

Unit 15

Statistics



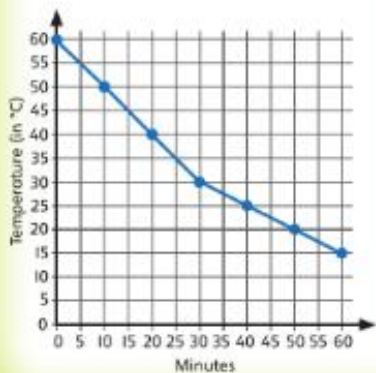
We will need some maths words.
Which ones do you recognise?

mean average
pie chart segment line graph
bar chart percentage
fraction data



In this unit we will ...

- ⚡ Learn to calculate the mean of a set of data
- ⚡ Use the mean to find missing data
- ⚡ Read and interpret pie charts using fractions
- ⚡ Read and interpret pie charts using percentages
- ⚡ Interpret and create line graphs



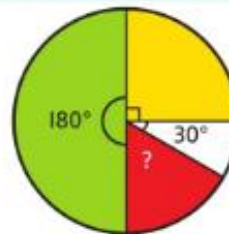
We will be interpreting line graphs.

Here is a line graph that shows the temperature of a hot chocolate drink that was left to cool.

What was the temperature of the hot chocolate after ten minutes?



We need to know that the angles around a point add up to 360° .
Calculate the missing angle.



This quick clip may be useful <https://www.bbc.co.uk/bitesize/clips/z3qmpv4>

The mean

Discover



What is the average number of marshmallows?



- 1** a) What is the average number of marshmallows on a stick?
- b) The children find six more marshmallows in the packet.
What would be the average number on a stick now?

Share

'Average' can mean different things. One way to think about average is to try to make every group an equal size. This is called finding the **mean**.



a)

Lexi			$7 + 2 = 9$
Olivia			$8 + 1 = 9$
Kate			$12 - 3 = 9$

To make the groups even, I would take three marshmallows from Kate and give two to Lexi and one to Olivia.



If every child had the same number of marshmallows, they would each have 9.
The mean is 9. The mean (average) number of marshmallows on a stick is 9.


b) Now there are 33 marshmallows in total.


Method 1	Method 2
Share 33 marshmallows between the 3 children.	Share the extra 6 marshmallows between the 3 children. Each child gets 2 more.
$33 \div 3 = 11$	$9 + 2 = 11$
The mean (average) number of marshmallows on a stick would be 11.	





Think together

1 Bella joins the other children. She has only 1 marshmallow.
 What is the mean number of marshmallows per child?

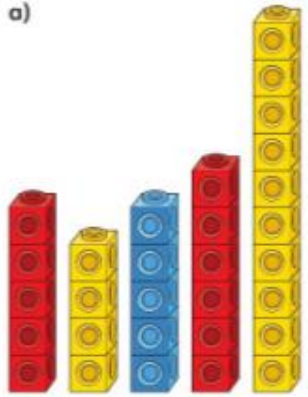
Lexi 

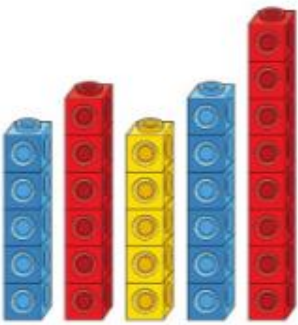
Olivia 

Kate 

Bella 

2 What is the mean number of cubes in each group of towers?

a) 

b) 

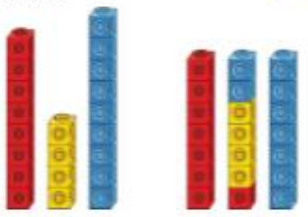
What do you notice? Can you explain?

3 Isla and Aki have found the mean of the numbers 8, 4 and 9.

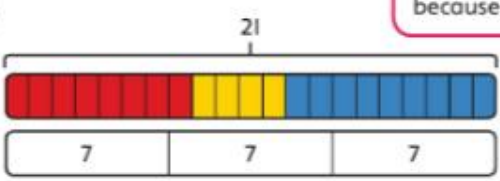
a) Discuss the similarities and differences between their methods. Do they both work all the time?

Aki

I made towers and rearranged the cubes to make equal heights.



Each new tower is 7 cubes high.
 The mean of 8, 4 and 9 is 7.



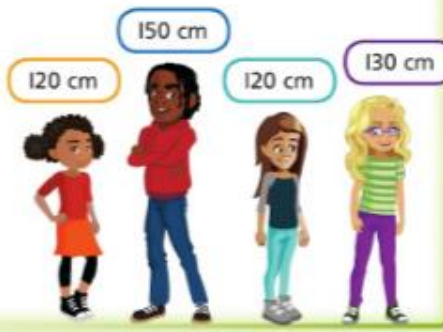
Isla

I worked out the total. I shared this into 3 equal groups because there were 3 numbers.

$8 + 4 + 9 = 21$
 $21 \div 3 = 7$

The mean of 8, 4 and 9 is 7.

b) Which method would you use to find the mean height of these children? Why?




The mean 2

Discover



- 1 a) Who had the highest mean score?
- b) What other ways could you compare the skaters' scores?

Share

a) The skaters received a different number of scores.



Ambika

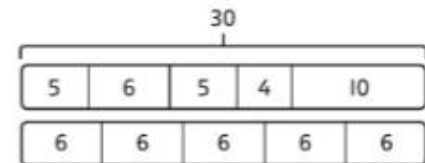
$$5 + 6 + 5 + 4 + 10 = 30$$

The total is 30, and the number of scores is 5.

$$30 \div 5 = 6$$

The mean score is 6.

Finding the mean is a useful way to compare groups of different sizes.



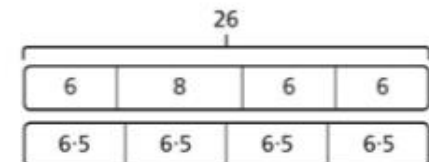
Jamie

$$6 + 8 + 6 + 6 = 26$$

The total is 26, and the number of scores is 4.

$$26 \div 4 = 6\frac{2}{4} = 6.5$$

The mean score is 6.5.



I don't think the mean has to be a whole number.



Jamie had the highest mean score.

Discuss with your carer and then complete the lesson in your book 6C p93

b) There are other ways to compare the scores.

Ambika received the highest mark, but also the lowest mark.

Ambika's most common mark was 5.

5 6 5 4 10

Jamie was more consistent. The judges all gave similar marks.

Jamie's most common mark was 6.

6 8 6 6

Think together

1 Compare the mean scores of these skaters.

Aki

6 7 7 8

Lee

6 4 7 8 2 6

2 What is the mean height of each athlete's jumps?

	Emma	Lee	Luis
Jump 1	1.4 m	1.55 m	2 m
Jump 2	2.1 m	1.1 m	1.2 m
Jump 3	1 m	1.1 m	No jump due to injury

3 Find the mean of each set of numbers. Explain what you notice.



2, 2, 2, 2

1, 3, 1.5, 2.5

1.9, 2.1, 1.9, 2.1

2, 2, 2, 2, 2

1.8, 1.9, 2.0, 2.1, 2.2

0, 0, 0, 8

The mean 3

Discover



The mean length of these baby snakes is 20 cm.

Length of baby corn snakes

- 20 cm
- 18 cm
- 22 cm
- 25 cm
- cm



- a) What is the length of the fifth snake?
- b) One more corn snake is born. The mean length increases by 1 cm. What is the length of the new snake?

Share

I know the mean, but one of the values is missing. I can represent this as a missing number.

- a) There are 5 snakes in total, with a mean length of 20 cm.

20	18	22	25	?
20	20	20	20	20

$$20 + 18 + 22 + 25 + ? = 20 \times 5$$

$$85 + ? = 100$$

The fifth snake must be 15 cm long.

- b) Now there are 6 snakes.

If the mean was still 20 cm, then the new snake would also be 20 cm long.

The new mean is actually 21 cm, so there are 6 additional centimetres.

20	20	20	20	20	
21	21	21	21	21	21

$$6 \times 21 = 126$$

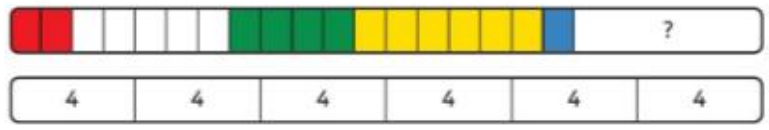
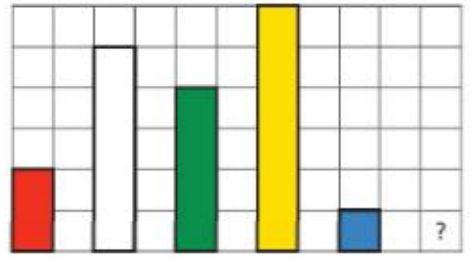
$$126 - 100 = 26$$

The new snake is 26 cm long.

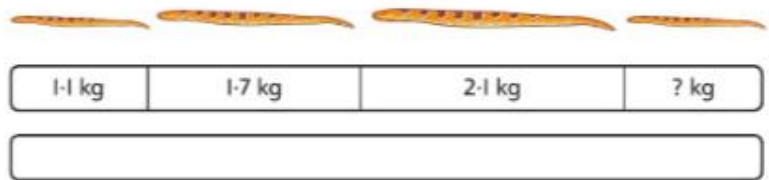


Think together

1 The mean height of six towers is 4. What is the height of the sixth tower?



2 The mean weight of these adult snakes is 1.5 kg. What is the weight of the last snake?



3 Four people are thinking of numbers. What are the numbers?



I am thinking of three numbers. The mean is 11.

I wonder whether there is more than one solution.

I will choose one number to be 11, and then pick two other numbers to balance the mean.



I am thinking of five numbers. The mean is 10.

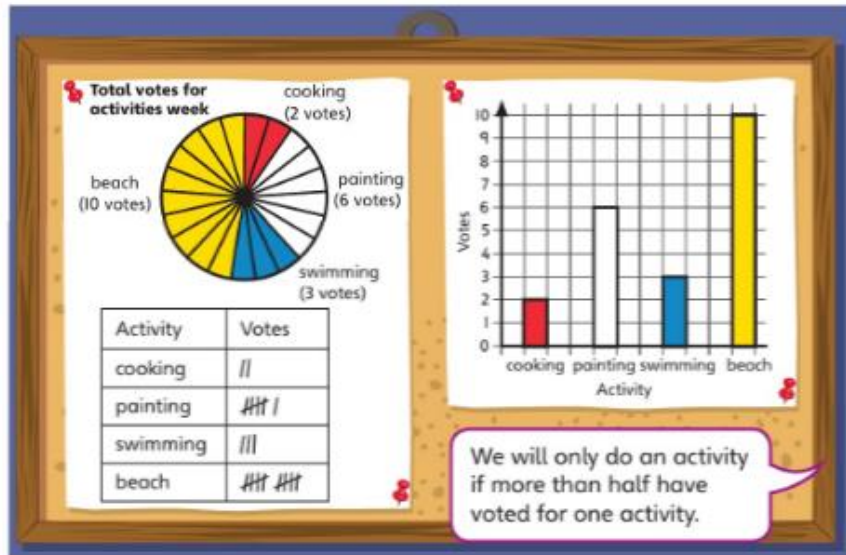
I am thinking of five numbers. The mean is 10, but none of the numbers is 10.

I am thinking of four numbers. The difference between the biggest and the smallest number is 4. The mean is 10.

This quick clip might be helpful <https://www.bbc.co.uk/teach/class-clips-video/maths-ks2-pie-and-pie-again-pie-charts/zbbhf4j>

Introducing pie charts

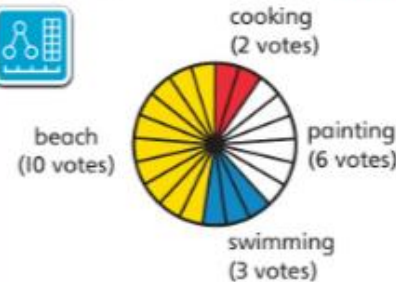
Discover



- 1 a) Which chart shows the most clearly whether an activity received more than half the votes?
- b) Compare the three ways of presenting the results.
What are the advantages and disadvantages of each chart?

Share

a) This type of chart is called a **pie chart**.



The pie chart is split into **segments** to show how each part fits into the whole. The whole circle represents **all** the results.



The pie chart shows the most clearly that no activity received half the votes.

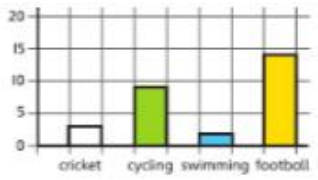
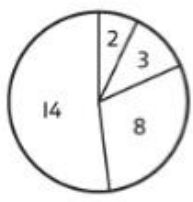
b) Each type of chart shows the same information, but presents it differently.

	Tally chart	Bar chart	Pie chart
Advantages	Can fill it in while you collect data. Easy to draw Easy to see 5s	Easy to compare which is most and least. Can use the scale to work out how much more or less.	Very easy to compare the parts with the whole.
Disadvantages	Have to count to compare. Does not show the whole clearly.	Does not show the whole clearly.	Not always easy to compare the parts. Can be difficult to draw accurately.

Think together

1 Which section of the pie chart represents each activity?

cricket	
cycling	###
swimming	
football	### ###



Tally chart

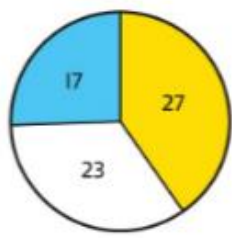
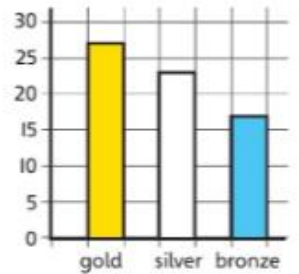
Pie chart

Bar chart



2 Below are three charts showing the medals that the British team won at the Olympic Games in 2016. Choose a chart to answer each question.

gold	### ### ### ### ###
silver	### ### ### ###
bronze	### ### ###



- a) How many more gold medals than silver medals did the team win?
- b) Which colour medal was approximately a quarter of the total?
- c) How many medals were won in total?



3 Max spins a spinner 30 times and records the results in a tally chart.

Animal	Frequency
cat	### ###
bird	### ###
fish	###



Which pie chart most closely matches the results?

A

C

B

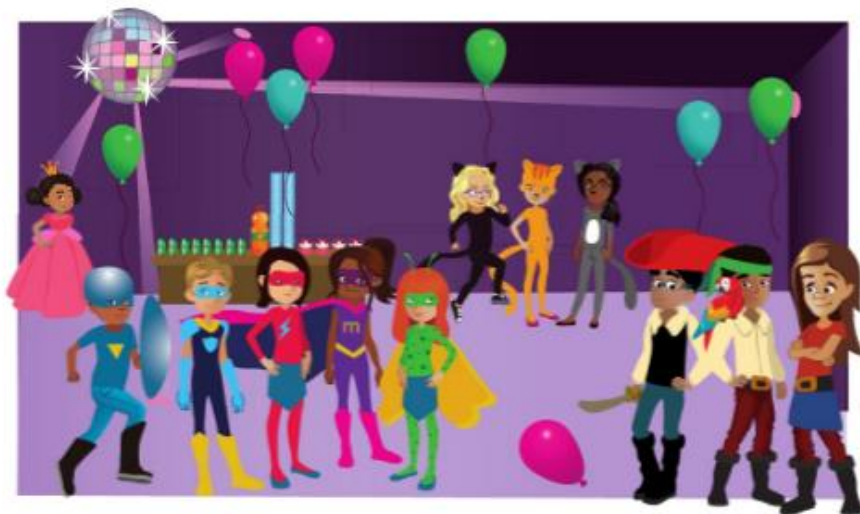
D

I will try to explain why the other pie charts do not match the results.



Reading and interpreting pie charts

Discover



- 1** a) How could you represent the children at the fancy dress party with a pie chart?
- b) One superhero, one cat and two pirates leave early. What would the pie chart look like now?
- What is the same and what is different about the two pie charts?

Share

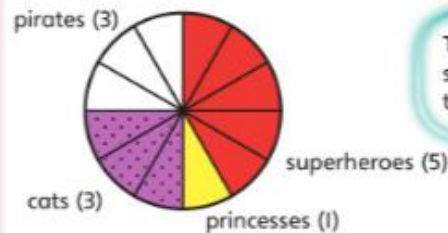
a)

Costume	Number
superhero	
princess	
cat	
pirate	

I will use the pie chart to represent the different types of costume shown on this tally chart.



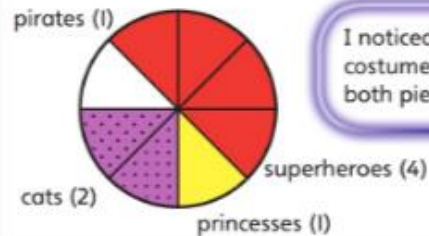
The pie must be divided into 12 equal segments. Each segment represents one child.



There are 5 superhero segments, because there are 5 superheroes.

- b) Now there are only 8 children left at the party, so there will only be 8 segments in the pie chart.

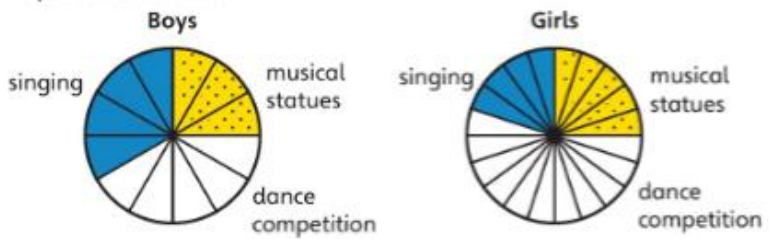
Each segment now takes up more of the chart.



I noticed that the section for cat costumes is the same size on both pie charts. I wonder why.

Think together

1 Some children have voted for their favourite party games. Each segment represents one child.

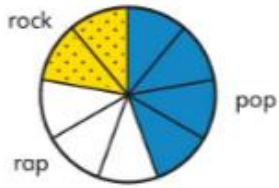


Look at the information in the pie charts then read the statements below. Do you agree with the statements?

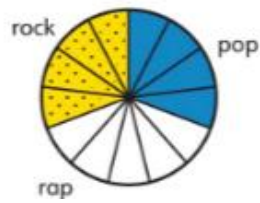
Singing is more popular amongst boys than girls.

The same number of boys and girls like musical statues.

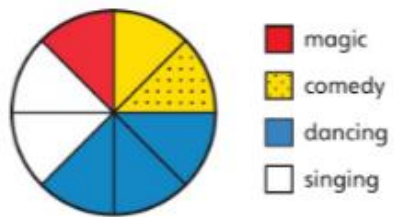
2 Before a party, some children voted for their favourite type of music.



At the party four more children voted. What did these children vote?

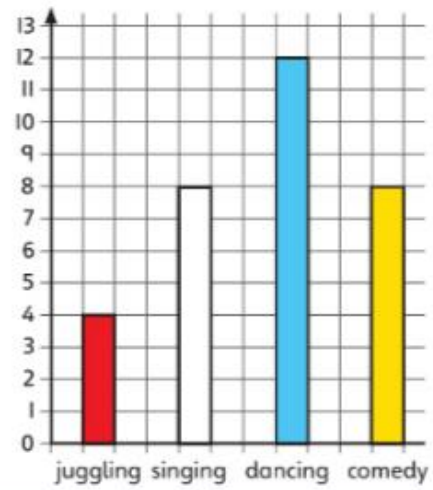


3 24 people entered a talent show. The pie chart shows what they performed.



a) How many more people danced than performed magic?
How many people did not sing?

b) Here is a chart showing the information for a different talent show. Sketch a pie chart that you could use to represent this information.



I will see if I can use each segment in my pie chart to represent more than one person.

