

# SMILE WORKCARDS

## Analysing and Interpreting Data Pack One

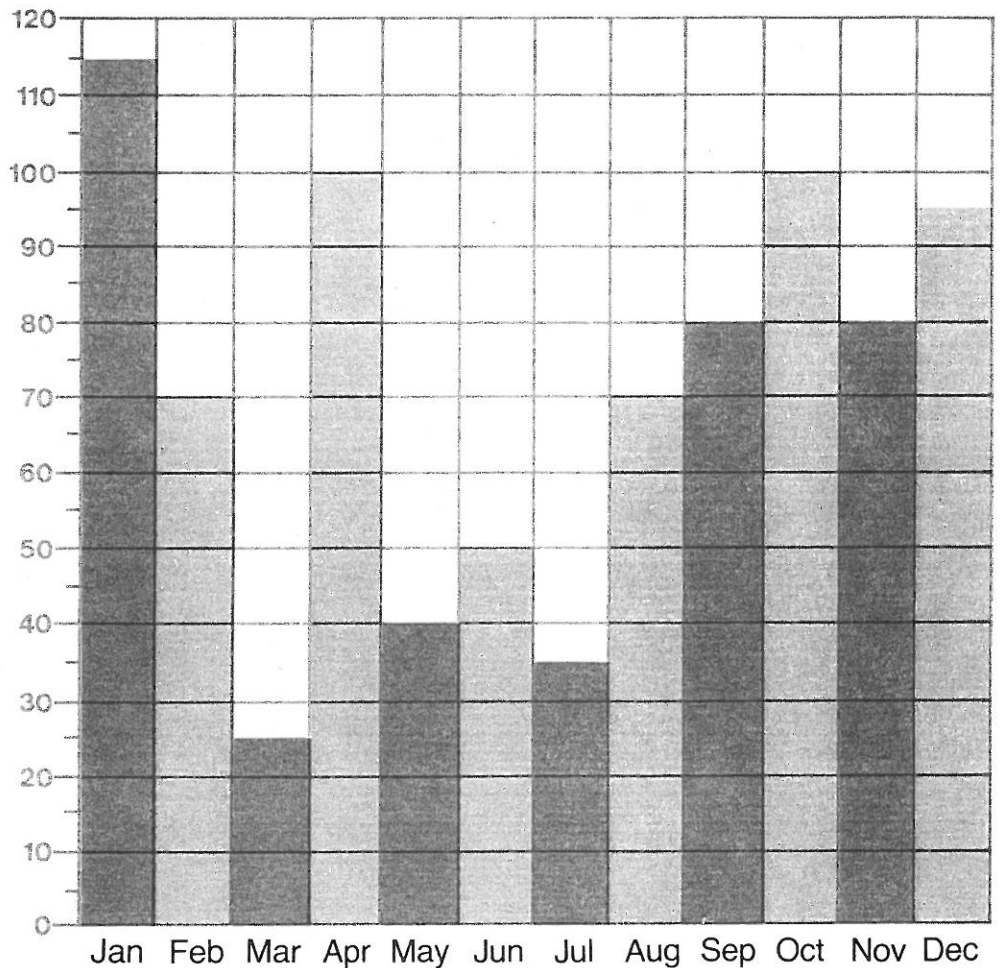
### Contents

	Title	Card Number
1	It's Raining	857
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## It's Raining

This block graph shows the monthly rainfall in England and Wales for one year. It is measured in millimetres (mm).



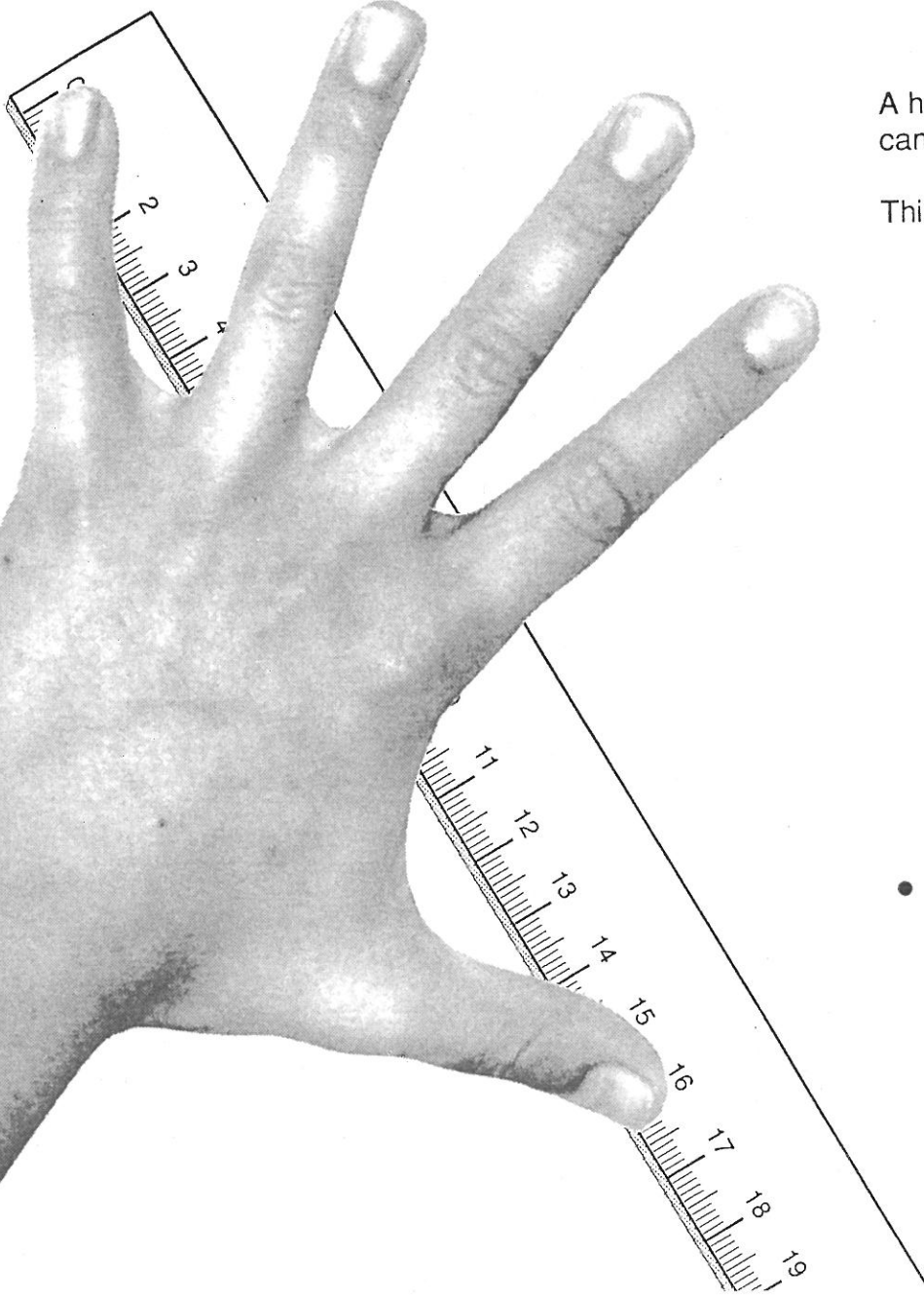
- 1) How much rain fell in January?
- 2) How much rain fell in February?
- 3) How much more rain fell in January than February?
- 4) What was the rainfall in March?
- 5) What was the total rainfall for the first 3 months of the year?
- 6) How much rain fell in May?
- 7) What was the rainfall in April?
- 8) How much less rain fell in May than April?
- 9) How much rain fell in the second 3 months of the year?
- 10) Which was the wettest month of the year?
- 11) Which was the driest month of the year?

## Discuss

*Which month would you choose to go on holiday?*

# Hand span

You will need a 30cm ruler.



A hand span is the *widest* you can stretch your hand.

This left hand span is **16.3cm**.

- Measure your **left** and **right** hand spans.



- Draw a table with these headings.  
Fill in the measurements of your left hand span and right hand span.

<i>Name</i>	<i>Left hand span (cm)</i>	<i>Right hand span (cm)</i>

- Measure the span of the left hand and right hand of everyone in your class.
- Each time make sure you both agree the measurements and then write them down in your table.

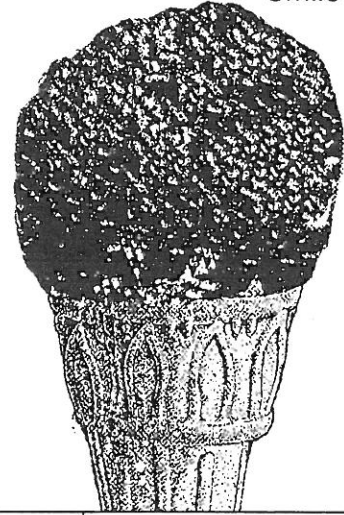
How many people have hand spans larger than yours?  
How many people have hand spans smaller than yours?  
Was your right hand span the same as your left hand span?  
How many people in your class have the same right hand and left hand span?  
Display your results.

# FAVOURITE ICE-CREAM



Geeta

I think chocolate ice-cream is the most popular. I'll do a survey of my class to see if I'm right.



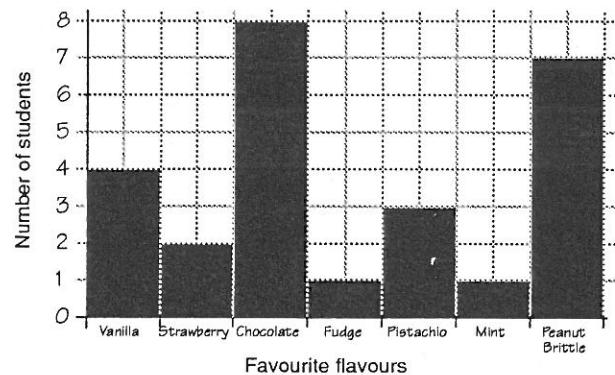
Name	Favourite flavour
Geeta	Chocolate
Michael	Fudge
Jadriel	Peanut Brittle

Geeta counted up how many students liked each flavour of ice-cream.

She drew this bar chart.

The **mode** is the **most popular** flavour.

1) Which flavour was the mode in Geeta's class?



2) Which flavour do you think is the most popular in your class?

Do a survey to see if you are right.

- Ask everyone in your class what is their favourite flavour.
- Count up how many students like each flavour.
- Draw a bar chart to show your results.
- Which flavour is the **mode** in your class?
- *Was your first guess right?*

3) Imagine you have enough money to buy four large tubs of ice-cream to share with your class.

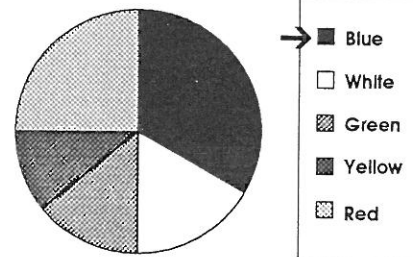
- Would you buy four *different* flavours?
- What flavours would you buy?

# The mode

The **mode** is a type of average.

The **mode** is the **most frequent** value

Favourite Colours Smile 0448



Blue is the **most popular** colour so blue is the **mode**.

Name	Height	Frequency
Carol	160cm	1
Kenny	156cm	2
Mohammed	156cm	
Razia	154cm	1
Hannah	150cm	3
Ishmael	150cm	
Kim	150cm	
Bernadine	146cm	2
Jack	146cm	
Faisal	143cm	1

The **most frequent** height is 150 cm, so 150cm is the **mode**.

1. A tally chart has been made to record the letters used in this piece of text taken from William Shakespeare's *Macbeth* (Act IV Scene 1).

Complete the chart by filling in the frequencies.

Double, double toil and trouble:  
 Fire, burn; and, cauldron bubble.  
 Fillet of a fenny snake,  
 In the cauldron boil and bake;  
 Eye of newt, and toe of frog,  
 Wool of bat, and tongue of dog,  
 Adder's fork, and blind-worm's sting,  
 Lizards leg, and howlet's wing  
 For a charm of powerful trouble,  
 Like hell-broth boil and bubble.  
 Double, double toil and trouble:  
 Fire, burn; and, cauldron, bubble.

Letter	A	B	C	D	E	F	G	H	I	J	K	L	M
Tally	### ##	### ##		### ##	### ##	###	###	###	###			### ##	
Frequency	22	24	4	22	28	14	6	5	13	0			

Letter	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Tally	###	### ##			###	###	###	###		###			
Frequency													

What is the **most frequently** used letter in this piece of text? \_\_\_\_\_

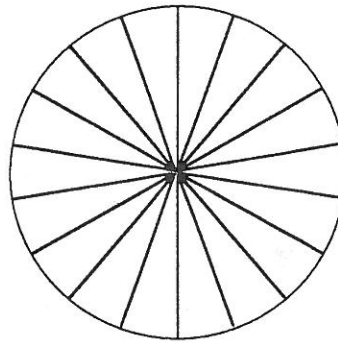
Letter \_\_\_\_\_ is the **mode**.

2. Throw a dice 18 times.

a) Record your results on this tally chart.

Dice Number	Tally	Frequency
1		
2		
3		
4		
5		
6		

b) Display your results on this pie chart. Complete the key.



Key	
1	<input type="checkbox"/>
2	<input type="checkbox"/>
3	<input type="checkbox"/>
4	<input type="checkbox"/>
5	<input type="checkbox"/>
6	<input type="checkbox"/>

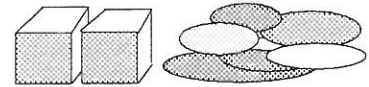
c) Which dice score is the mode? \_\_\_\_\_

3. Here are the results for Kudeza's matrix.

Card No.	Test Mark
0694	8
↓	8
0294	10
1383	10
0220	7
1750	5
0291	10
0823	10
↓	10
0691	10

Which test mark is the mode? \_\_\_\_\_

4.



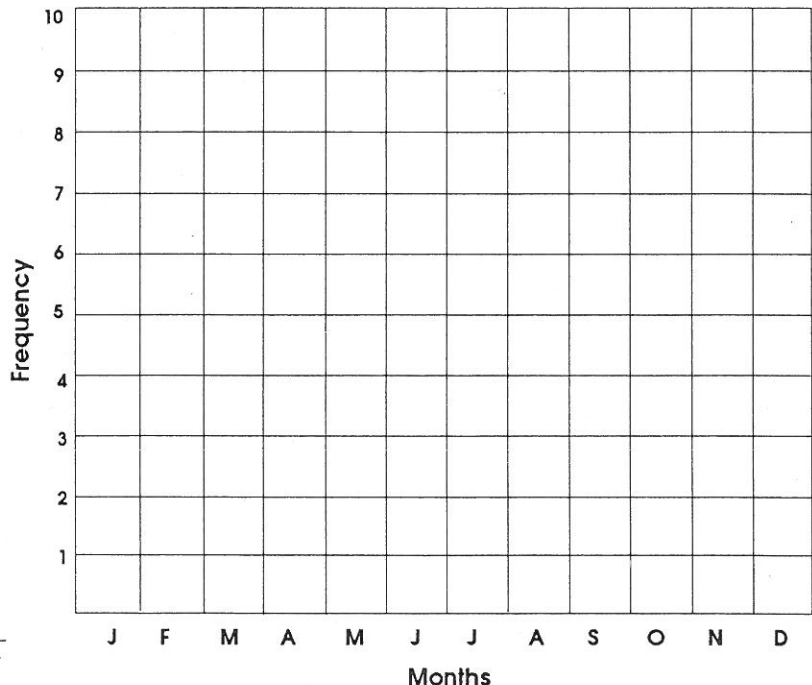
Take a handful of centicubes or counters.

Which colour is the mode? \_\_\_\_\_

5. Do a survey of your class to find in which month people were born.

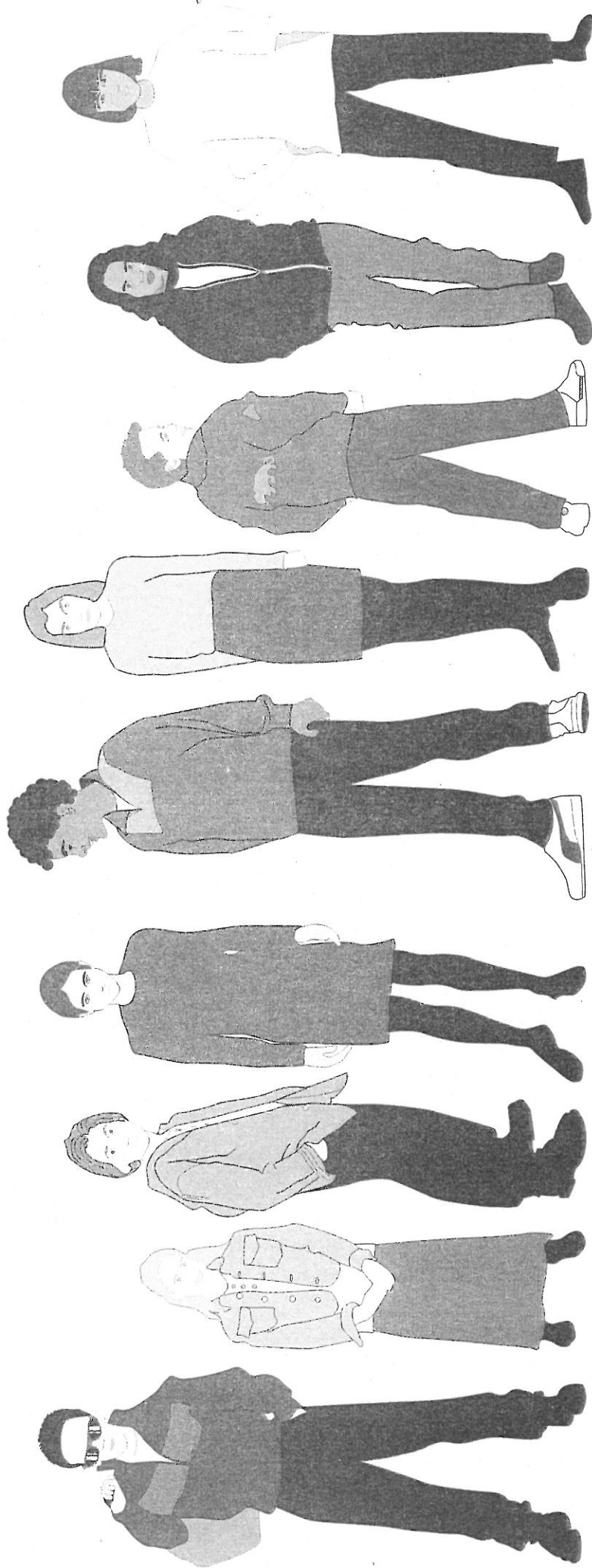
Use this grid to display your results.

Which month is the mode? \_\_\_\_\_



# The Median

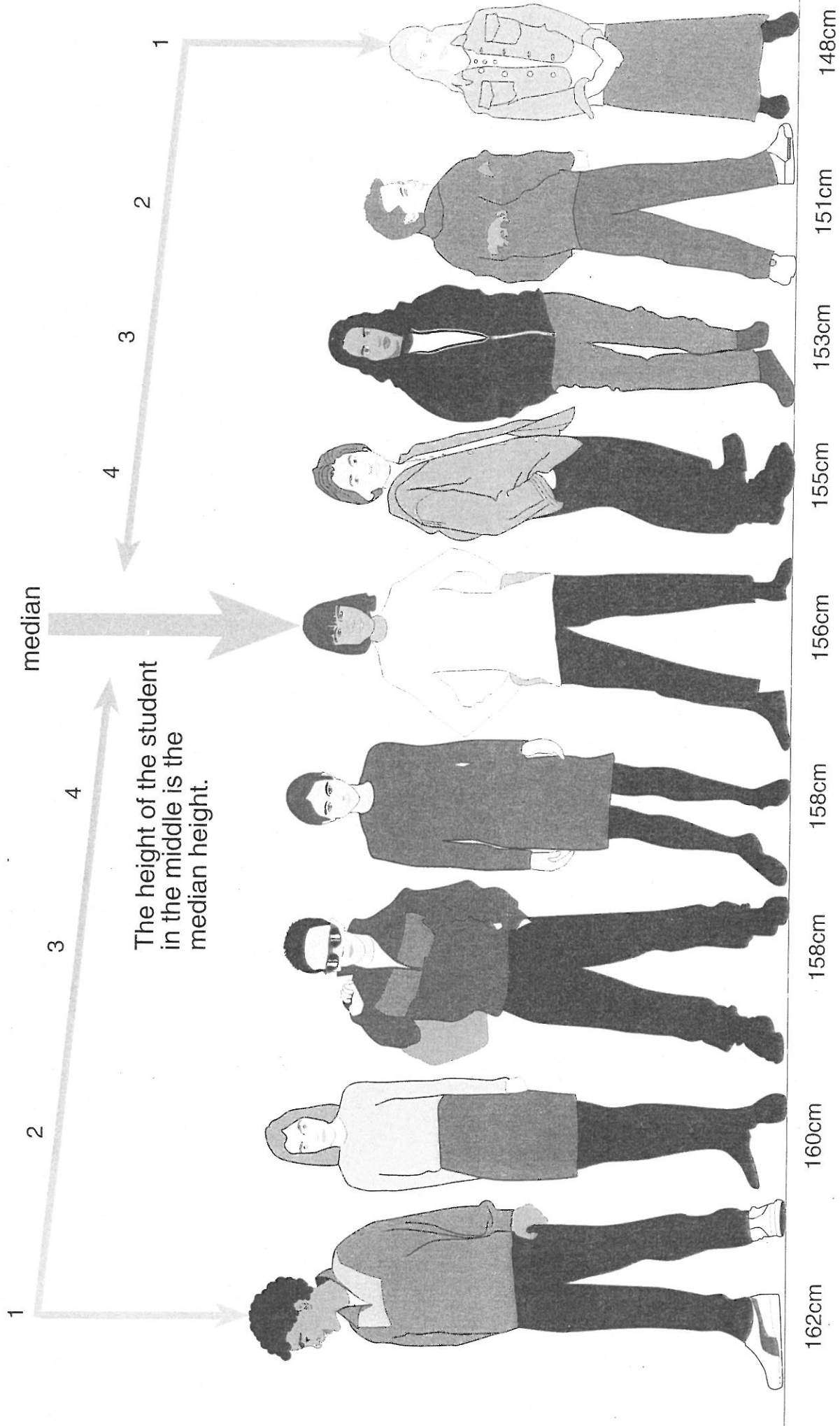
The median of a set of numbers is the middle number, once the numbers have been arranged in order of size.



Turn the page to see how you would find the median height of this group of students.



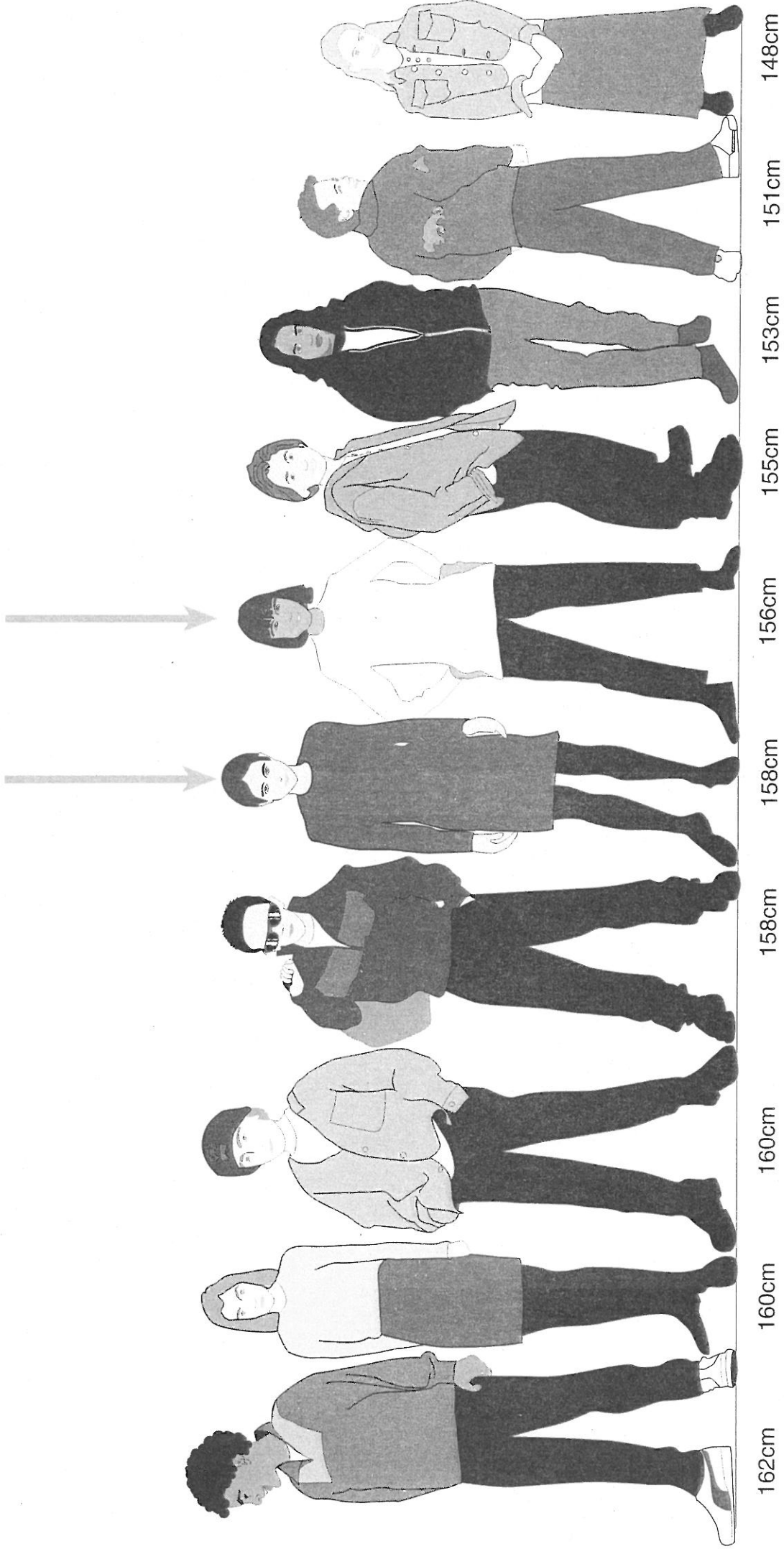
Arrange the students in order of height.



1. What is the median height?

Another student joins the group.

The median height lies half way between these 2 students.

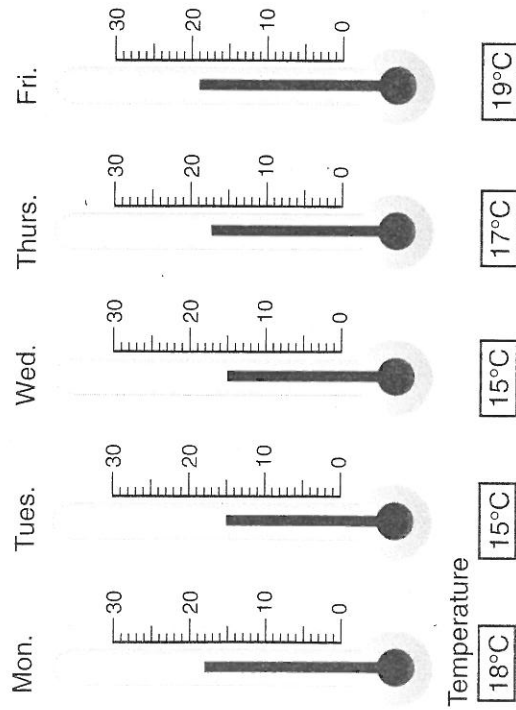


2. What is the median height now?

3. Collect 5 pens.  
Write down their lengths.  
Put them in order.

**What is the median length?**

4. Here are some temperatures for 5 days.



To find the median temperature:

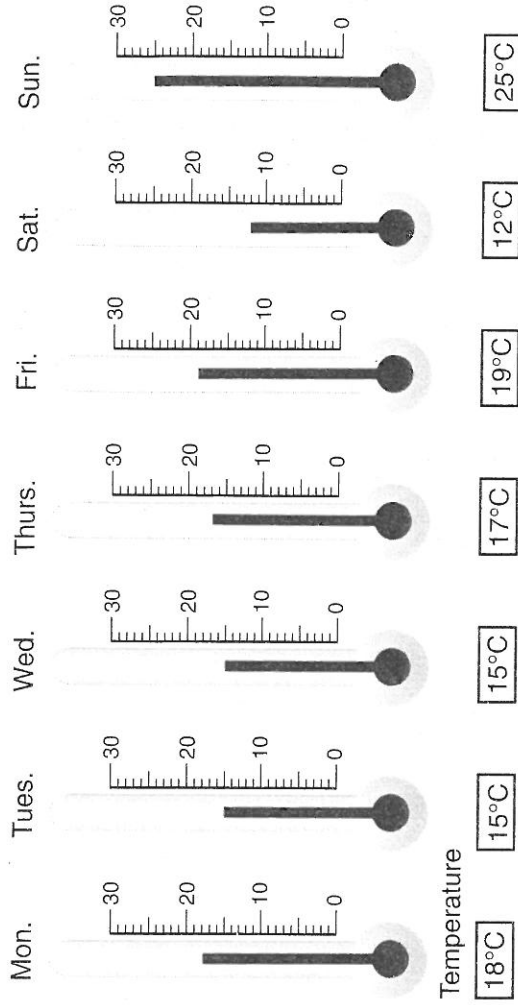
Write the temperatures in order.

15°C, , , , 19°C

Find the middle value.

**What is the median temperature?**

5. Over the weekend Saturday was cold but Sunday was very hot.



Find the new median temperature.

What do you notice?

Has the median changed?

Explain why.

6. Choose two of the following surveys to do in your class.  
Ask 10 people for your first survey and 11 for your second.  
Find the median in each case.

How long did it take you to get to school today?

How many SMILE tasks have you done this year?

How many letters are in your 1st name?

Take a handful of counters or cubes. How many in a handful?

Estimate the height of the classroom?

What is your hand span in millimetres?

# The Mean

To find the mean of a set of values

- Find the total of all the values.
- Divide the answer by the number of values.

Sarif's marks

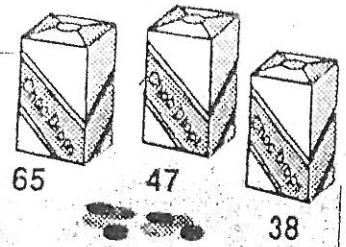
Art	English	History	Science	French	Geography	Maths
44	37	29	31	29	36	25

Total number of marks = 231  
 $(44 + 37 + 29 + 31 + 29 + 36 + 25)$

Number of subjects = 7

Mean =  $\frac{231}{7} = 33$

Sarif's mean mark is 33.



These three boxes each contain a different number of sweets.

The total number of sweets is 150.

If these were shared out equally among the three boxes, there would be 50 sweets in each box.

*Total number of sweets*

$$\begin{array}{r} 65 \\ 47 \\ + 38 \\ \hline 150 \end{array}$$

*Mean of the three numbers*  $150 \div 3 = 50$

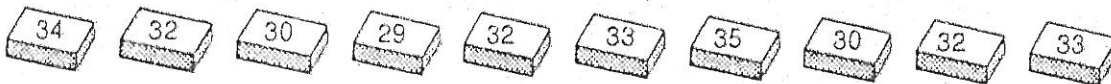
The mean number of sweets is 50.

1. Danny's marks were:

English	History	Science	French	Geography	Maths	Art
34	20	31	25	28	42	37

Find Danny's mean mark.

2. The number of matches in ten match boxes were:



What should the manufacturer put for the mean contents on the match box?

3. The numbers of cars passing each hour in Carla's vehicle survey were:

Time	1st hour	2nd hour	3rd hour	4th hour	5th hour	6th hour
Cars	75	83	204	66	90	86

Find the mean number of cars per hour.

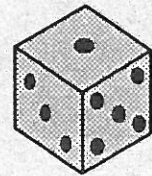
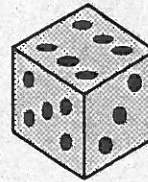
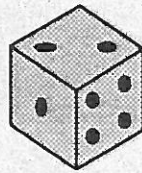
4. These students collected the following amounts of money for charity

Nelson	Candy	Jay	Ha	Grant
25p	18p	29p	31p	22p

Find the mean amount collected per student

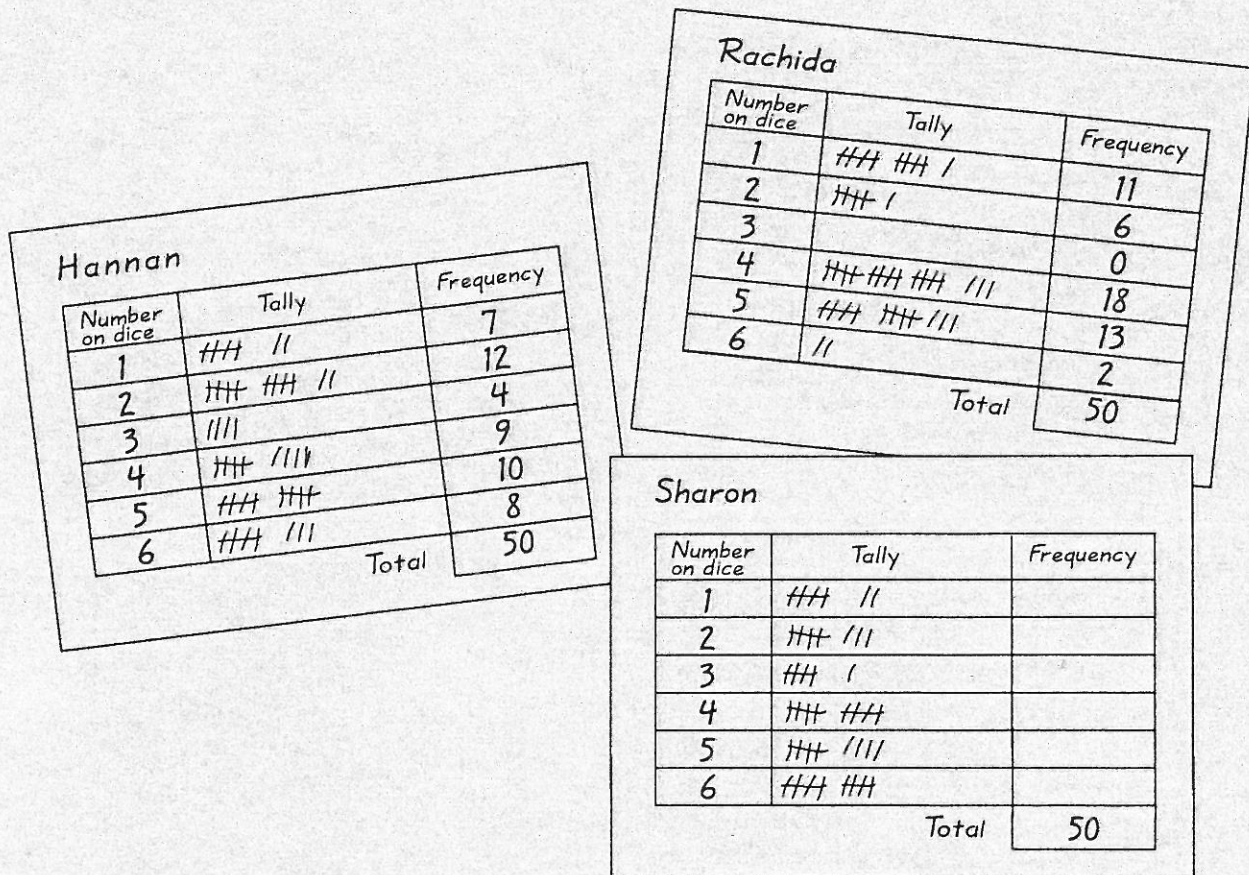
# Testing Dice

Three students, Hannan, Rachida and Sharon made their own dice out of paper.



They tested their dice to make sure they were fair.

These tally charts show their results after 50 throws.

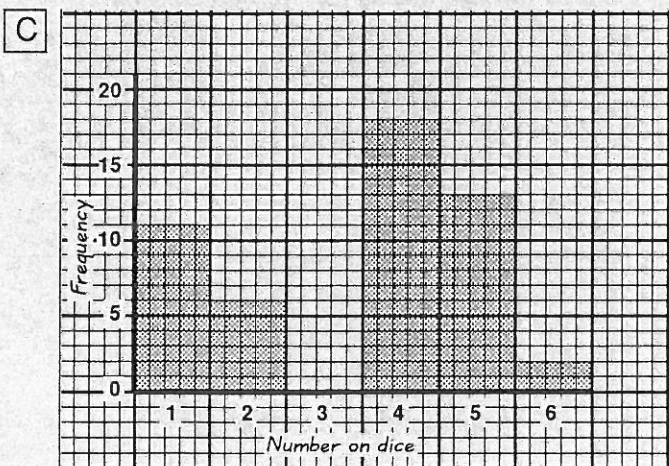
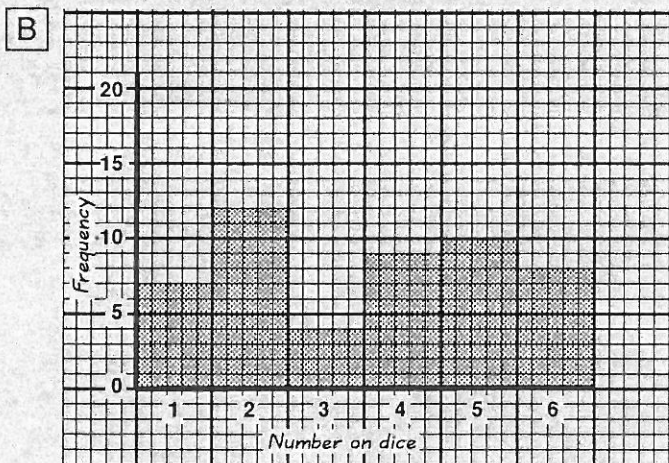
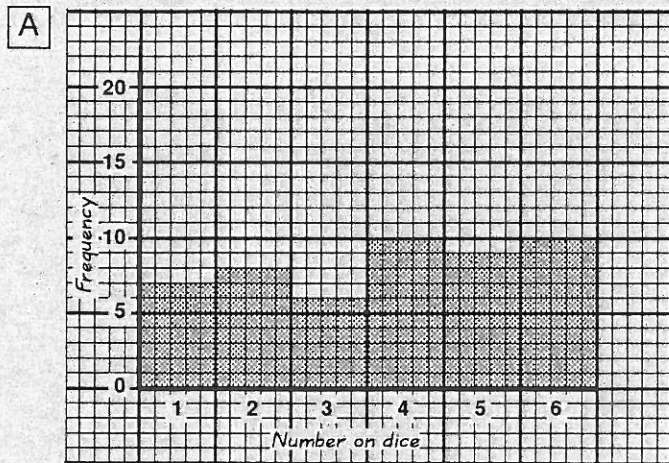


- 1) Copy and complete Sharon's tally chart.
- 2)
  - a) How many times did Hannan throw a '5'?
  - b) How many times did Rachida throw a '5'?
  - c) How many times did Sharon throw a '5'?
- 3) The **mode** in Hannan's test was '2'. (She threw a '2' 12 times. 12 was the highest frequency.)
  - a) What number on the dice was the mode in Rachida's test?
  - b) What numbers on the dice were the modes in Sharon's test?
- 4) The **range** of frequencies in Hannan's test was 8. (This is the difference between the highest frequency (12) and the lowest frequency (4).)
  - a) What was the range of frequencies in Rachida's test?
  - b) What was the range of frequencies in Sharon's test?

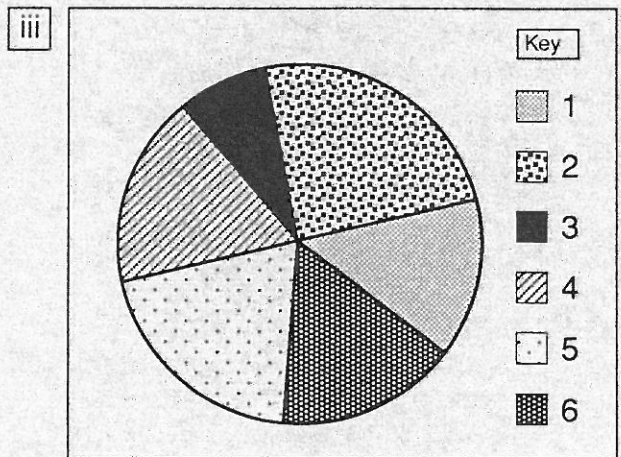
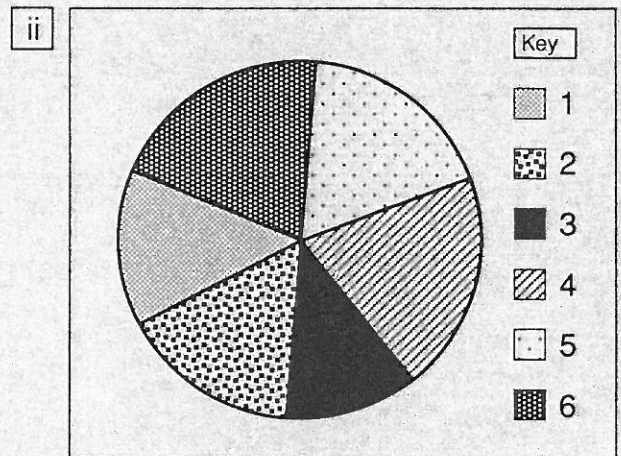
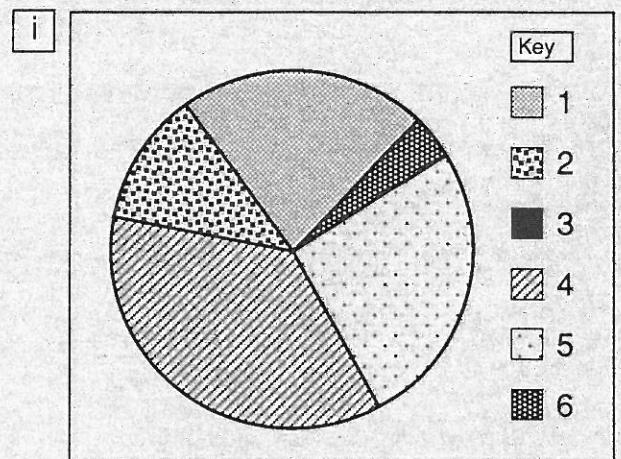
5) Each student displayed their data on a **bar chart**, and a **pie chart**. They gave in their charts but forgot to write their names on them.

Which bar chart and which pie chart belongs to each student?

**Bar charts**

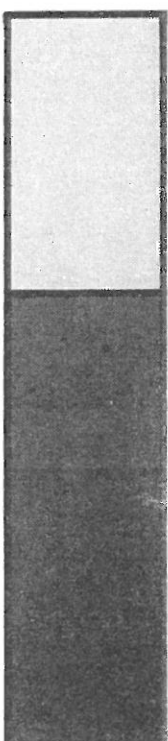


**Pie charts**

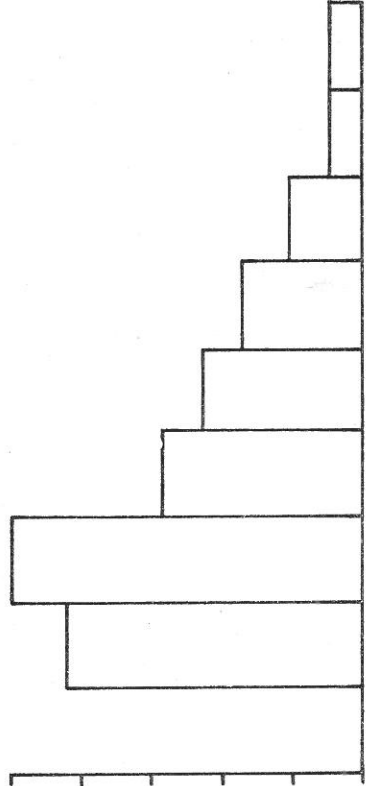


6) Which two dice would you use for a fair game? Explain how you decided.

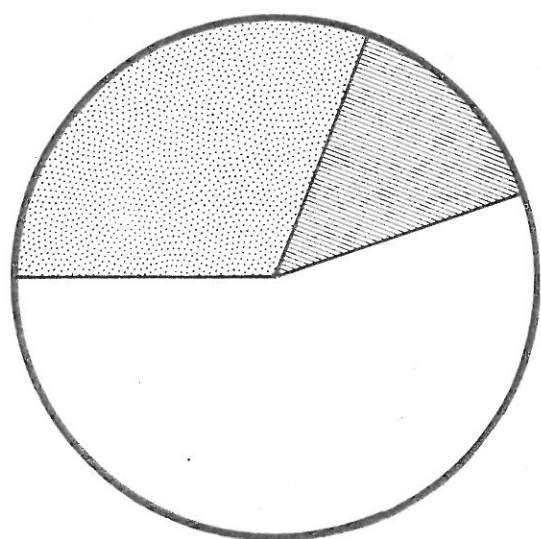
# Statistics Three Review



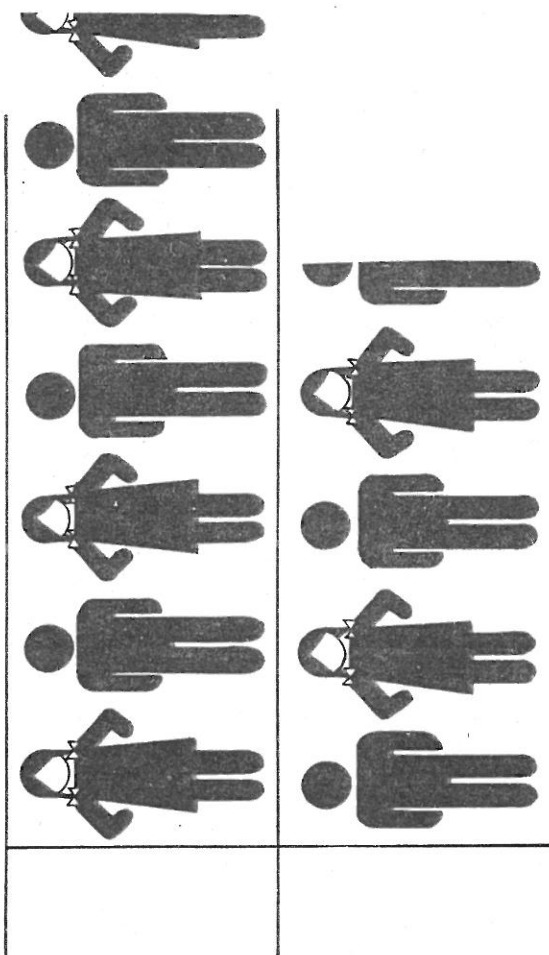
BAR GRAPH



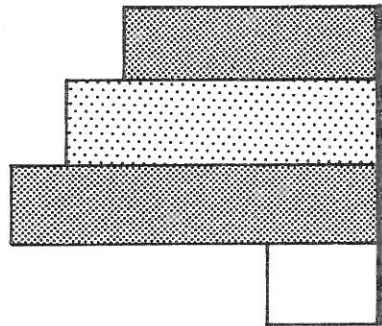
HISTOGRAM



PIE-CHART



PICTOGRAPH



BLOCK DIAGRAM

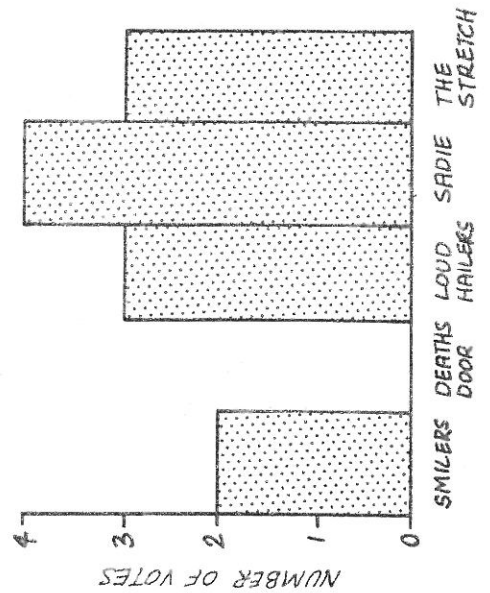
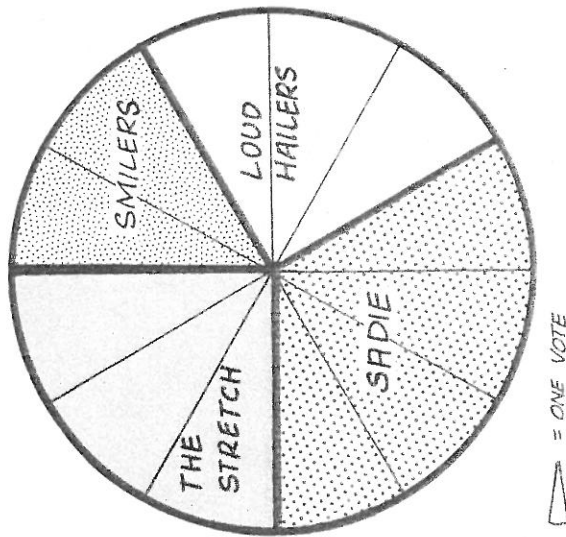
Some friends were asked to vote for the rock group (or groups) they would like to watch. There were five groups to choose from and they were allowed to vote for more than one group.

- 1) How many votes did "Smilers" get?
- 2) How many votes did each group get?
- 3) How many degrees on the pie-chart represent each vote?






4) What fraction of the votes went to "The Stretch"?

5)  $\frac{2}{12}$  of the votes went to "Smilers", so their part of the pie is  $60^\circ$ .  
Write a similar statement for "Sadie".

6) What information does the histogram show that the pie-chart does not?





"See You" SMILERS	
"Rat a tat" DEATHS DOOR	
"Come on over" LOUD HAILERS	
"Look Back" SADIE	
"Love me too" The Stretch	

This chart shows the sales of the latest records of the 5 groups

 represents 10,000 records.

7) What does  represent?

8) What does  represent?

9) If you had a record shop which record would you stock most of?

10) How many of each record have been sold?

11) How many records have been sold altogether?

12)  $\frac{3}{15}$  of the total were "Come on over" by Loud Hailers.  
What fraction of the total were Sadie's record "Look Back"?

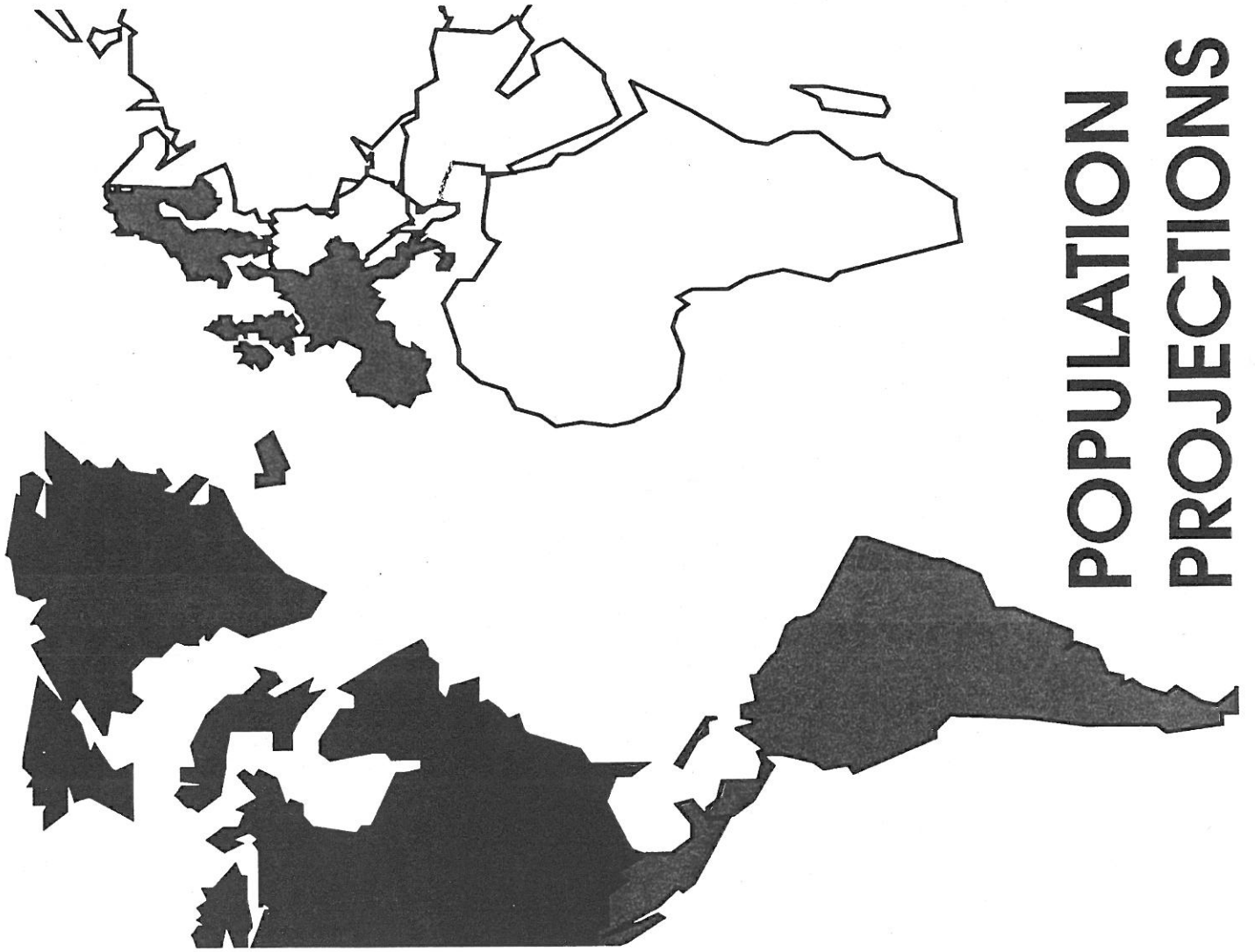
Turn over

- 13) Compare the three diagrams. What is the mode in each case?
- 14) Compare the three diagrams. What difference is there between the choices of the 12 friends and the record sales?
- 15) Which do you think gives the best guide to the groups' popularity?

A survey of these five groups is to be made by "ROCK" magazine. 33 out of 100 votes are expected to be for "Sadie" and people can vote for more than one group.

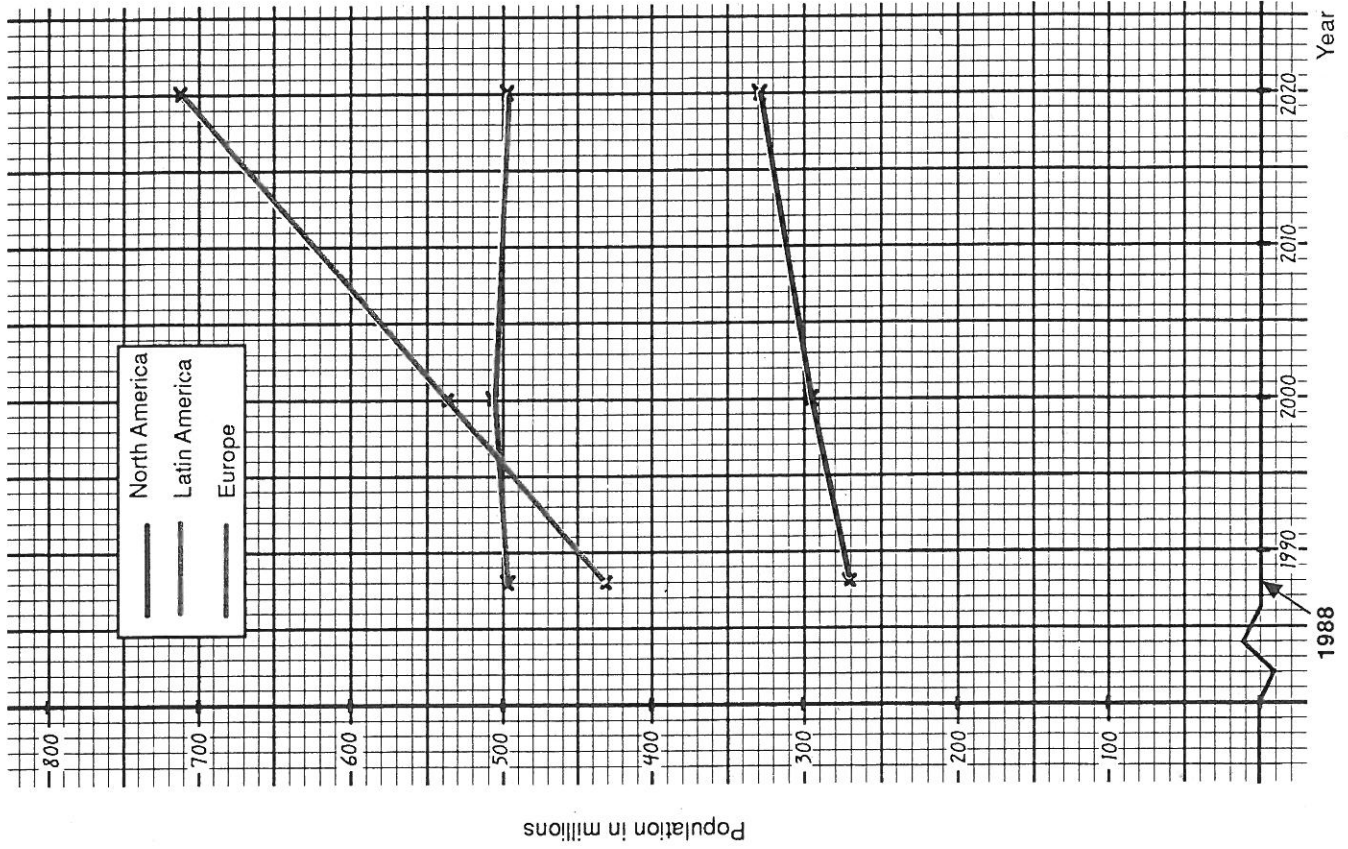
- 16) How many out of 100 do you expect to vote for the "Loud Hailers"?
- Write a few lines to say how you decided.





# POPULATION PROJECTIONS

## Estimated and Projected Population (millions)



Use the graph opposite to answer the following questions about the projected populations of three regions, North America, Latin America and Europe.

- Which region had the largest population in 1988?
- The population of Latin America in 1988 was approximately 430 million. What was the approximate population of North America in 1988?
- Approximately how many more people were there in Europe than there were in North America in 1988?
- Look at the graph for the projected population of Latin America.
  - What is the projected population for the year 2000?
  - What is the projected population for the year 2010?
  - What is the projected increase from 2000 to 2020?
- The populations for the year 2020 are projections. If these trends for 2000 to 2020 continue:
  - What will the projection for each region be in the year 2040?
  - Write a few sentences about the trend in the population for these three regions.



בססל בל < אכב  
באבא בבלב > אכב

The most frequent letters in this secret message are, in order.

E, T, A, H, I & S, O

Use sheet 0808A

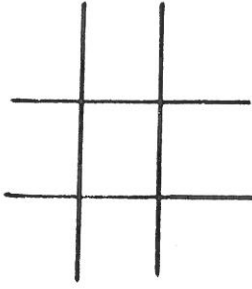
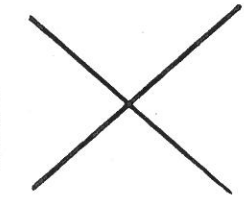
Remember - when you have found which symbol occurs most, write E underneath it. Do the same for T, A, H, I, S and O .....



The original code was developed over 200 years ago.

Can you work out how the symbols were chosen?

HINT



If you found this work interesting then after you have looked at the answers, try to decode the message over the page.



