USING MATHEMATICS 3 (ACC 3)
Outcome 2

Exercise 1

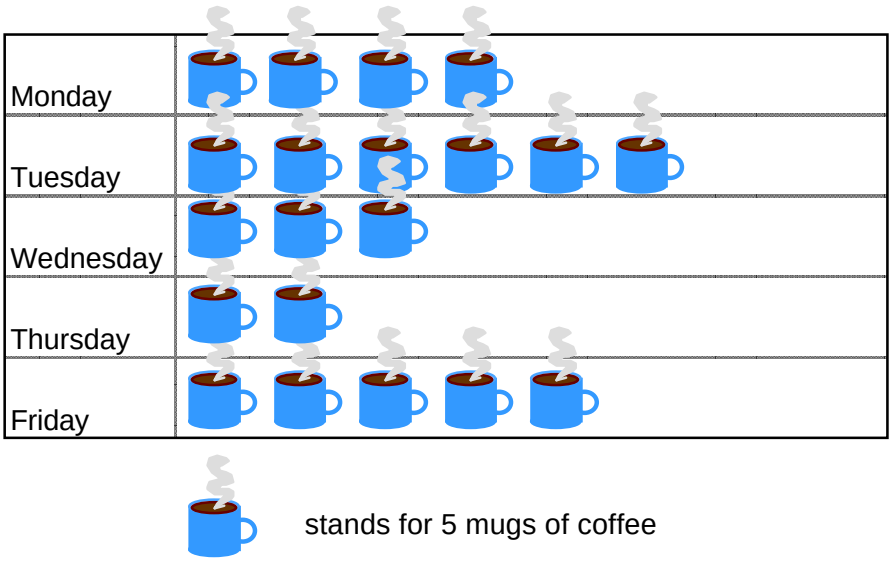
Reminders

You have already completed some work on **Pictographs** in Using Mathematics 1.

A pictograph is a graph which uses pictures to display information.

Each picture used in the graph has a 'value'.

This value is given in the 'key'.



If you get stuck - look up the Wordbank to help you.

Wherever possible - set out your working.

1. The pictograph shows the number of hours sunshine recorded at Glasgow Airport during the first 6 months of last year.

Month	Number of hours of sunshine at Glasgow Airport
Jan	☀☀
Feb	☀☀☀
Mar	☀☀☀☀☀
Apr	☀☀☀☀☀☀☀☀
May	☀☀☀☀☀☀☀☀☀☀
June	☀☀☀☀☀☀☀☀

☀ stands for 20 hours of sunshine

Use the pictograph above to answer these questions :

a) How many hours sunshine did Glasgow have in February?

b) Which month had most sunshine?

c) Which two months had the same number of hours of sunshine?

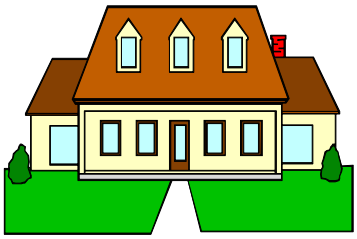
You need Graphs Worksheet 1

2. Use the data given on the worksheet to complete the pictograph.

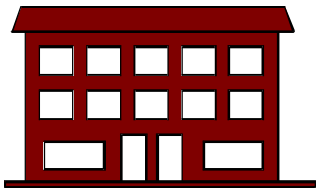
3.

a) Ask each person in your class what type of house they live in :

Do they live in: a **detached house**



a **semi - detached house**



a **flat**

a **terraced house**

or another type of home (call this one **other**) ?

b) Count up the number of people who live in each type of house and use the data to draw a pictograph.

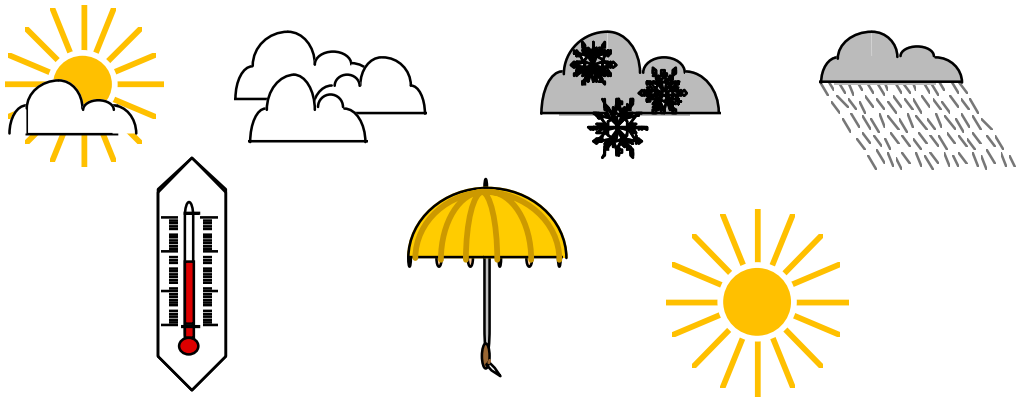
Use a picture of a house to stand for a number of people.

Remember to label the axes and to include a key.

4.

a) From a newspaper, teletext or the internet collect data about the weather in five towns in the UK. You might want information about the amount of rainfall, the number of hours sunshine or the average temperature on a particular day. Ask your teacher for help.

b) Choose a symbol or picture which you think would be suitable for a pictograph about the weather.



c) Draw a pictograph to show the data you have collected.

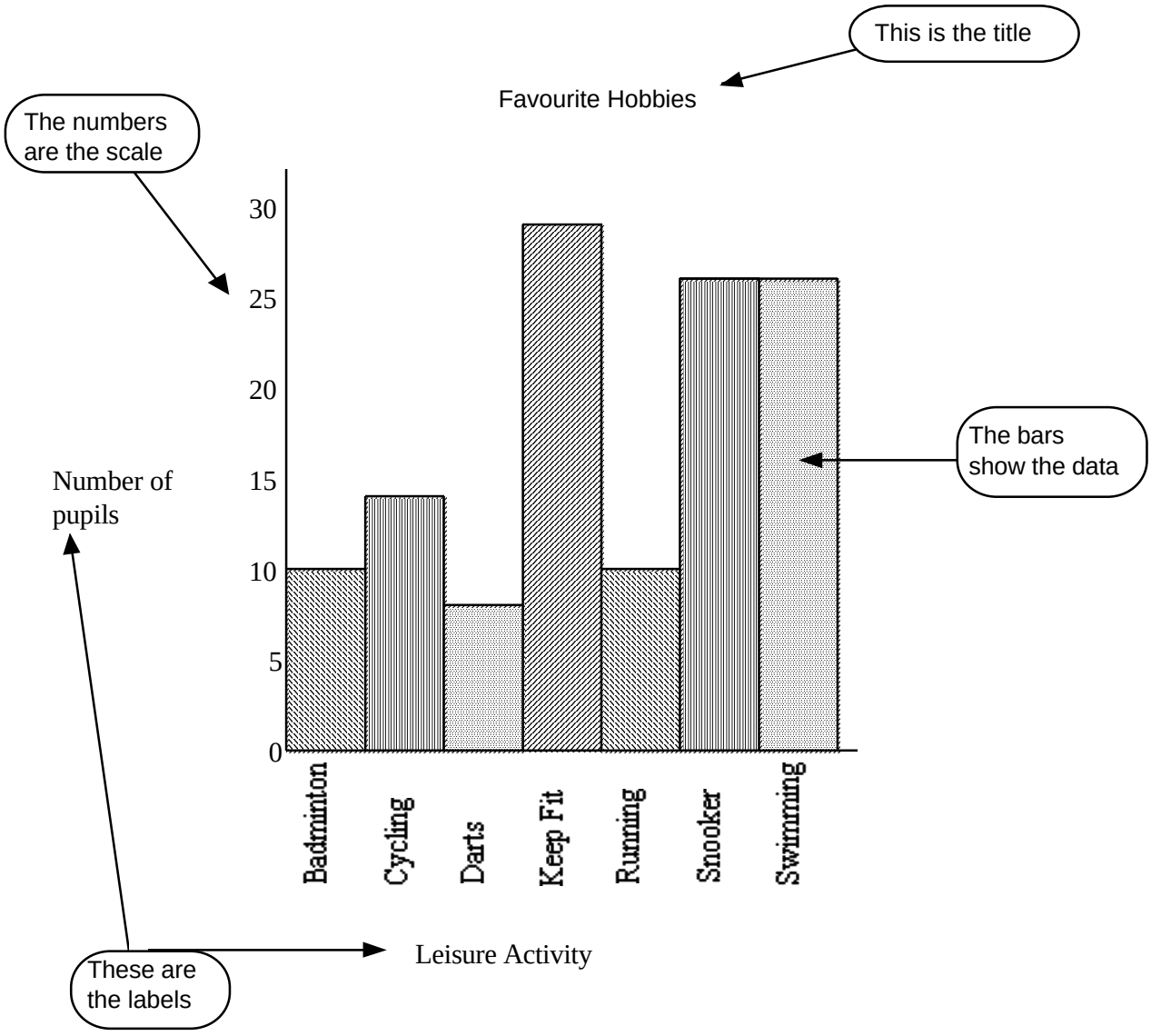
Exercise 2

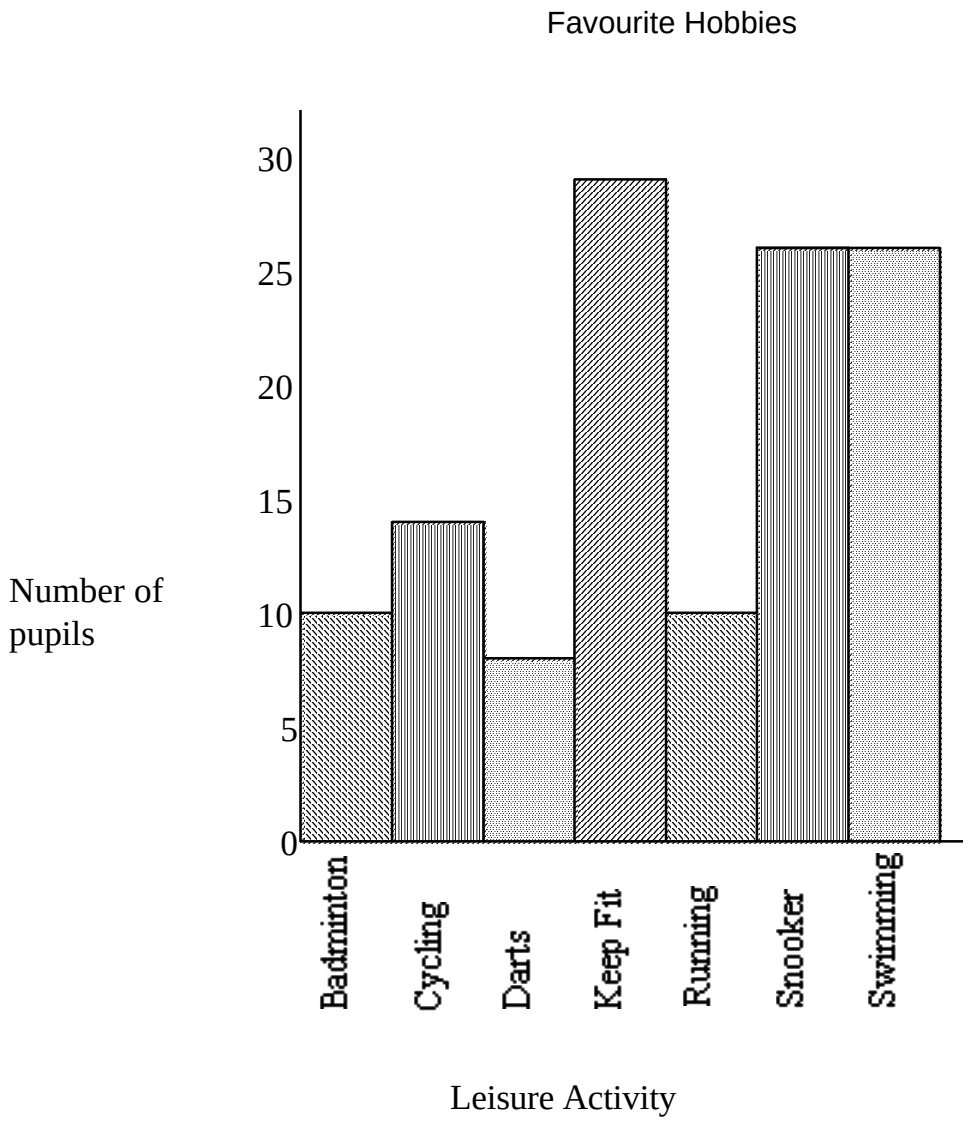
Reminders

A bar graph is another way of displaying information.

It uses bars or columns to show the information in a chart.

Here is an example of a bar graph.





1. Use the bar graph above to answer these questions :

   a) What is the most popular leisure activity?

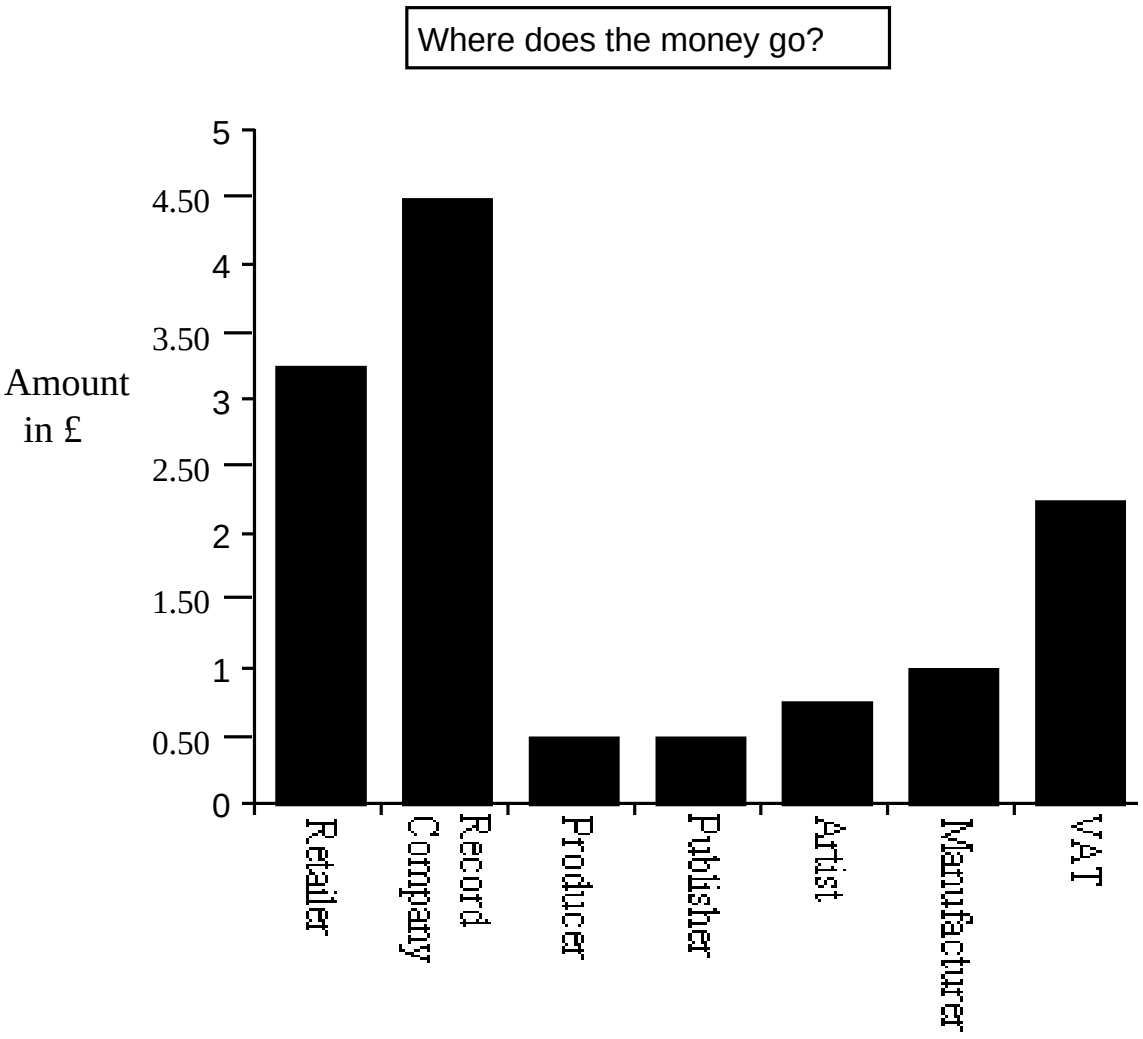
   b) What is the least popular leisure activity?

   c) How many people like badminton?

   d) How many people like cycling?

   e) How many prefer cycling to badminton?

2. When you buy a CD, at a cost of about £12 - where does the money go? The bar graph below shows how the money is split up between all of the people involved in making the CD.



Use the graph to answer these questions:

a) Who gets most of the money from the sale of the CD?

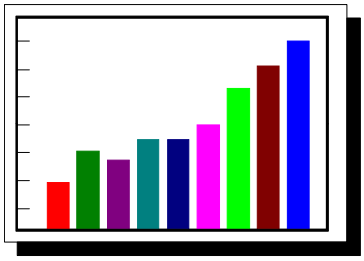
b) How much is the VAT?

c) How much does the artist get from each CD?

d) Which two people get the same amount?

You need Graphs Worksheet 2

3. Use the data on Graphs Worksheet 2 to complete the two bar graphs.
   Use a ruler to draw the bars.

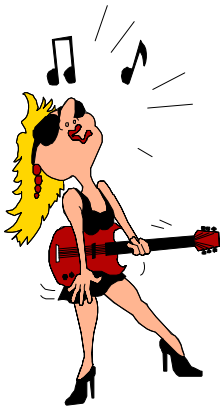


Remember to include a title, labels and scales on your graphs.

4. a) Make a list of five groups or singers whose music you like.

   b) Now ask each person in your class to choose their favourite group or singer from your list.
   Each person must choose one group or singer.

Count up the answers
- you should have one answer for each person in your class



   c) Use the data you have collected to draw a bar graph.

   d) Colour your bar graph.

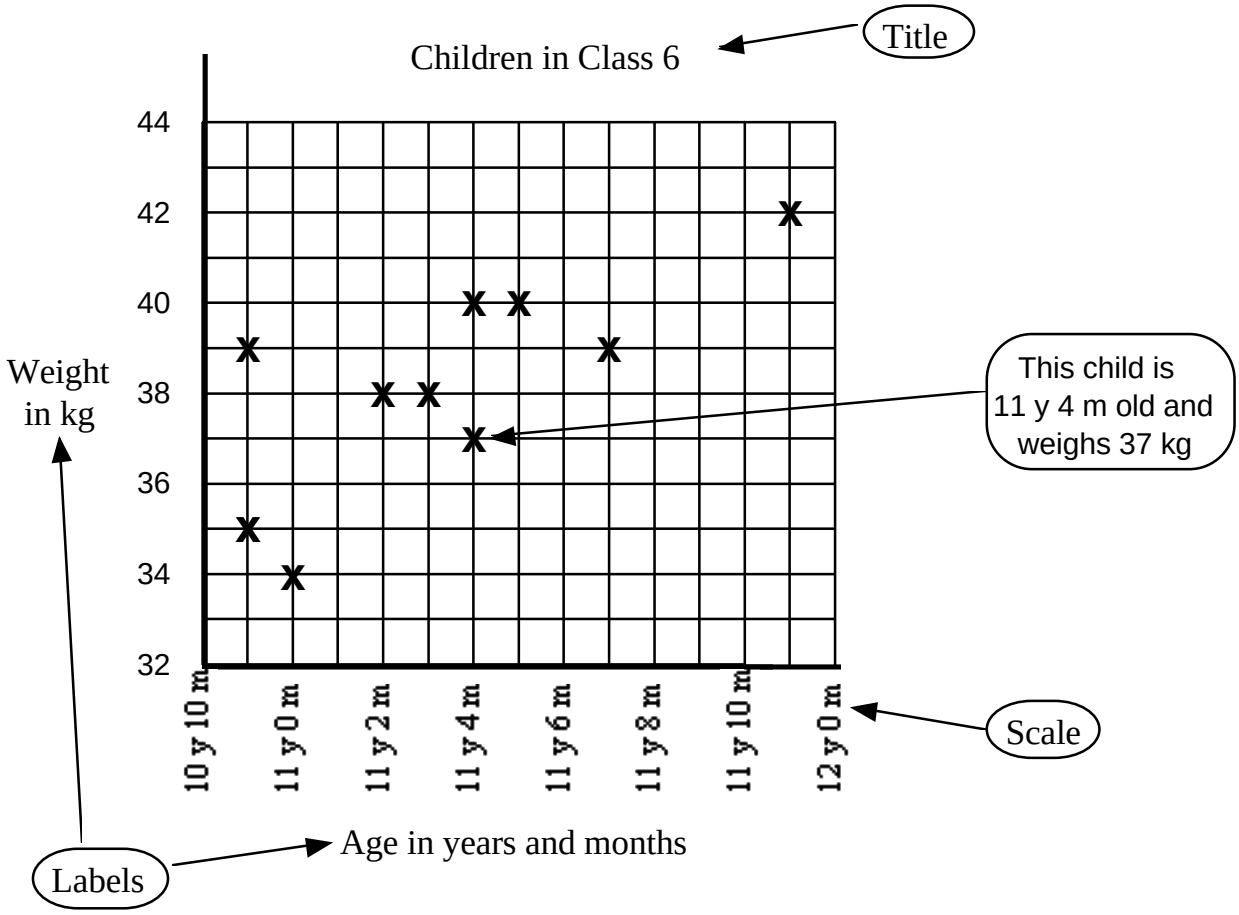
Exercise 3

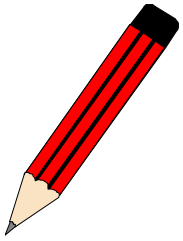
Reminders

Here is an example of a scattergraph.

It compares the ages of 10 children with their weights (in kg).

Each cross stands for one child.





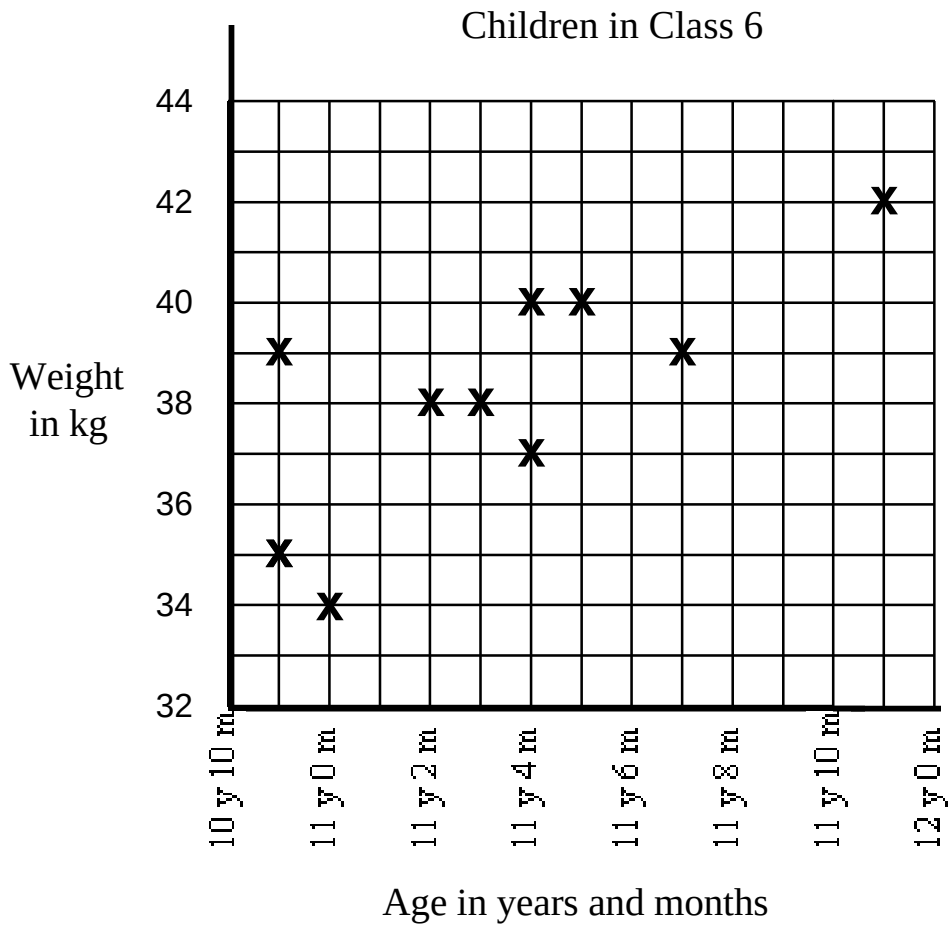
1. Use the scatter graph below to answer these questions :

   a) How many children weigh 38 kg?

   b) How much does the heaviest child weigh?

   c) What age is the youngest child?

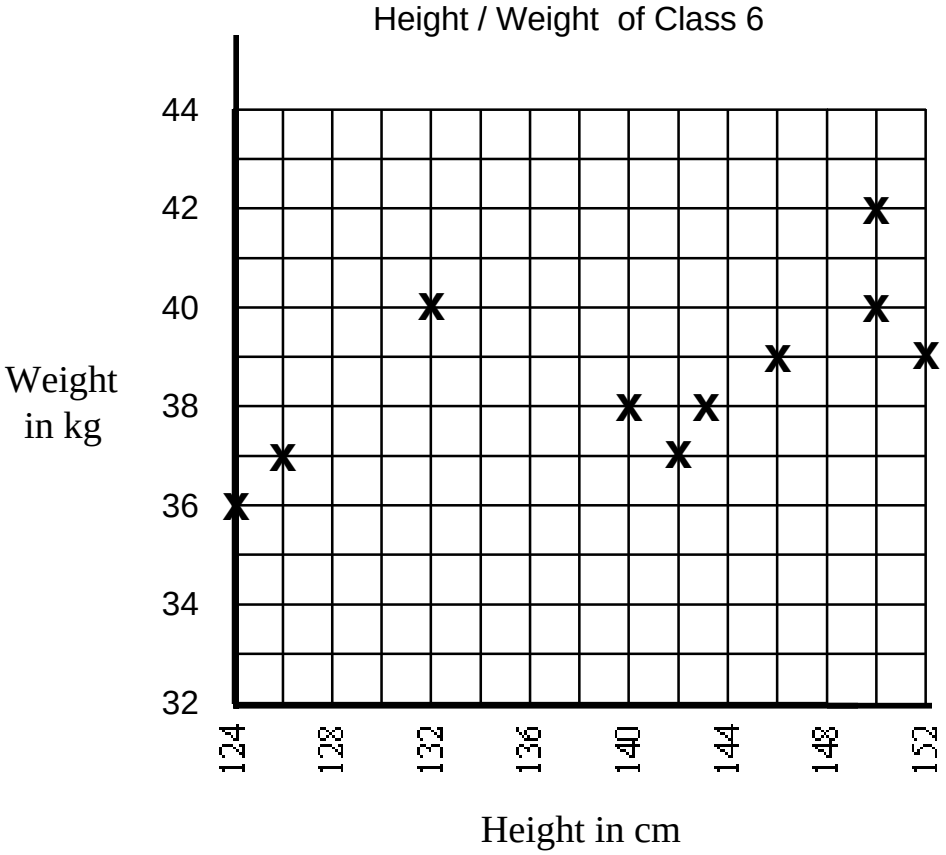
   d) What age is the lightest child?



2. The scattergraph below shows the weight (in kg) and the height (in cm) of 10 children.

   Use the graph to answer these questions:

   a) What height is the tallest child?
   b) What weight is the lightest child?
   c) How many children are 149 cm tall?
   d) What height is the heaviest child?



You need Graphs Worksheet 3

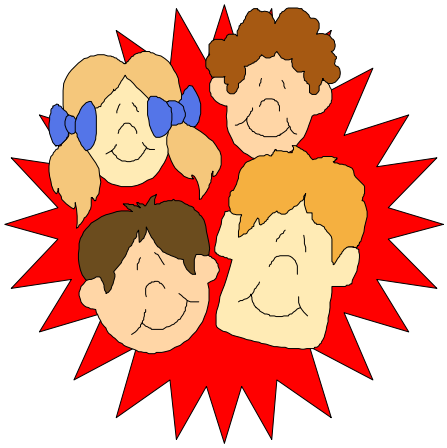
3. Use the data given on Graphs Worksheet 3 to complete the scattergraphs.

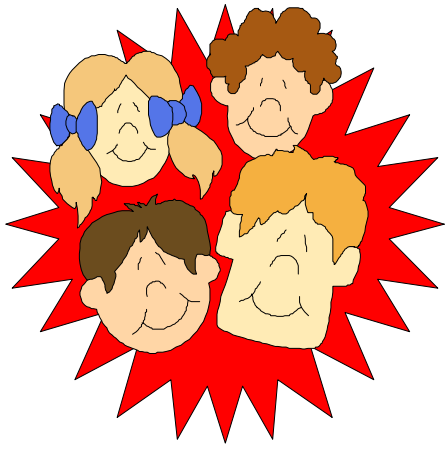
4.

a) Measure the height (in cm) of 8 people in your class.

Write the results in your jotter.

Write down the age of each of the 8 people (in years and months).





b) Draw a scattergraph to display the information you have gathered.

Reminder

Your scattergraph should have a title, labels and scales clearly marked.

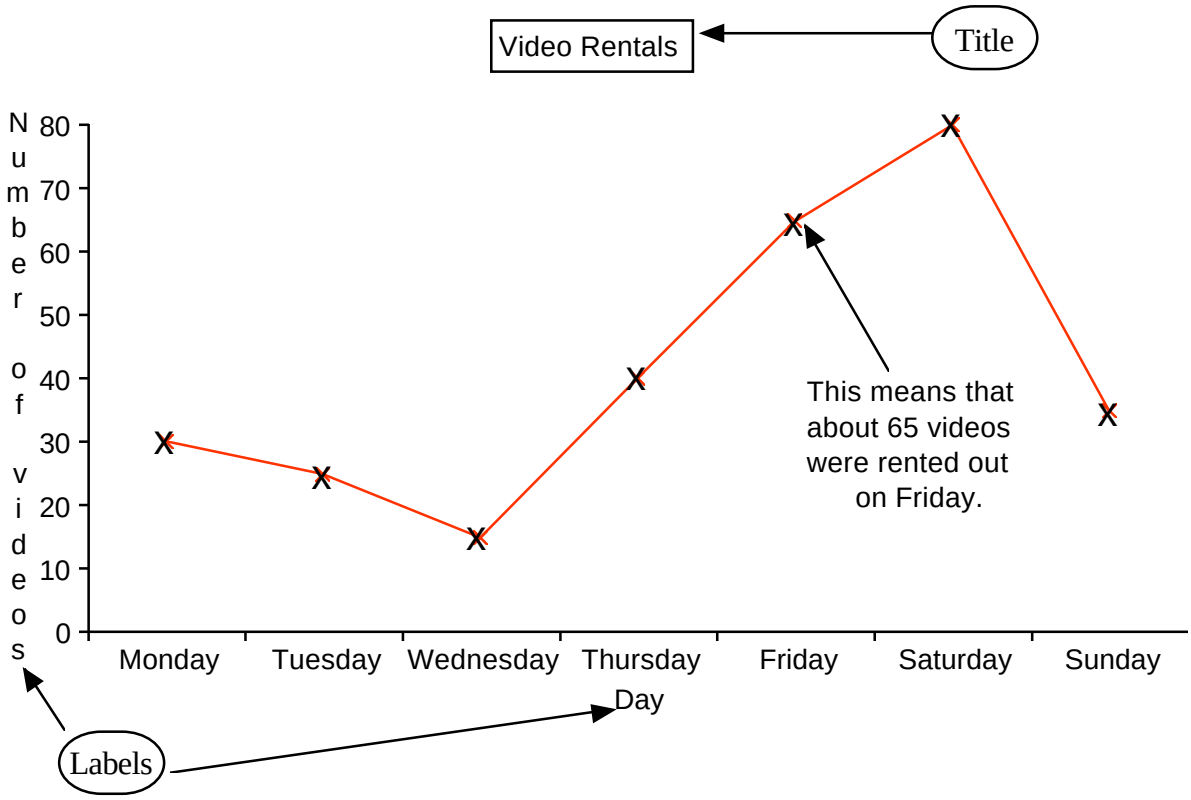
Exercise 4

Reminders

A line graph is another way of displaying information in a graph.

A line graph should still have a title, labels and scales.

Here is an example :



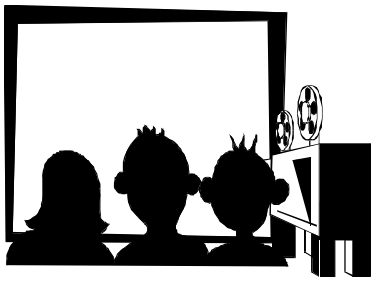
The graph shows that

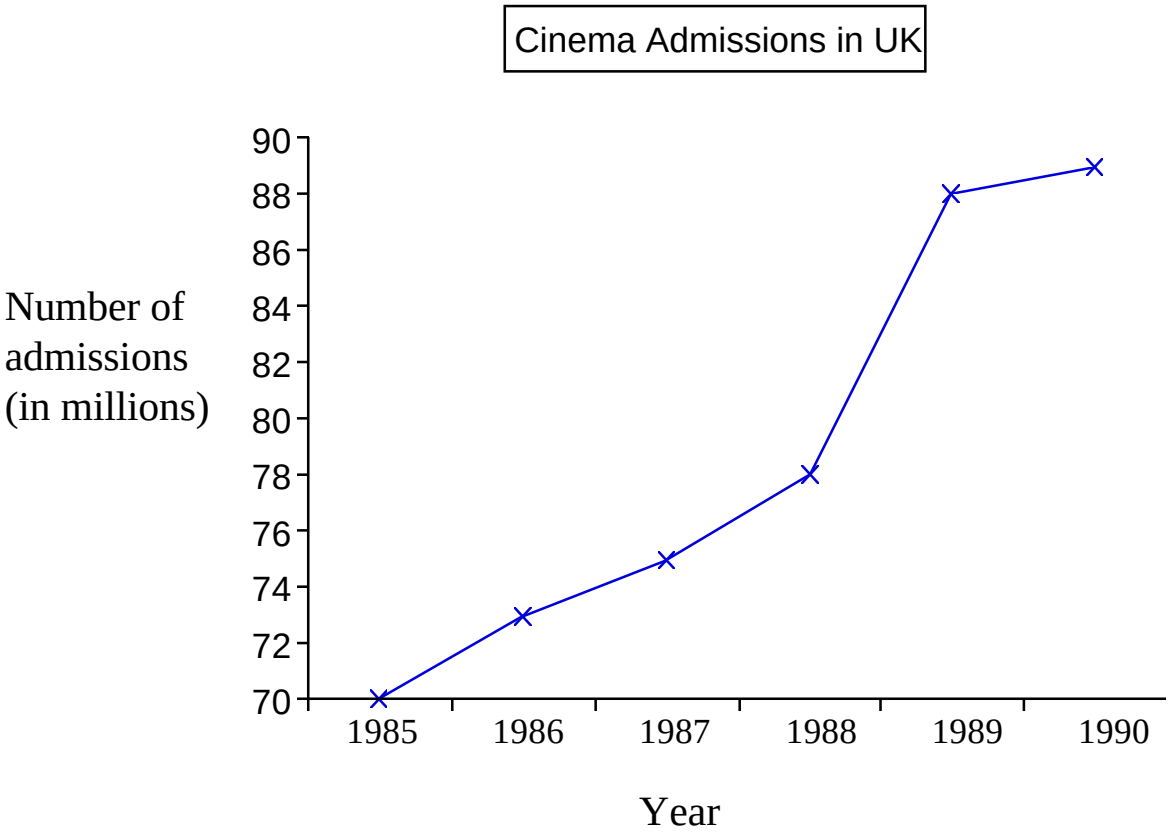
a) Most videos were rented on Saturday.

b) Fewest videos were rented on Wednesday.

c) On Monday, 30 videos were rented.

1. The line graph below shows the number of admissions to the cinema in the UK each year, from 1985 until 1990.
   The figures are in millions.





Use the graph to answer these questions:

a) Which year had the highest number of admissions?

b) In which year did 73 million people go to the cinema?

c) How many cinema admissions were there in 1985?

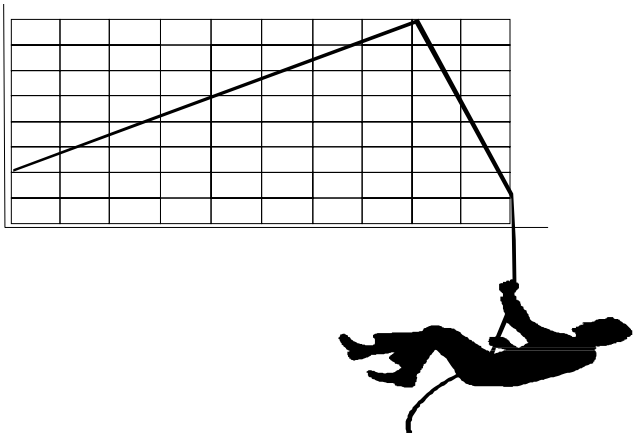
d) How many cinema admissions were there in 1987?

e) How many more admissions were there in 1987 than in 1985?

f) How many admissions were there altogether from 1985 until 1990?

You need Graphs Worksheet 4

2. Use the data given on Graphs Worksheet 4 to draw the two line graphs.



Exercise 5

You should work with a partner or in a small group

Reminders

Over the last few weeks you should have been collecting data or information from pupils, staff, family, newspapers, magazines, teletext or the internet.

a) Choose a set of data each to work with.
You are going to display the data in a graph.

b) Decide what type of graph (pictograph, bar graph, scattergraph or line graph) you think would be best.

c) Think carefully about the title, labels, scales and key that may be needed.

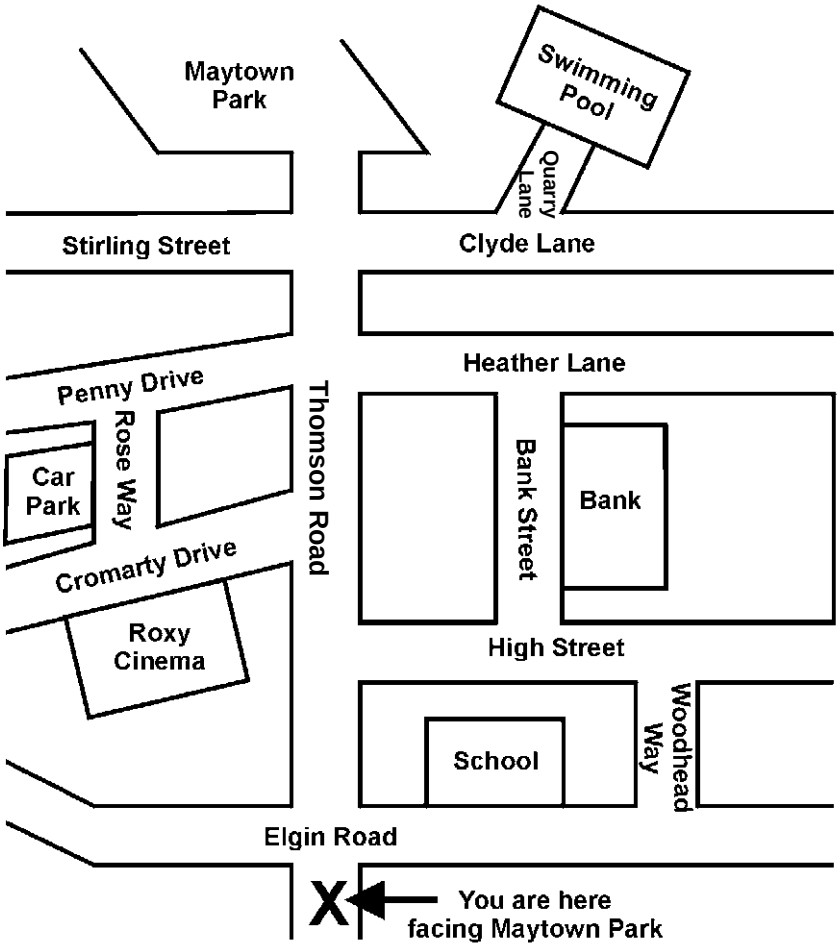
d) Use a large sheet of paper or card and draw and colour your graph.

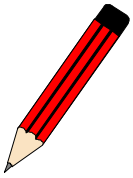
Check with your teacher :

If possible you should now spend some time looking at how a computer package (like Clarisworks) can be used to draw graphs.

If you can, use some of the data that you gathered to draw and print out two other graphs.

Exercise 6





1. Look at the map above. Imagine you are standing at 'X'.
   a) Which road leads to Maytown Park?
   b) Which road is second on the left?
   c) Which road is first on the left?
   d) Which road is third on the right?
   e) Which road is first on the right?

f) Where will you be if you take the second turning on the right and then the first on the left?

g) Where will you be if you take the first turning on the right and then the on the left?

h) Where will you be if you take the second turning on the left and then the first on the right?

Reminders

How to give directions

Example : The way to the Roxy Cinema

Answer : Walk up Thomson Road. Take the second turning on the left into Cromarty Drive. The cinema is on your left.

2. Look at the map on the previous page. Imagine you are standing at 'X'.

a) Give directions to the bank.

b) Give directions to the swimming pool.

c) Give directions to the car park.

You need Graphs Worksheet 5

– the map of Newbury Town Centre

3. Use the map of Newbury town centre to answer each of the following questions :

a) Jim comes out of the school gate and turns right.
He walks to the end of Birch Avenue and turns left into Cedar Way.
Then he turns into the first street on the right.
What is the name of this street?

b) Anna leaves the bus station and walks down Ash Lane.
She takes the third turning on the left followed by the second turn on the right.
What street is Anna now in?

c) Tom lives in Cedar Way opposite the car park.
He works at the swimming pool.
Describe the route Tom would walk each day to get from his house to the swimming pool.

d) Robin is at the bus station.
He wants to get to the Health Centre.
Describe the route he should take from the bus station to the Health Centre.

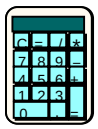
4. Andrew arrives at the main entrance to your school and asks for directions to each of the following places. Write down the instructions you would give him.

Always start from the front door.

a) the Headteacher's office
b) the lunch room or canteen
c) the PE changing rooms
d) your Maths classroom
e) your English classroom

Exercise 7

You may use a calculator for this exercise



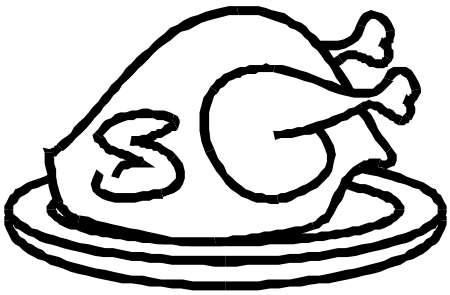
A recipe book gives the following instructions for roasting a chicken :

"Set oven temperature to 200 ^{o}C .

Place chicken in a roasting tin and cover.

Place in oven.

Cook for 20 minutes per pound"



Example

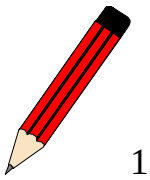
How long will it take to cook a chicken weighing 4 pounds?

Time (minutes)= weight (in pounds) x 20

On your calculator

4 x 20 = 60

It will take 80 minutes (or 1 hour and 20 minutes) to cook the chicken.



1. Use the instructions on page 22 to find how long it will take to cook a chicken weighing

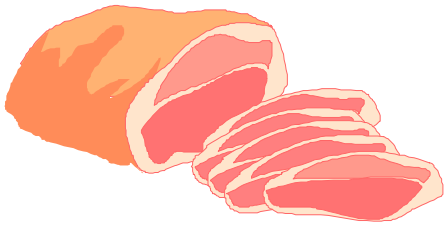
   a) 3 pounds b) 5 pounds c) 4.5 pounds

2. Thomas has to cook a chicken which weighs 3.5 pounds.

   a) How long will the chicken take to cook?

   b) Thomas puts the chicken into the oven at 6.30 p.m.
   When will it be ready?

In the same recipe book we are told that to roast a piece of beef it should be "**put in the oven at 220 ^{o}Celsius and cooked for 35 minutes per kilogram plus an extra 20 minutes".**



Example

a) How long would it take to cook a piece of beef weighing 3 kilograms?

Time (minutes)= weight (in kgs) x 35 + 20

On your calculator

3 x 35 + 20

It will take 115 minutes (or 1 hour and 55 minutes) to cook the beef.

b) If the beef is put into the oven at 5 p.m. when will it be cooked?

5 p.m. + 1 hour 55 minutes = 6.55 p.m.

The beef will be ready at 6.55 p.m.

3. Work out how long it will take to cook a piece of beef weighing

   a) 2 kg b) 2.6 kg c) 5 kg

4. Sameena is having a dinner party.

   She has a piece of beef which weighs 4 kg.

   a) How long will Sameena need to cook the beef?

   b) Sameena wants to take the beef out of the oven at 7 p.m.

      When will she need to put the beef into the oven?

A garage works out its customers' bills using the following formula

Cost = Parts Value + (Hours Labour x 18)

Example

Sarah puts her car in for a repair.

The parts for the repair cost £120.

The mechanic takes 3 hours to do the repair.

What is the total cost of the repair to Sarah's car?

Cost = Parts Value + (Hours Labour x 18)

Cost = 120 + (3 x 18)

On your calculator,

120 + (3 x 18) = 174

The repair costs £174

If you **don't** get the answer 174 on your calculator

- ask your teacher for help

5. Use the formula given above to work out the repair bills for these customers

Customer Name	Cost of Parts (£)	Hours Labour
Melinda Black	£342	4
Sam Harper	£86.50	2
Pete Rivers	£196	3.5

Temperatures can be measured in ^{o}Fahrenheit or in ^{o}Celsius.

It is useful to be able to change from one unit of measure to the other.

This example shows you how to change a temperature from ^{o}Celsius to ^{o} Fahrenheit.

To change from °C to °F

multiply by 9, divide by 5 and then add on 32

Change 20^{o}C to ^{o}F.

On your calculator,

20 × 9 ÷ 5 + 32 = 68

This means that

20^{o}C = 68^{o}F

6. Use the rule to change each of these temperatures into ^{o}Fahrenheit.

   a) 15^{o}C b) 30^{o}C c) 0^{o}C

To change from °Fahrenheit to °Celsius, we reverse the rule :

take away 32, multiply by 5 and divide by 9

Example

Change 95°F to °C

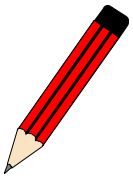
On your calculator,

95 - 32 = 63

63 x 5 ÷ 9 = 35

This means that

95°F = 35°C



7. Use the rule to change each of these temperatures into °Celsius

   a) 59°F b) 113°F c) 122°F

Exercise 8

Practical Work

Go to Home Economics or the school library.

Find a cookery book.

Look for the section on meat.

Find the times for cooking :

Roast Beef

Roast Pork

Roast Lamb

For each one,

a) write the cooking time per pound in your jotter.

b) write the cooking time per kilogram in your jotter.

Graphs Worksheet 1

1. This table gives the average number of rainy days in London from January until June.

   Use the information to complete the pictograph below.

Month	Average number of rainy days
January	15
February	13
March	11
April	12
May	12
June	11

 stands for 2 days

Month	Average number of rainy days per month in London
Jan	
Feb	
Mar	
	

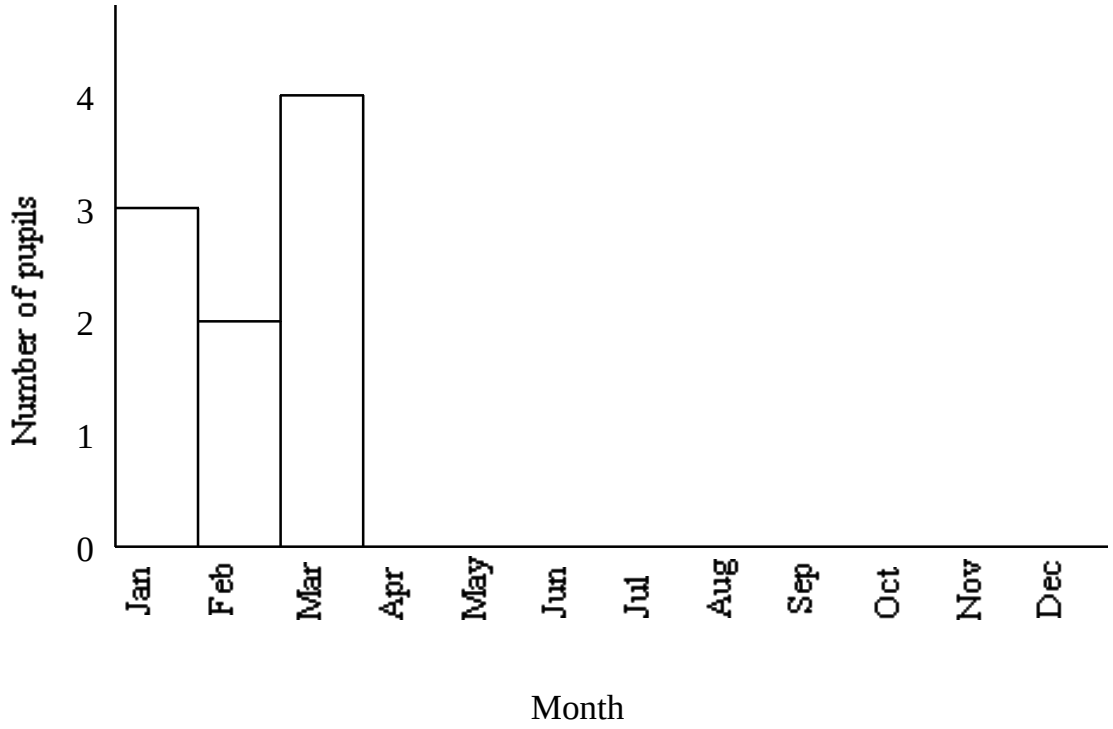
Go back to Page 3 of the booklet

Graphs Worksheet 2 (front)

1. The table below shows the months in which 25 people were born.

a) Complete the bar chart using the data from the table.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
No. of people	3	2	4	1	1	2	1	3	1	3	3	1



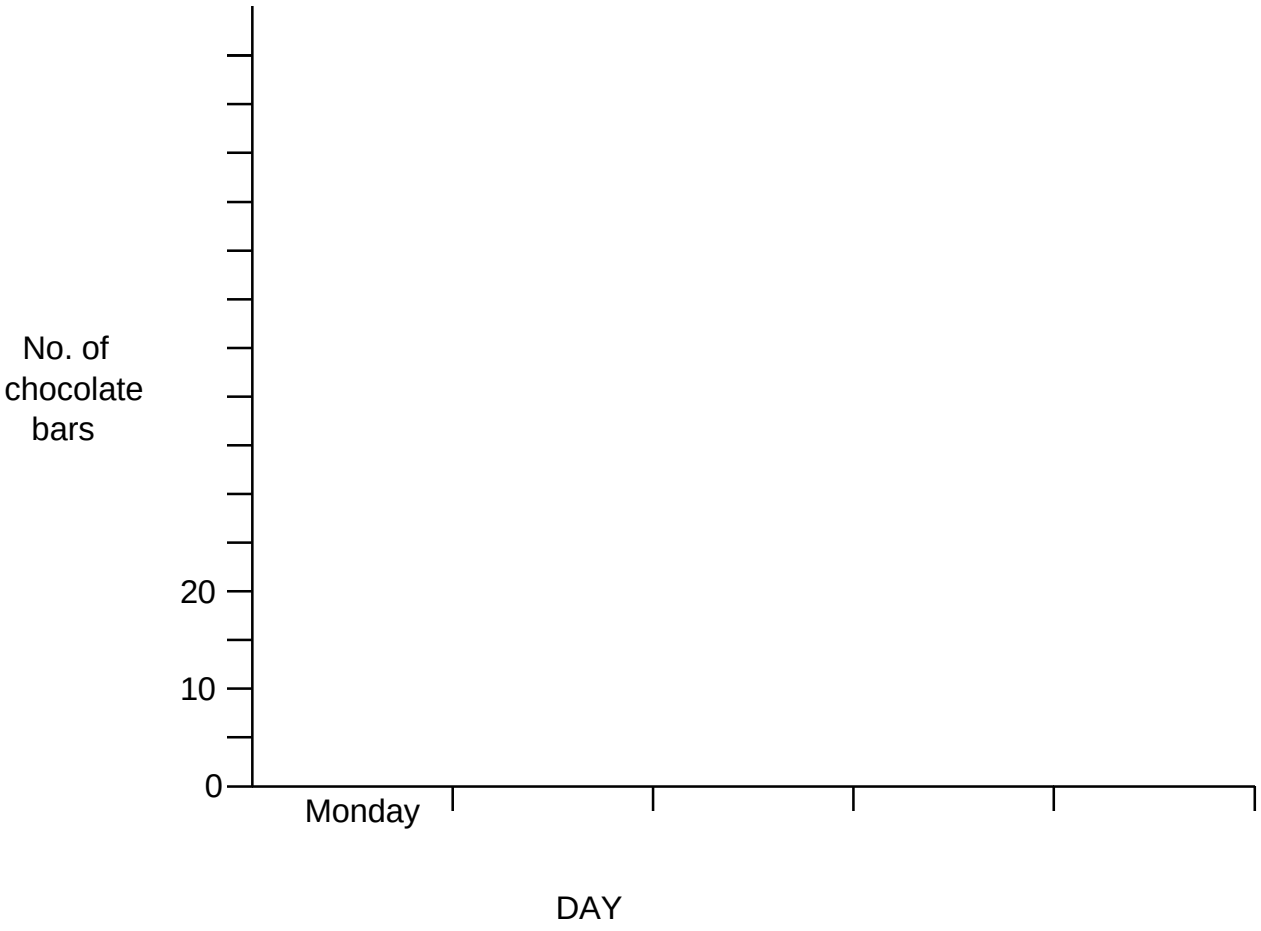
b) Colour your graph in.

Graphs Worksheet 2 (back)

2. The table below shows the number of chocolate bars sold in a shop each day last week.

a) Draw a bar chart on the axes below using the data from the table.

Day	Monday	Tuesday	Wednesday	Thursday	Friday
No. of chocolate bars	40	60	25	45	65



b) Colour your graph in.

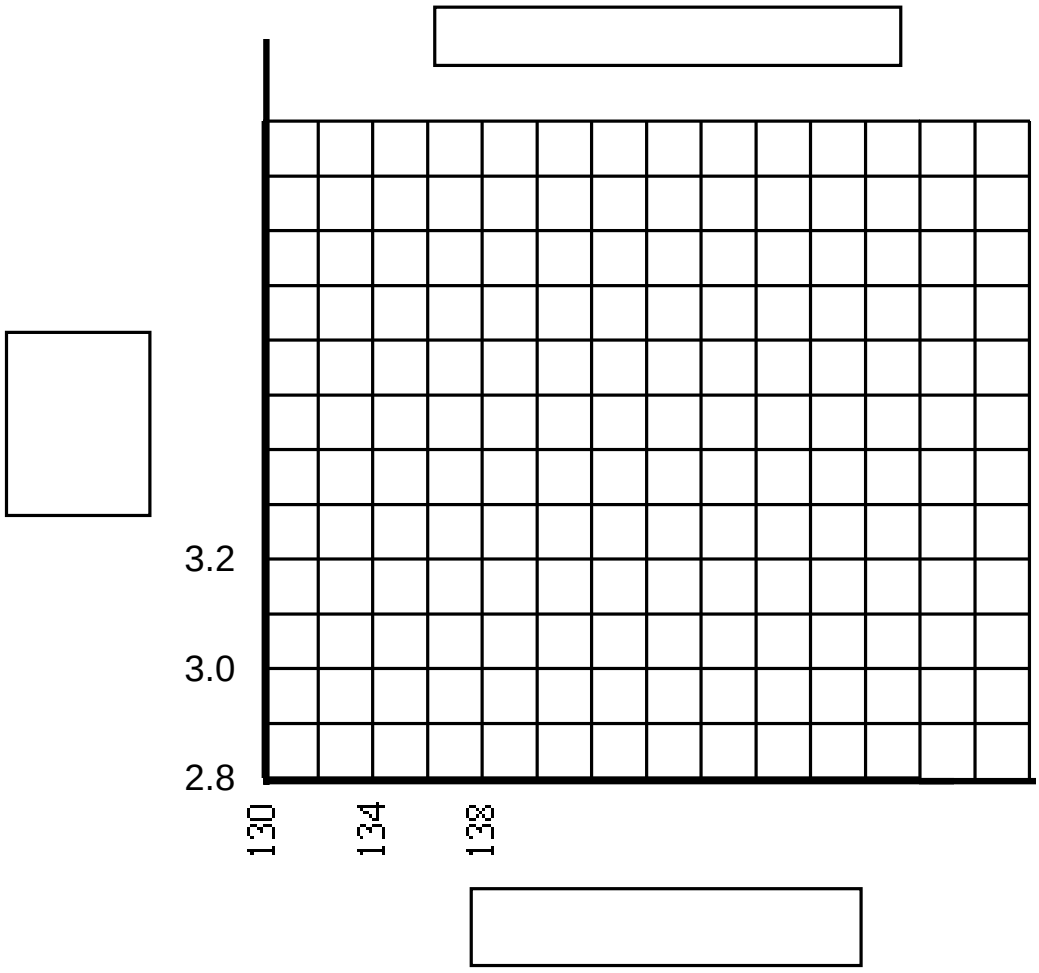
Go back to Page 8 of the booklet

Graphs Worksheet 3 (front)

1. The table gives the height (in cm) and the distances jumped (in metres) of 10 people who took part in the long jump competition.

Height	132	136	131	135	136	143	142	150	138	147
Distance	3.5	3.2	4.0	3.1	2.8	3.9	3.5	3.5	3.2	3.3

Use the data to complete the scattergraph below:

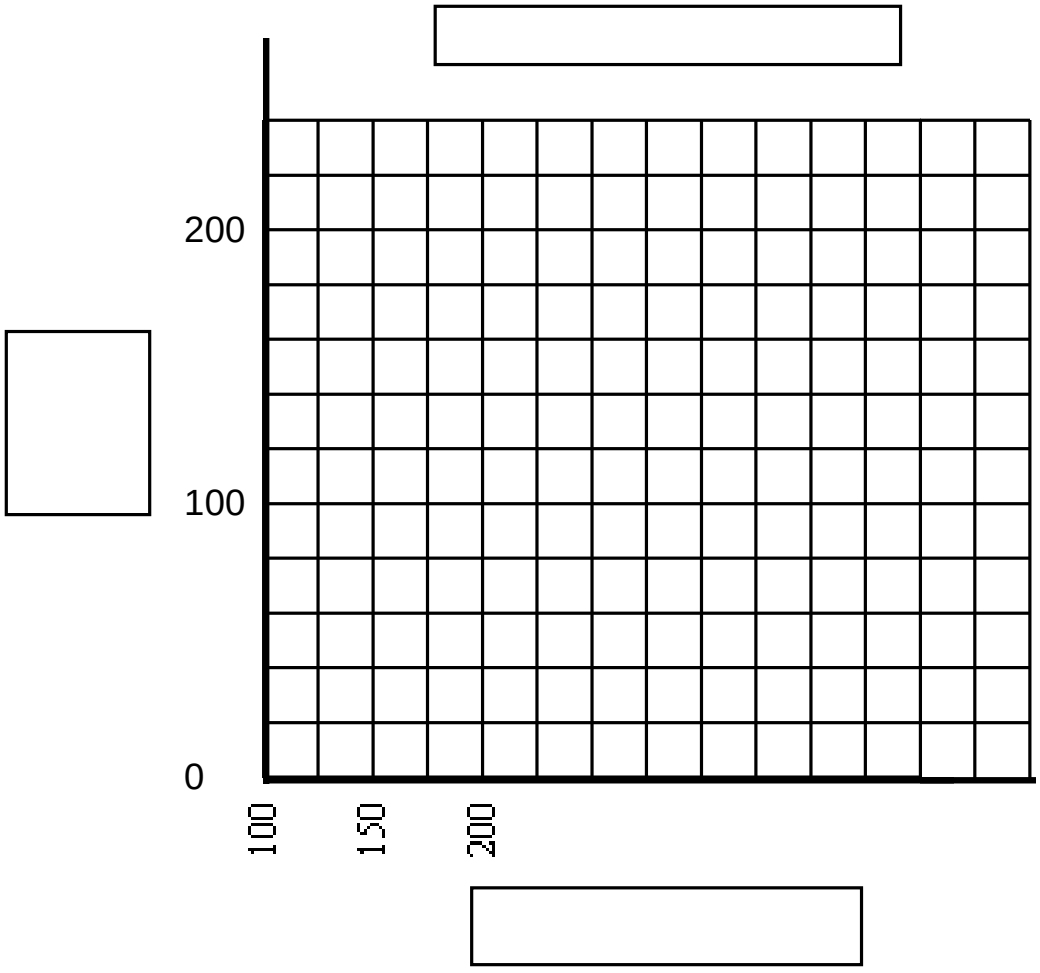


Graphs Worksheet 3 (back)

2. The table gives the weekly income of eight people compared to the average amount each spends on food each week.

Weekly income (£)	450	250	300	500	300	150	200	400
Amount spent on food (£)	180	110	120	220	140	70	80	160

Use the data to complete the scattergraph below:



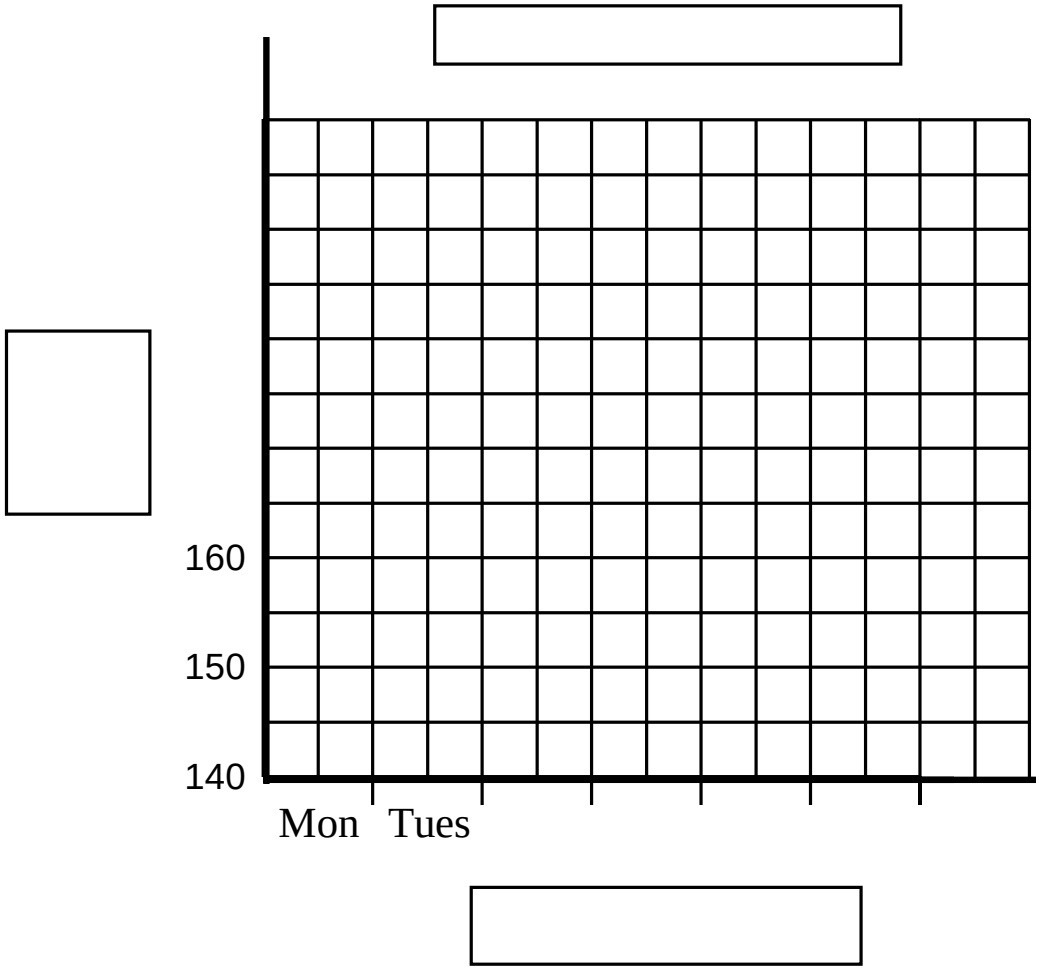
Go back to Page 12 of the booklet

Graphs Worksheet 4 (front)

1. The table shows the daily takings of a baker's shop during one week.

Day	Mon	Tues	Wed	Thurs	Fri	Sat
Amount in £	180	170	150	170	200	220

Use the data to complete the line graph below:

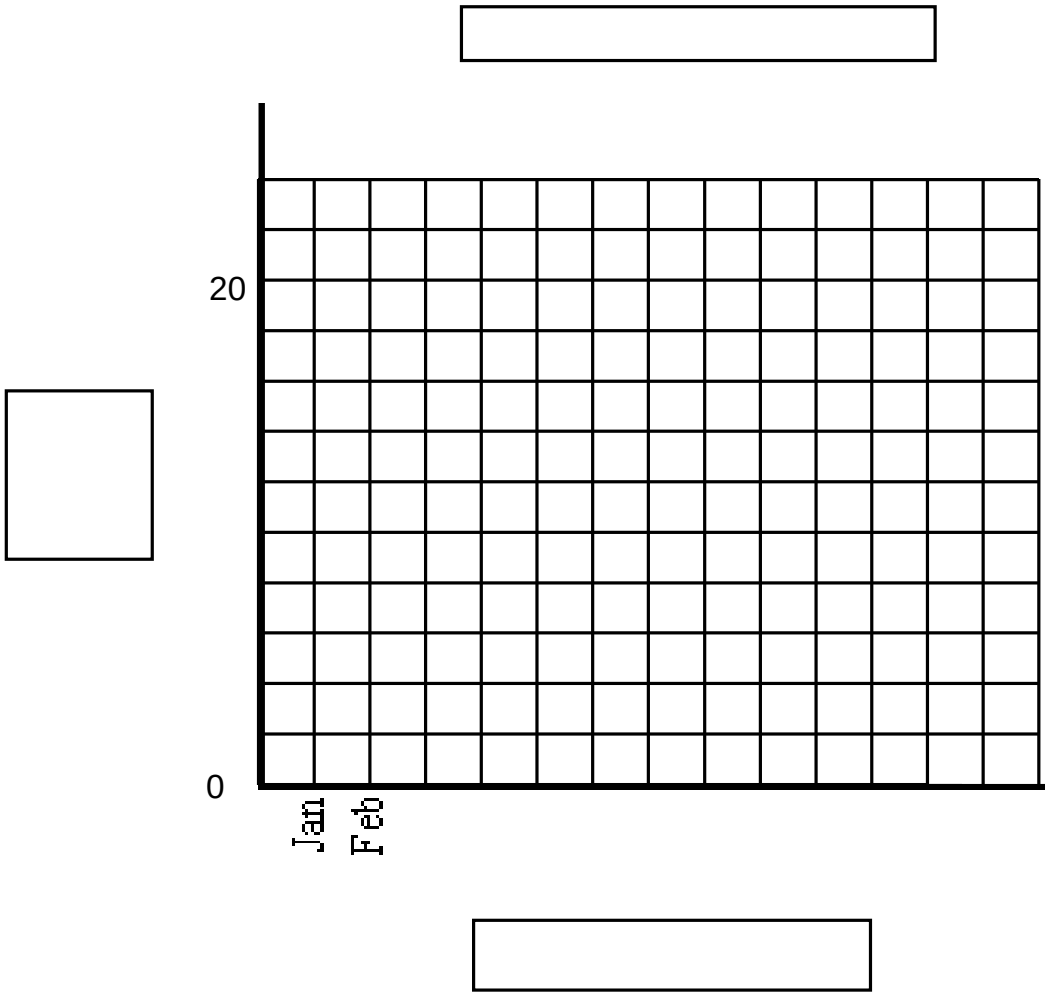


Graphs Worksheet 4 (back)

2. The table shows the average maximum temperature (in ^{o}C) in Munich throughout the year

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Temp. (^{o}C)	1	3	9	14	18	21	23	23	20	13	7	2

Use the data to complete the line graph below:



Ask your teacher what you should do next

Graphs Worksheet 5

Newbury Town Centre