

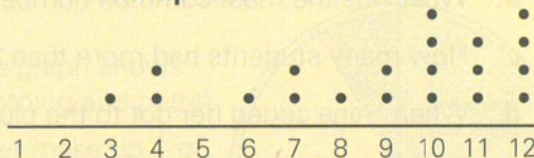
## Dot plots

A **dot plot** is an easy way to put data values in order and observe the **distribution** of the data set. As each value occurs, a dot is placed above that value on a **scale**.

**Example:** Scores (out of 12) for a multiplication test are recorded on the dot plot alongside.

6	7	9	4	12	11	10	11	12	12
7	9	10	10	11	12	10	4	3	8

**Multiplication test scores**



## Strip graphs

A **strip graph** uses labelled rectangles of equal size to display data values.

- Each rectangle represents the same frequency (as described by a **key**).
- The frequency of each value is shown by the number of rectangles it uses.

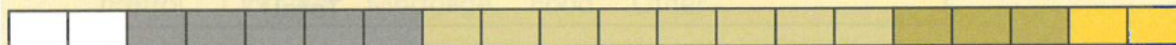
This allows the frequency of each value to be seen as a fraction of the total frequency.

**Example:** A restaurant filled in a tally chart of children's meal orders one Friday night.



Meal	Tally	Frequency
Chicken nuggets		4
Fish		10
Pizza		16
Pasta		6
Sausages and chips		4
<b>Total</b>		40

A strip graph is drawn – divided into 20 equal parts (each part represents 2 meals).



**Key:** Each part represents 2 meal orders

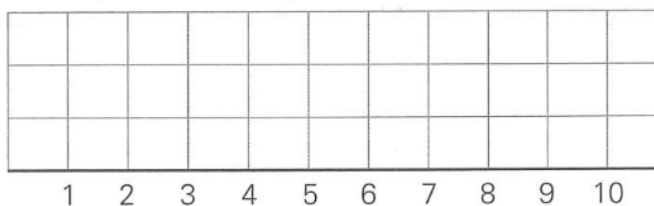
□ = chicken nuggets    ■ = fish    ■ = pizza    ■ = pasta    ■ = sausages and chips

From the strip graph it is easy to see that the most popular meal ordered was the pizza and the least popular meals were the chicken nuggets and the sausages and chips.

## Practising dot plots and strip graphs

1. a. Plot the following test results (out of 10) on to the dot plot below.\*

4	7	9	2	6	7	8	10
10	10	9	4	9	7	5	



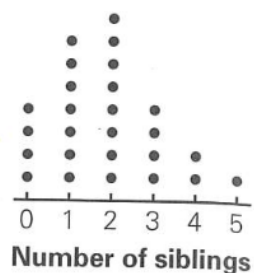
- b. From the results above, would you say that the majority of the class had done well or poorly in the test? Give a reason for your answer.

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2. Hana asked each person in her class how many siblings (brothers and/or sisters) they had. The results were as shown in the dot plot.



- a. How many students took part in Hana's survey? \_\_\_\_\_
- b. What was the most common number of children in a family? \_\_\_\_\_
- c. How many students had more than 2 siblings? \_\_\_\_\_
- d. When Hana added her dot to the plot, the data set became bimodal (two modes).  
How many siblings does Hana have? \_\_\_\_\_
3. When planning the height of a dot plot, which average is the most important and why?

4. Cinema staff filled in a tally chart of how many people attended different movies one Monday night.

Each box in the strip represents 5 people.



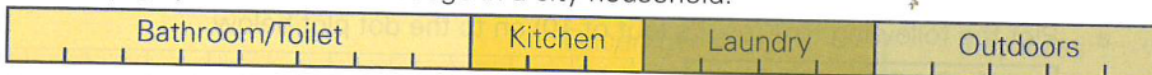
- a. Fill in the frequency column in the tally chart alongside.

Movie	Tally	Frequency
Gnomeo and Juliet		
Rango		
Unknown		
The King's Speech		
Hall Pass		
Total		

- b. Complete the strip graph for the data, as started below.  
Remember to complete the box for the key below the graph!

<b>Key:</b>																			

5. This strip graph shows water usage in a city household.



For example, the kitchen takes up 3 divisions in the strip graph.

- a. How many divisions are in the graph?   12
- b. If the whole strip represents 100%, what percentage does each division represent?   8.33
- c. What percentage of water use is in the bathroom/toilet?   40   %  
the kitchen?   25   %    the laundry?   16.67   %    outdoors?   25   %



## Statistics: Displaying grouped data – histograms

Scores are **grouped** when there are too many different data values for individual bars on a bar graph.

**Histograms** can be used to show **grouped data**.

**Example:** Marks in a maths test are awarded the grades A, B, C, D or E according to the following criteria:

A: 80–100%; B: 60–79%; C: 40–59%; D: 20–39%; E: 0–19%

The table shows a set of maths test results for 60 students.

61	25	68	63	52	64	70	40	65	91	44	79	21	94	48	71	50	97	73	11
67	46	73	41	63	13	64	77	41	88	68	55	70	62	49	93	75	55	95	60
49	72	57	71	69	41	48	71	66	71	27	61	53	86	65	46	70	35	99	45

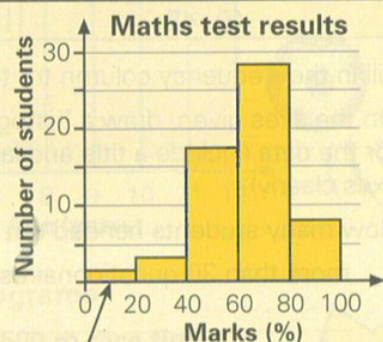
The bars in a histogram are all the same width and have no gaps between them.



These data are tallied then shown on a histogram.

Marks	Tally	Number
E 0–		2
D 20–		4
C 40–		18
B 60–		28
A 80–100		8
<b>Total</b>		60

**Note:** 0– means marks from 0% up to but not including 20%.

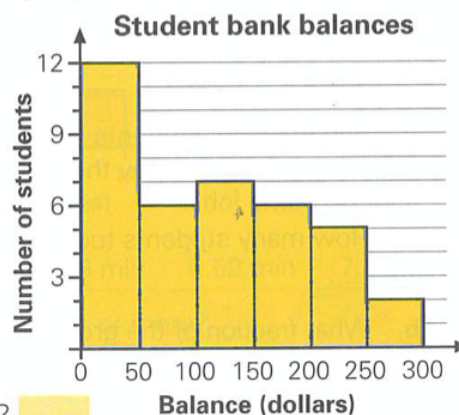


the first bar shows E grades: (0–19%)  
the next bar shows D grades: (20–39%)  
and so on

## Practising displaying grouped data – histograms

1. The histogram below shows the bank balances of a group of students in a survey.

- How many students have bank balances less than \$50?
- How many students have bank balances of between \$50 and \$100?
- How many students have less than \$150 in their banks?
- How many students have \$150 or more in their banks?
- How many students have at least \$100, but less than \$250?
- How many students participated in the survey?
- What general pattern does this graph show?



- Does the majority of students have a bank balance more or less than \$100?

## Statistics: Displaying grouped data – histograms

2. Some Year 8 students recorded the number of questionnaires they handed out for their Statistics project.

43	40	28	46	17	34	28	45	42	12	10	18	16	27	29	37	39	22
11	17	27	46	36	32	38	47	49	35	41	32	40	21	22	28	19	45

- a. Complete the tally chart for the data (the first three tallies have been done for you).

Year 8 Statistics questionnaire numbers		
Questionnaires handed out	Tally	Frequency
0–9		
10–19		
20–29	I	
30–39		
40–49	II	

- b. Fill in the frequency column for the data.

- c. On the axes given, draw a histogram for the data (include a title and label axes clearly).

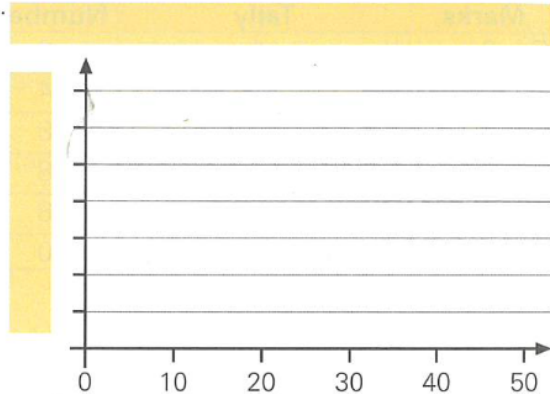
- d. How many students handed out

- i. more than 30 questionnaires?

\_\_\_\_\_

- ii. fewer than 20 questionnaires?

\_\_\_\_\_



- e. Give one advantage and one disadvantage of the histogram (and table) over the original data.

\_\_\_\_\_

\_\_\_\_\_

3. A group of senior students at Hilltop High were asked how much money they earned weekly at their part-time jobs.

- a. How many students took part in the survey?

\_\_\_\_\_

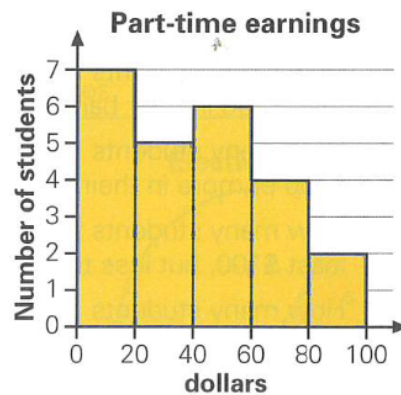
- b. What fraction of the group earned over \$60 per week?

\_\_\_\_\_

- c. Estimate the median earnings per week. Explain your reasoning

\_\_\_\_\_

\_\_\_\_\_





## Statistics: Displaying continuous data – histograms

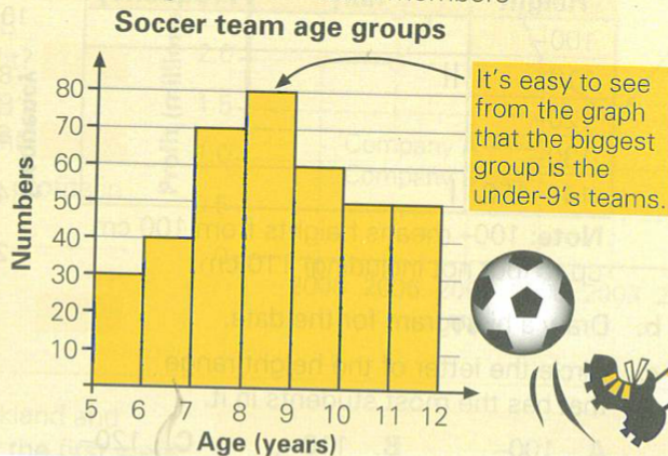
**Continuous** data are measurement data like length, weight and time.

A **histogram** is also used to show continuous data.

**Example:** Sam was 7 years old on January 1, so he is in the under-8's team at his soccer club. The frequency table and histogram show team members by age at Sam's soccer club.

Age	Team	Number
5–	Under 6	30
6–	Under 7	40
7–	Under 8	70
8–	Under 9	80
9–	Under 10	60
10–	Under 11	50
11–12	Under 12	50

**Note:** 5– means 5 years or older (but not yet 6) on January 1.



Continuous data have no gaps between possible data values.



## Practising displaying continuous data – histograms

1. The times of Year 8 students running a 1 500 m race are shown on the histogram.

a. Above each bar on the histogram, write the frequency for that interval of race times. The first one has been done for you.

- b. Circle race times in the list below that belong in the most common time interval.

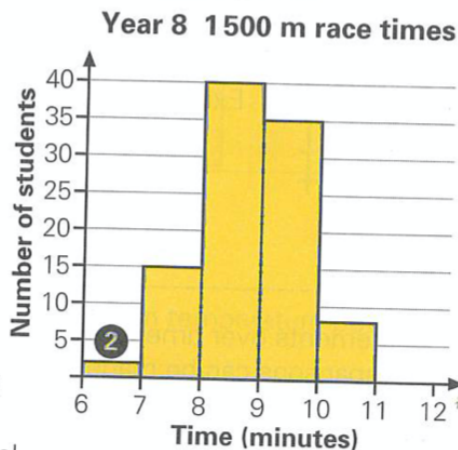
7.29 min    8.45 min    9.02 min    8.02 min    6.35 min    8.59 min    7.56 min

- c. How many students completed the race in 9 minutes or more?

- d. In which time range were the fastest times recorded?

- e. How many students in total ran the 1 500 m race?

- f. Comment on two features of the data that interest you.



**Remember**  
6– means  
6 minutes or more,  
but less than  
7 minutes



## Statistics: Displaying continuous data – histograms

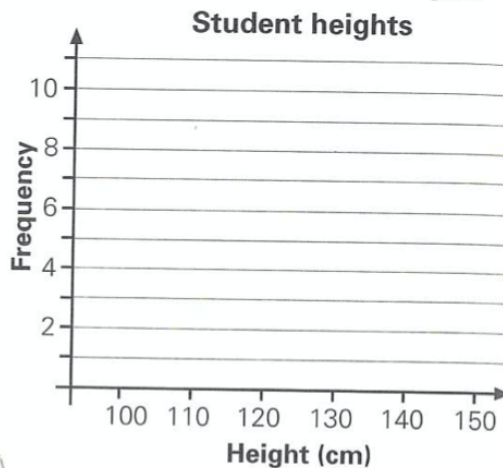
2. Students' heights in centimetres are recorded for a class.

118 148 110 125 122 124 108 117 126 121 109 115 136 131 107  
128 134 113 132 126 134 119 131 143 113 122 135 125 129 139

- a. Fill in the tally chart and the frequency table for these data. The first three heights have been tallied for you (and crossed out).

Height	Tally	Frequency
100–		
110–		
120–		
130–		
140–150		

**Note:** 100– means heights from 100 cm up to (but not including) 110 cm.



- b. Draw a histogram for the data.
- c. Circle the letter of the height range that has the most students in it.
- A. 100–      B. 110–      C. 120–      D. 130–      E. 140–150
- d. How many students are under 120 cm?
- e. How many students are between 110 cm and 140 cm?
- f. Which shows patterns in the data better: the original list, the table or the histogram?

Explain: \_\_\_\_\_