








Statistics: Gardening Statistics

Aim: Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. I can interpret and present data using bar charts and time graphs.	Success Criteria: I can say if data is discrete or continuous. I can collect data in tables. I can interpret and answer questions about data presented in bar charts and time graphs. I can present data in a bar chart or time graph.	Resources: Lesson Pack
	Key/New Words: Bar chart, time graph, table, data, axis, discrete data, continuous data.	Preparation: Differentiated Gardening Statistics Activity Sheets - one per child Vegetable Patch Bar Chart Board Game - one per pair

Prior Learning: It will be helpful if children have experience of interpreting data in tables.

Learning Sequence

	Sunflower Heights: Using the sunflowers displayed on the Lesson Presentation , the children rehearse reading a partially numbered scale to complete a table of data showing the height of each sunflower (continuous data).	
	Sunflowers Presenting Data: Discuss the best way to present the table of data from the previous activity graphically. Encourage the children to identify that the height of each sunflower is continuous data, but that as each sunflower's height is unrelated, the best way to visually compare each height is as a bar chart. Use the displayed bar chart of the data to answer the given questions.	
	Growing Runner Beans: Discuss the best way to graphically represent the table of data shown on the Lesson Presentation , which shows the height of a bean plant measured every day for two weeks. Encourage the children to first identify that the height of the bean plant is continuous data, and then to identify that the height has been measured over time. Agree that the data should be presented as a time graph so that the change in height over time can be shown.	
	Time Graphs: Use the step-by-step instructions and animated diagrams shown on the Lesson Presentation to model how to draw a time graph of the data.	
	Bean Growing Questions: Answer the questions shown on the Lesson Presentation about the time graph from the previous activity.	
	Strawberry Plant Challenge: Discuss the table of data shown on the Lesson Presentation , which shows the height of two strawberry plants measured every day for one week and what a time graph showing the data would look like. Agree that the time graph would have two lines of data: one for each plant. Look at the time graph of the data on the next slide and draw attention to the use of a key/legend to identify the different sets of data. Demonstrate how to answer a question comparing the two sets of data by reading the graph correctly.	
	Gardening Statistics: Children complete the differentiated Gardening Statistics Activity Sheets , to show they can interpret and present data using bar charts and graphs.	
	Using the table of data about the heights of different flowers, the children draw a bar chart using a scale of 10. Children answer questions about the bar chart.	
	Using the table of data about the height of a bean plant measured every day for one week, the children draw a time graph. Children answer questions about the time graph.	
	Using the table of data about the heights of two sunflowers measured every day for one week, the children draw a double time graph. Children answer questions about the time graph.	

	<p>Diving into Mastery: Schools using a mastery approach may prefer to use the following as an alternative activity. These sheets might not necessarily be used in a linear way. Some children might begin at the 'Deeper' section and in fact, others may 'dive straight in' to the 'Deepest' section if they have already mastered the skill and are applying this to show their depth of understanding.</p> <p> Children identify discrete and continuous data and plot a time graph.</p> <p> Children interpret a time graph and find mistakes in an incorrect interpretation.</p> <p> Children plot more than 2 sets of continuous data on one line graph and identify the questions that can be answered from it.</p>	
	<p>Vegetable Patch Bar Chart Board Game: Use the Vegetable Patch Bar Chart Board Game in partners. Each space on the board contains data about the number of vegetables grown. On their turn, each child rolls the dice and moves their counter forward the number rolled, transferring the data from the space they land on to the accompanying bar chart template. When both children reach the finish, they discuss the bar chart created, using the question prompts provided.</p>	

Masterit

Extendit: Plant your own flowers or vegetables and collect measurement data over time that can be presented as a time graph.

Linkit: Link data collection to a science experiment investigating the requirements of plants for life and growth.

Aim: I can interpret and present data using bar charts and time graphs.				Date:					
				Delivered By:			Support:		
Success Criteria	Me	Friend	Teacher	T	PPA	S	I	AL	GP
I can say if data is discrete or continuous.				Notes/Evidence					
I can collect data in tables.									
I can interpret and answer questions about data presented in bar charts and time graphs.									
I can present data in a bar chart or time graph.									
Next Steps									
) _____									
) _____									

T	Teacher	I	Independent
PPA	Planning, Preparation and Assessment	AL	Adult Led
S	Supply	GP	Guided Practice

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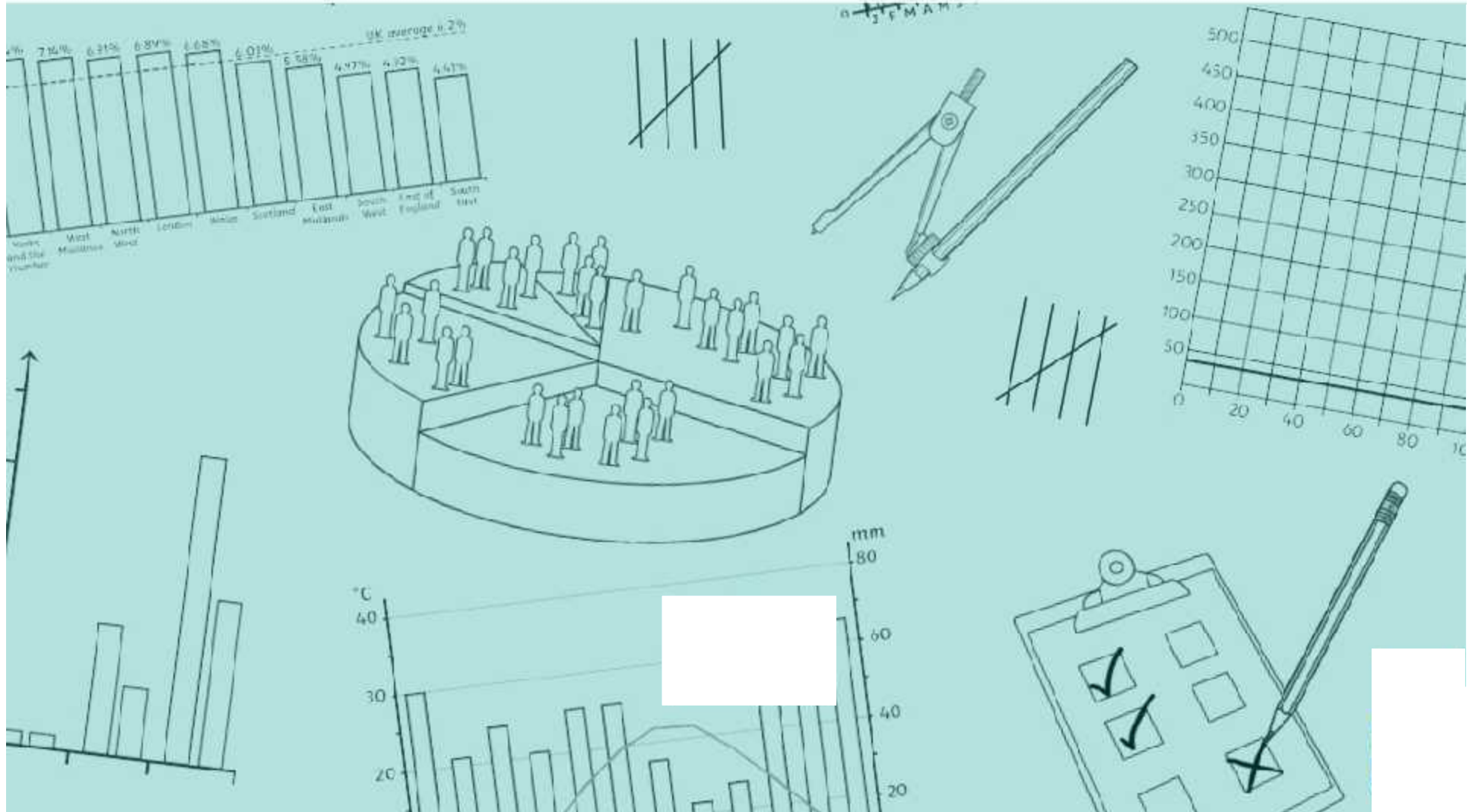
T	Teacher	I	Independent
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Maths

Statistics

Gardening Statistics



Aim

- I can interpret and present data using bar charts and time graphs.

Success Criteria

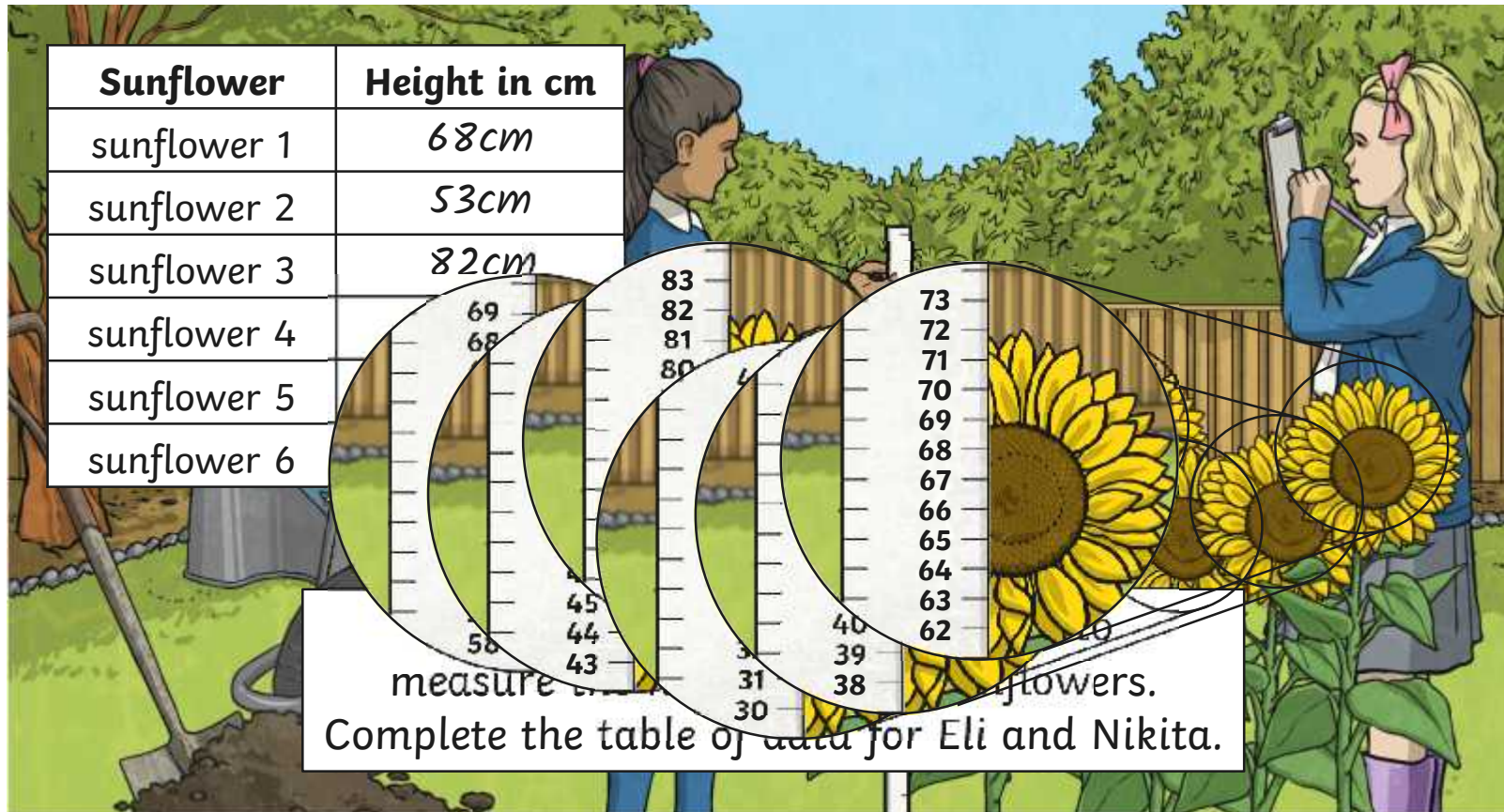
- I can say if data is discrete or continuous.
- I can collect data in tables.
- I can interpret and answer questions about data presented in bar charts and time graphs.
- I can present data in a bar chart or time graph.

Sunflower Heights



Ms Jones runs an after-school gardening club for the children in Class 4. Over the last term, they have been growing sunflowers.

Sunflower	Height in cm
sunflower 1	68cm
sunflower 2	53cm
sunflower 3	82cm
sunflower 4	
sunflower 5	
sunflower 6	



Complete the table of data for Eli and Nikita.

Sunflowers Presenting Data



Ms Jones asks Eli and Nikita to draw a graph to compare the heights of the sunflowers.

How do you think they should present the data?

Instead, we should draw a bar chart so we can visually compare each sunflower's height, which is discrete data.

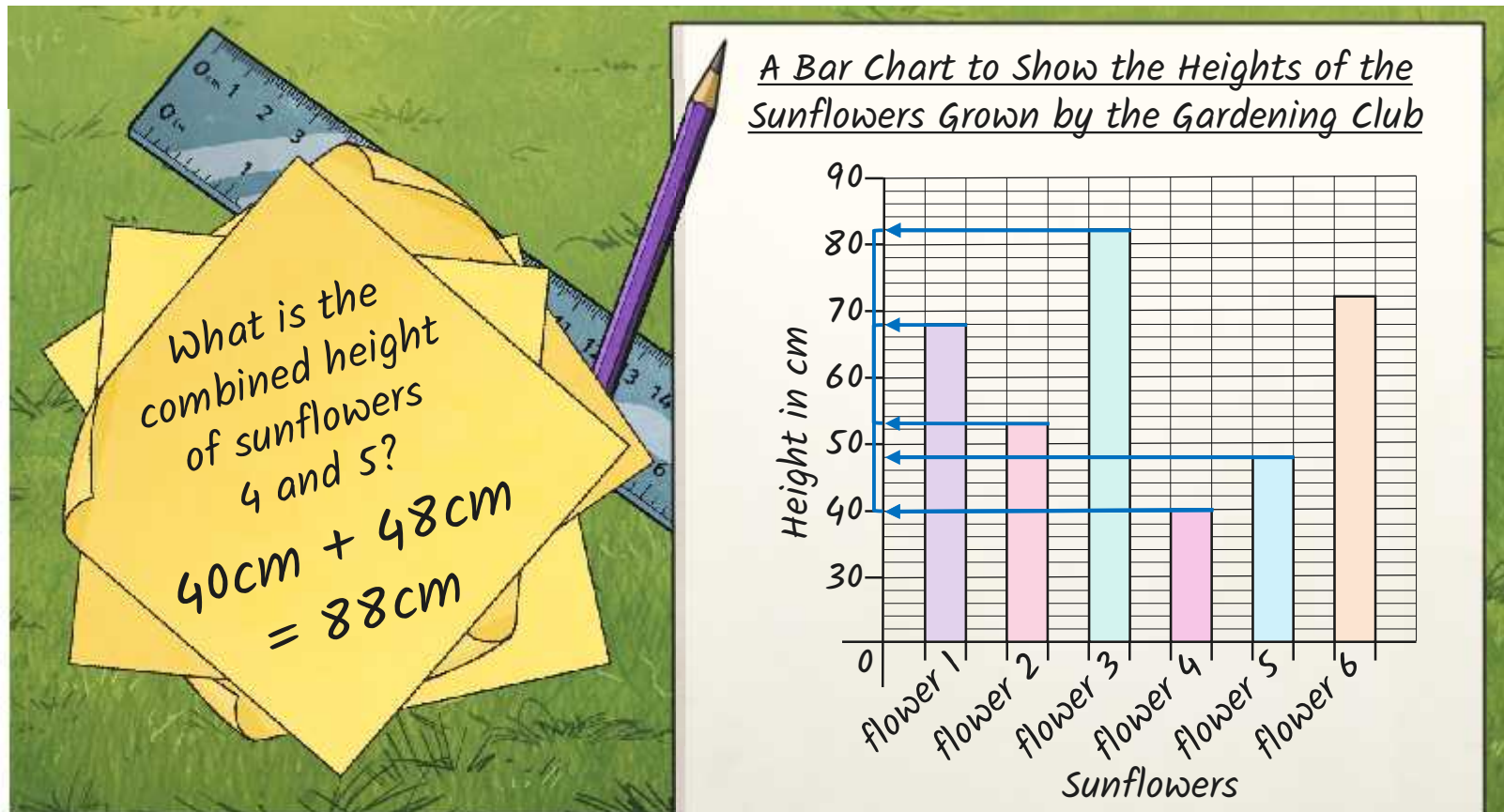
can't agree which type of Eli thinks they should draw but Nikita thinks they should draw a time graph.

Sunflower	Height in cm
sunflower 1	68cm
sunflower 2	53cm
	82cm
	40cm
	48cm
	72cm

Sunflowers Presenting Data



Eli and Nikita write four questions about their bar chart.
Can you correctly answer them?



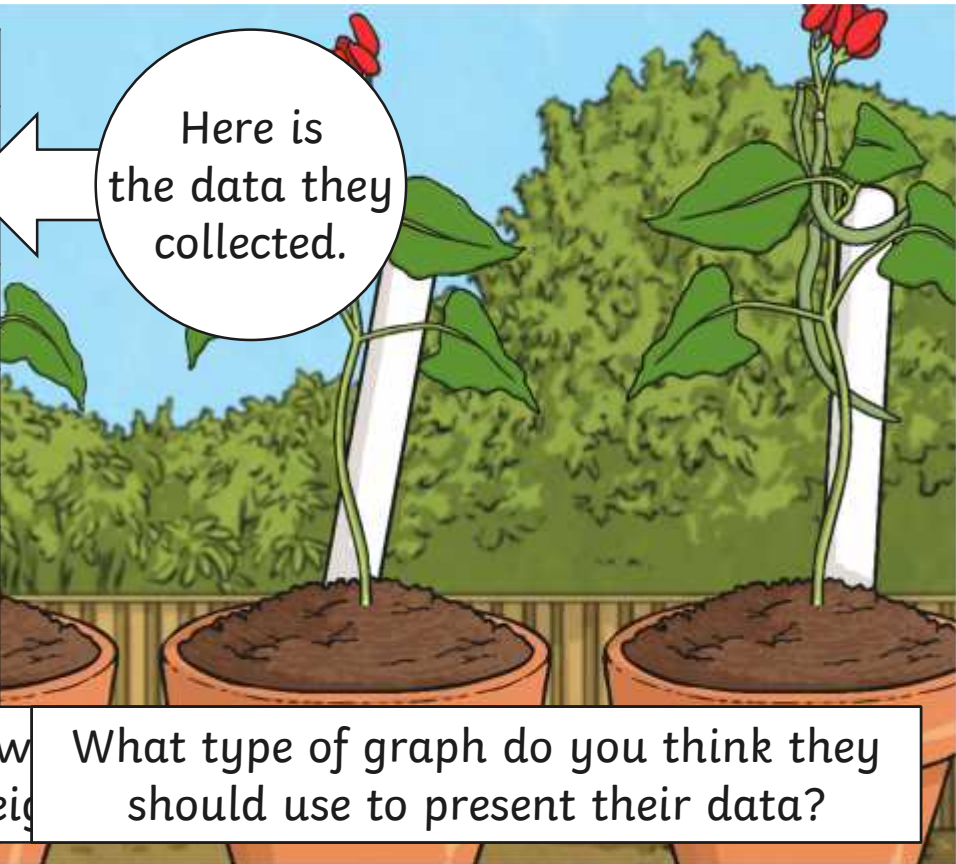
Growing Runner Beans



The gardening club have also been growing runner beans in the school vegetable plot.

Day	Height in cm
1	0
2	1.2
3	1.8
4	1.8
5	2.4
6	2.8
7	4.6
8	5
9	5.8
10	6.4
11	7.4
12	8.2
13	9.1
14	10.0

Here is the data they collected.



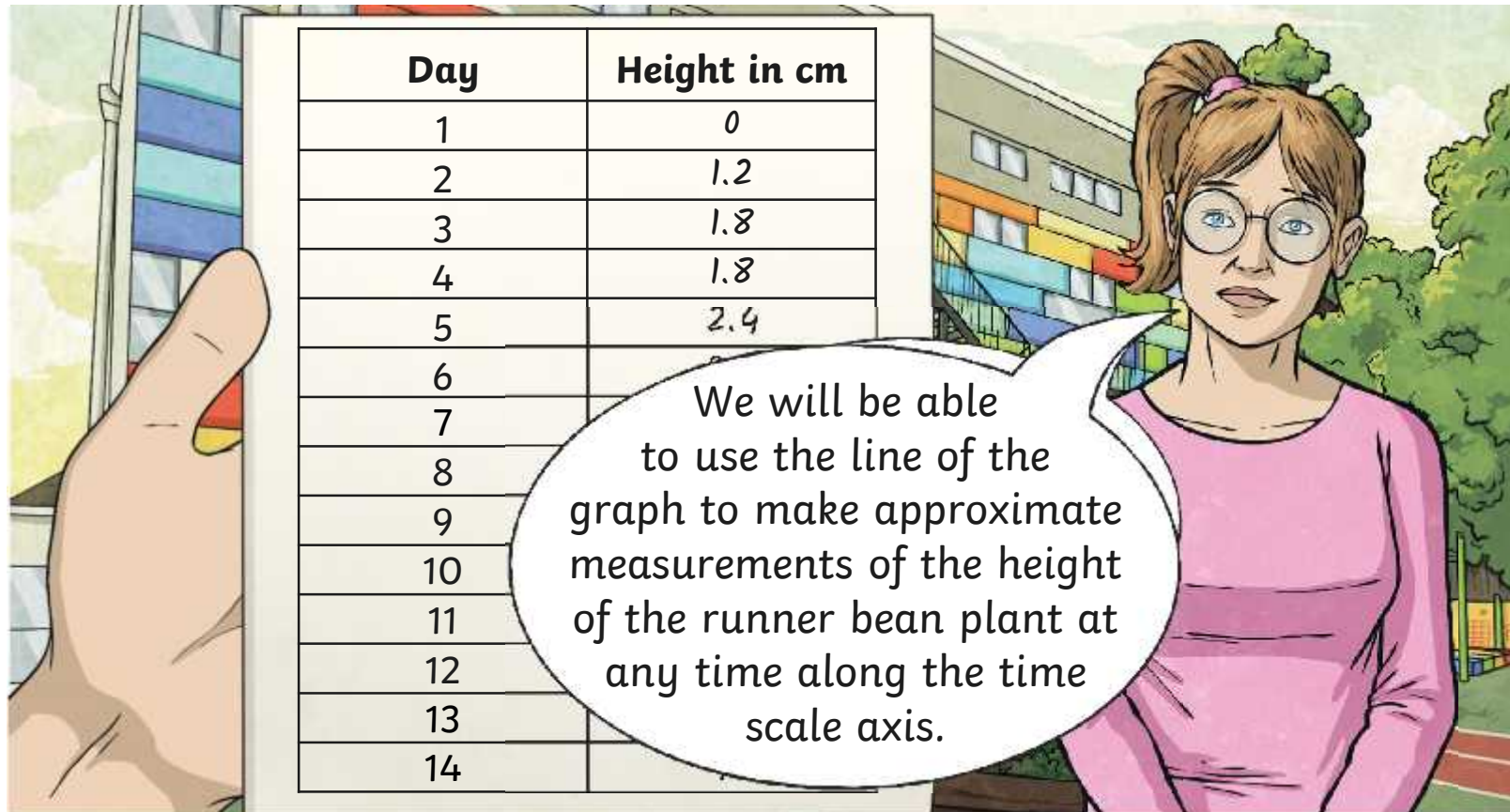
Every day for two weeks the gardening club measured the height of the runner beans.

What type of graph do you think they should use to present their data?

Growing Runner Beans

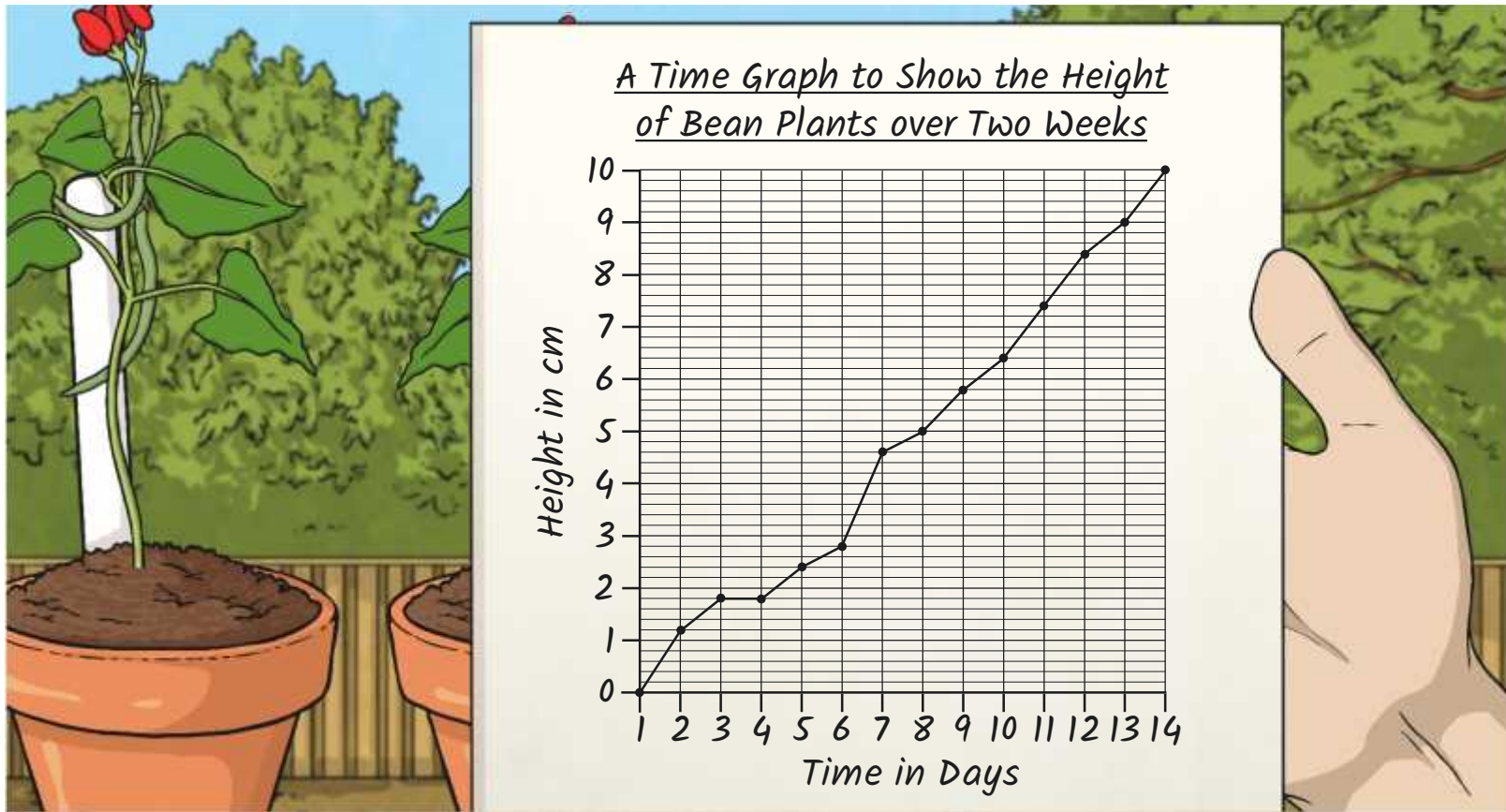


Over the two weeks, Eli and Nikita have been measuring the height of the bean plant which is a **continuous** measurement.



Time Graphs

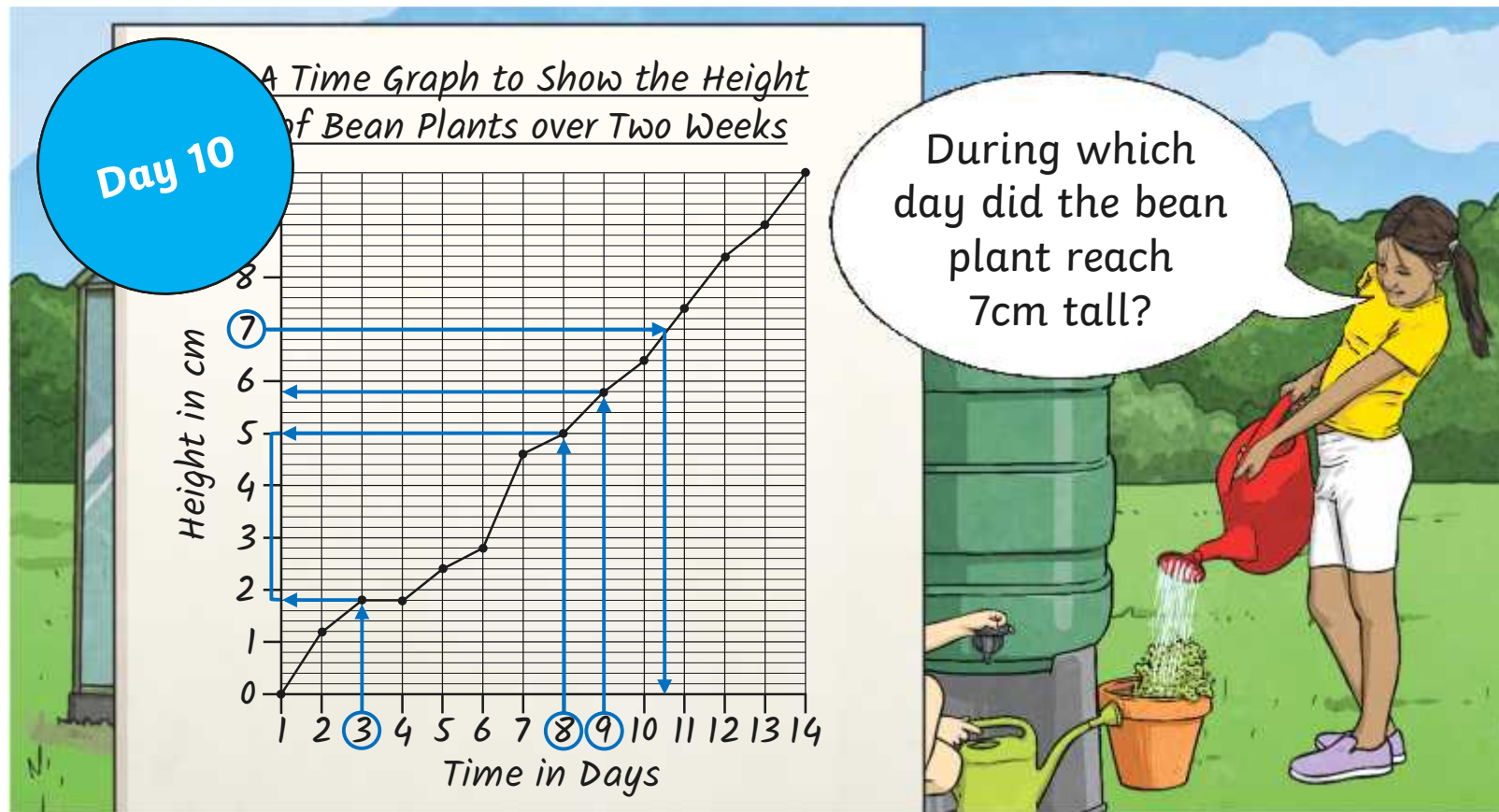
Time graphs are a way of showing how something changes over time. The data is plotted on a grid with a horizontal axis and a vertical axis. The horizontal axis is usually labeled 'Time' and the vertical axis is usually labeled 'Height' or 'Distance'.



Bean Growing Questions



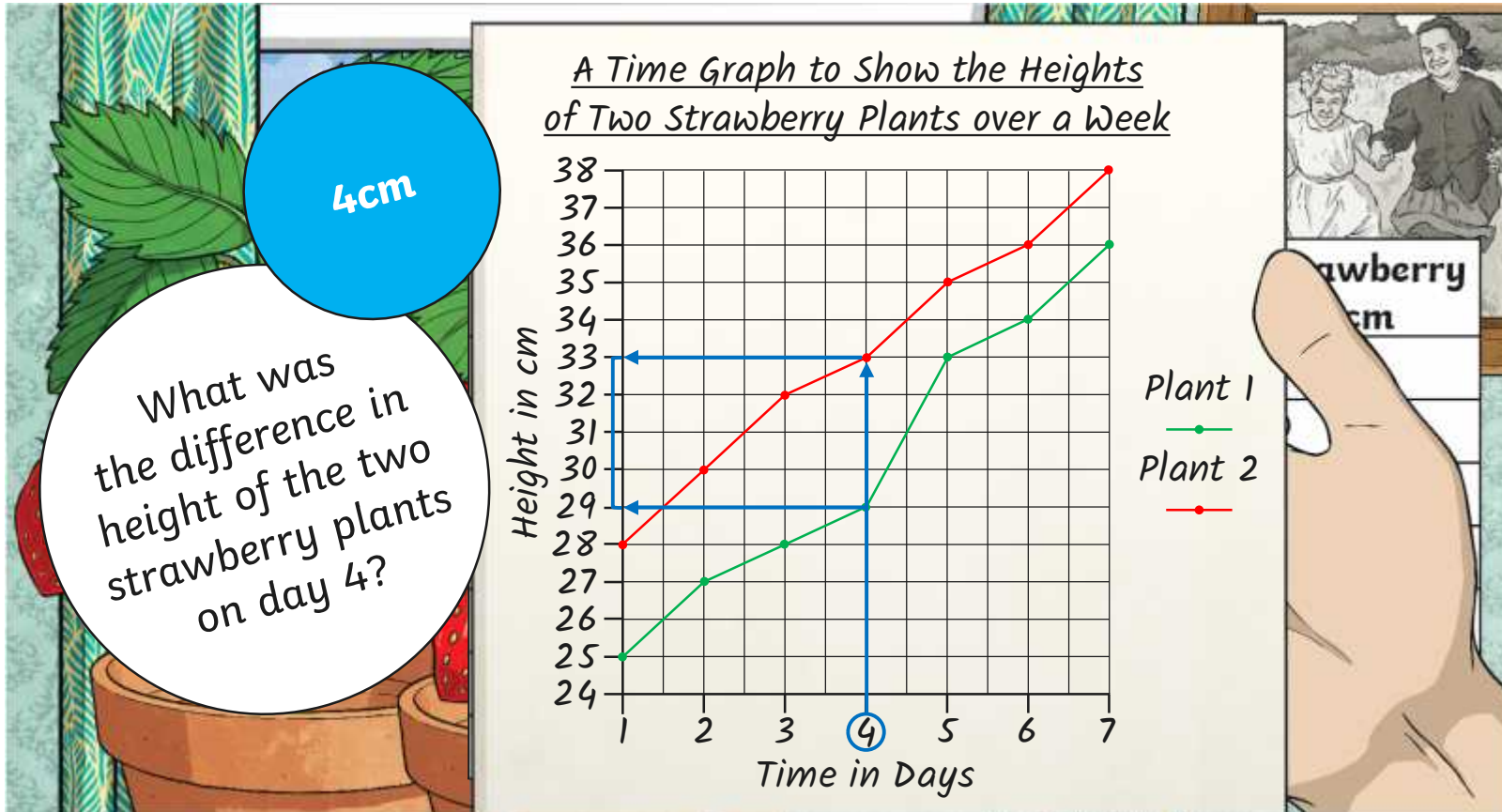
Can you answer these questions using data from the time graph?



Strawberry Plant Challenge



A line graph shows the height of two strawberry plants over a week. The y-axis represents height in centimeters, and the x-axis represents time in days. The plants are labeled Plant 1 and Plant 2. The graph shows that Plant 1 grows faster than Plant 2.



Gardening Statistics



Use your marvellous maths skills to complete these activity sheets:

Gardening Statistics

Track the height and power item (e.g. toys) over time and graph.

Here is a table of data on the height of two sunflowers measured over time.

Week	1	2	3	4	5	6
Sunflower 1 (height in cm)	24	27	31	33	36	38
Sunflower 2 (height in cm)	26	29	32	34	37	39

Draw a line graph to show the data. Use the axes to show:

1) What type of data is the height of the sunflowers?

2) Which sunflower grows more over time?

3) How many cm taller was sunflower 1 than sunflower 2 by week 6?

4) At which week was the height difference between the two sunflowers the greatest?

Gardening Statistics

Track the height and power item (e.g. toys) over time and graph.

Here is a table of data on the height of a sunflower measured over time.

Week	1	2	3	4	5	6
Height in cm	22	28	32	34	37	39

Draw a line graph to show the data. Use the axes to show:

1) What type of data is the height of the sunflower?

2) How many cm taller is the sunflower over week 2 and week 3?

3) How many cm taller is the sunflower at week 6 than at week 1?

4) How many cm taller is the sunflower at week 6 than at week 2?

Gardening Statistics

Track the height and power item (e.g. toys) over time and graph.

Here is a table of data on the height of a tall sunflower measured over time.

Week	1	2	3	4	5	6
Height in cm	29	33	38	41	45	48

Draw a line graph to show the data. Use the axes to show:

1) What type of data is the height of the sunflower?

2) What is the difference in height between sunflowers 1 and 2?

3) Which two sunflowers had the greatest difference in height?

Vegetable Patch Bar Chart Game



Work in pairs to complete this great gardening challenge:

On your turn, roll the dice and move your counter forward the number rolled.

Continue until you both reach the finish. Use the frequency table to draw a bar chart.

Transfer the data about the vegetables from the square you land on to the frequency table.

Discuss the bar chart you have created, using the suggested questions.

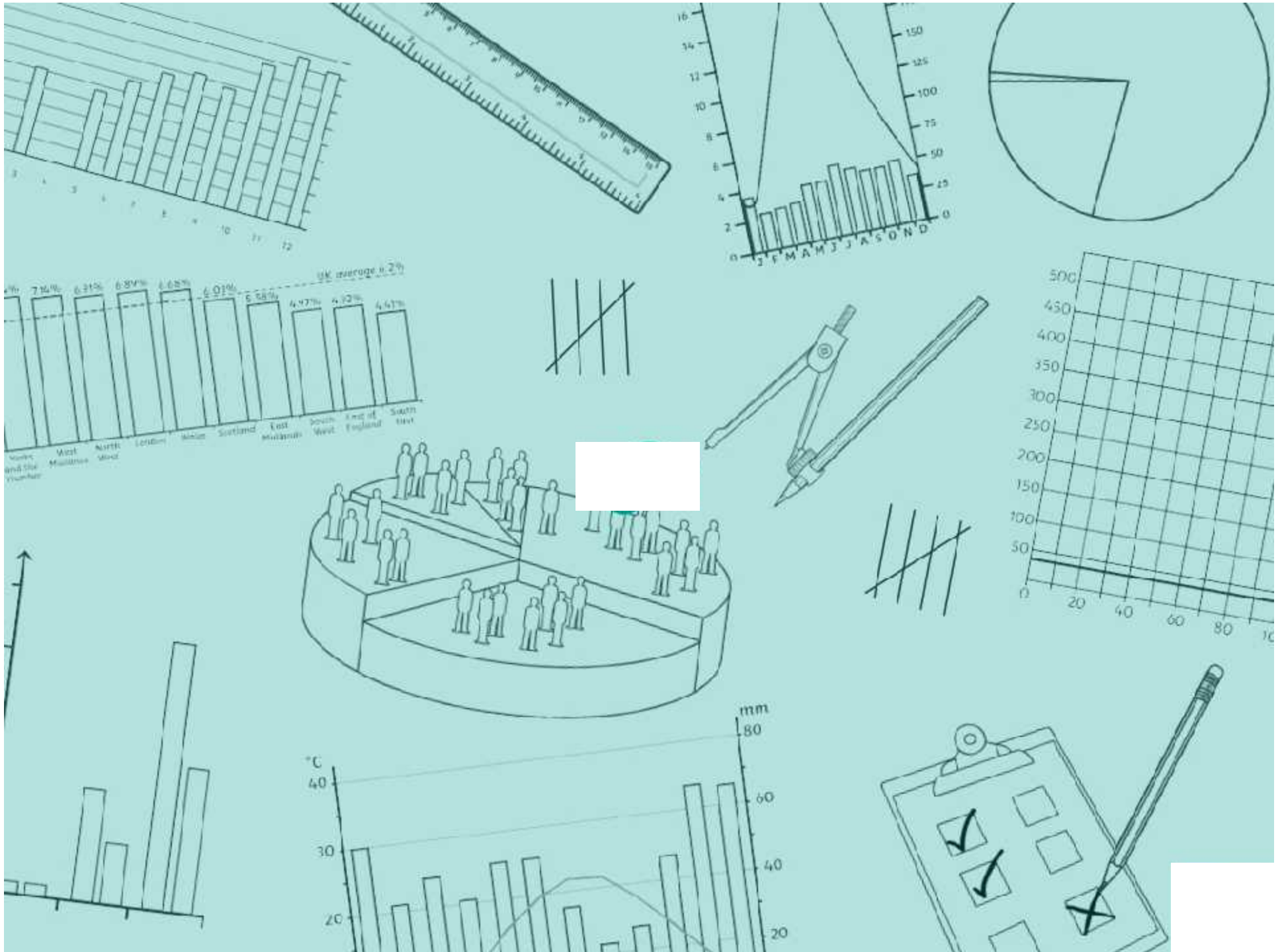
Aim



- I can interpret and present data using bar charts and time graphs.

Success Criteria

- I can say if data is discrete or continuous.
- I can collect data in tables.
- I can interpret and answer questions about data presented in bar charts and time graphs.
- I can present data in a bar chart or time graph.





Gardening Statistics

I can interpret and present data using bar charts and graphs.

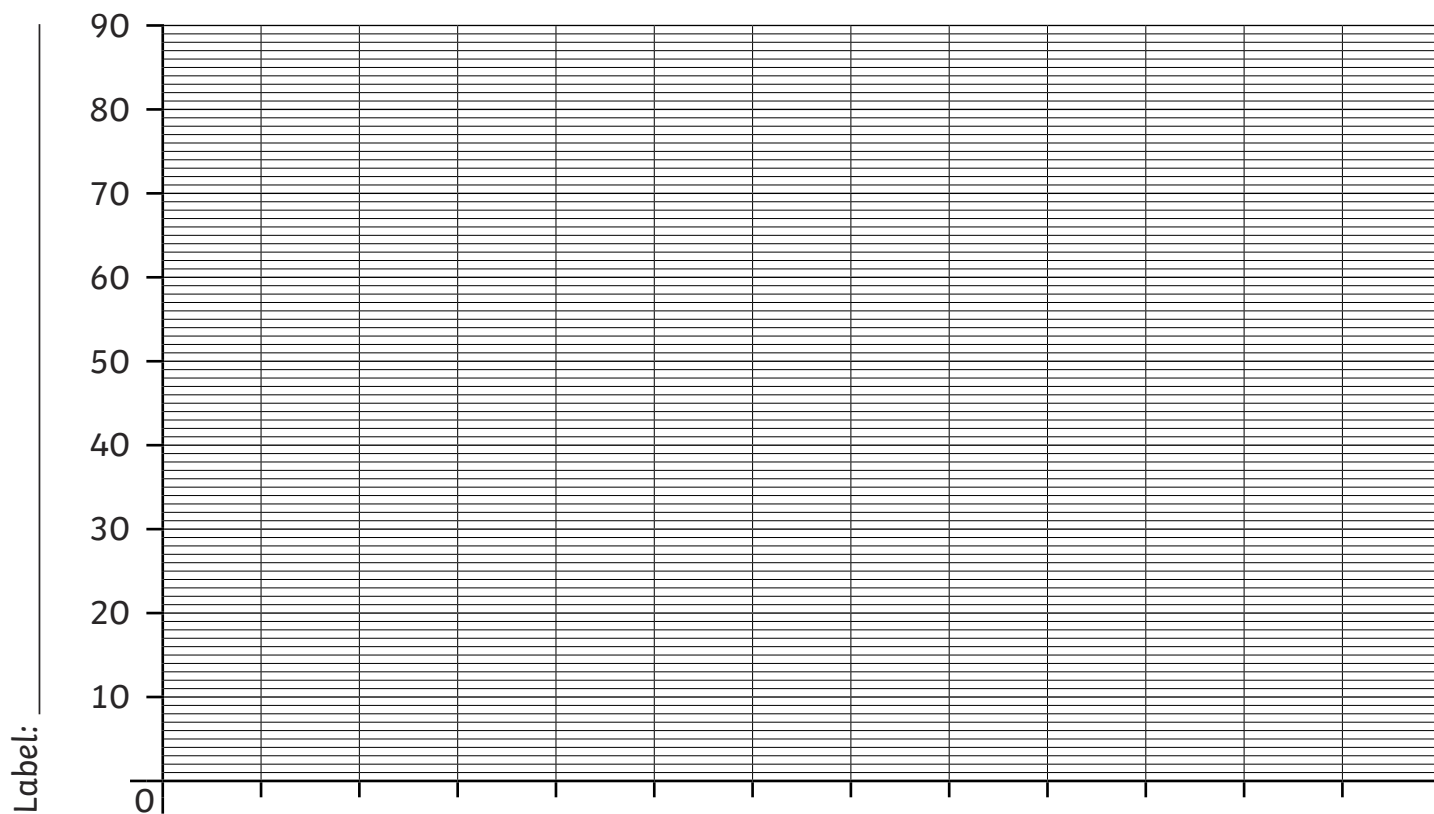


Here is a table of data that shows the heights in cm of different sunflowers.

Sunflower	1	2	3	4	5	6
Height in cm	54	63	89	77	58	66

Draw a bar chart to show the data:

A Bar Chart to Show _____



Label: _____

1) What is the height of the tallest sunflower?

3) What is the difference in height between sunflowers 1 and 3?

2) What type of data is the height of the sunflowers?

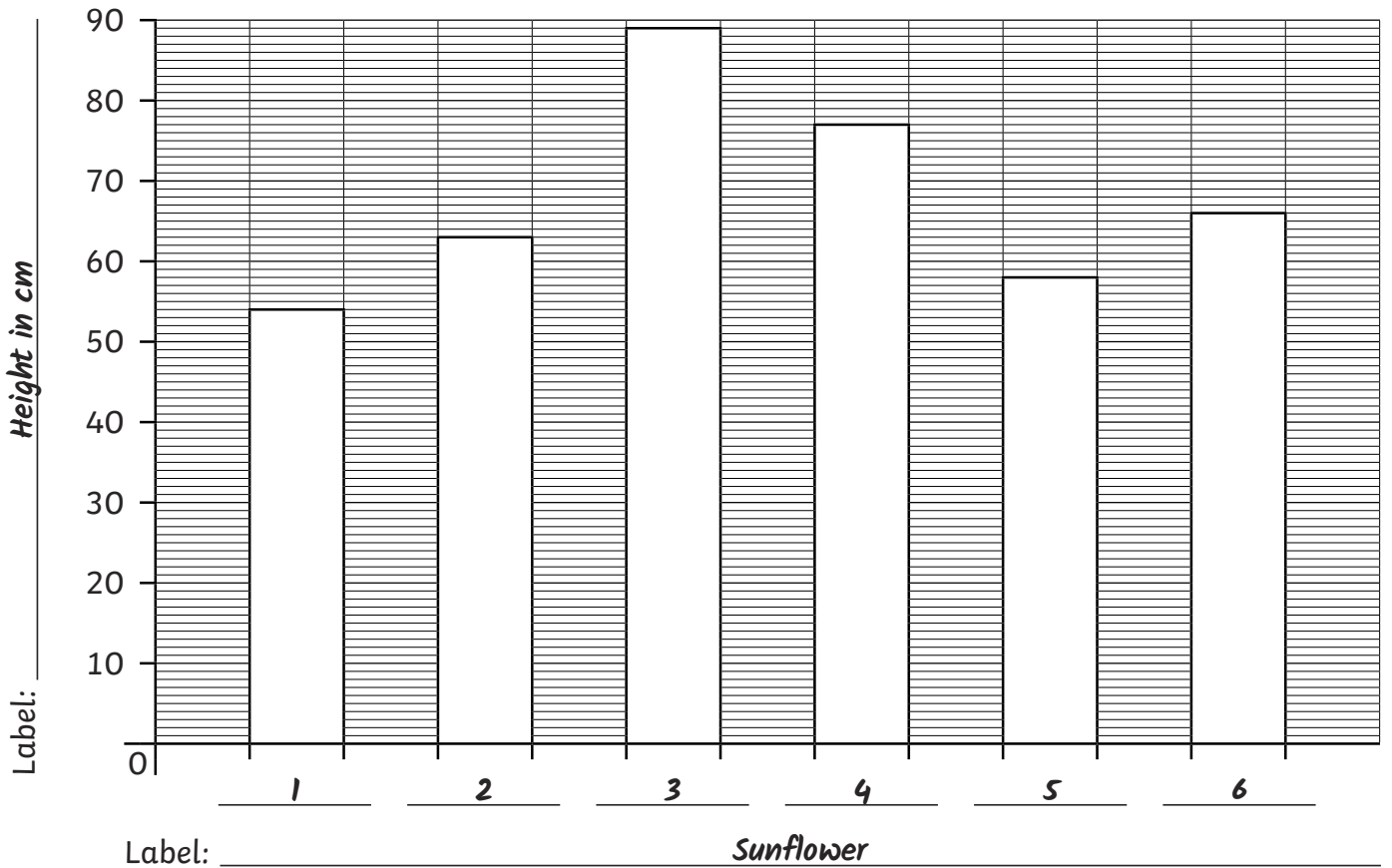
4) Which two sunflowers have a height difference of 31cm?



Gardening Statistics Answers

Question	Answer
Draw a bar chart to show the data:	

A Bar Chart to Show the Heights of Different Sunflowers



1. What is the height of the tallest sunflower?	
	<i>89cm</i>
2. What type of data is the height of the sunflowers?	
	<i>continuous</i>
3. What is the difference in height between sunflowers 1 and 3?	
	<i>35cm</i>

4. Which two sunflowers have a height difference of 31cm?	
	<i>sunflower 3 and sunflower 5</i>



Gardening Statistics

I can interpret and present data using bar charts and graphs.

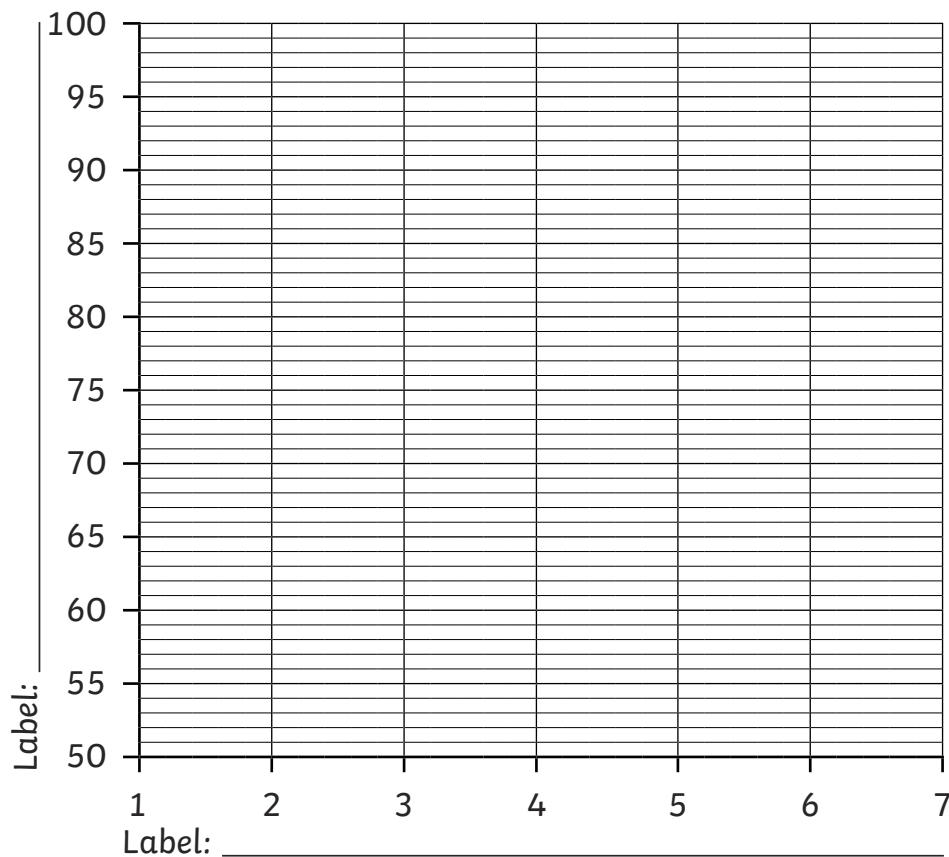


Here is a table of data that shows the height of a sunflower, measured over seven weeks.

Week	1	2	3	4	5	6	7
Height in cm	51	58	68	74	80	90	95

Draw a time graph to show the data:

A Time Graph to Show _____



1) What type of data is the height of the sunflower?

3) How many cm did the sunflower grow over week 2 and week 3?

2) How many cm did the sunflower grow over week 1?

4) How many cm did the sunflower grow altogether over the seven weeks?

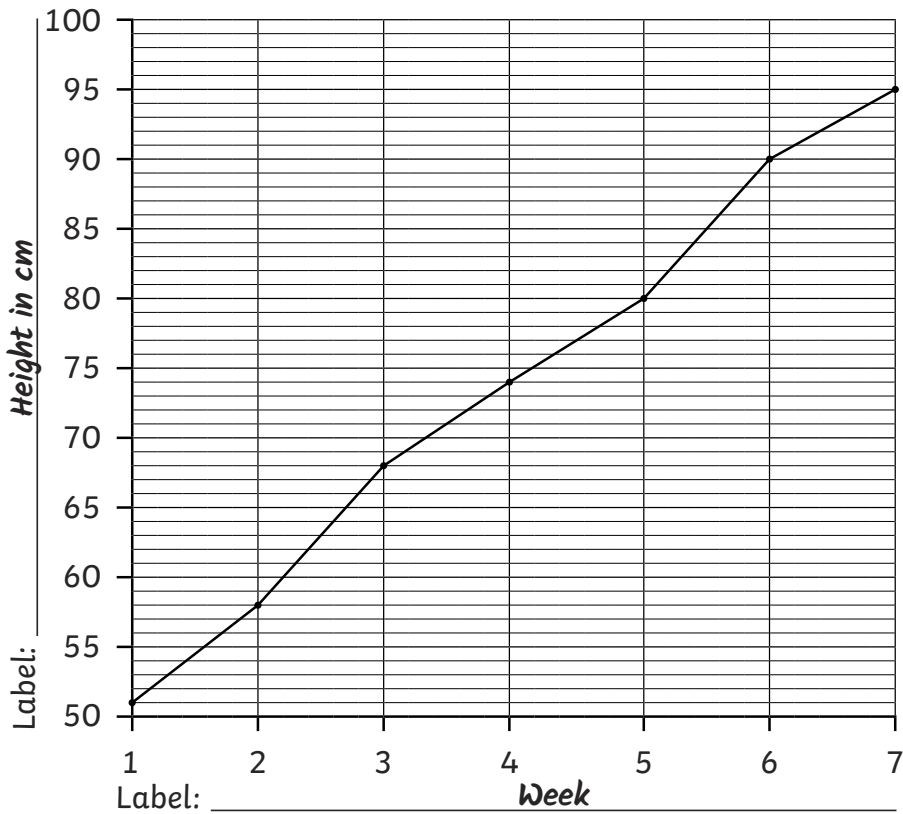


Gardening Statistics Answers

Question	Answer
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Draw a bar chart to show the data:

A Time Graph to Show the Height of a Sunflower over Seven Weeks



	What type of data is the height of the sunflower?
	<i>continuous</i>
	How many cm did the sunflower grow over week 1?
	<i>7cm</i>
	How many cm did the sunflower grow over week 2 and week 3?
	<i>16cm</i>
	How many cm did the sunflower grow altogether over the seven weeks?
	<i>44cm</i>



Gardening Statistics

I can interpret and present data using bar charts and graphs.

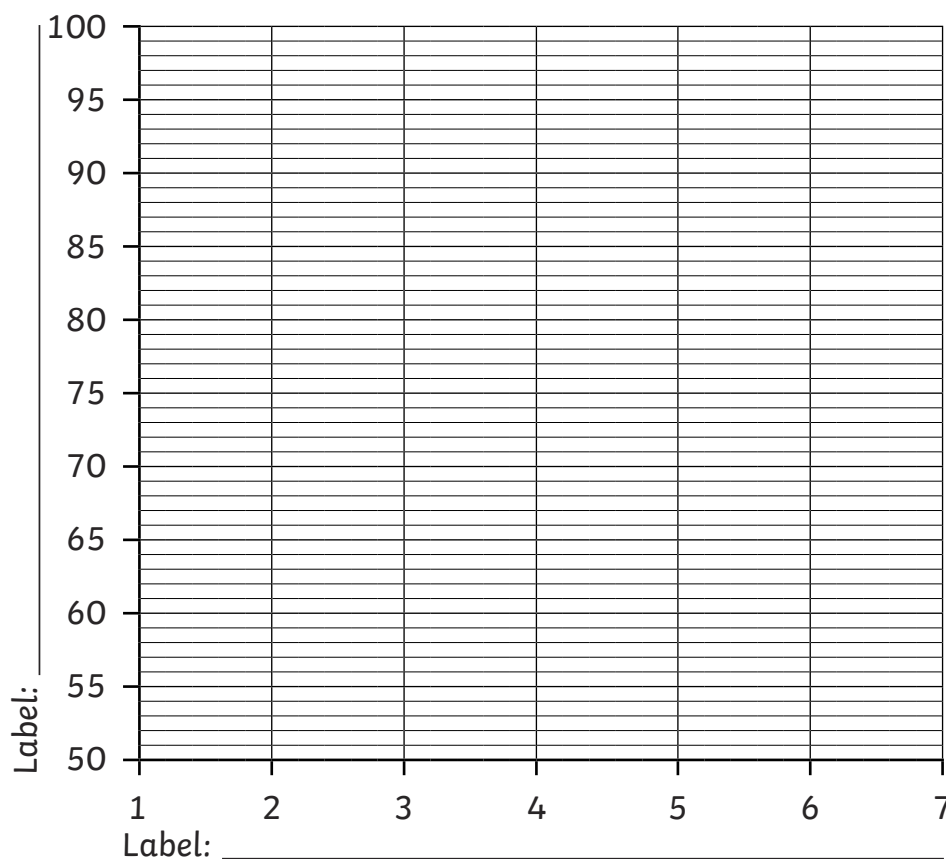


Here is a table of data that shows the height of two sunflowers, measured over seven weeks.

Week	1	2	3	4	5	6	7
Sunflower 1 Height in cm	52	57	69	73	81	90	96
Sunflower 2 Height in cm	50	54	60	66	75	80	90

Draw a time graph to show the data:

A Time Graph to Show _____



Key/Legend

- - - - = height of sunflower 1

—●— = height of sunflower 2



1) What type of data is the height of the sunflowers?

3) How many cm taller was sunflower 1 than sunflower 2 by week 6?

2) Which sunflower grew more over week 4?

4) At which week was the height difference between the two sunflowers 3cm?

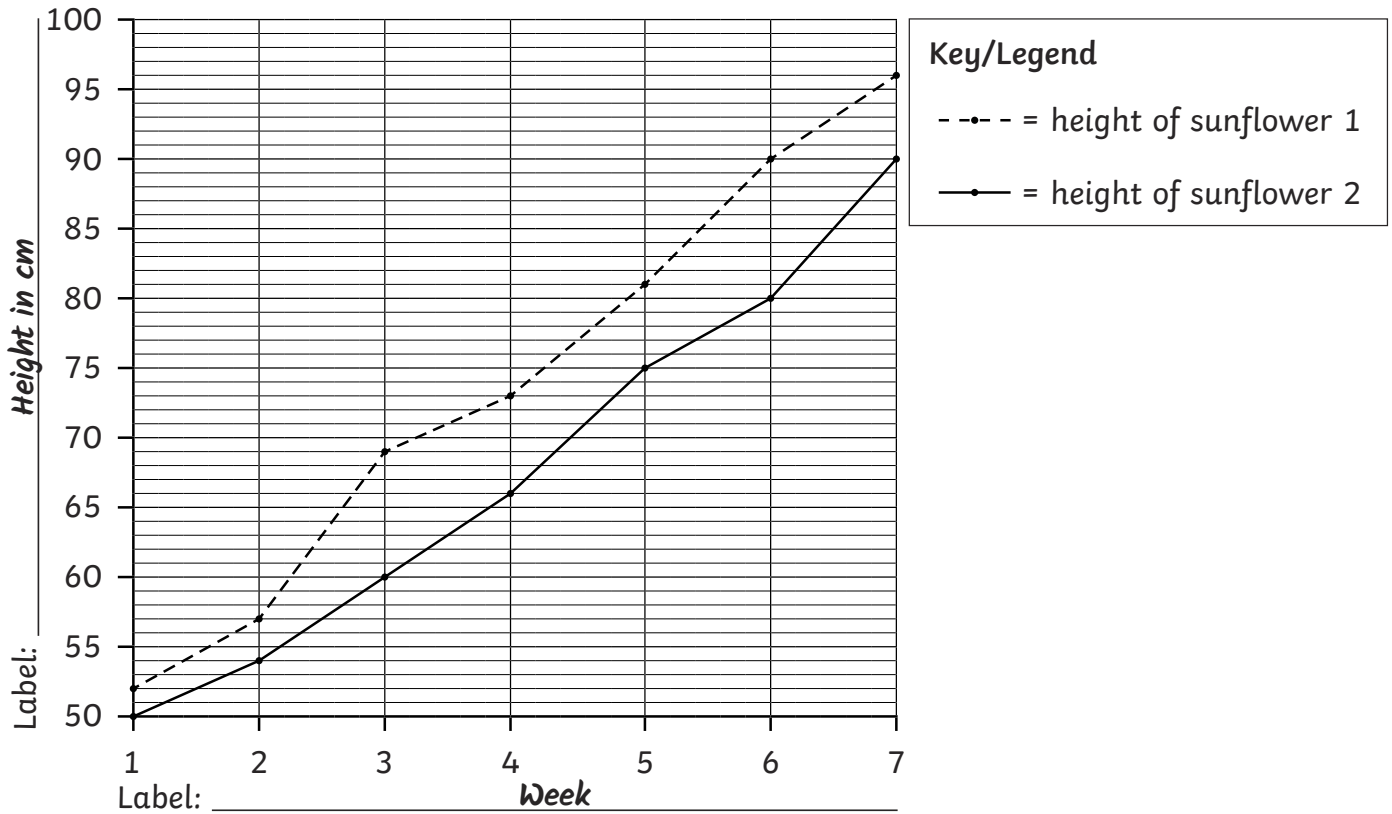


Gardening Statistics Answers

Question	Answer
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Draw a bar chart to show the data:

A Time Graph to Show the Height of a Sunflower over Seven Weeks



What type of data is the height of the sunflowers?

continuous

Which sunflower grew more over week 4?

sunflower 2

How many cm taller was sunflower 1 than sunflower 2 by week 6?

10 cm

At which week was the height difference between the two sunflowers 3cm?

week 2



1) Circle the examples of continuous data.

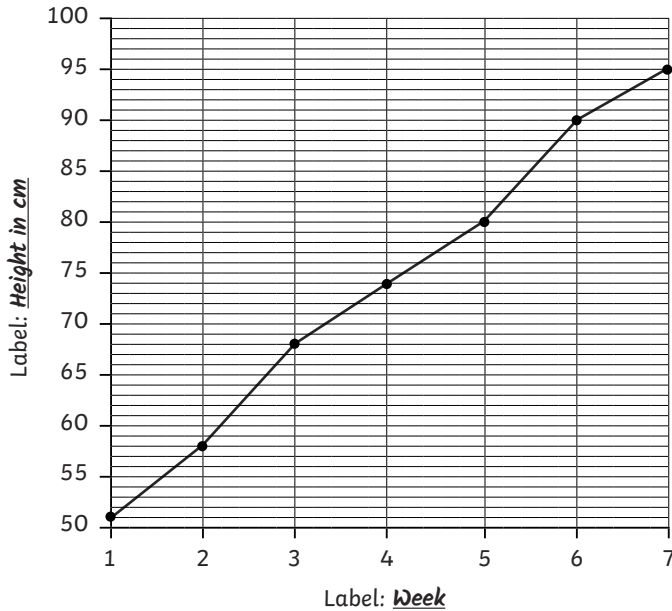
The height of a sunflower, in centimetres, over a week.

The number of flowers in each pot in a garden.

The comparative height of 5 sunflowers in cm, after a month.

The length of a bean on a plant, in millimetres, over a week.

2)



1) a) 5, 6 and 7

b) 4

c) 1, 3, 5 and 6

2) No. Plant 1 grew 11cm and plant 2 grew 10cm.



1) Children could compare their graphs to check

2) a) Jasir's

b) 3, 4 and 5





1) Circle the examples of continuous data.

The height of a sunflower, in centimetres, over a week.

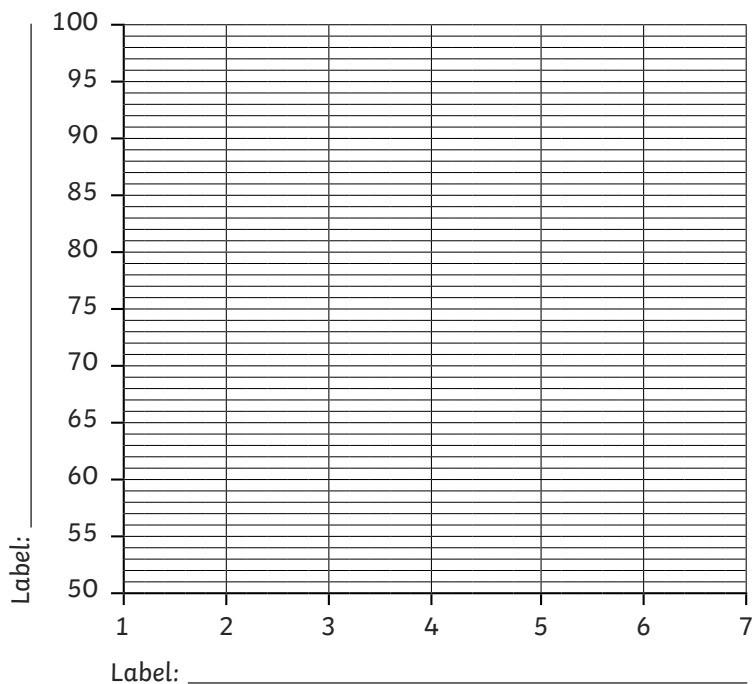
The number of flowers in each pot in a garden.

The comparative height of 5 sunflowers in cm, after a month.

The length of a bean on a plant, in millimetres, over a week.

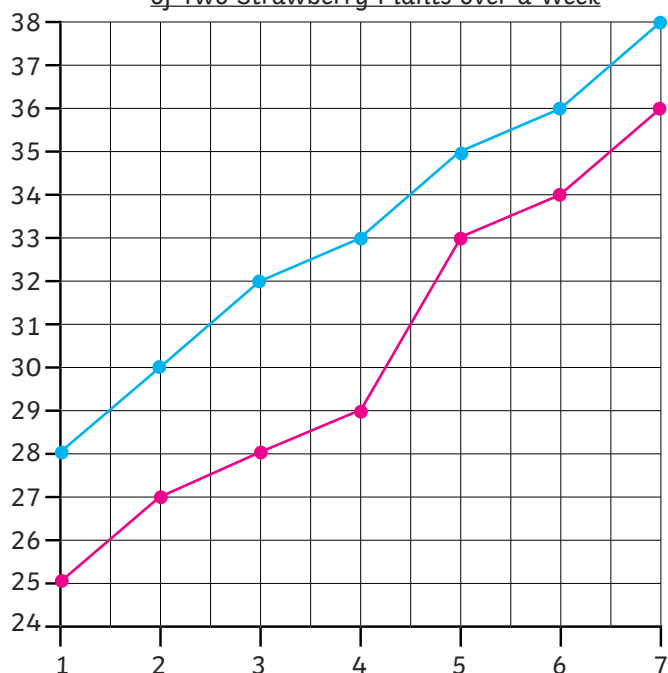
2) Plot the height of a sunflower on the blank graph below, using this data.

Week	1	2	3	4	5	6	7
Height in cm	51	58	68	74	80	90	95



Don't forget to label your graph and use a ruler!

A Time Graph to Show the Heights of Two Strawberry Plants over a Week



1) Use the line graph to answer the following questions.

a) On which days were the plants closest in height? _____

b) Which day did plant 1 grow the most? _____

c) On which days did both plants grow the same amount? _____

2) Morag said, "Plant 2 grew the most." Is she correct? _____

Explain your answer.

— Plant 1 — Plant 2



1) Look at this data.



Name of Child	Height of Bean Plant on Each Day (mm)				
	Day 1	Day 2	Day 3	Day 4	Day 5
Sabrina	12mm	16mm	21mm	29mm	33mm
Ginny	19mm	27mm	32mm	38mm	45mm
Jasir	13mm	21mm	29mm	39mm	45mm
Santino	15mm	22mm	25mm	31mm	38mm
Lucy	18mm	24mm	25mm	29mm	35mm

Use squared paper to plot this data on a line graph. You could use a different colour for each child's plant.

- 2) a) Whose plant grew the most? _____
b) On what days were two plants the same size? _____
- 3) Write questions for a partner to answer using your line graph.

- 1) Circle the examples of continuous data.



The height of a sunflower, in centimetres, over a week.

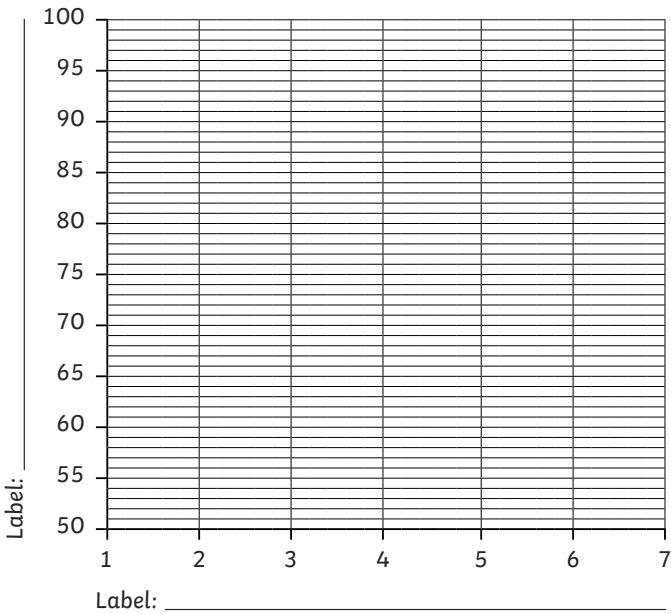
The number of flowers in each pot in a garden.

The comparative height of 5 sunflowers in cm, after a month.

The length of a bean on a plant, in millimetres, over a week.

- 2) Use this data to draw a line graph plotting the height of a sunflower.

Week	1	2	3	4	5	6	7
Height in cm	51	58	68	74	80	90	95



Don't forget to label your graph and use a ruler!

- 1) Circle the examples of continuous data.



The height of a sunflower, in centimetres, over a week.

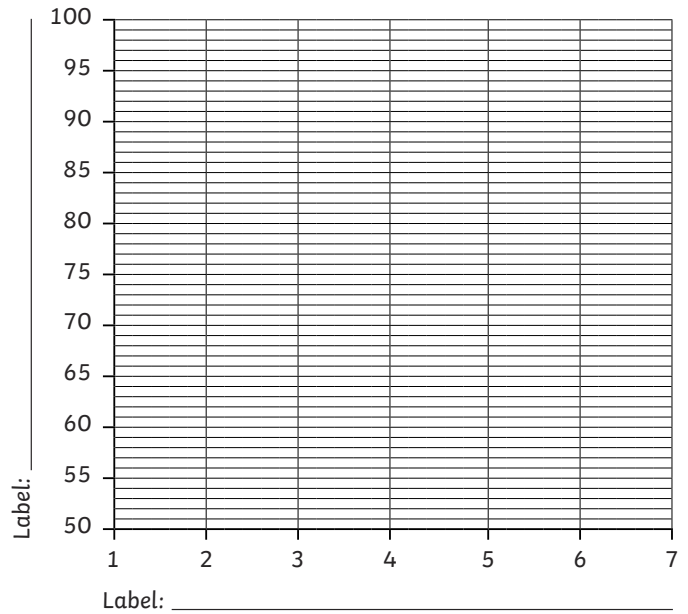
The number of flowers in each pot in a garden.

The comparative height of 5 sunflowers in cm, after a month.

The length of a bean on a plant, in millimetres, over a week.

- 2) Use this data to draw a line graph plotting the height of a sunflower.

Week	1	2	3	4	5	6	7
Height in cm	51	58	68	74	80	90	95



Don't forget to label your graph and use a ruler!

1) Use the line graph to answer the following questions.

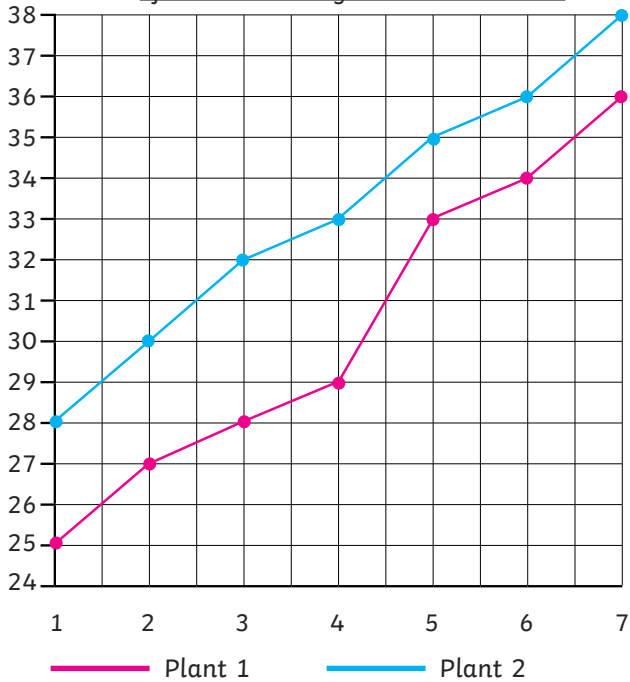


- a) On which days were the plants closest in height?
- b) Which day did plant 1 grow the most?
- c) On which days did both plants grow the same amount?

2) Morag said, "Plant 2 grew the most." Is she correct?

Explain your answer.

A Time Graph to Show the Heights of Two Strawberry Plants over a Week



1) Use the line graph to answer the following questions.

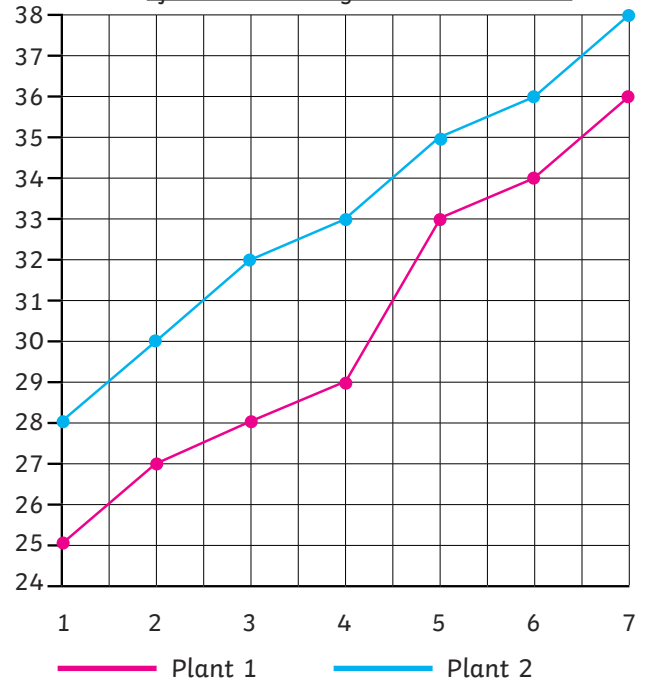


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2) Morag said, "Plant 2 grew the most." Is she correct?

Explain your answer.

A Time Graph to Show the Heights of Two Strawberry Plants over a Week



1) Look at this data.



Name of Child	Height of Bean Plant on Each Day (mm)				
	Day 1	Day 2	Day 3	Day 4	Day 5
Sabrina	12mm	16mm	21mm	29mm	33mm
Ginny	19mm	27mm	32mm	38mm	45mm
Jasir	13mm	21mm	29mm	39mm	45mm
Santino	15mm	22mm	25mm	31mm	38mm
Lucy	18mm	24mm	25mm	29mm	35mm

Use squared paper to plot this data on a line graph. You could use a different colour for each child's plant.

- 2) a) Whose plant grew the most?
b) On what days were two plants the same size?
- 3) Write questions for a partner to answer using your line graph.

1) Look at this data.



Name of Child	Height of Bean Plant on Each Day (mm)				
	Day 1	Day 2	Day 3	Day 4	Day 5
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Use squared paper to plot this data on a line graph. You could use a different colour for each child's plant.

- 2) a) Whose plant grew the most?
b) On what days were two plants the same size?
- 3) Write questions for a partner to answer using your line graph.

Vegetable Patch Bar Chart Board Game

START

FINISH

How to Play

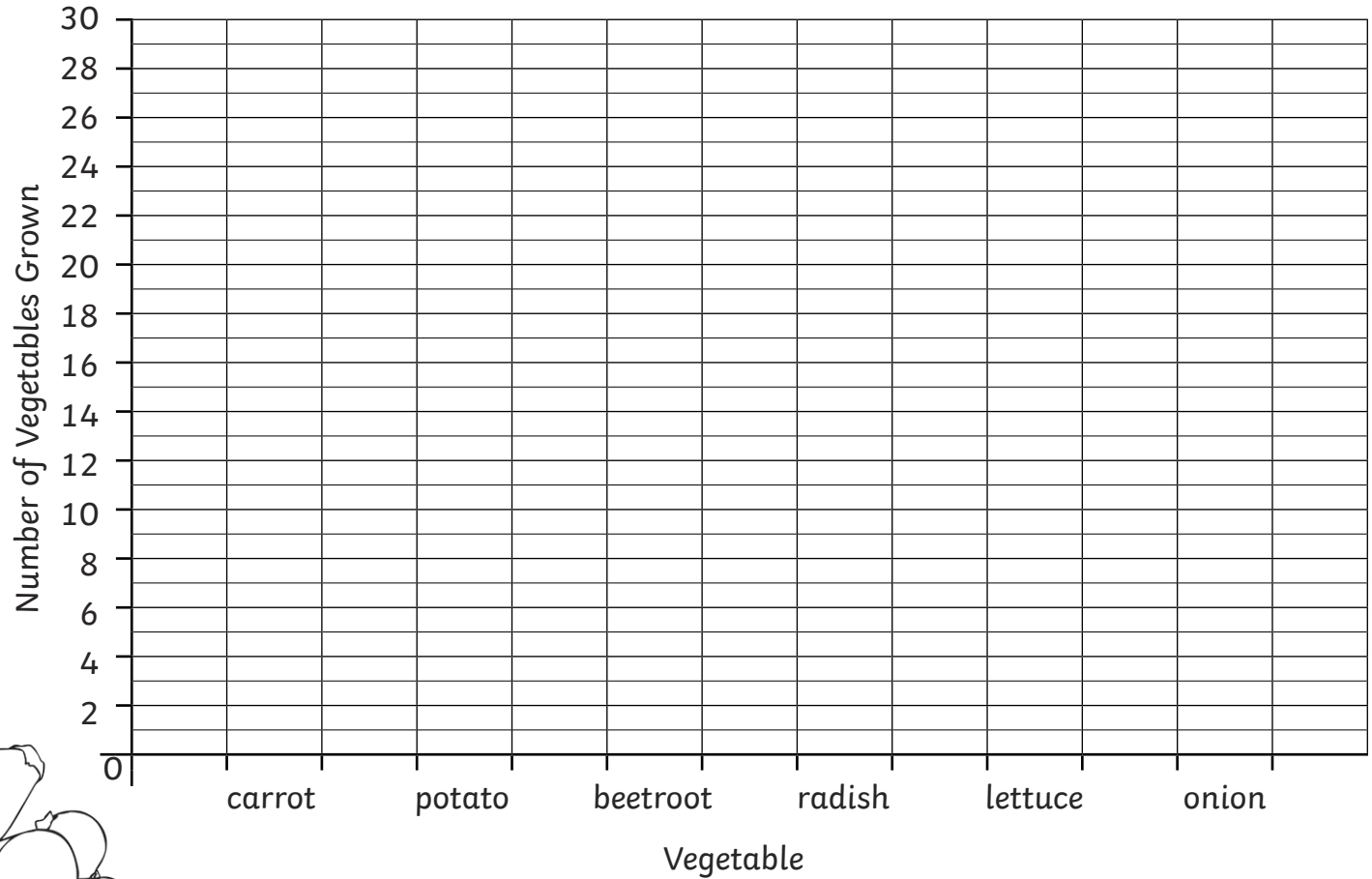
- 1) On your turn, roll the dice and move your counter forward the number rolled.
- 2) Transfer the data about the vegetables from the square you land on to the frequency table.
- 3) Continue until you both reach the finish.
- 4) Use the frequency table to draw a bar chart.
- 5) Discuss the bar chart you have created, using the suggested questions.

Vegetable Counts:

- Onion: 3 onions grown, 6 onions grown, 4 onions grown
- Radish: 6 radishes grown, 3 radishes grown, 4 radishes grown, 5 radishes grown
- Carrot: 5 carrots grown, 4 carrots grown, 7 carrots grown
- Lettuce: 2 lettuces grown, 5 lettuces grown, 4 lettuces grown, 3 lettuces grown
- Potatoes: 4 potatoes grown, 7 potatoes grown, 5 potatoes grown, 6 potatoes grown
- Beetroot: 7 beetroots grown, 3 beetroots grown, 8 beetroots grown

A Bar Chart to Show the Number of Different Vegetables Grown on the Allotment

Vegetable	Tally	Frequency
carrot		
potato		
beetroot		
radish		
lettuce		
onion		



Questions to Discuss

Which vegetable did you grow the most of?

Which vegetable did you grow the least of?

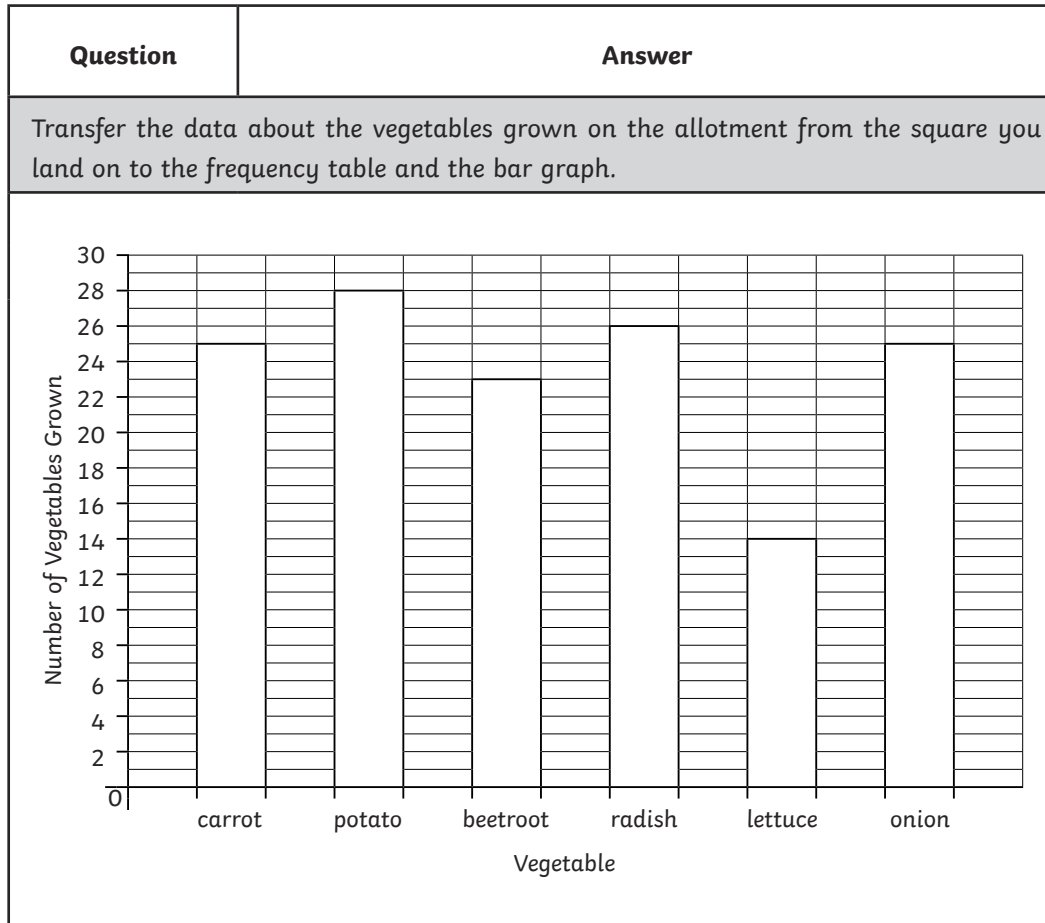
What was the difference between the number of carrots and potatoes grown?

What was the difference between the number of lettuces and onions grown?

What was the difference between the number of beetroots and radishes grown?

How many vegetables did you grow altogether?

Vegetable Patch Bar Chart Board Game **Answers**



Which vegetable did you grow the most of?
<i>potato</i>
Which vegetable did you grow the least of?
<i>lettuce</i>
What was the difference between the number of carrots and potatoes grown?
<i>3 more potatoes</i>
What was the difference between the number of lettuces and onions grown?
<i>11 more onions</i>
What was the difference between the number of beetroots and radishes grown?
<i>3 more radishes</i>
How many vegetables did you grow altogether?
<i>141 vegetables</i>

Statistics | Gardening Statistics

I can interpret and present data using bar charts and time graphs.		
I can say if data is discrete or continuous.		
I can collect data in tables.		
I can interpret and answer questions about data presented in bar charts and time graphs.		
I can present data in a bar chart or time graph.		

Statistics | Gardening Statistics

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Statistics | Gardening Statistics

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