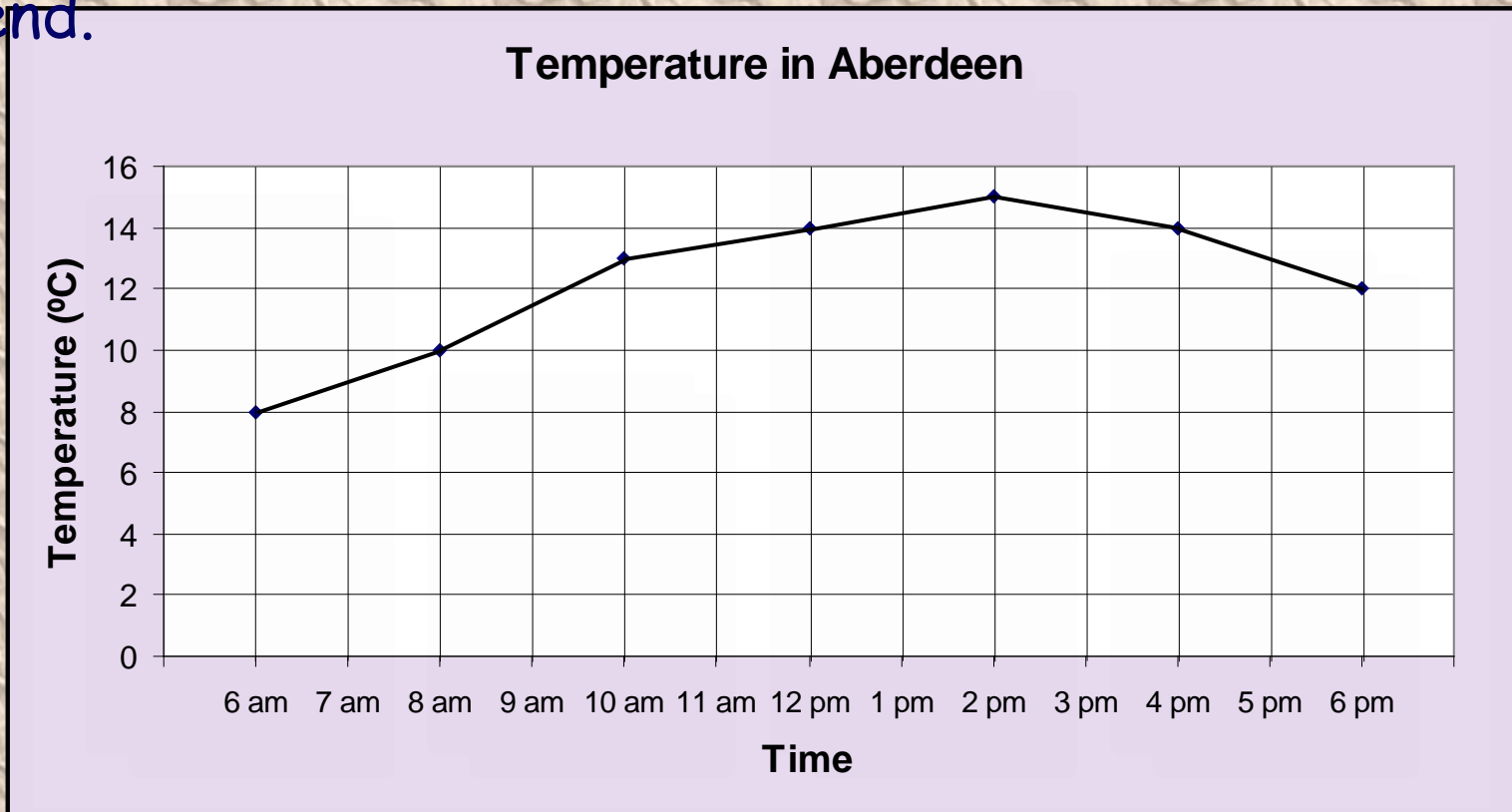
Constructing a Line Graph

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

	6:00 am	7:00 am	8:00 am	9:00 am	10:00 am	11:00 am
Temp ℃	101	102	102	101	100.5	101

Temperature ℉

Time Hours

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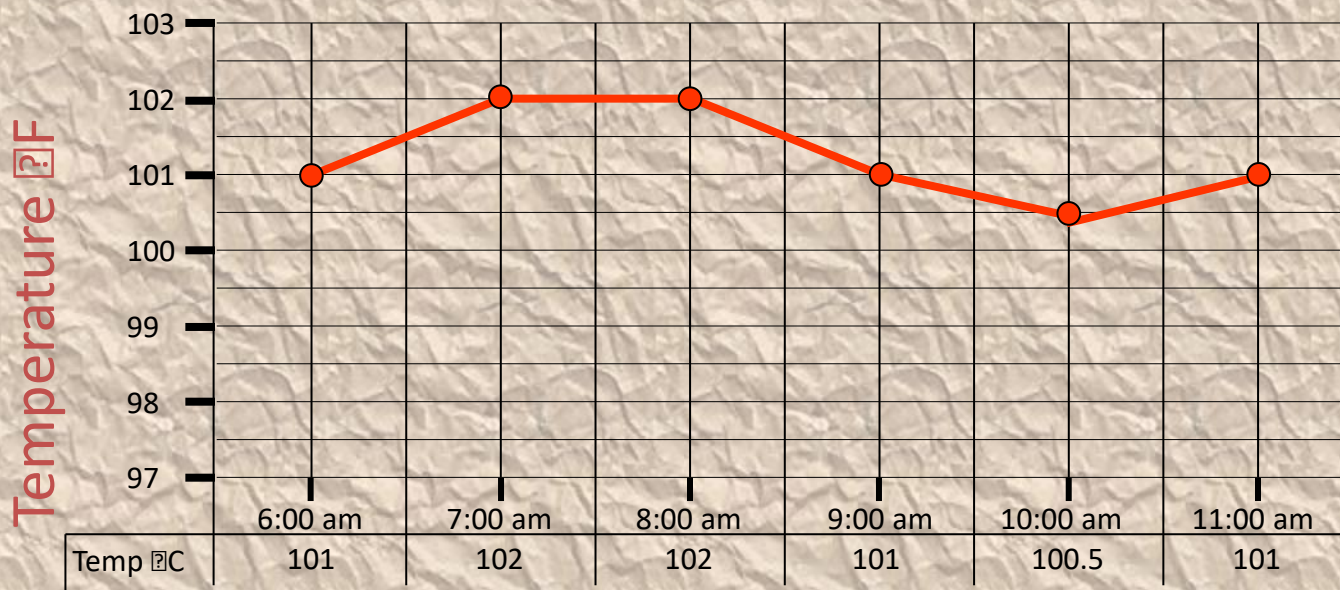
Different Averages

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

Mean $= \dfrac{48}{6} = 8$

Mode $= 14$

Range $= 14 - 1 = 13$

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

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

Aims of the Lesson

1. Understand the term Frequency Table.

2. Construct a Frequency Table.

3. Interpret information from Frequency Tables.

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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

卌 represents a tally of 5

Sum of Tally is the Frequency

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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

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Frequency tables

X58	X56	X59	X57	X60	X56	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		

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Frequency tables

58	56	59	57	60	56	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	III	3
57	IIII	4
58	IIII IIII	9
59	IIII IIII III	13
60	IIII IIII	10
61	IIII	5
62	IIII	4

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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 they 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

R... M... ... from Frequency Table

High – Low
= 6 – 0
= 6

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

General

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

1-Mar-22

Range ... from Frequency Table

Here ...

Mode
value that occurs the most
= 5

25 + 29 = 54
25 + 29 + 20 = 74

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 = 140

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.

Created by Mr. Lafferty Maths Dept.

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'.

Mean Number of coins = $\dfrac{40}{16}$ = 2.5 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 × 9 = 0
1	13	1 × 13 = 13
2	6	2 × 6 = 12
3	1	3 × 1 = 3
5	1	5 × 1 = 5
Totals	30	33