

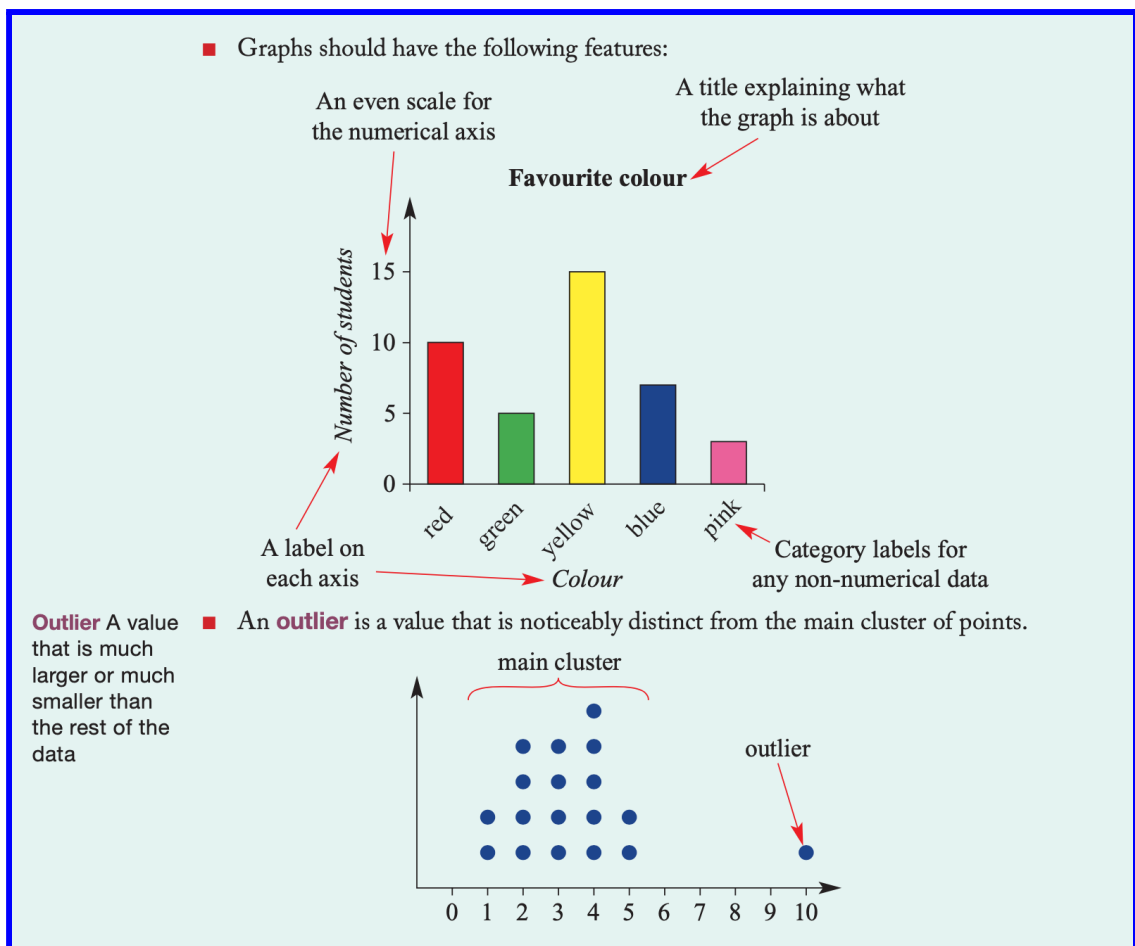
# Dot plots and column graphs

**WALT:** Draw and read dot plots and column graphs

**Success Criteria:** I know ....

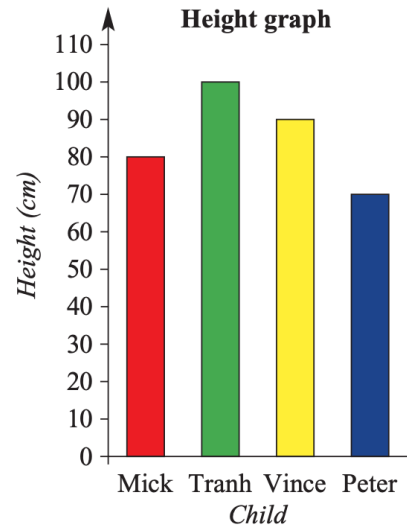
- If I surveyed my classes' favourite colours, the results could be shown as a column graph or colour of their eyes or favourite flavour of icecream. It is also called a categorical data
- A **dot plot** can be used to display data, where each dot represents one **datum**
- I also know that Datum means one score of piece of data
- In dot plot each dot represents one score

## Examples



## Read the following graphs

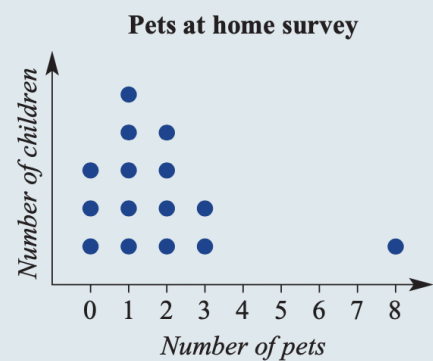
- 1 Fill in the blanks in the following sentences.
  - a A \_\_\_\_\_ is a graph which uses dots to represent data.
  - b A graph showing data in different categories as rectangles is called a \_\_\_\_\_.
  - c An \_\_\_\_\_ is a value that is noticeably distinct from the main cluster of points.
- 2 This column graph shows the height of four boys. Answer true or false to each of the following statements.
  - a Mick is 80 cm tall.
  - b Vince is taller than Tranh.
  - c Peter is the shortest of the four boys.
  - d Tranh is 100 cm tall.
  - e Mick is the tallest of the four boys.



## Interpreting the Dot Plot ( Teacher explanation )

This dot plot represents the results of a survey that asked some children how many pets they have at home.

- a Use the graph to state how many children have 2 pets.
- b How many children participated in the survey?
- c What is the range of values?
- d What is the median number of pets?
- e What is the outlier?
- f What is the mode?



### Solution

- a 4 children
- b 15 children
- c  $8 - 0 = 8$
- d 1 pet
- e 8 pets
- f 1 pet

### Explanation

There are 4 dots in the '2 pets' category, so 4 children have 2 pets.

The total number of dots is 15.

Range = highest - lowest  
In this case, highest = 8, lowest = 0.

Write the values in order:

0, 0, 0, 1, 1, 1, 1, 1, 2, 2, 2, 2, 3, 3, 8

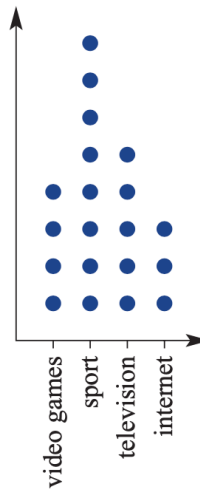
↑  
Middle value = median = 1

The main cluster of values is from 0 pets to 3 pets. The dot showing 8 pets is significantly outside this cluster.

The most common number of pets is 1 pet.

**3** The favourite after-school activity of a number of Year 7 students is recorded in this dot plot.

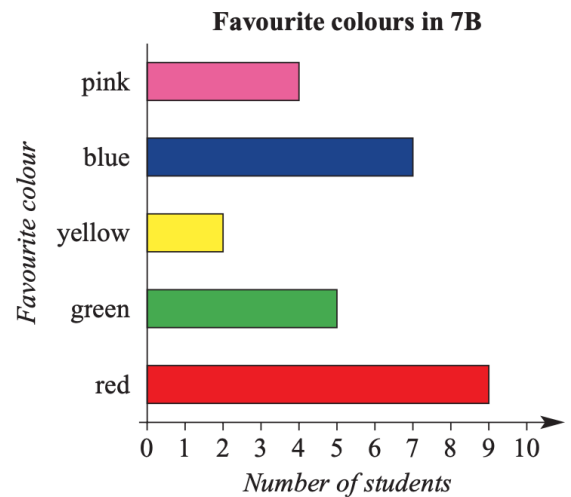
- a** How many students have chosen television as their favourite activity?
- b** How many students have chosen surfing the internet as their favourite activity?
- c** What is the most popular after school activity for this group of students?
- d** How many students participated in the survey?



**4** From a choice of pink, blue, yellow, green or red, each student of Year 7B chose their favourite colour. The results are graphed below.

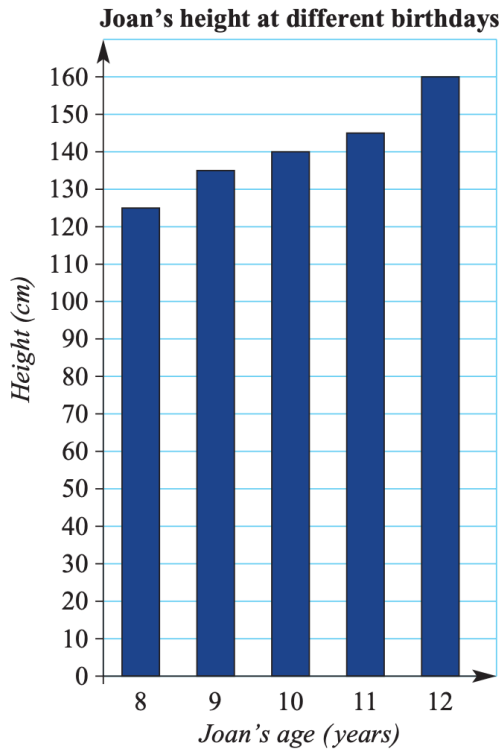
Fluency

- a** How many students chose yellow?
- b** How many students chose blue?
- c** What is the most popular colour?
- d** How many students participated in the class survey?



Next page

5 Joan has graphed her height at each of her past five birthdays.



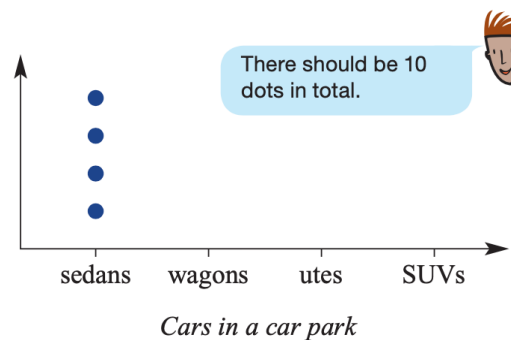
- a How tall was Joan on her 9th birthday?
- b How much did she grow between her 8th birthday and 9th birthday?
- c How much did Joan grow between her 8th and 12th birthdays?
- d How old was Joan when she had her biggest growth spurt?

## Now it's time to draw a dot plot

6 The types of cars parked in a small car park were:

Sedan	Wagon	Ute	SUV
4	1	2	3

- a How many utes were in the car park?
- b Copy and complete the dot plot.



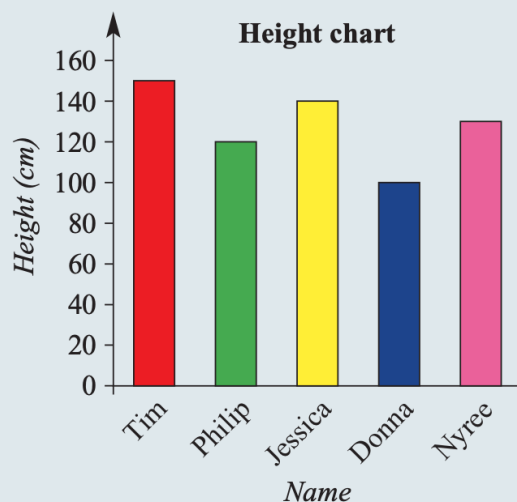
## Constructing a column graph

### Teacher explanation

Draw a column graph to represent the following people's heights.

Name	Tim	Philip	Jessica	Donna	Nyree
Height (cm)	150	120	140	100	130

#### Solution



#### Explanation

First decide which scale goes on the vertical axis. Maximum height = 150 cm, so axis goes from 0 cm to 160 cm (to allow a bit above the highest value).

Remember to include all the features required, including axes labels and a graph title.

**7** Draw a column graph to represent each of these boys' heights at their birthdays.

**a** Mitchell

Age (years)	Height (cm)
8	120
9	125
10	135
11	140
12	145

**b** Fatu

Age (years)	Height (cm)
8	125
9	132
10	140
11	147
12	150

The scale on your vertical axis could go 0, 10, 20, ... 150.



**8** The ages (in years) of children at a party were: 7, 10, 8, 11, 8, 7, 9, 10, 12, 8.

**a** Represent this as a dot plot.

**b** What is the range of the ages?

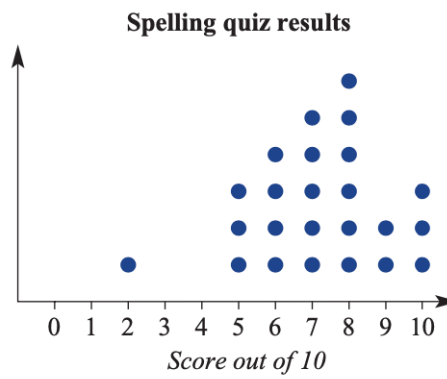
Range = largest - smallest



## Problem solving and reasoning - extension activity

9 The results of a Year 4 spelling quiz are shown as a dot plot.

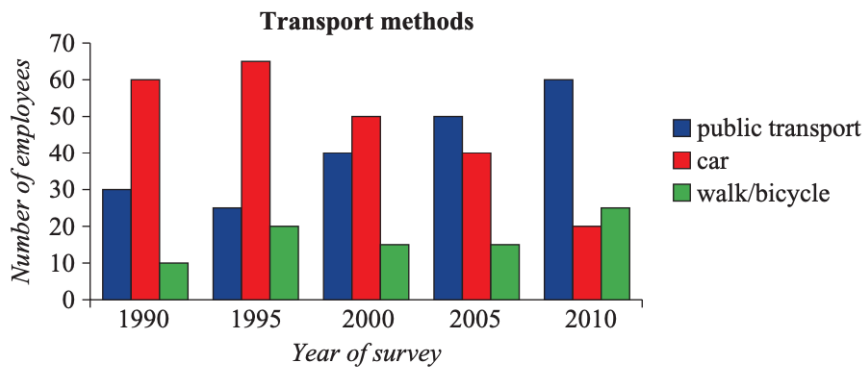
- a How many students got a score of 6?
- b What is the most common score in the class?
- c How many students participated in the quiz?
- d What is the range of scores achieved?
- e What is the median score?
- f Identify the outlier.



See Example 3 if you need help.



10 Every five years, a company in the city conducts a transport survey of the way people get to work in the mornings. The results are graphed below.



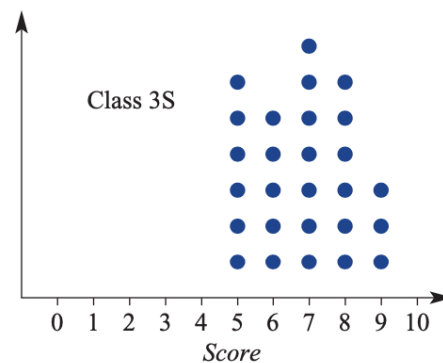
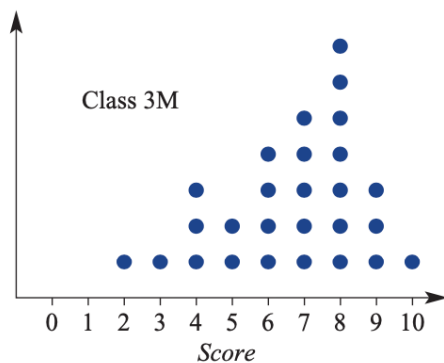
- a Copy and complete this table to show the data in the graph.
- b In which year(s) was public transport the most popular option?
- c In which year(s) were more people walking or cycling to work than driving?
- d Suggest one reason why the number of people driving to work has decreased.
- e What is one other trend that you can see from looking at this graph?

	1990	1995	2000	2005	2010
Use public transport	30				
Drive a car	60				
Walk or cycle	10				

- 11 a** Draw a column graph to show the results of the following survey of the number of boys and girls born at a certain hospital. Put the years on the horizontal axis.

	2000	2001	2002	2003	2004	2005
<b>Number of boys born</b>	40	42	58	45	30	42
<b>Number of girls born</b>	50	40	53	41	26	35

- b** During which year(s) were more girls born than boys?  
**c** Which year had the smallest number of births?  
**d** Which year had the greatest number of births?  
**e** During the time of the survey, were more boys or girls born?
- 12** Mr Martin and Mrs Stevensson are the two Year 3 teachers at a school. For the latest arithmetic test, they plotted their students' scores on dot plots.



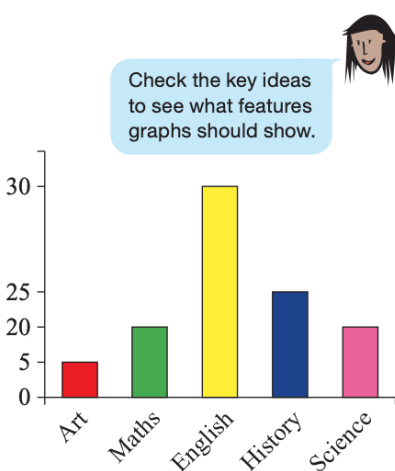
- a** What is the median score for class 3M?  
**b** What is the median score for class 3S?  
**c** State the range of scores for each class.  
**d** Based on this test, which class has a greater spread of arithmetic abilities?  
**e** If the two classes competed in an arithmetic competition, where each class is allowed only one representative, which class is more likely to win? Why?

## Misleading graphs ( Teacher Discussion)

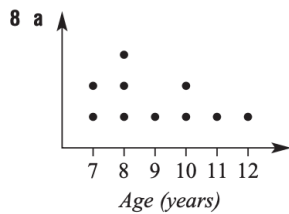
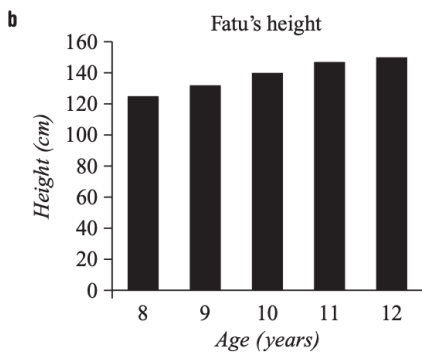
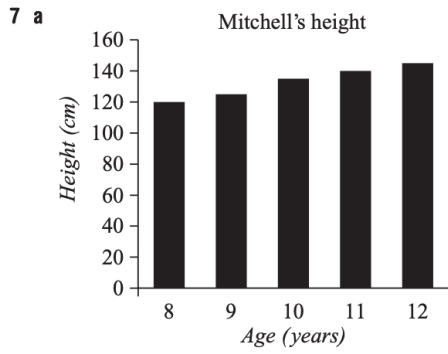
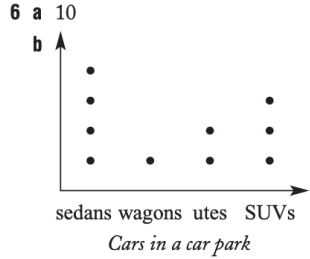
### ★ Misleading graphs

- 13** A survey is conducted of students' favourite subjects. Someone has tried to show the results in a column graph.

- a** What is wrong with the scale on the vertical axis?  
**b** Give at least two other problems with this graph.  
**c** Redraw the graph with an even scale and appropriate labels.  
**d** The original graph makes Maths look twice as popular as Art, based on the column size. According to the survey, how many times more popular is Maths?  
**e** The original graph makes English look three times more popular than Maths. From the survey, how many times more popular is English?  
**f** Look in a newspaper or magazine for a graph with an uneven scale that makes the graph misleading.



- 1 a dot plot    b column graph    c outlier  
 2 a true    b false    c true    d true    e false  
 3 a 5    b 3    c sport    d 20  
 4 a 2    b 7    c red    d 27  
 5 a 135 cm    b 10 cm  
     c 35 cm    d 11 years old



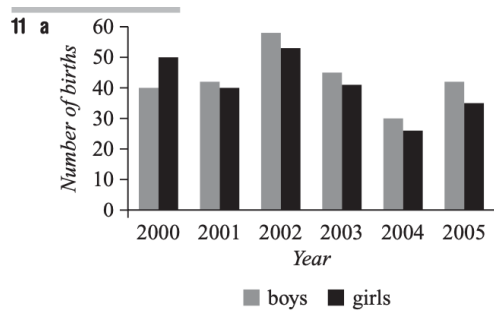
b 5

- 9 a 4    b 8    c 24  
 d 8    e 7    f 2

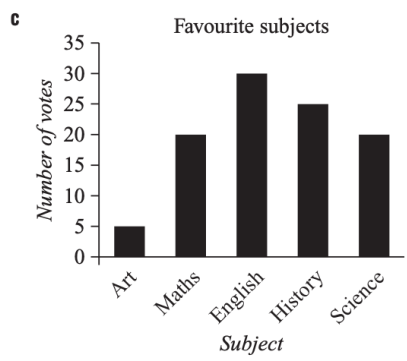
10 a

	1990	1995	2000	2005	2010
Using public transport	30	25	40	50	60
Driving a car	60	65	50	40	20
Walking or cycling	10	20	15	15	25

- b 2005 and 2010  
 c 2010  
 d Environmental concerns; others answers possible.  
 e Public transport usage is increasing; other answers possible.



- b 2000    c 2004    d 2002    e boys  
 12 a 7    b 7  
 c 3M: 8, 3S: 4    d 3M  
 e 3M because the student who got 10 is in that class.  
 13 a It is unequal.  
 b The axes have no labels and it does not have a title.



- d four times as popular  
 e one and a half times as popular



