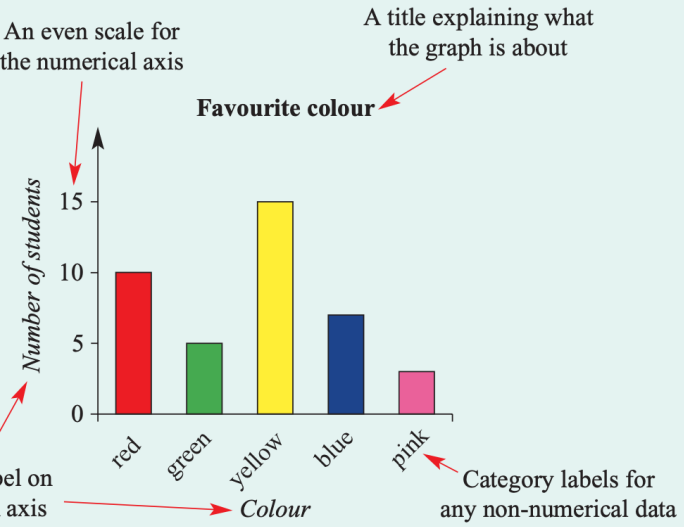
Dot plots and column graphs

WALT to 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 peace of data
- In dot plot each dot represents one score

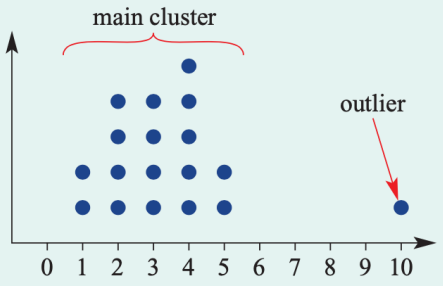
Examples

■ Graphs should have the following features:



Outlier A value that is much larger or much smaller than the rest of the data

■ An **outlier** is a value that is noticeably distinct from the main cluster of points.



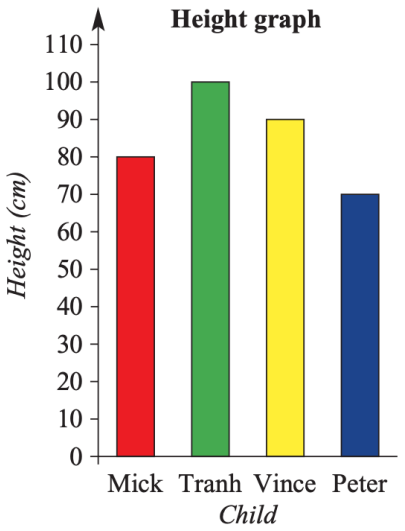
Read the following graphs

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.

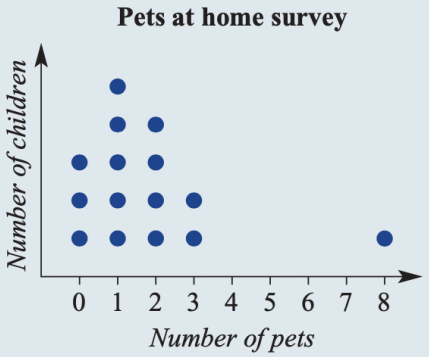
- **a** Mick is 80 cm tall.
- **b** Vince is taller than Tranh.
- **c** Peter is the shortest of the four boys.
- **d** Tranh is 100 cm tall.
- **e** Mick is the tallest of the four boys.



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	Explanation
a 4 children	There are 4 dots in the '2 pets' category, so 4 children have 2 pets.
b 15 children	The total number of dots is 15.
c 8 − 0 = 8	Range = highest − lowest In this case, highest = 8, lowest = 0.
d 1 pet	Write the values in order: 0, 0, 0, 1, 1, 1, 1, (1), 2, 2, 2, 2, 3, 3, 8 ↑ Middle value = median = 1
e 8 pets	The main cluster of values is from 0 pets to 3 pets. The dot showing 8 pets is significantly outside this cluster.
f 1 pet	The most common number of pets is 1 pet.

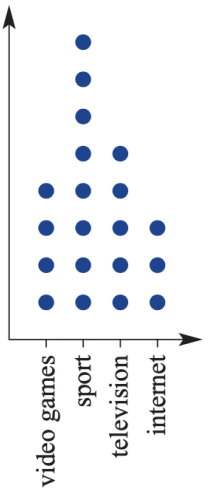
3 The favourite after-school activity of a number of Year 7 students is recorded in this dot plot.

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.

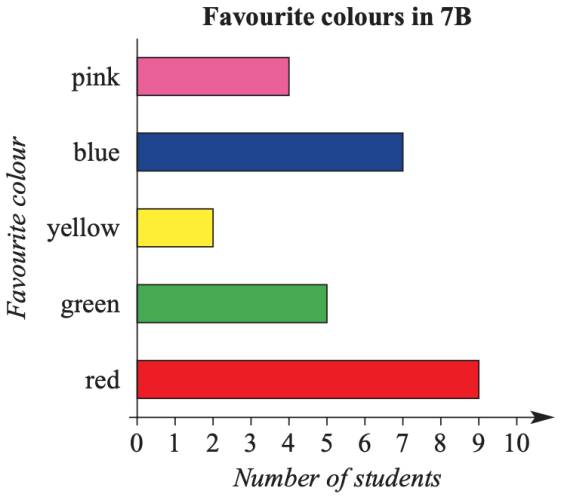
Fluency

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?



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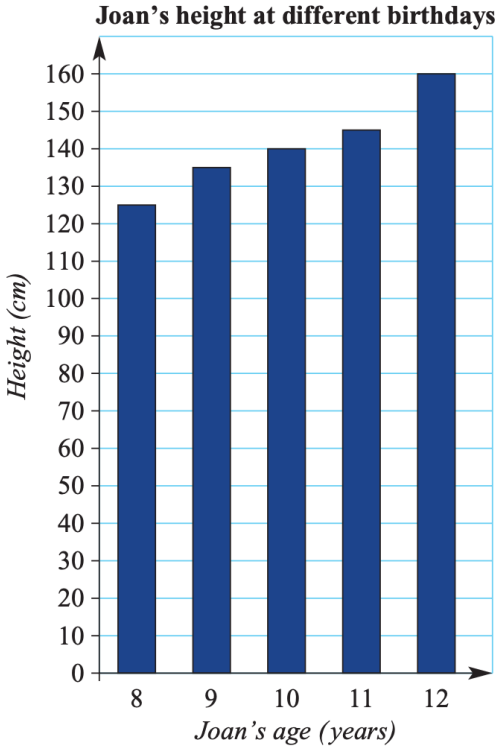
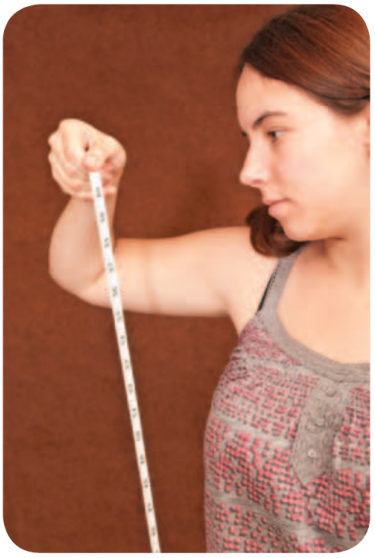
5 Joan has graphed her height at each of her past five birthdays.





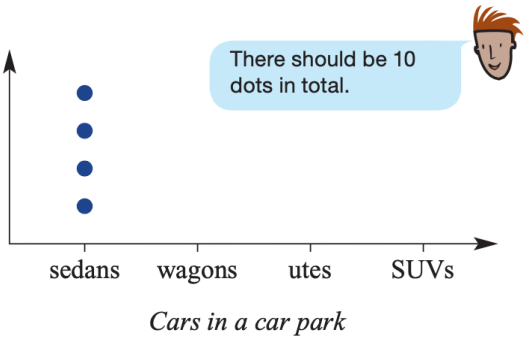
a How tall was Joan on her 9th birthday?
b How much did she grow between her 8th birthday and 9th birthday?
c How much did Joan grow between her 8th and 12th birthdays?
d How old was Joan when she had her biggest growth spurt?

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.



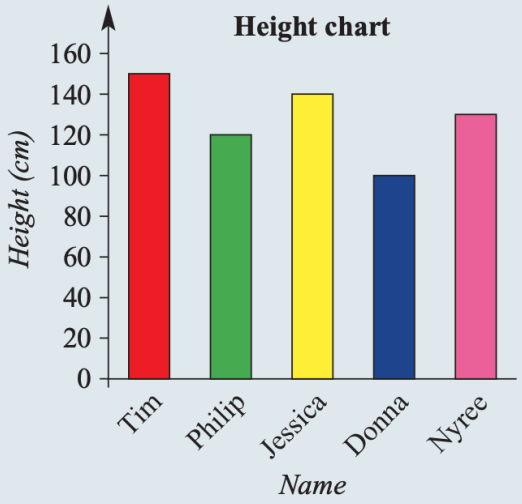
Constructing a column graph

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?

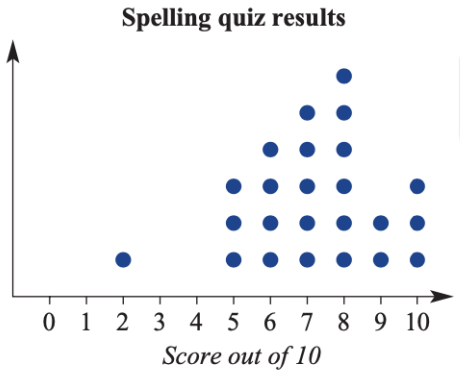
b What is the most common score in the class?

c How many students participated in the quiz?

d What is the range of scores achieved?

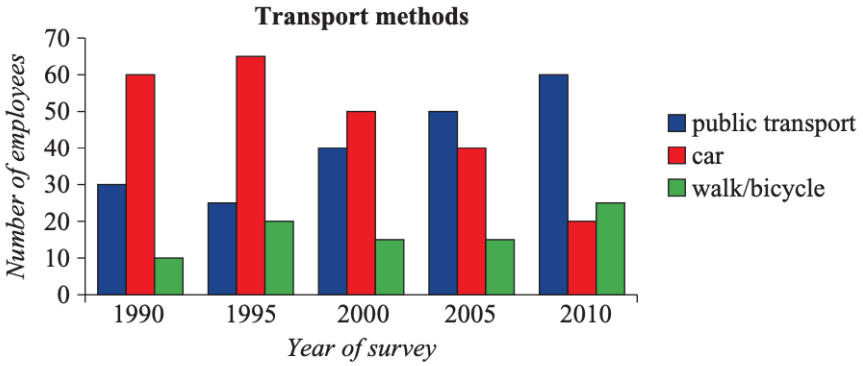
e What is the median score?

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.

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

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.

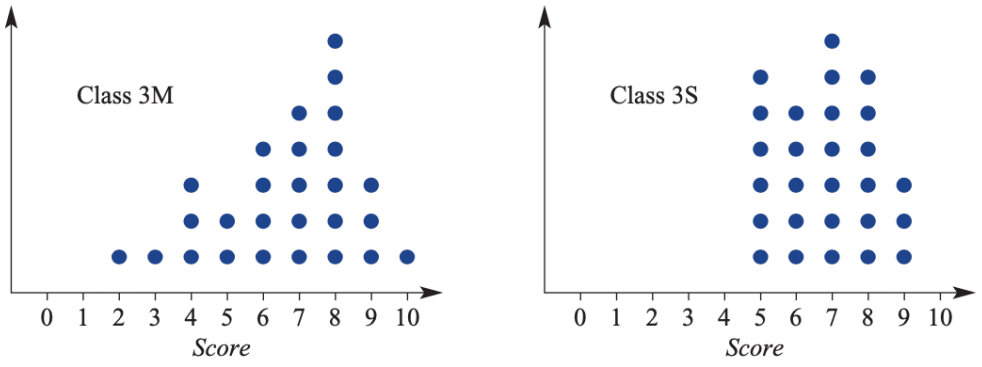
e What is one other trend that you can see from looking at this graph?

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
Number of boys born	40	42	58	45	30	42
Number of girls born	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.



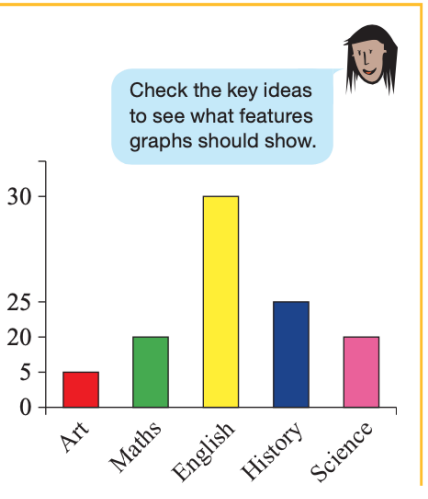
a What is the median score for class 3M?
b What is the median score for class 3S?
c State the range of scores for each class.
d Based on this test, which class has a greater spread of arithmetic abilities?
e If the two classes competed in an arithmetic competition, where each class is allowed only one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

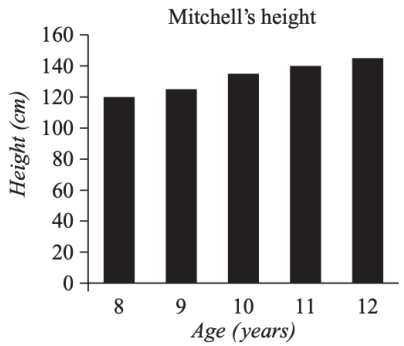
c 35 cm **d** 11 years old

6 **a** 10

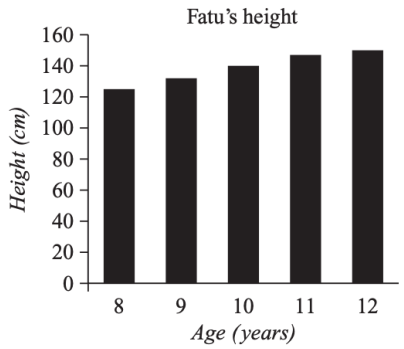
b

Cars in a car park

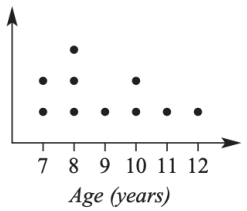
7 **a**



b



8 **a**



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

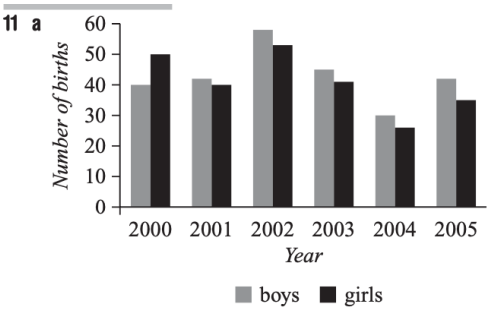
b 2005 and 2010

c 2010

d Environmental concerns; others answers possible.

e Public transport usage is increasing; other answers possible.

11 **a**



b 2000 **c** 2004 **d** 2002 **e** boys

12 **a** 7 **b** 7

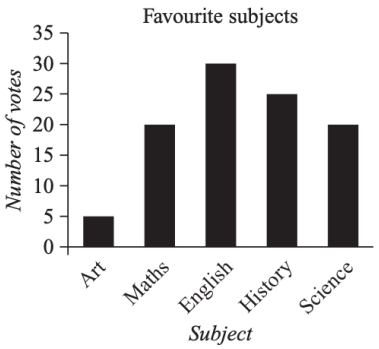
c 3M: 8, 3S: 4 **d** 3M

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.

c



d four times as popular

e one and a half times as popular