Statistics: Capital City Temperatures

Aim:	**Success Criteria:**	**Resources:**
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.	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.	**Lesson Pack**
	Key/New Words: Bar chart, time graph, table, data, axis, discrete data, continuous data, key/legend.	**Preparation:** **Capital City Temperatures Activity Sheets** – one per child **Paris Temperature Graph Board Game** – one per pair

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

Learning Sequence

	Reading a Thermometer: Using the thermometers displayed on the **Lesson Presentation**, the children rehearse reading a partially numbered scale to complete a table of data showing the temperature each lunchtime over five days. They then answer questions about the data they have collected.	
Whole Class	**Daily Temperatures:** Discuss the best way to present the table of data from the previous activity as a graph. Encourage the children to think of the pros and cons of both bar charts and time graphs. Using the explanations shown on the **Lesson Presentation**, discuss how the data can be correctly presented as both types of graph.	
Whole Class	**Capital City Temperatures:** Discuss whether a bar chart or time graph is the best way to represent the table of data shown on the **Lesson Presentation**, which shows the highest recorded temperature in six different capital cities on the same day. Agree that the data hasn't been measured over time, so a bar chart is the best choice. Use the displayed bar chart of the data to answer the given questions.	
Whole Class	**Temperature over Time:** Discuss whether a bar chart or time graph is the best way to represent the table of data shown on the **Lesson Presentation**, which shows the temperature in London over nine days. Agree that the data can be presented as a time graph due to the temperature being measured over time.	
	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 from the previous activity. Discuss how the data is plotted on to the time graph and then joined to create a continuous line, which shows how the temperature rises and falls over time.	
Whole Class	**Temperature over Time Questions:** Use the graph shown on the **Lesson Presentation** to answer the given questions.	
Whole Class	**Time Graph Challenge:** Discuss the graph shown on the **Lesson Presentation**, which shows the temperature in London and Madrid over nine days. Agree that the graph is showing two sets of data which can be compared. 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.	
	Temperature Time Graphs: Children complete the differentiated **Capital City Temperatures Activity Sheets**, to show that they can interpret and present discrete and continuous data using bar charts and graphs. ★ Using the table of data about the daily high temperatures of different capital cities, 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 daily high temperatures of a capital city, the children draw a time graph. Children answer questions about the time graph. ★★★ Using the table of data about the daily high temperatures of two capital cities, the children draw a double time graph. Children answer questions about the time graph.	

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.

Children draw and interpret a temperature line graph.

Children interpret two sets of data presented on the same graph and identify mistakes when reading and interpreting line graphs.

Children correct common misconceptions about line graphs and draw their own temperature graph.

Paris Temperature Graph Board Game: Use the in partners. Each space on the board contains data about the temperature of Paris on a different day of the month of May. 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 graph template. When both children reach the finish, they discuss the graph created, using the question prompts provided.

Masterit

Extendit: Collect temperature data for the local environment or use the Internet to find data for a specific location linked to a topic and use this data to construct further examples of temperature time graphs.

Reverseit: Children use a temperature time graph to construct their own version of the , using the data from the graph to populate the spaces on the game board.

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

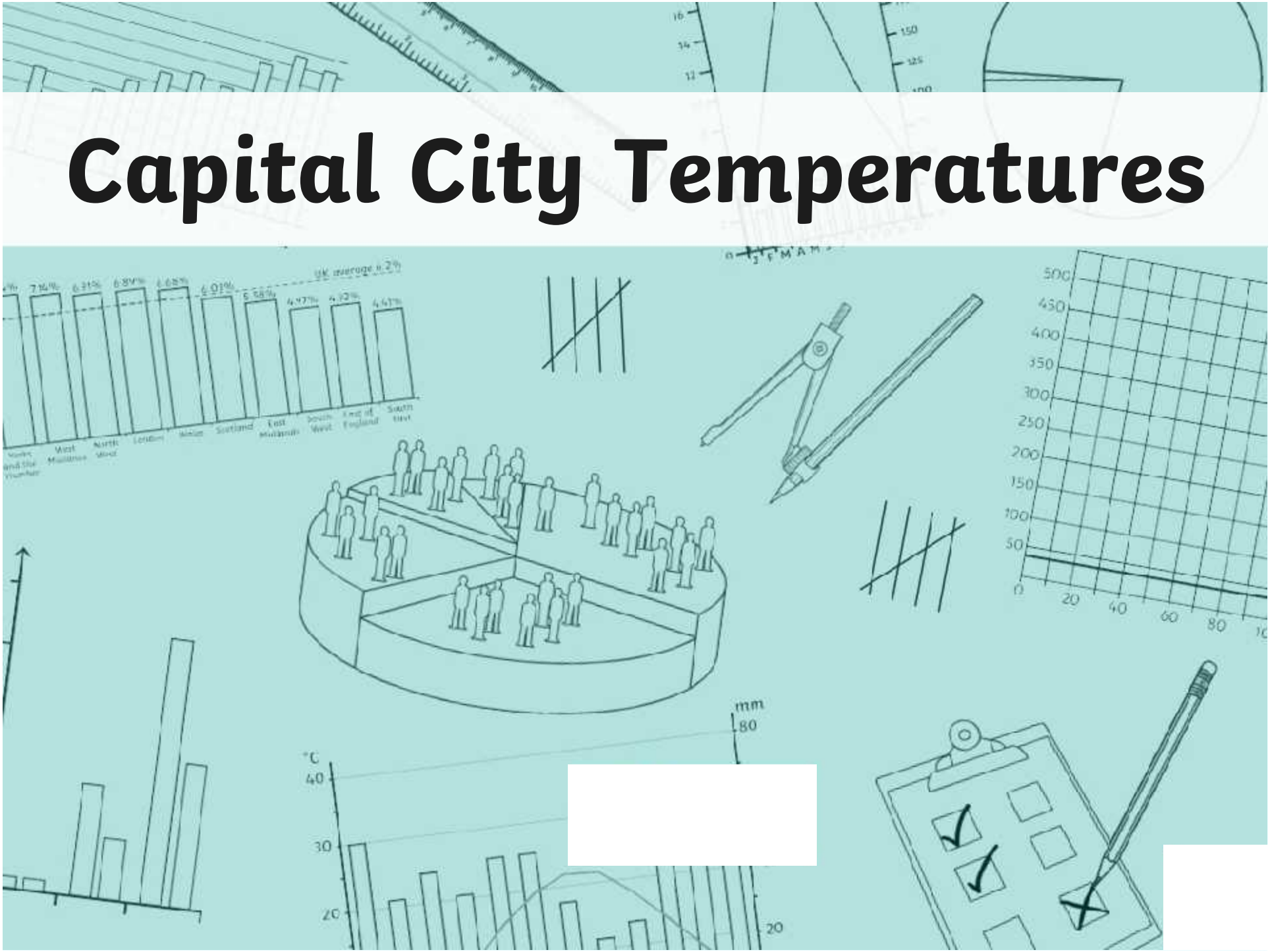
Aim: I can interpret and present data using bar charts and time graphs.				**Date:**					
				Delivered By:			**Support:**		
Success Criteria	**Me**	**Friend**	**Teacher**	**T**	**PPA**	**S**	**I**	**AL**	**GP**
I can say if data is discrete or continuous.				**Notes/Evidence**					
I can collect data 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

Maths

Statistics

Capital City Temperatures



Aim

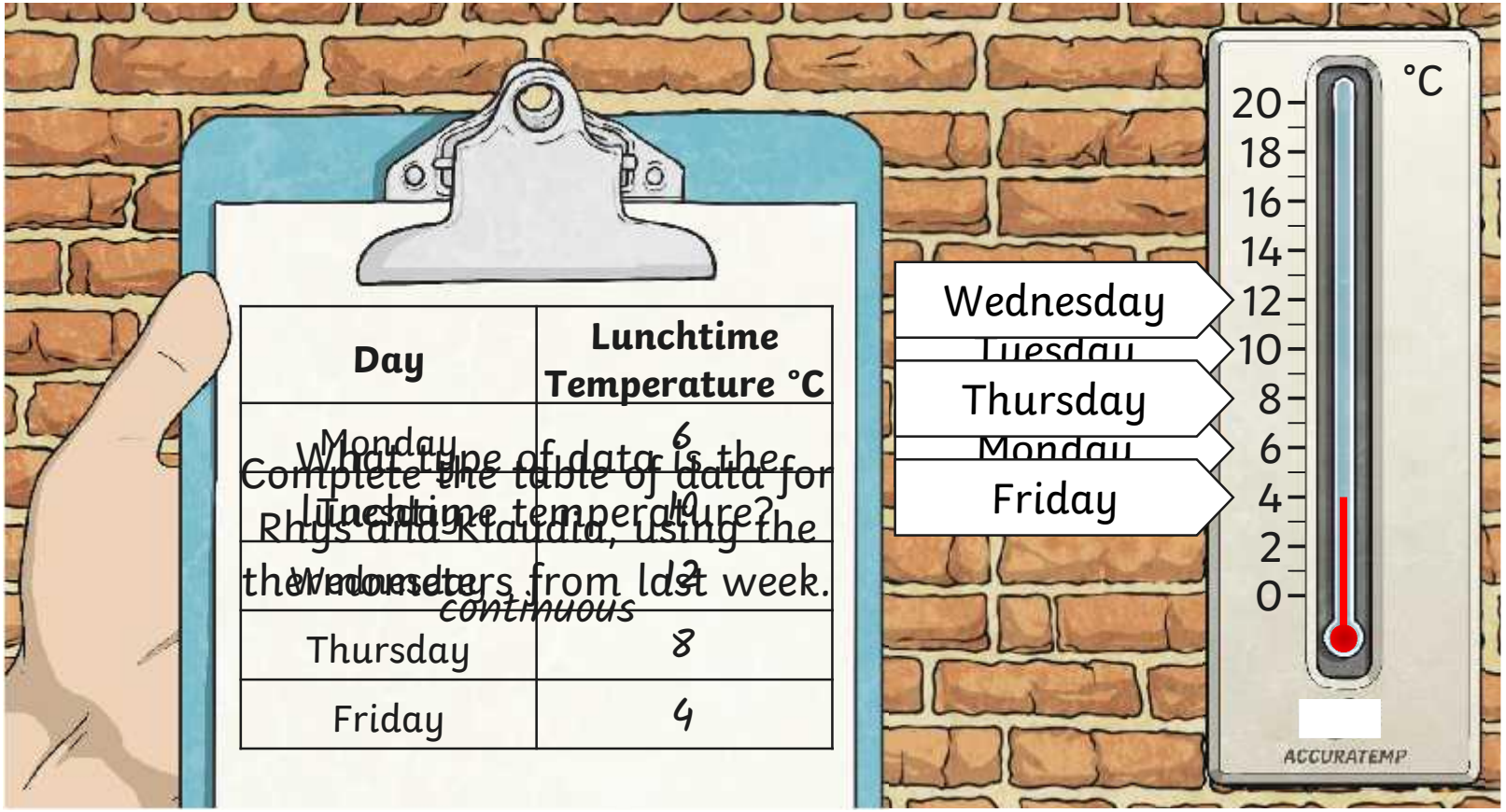
- I can interpret and present data using bar charts and time graphs.

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.

Reading a Thermometer

Class 4 have a thermometer on the wall of their playground.
Every lunchtime, Rhys and Klaudia record the temperature in °C.



Complete the table of data for Rhys and Klaudia, using the thermometers from last week.

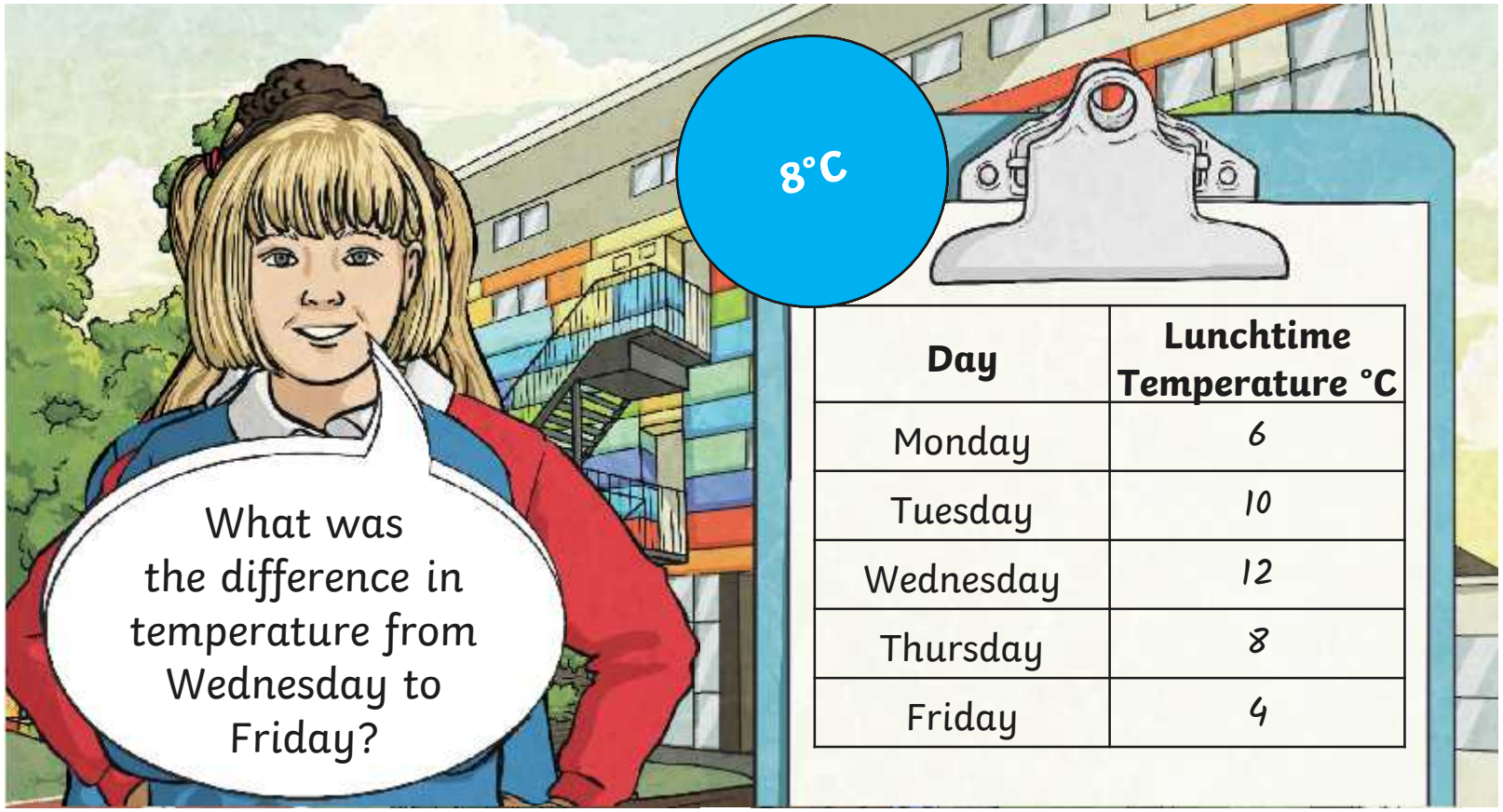
What type of data is the lunchtime temperature?

continuous

Regent Studies | www.regentstudies.com

Reading a Thermometer

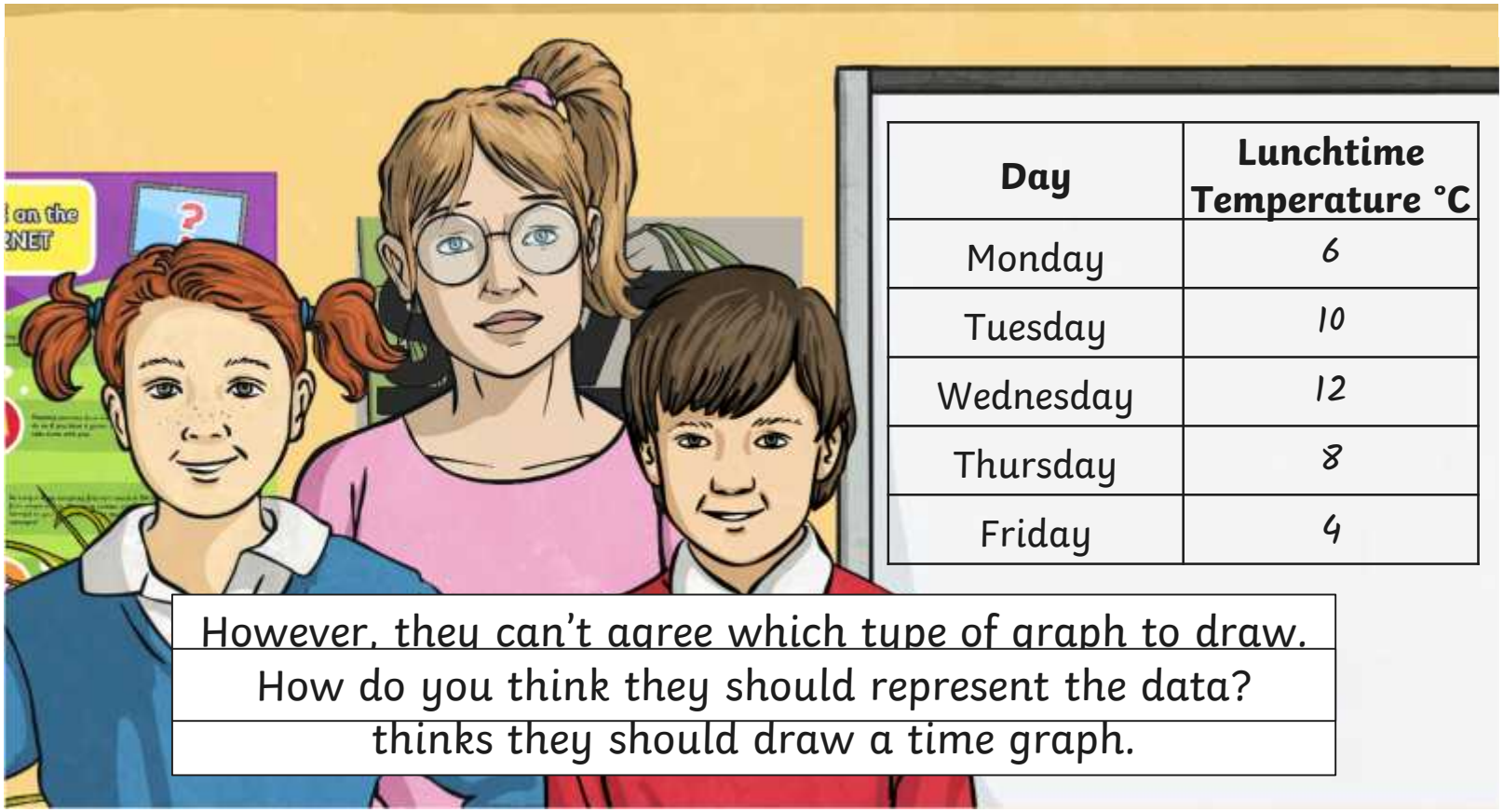
Use the table of continuous temperature data to answer these questions:



Day	Lunchtime Temperature °C
Monday	6
Tuesday	10
Wednesday	12
Thursday	8
Friday	4

Daily Temperatures

Ms Jones has asked Rhys and Klaudia to draw a graph of last week's lunchtime temperatures.



Day	Lunchtime Temperature °C
Monday	6
Tuesday	10
Wednesday	12
Thursday	8
Friday	4

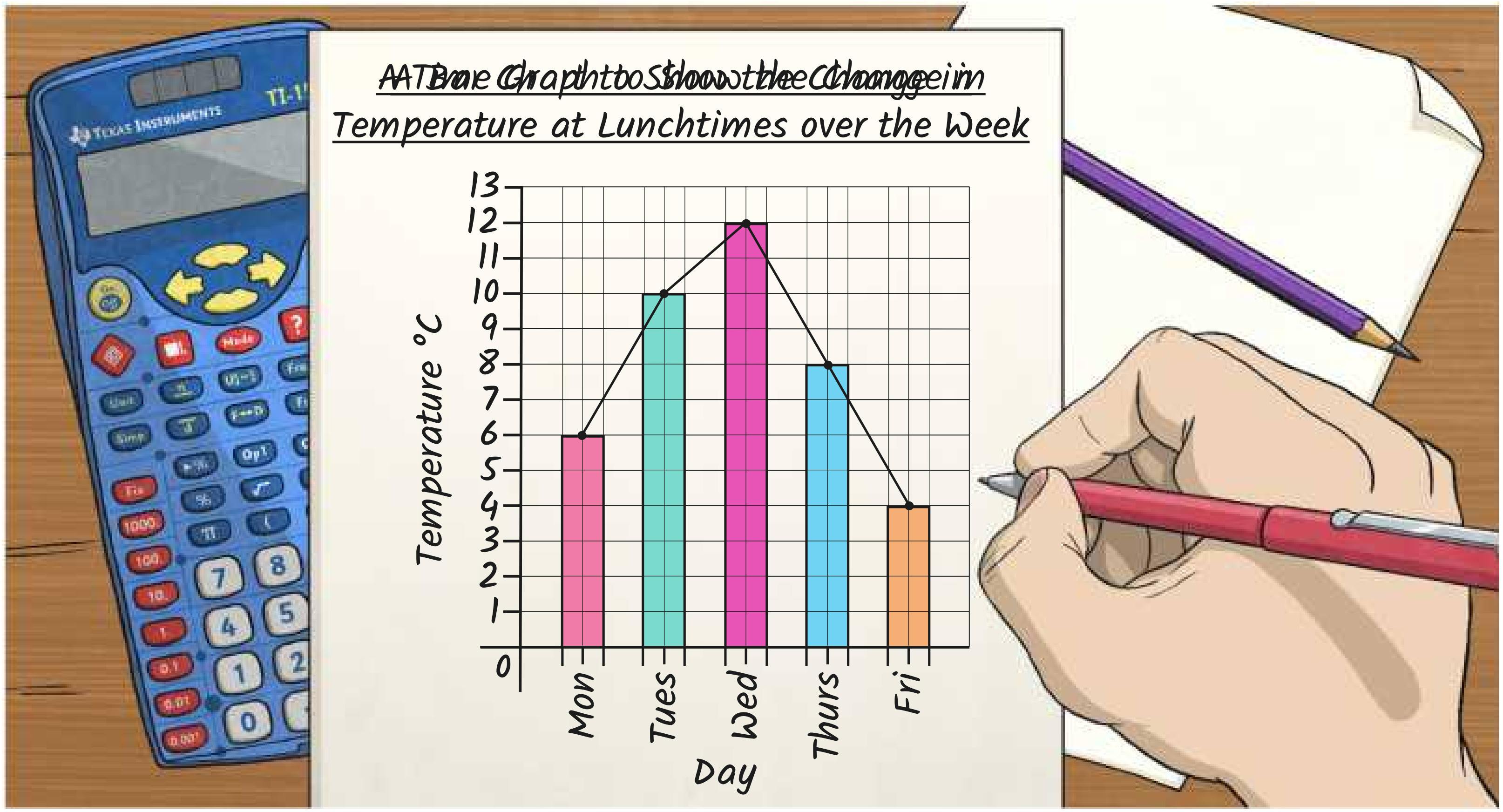
However, they can't agree which type of graph to draw.
How do you think they should represent the data?
thinks they should draw a time graph.

Daily Temperatures

Fantastic maths thinking. We can visually see how the temperature went up and down over the five days with a line graph.

Good, Klaudia. Rhys can visually compare each day's temperature using a bar chart.

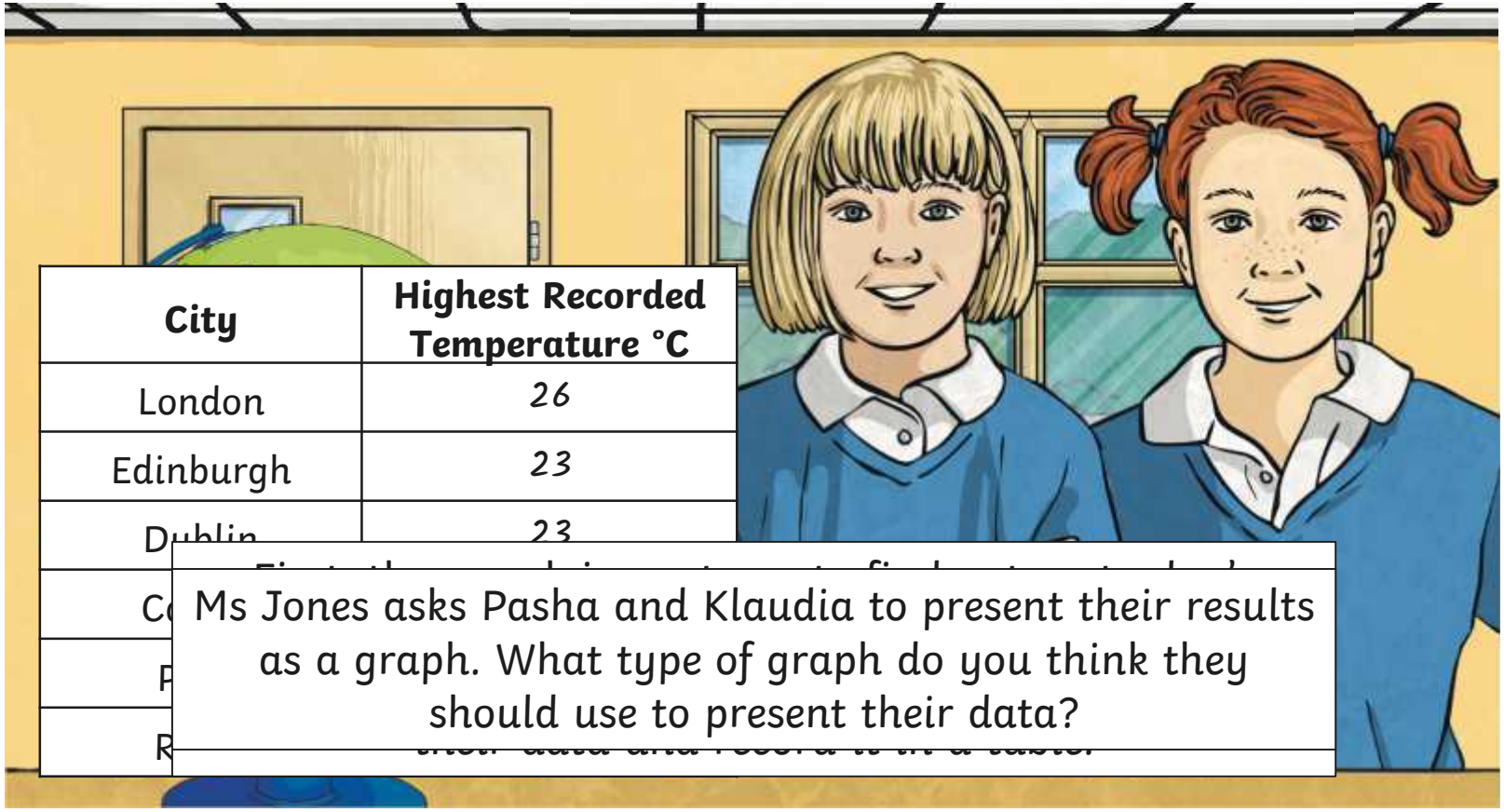
Ms Jones explains that Rhys and Klaudia are both correct!



Capital City Temperatures

Whole Class

In their geography lesson, Class 4 are investigating the temperature of different cities around the world.

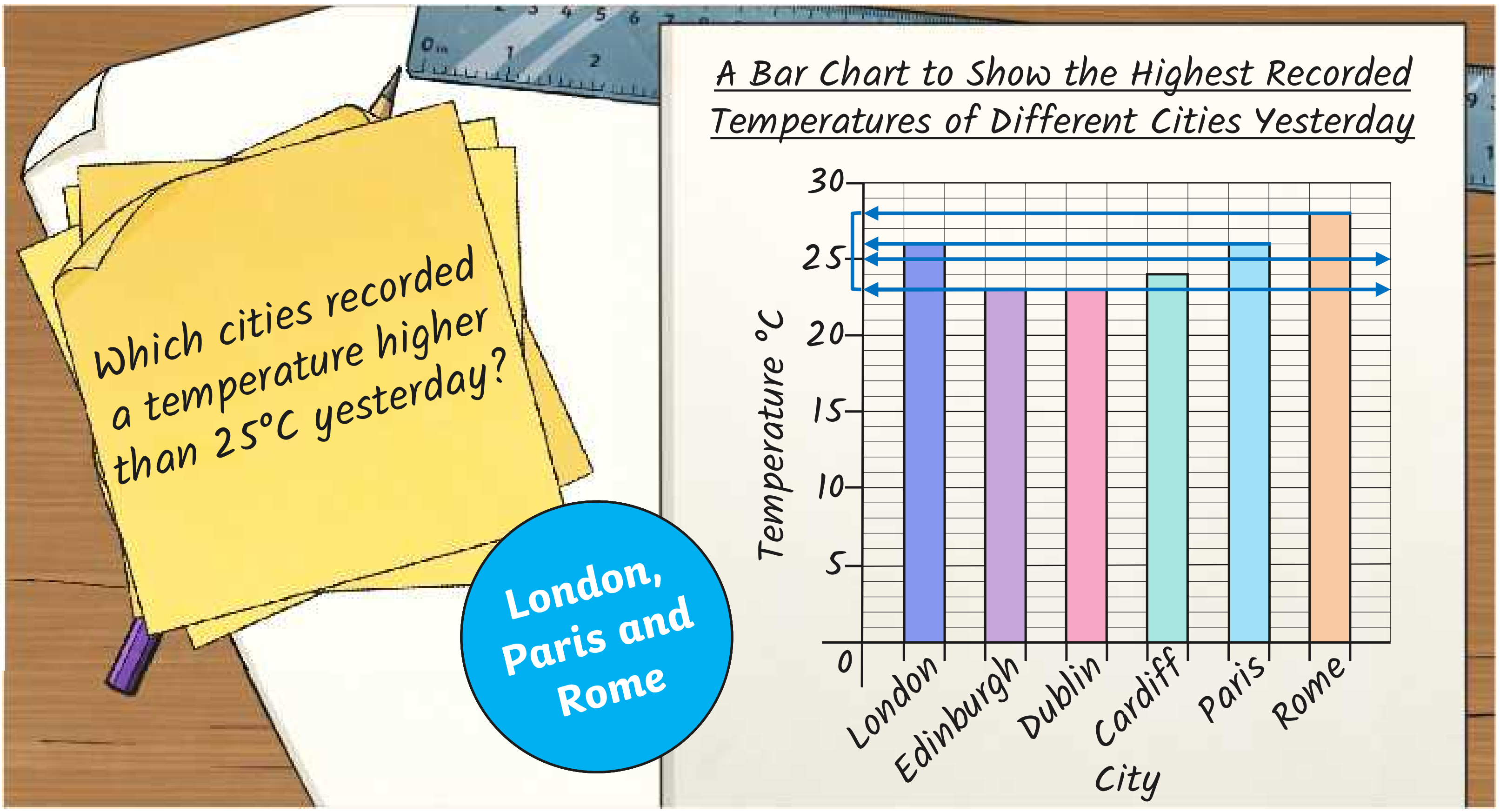


City	Highest Recorded Temperature °C
London	26
Edinburgh	23
Dublin	23
C	
P	
R	

Ms Jones asks Pasha and Klaudia to present their results as a graph. What type of graph do you think they should use to present their data?

Capital City Temperatures

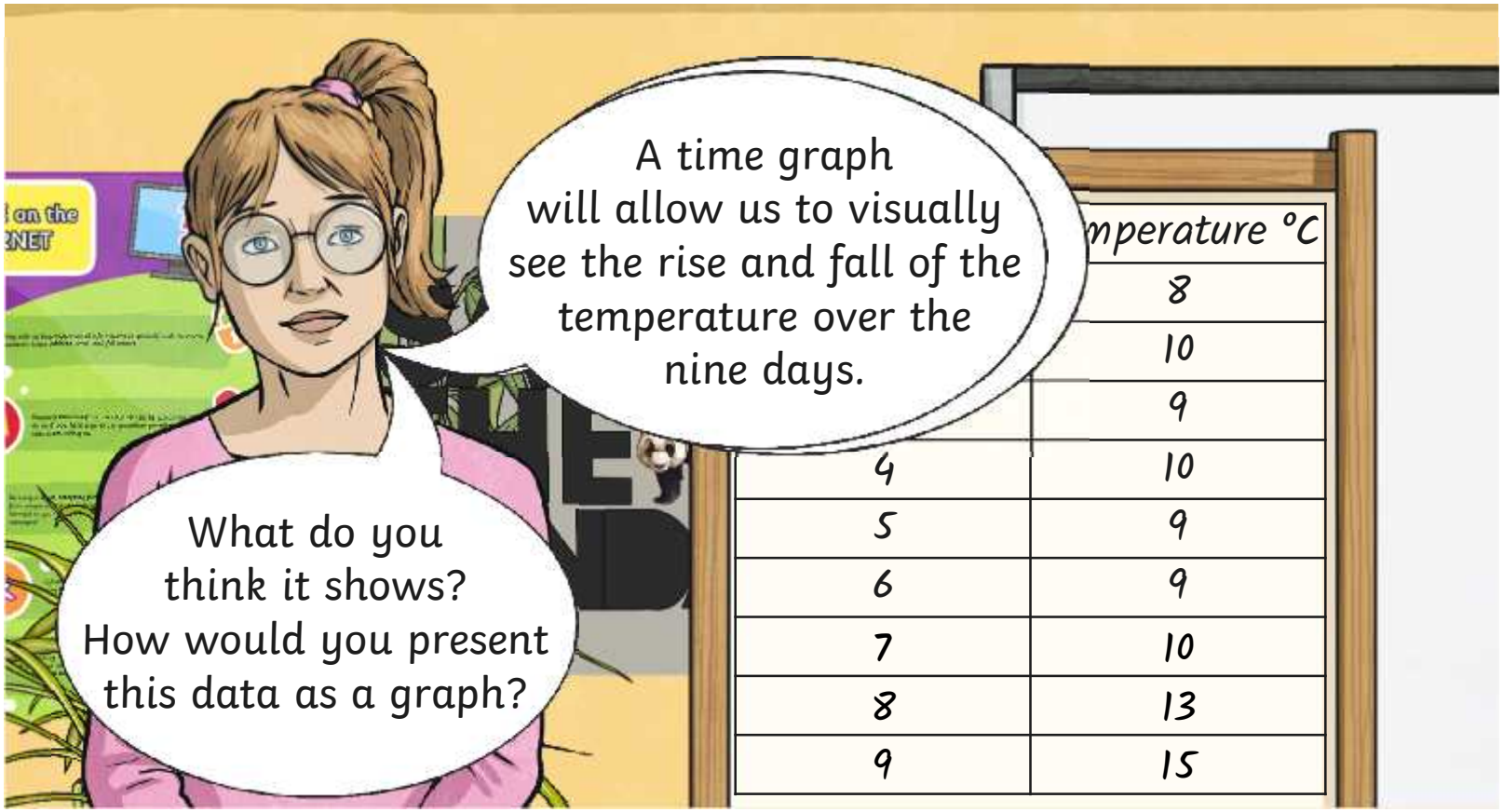
Pasha … chart.
deci… data.



Temperature over Time

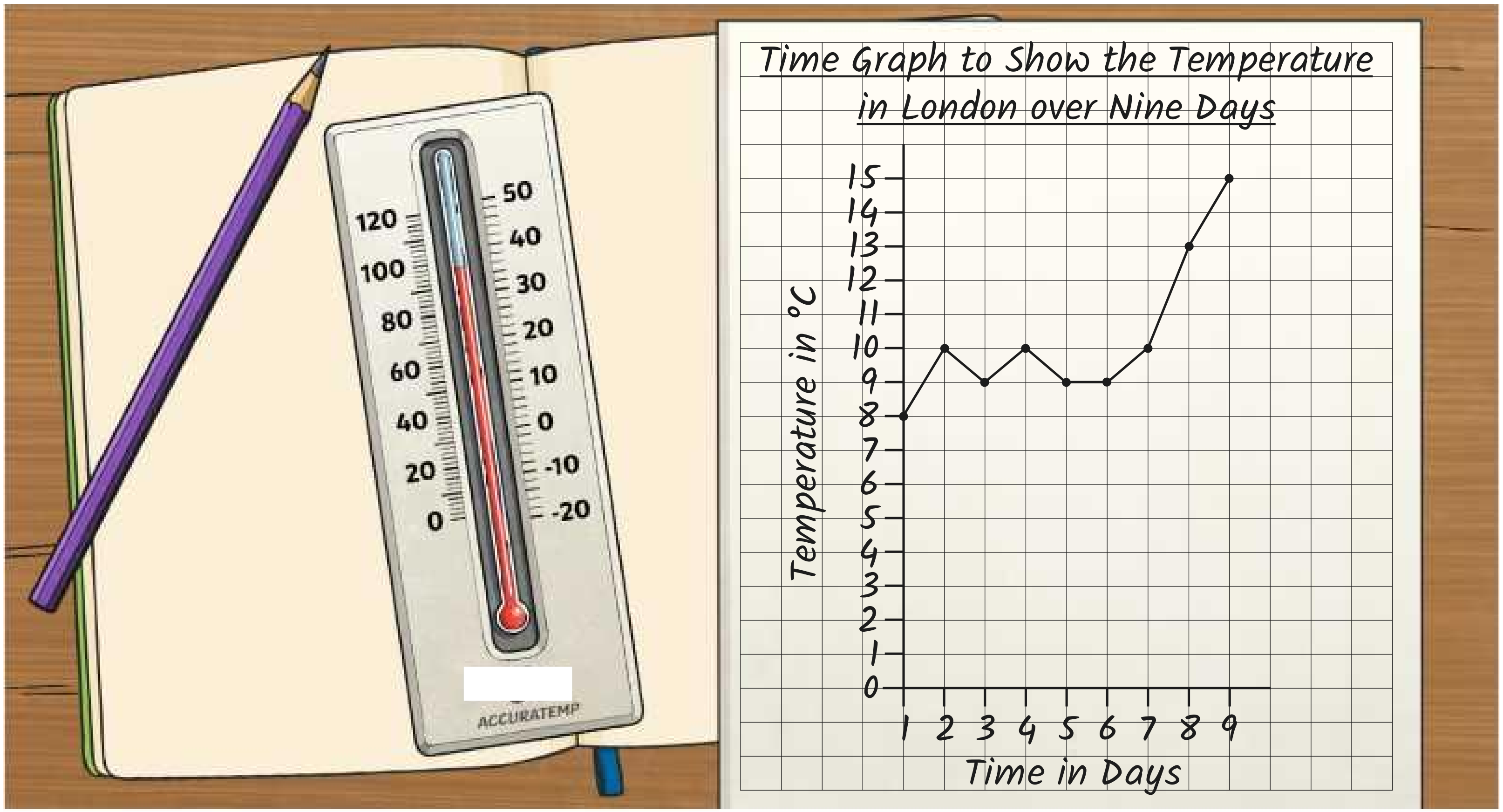
Whole Class

Next, Ms Jones shows the children in Class 4 this table of data for the city of London.



Time Graphs

[illegible]

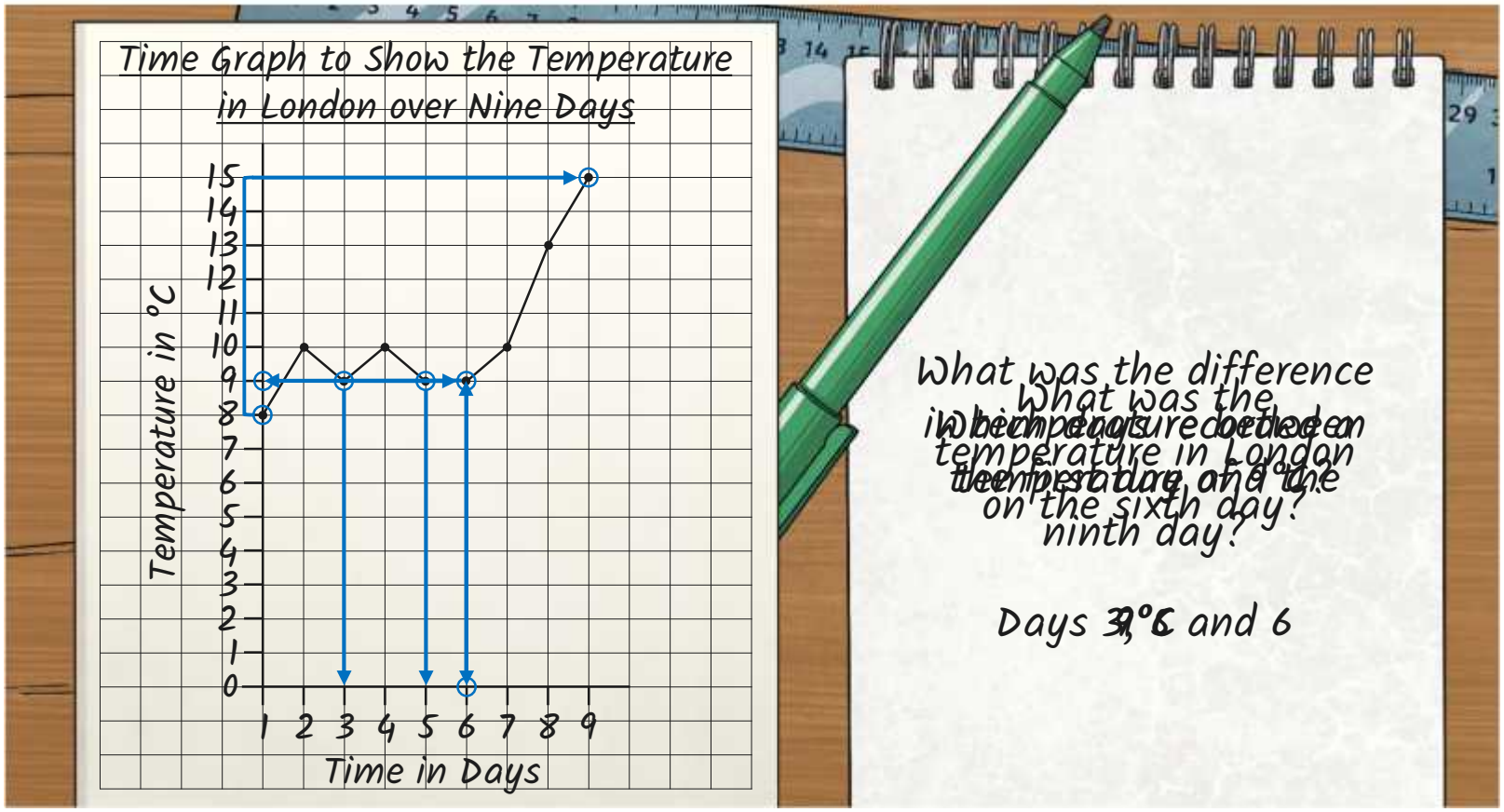


Time Graph to Show the Temperature in London over Nine Days
Temperature in °C
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
1 2 3 4 5 6 7 8 9
Time in Days
120
100
80
60
40
20
0
50
40
30
20
10
0
-10
-20
ACCURATEMP

Temperature over Time Questions

Whole Class

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



Time Graph Challenge

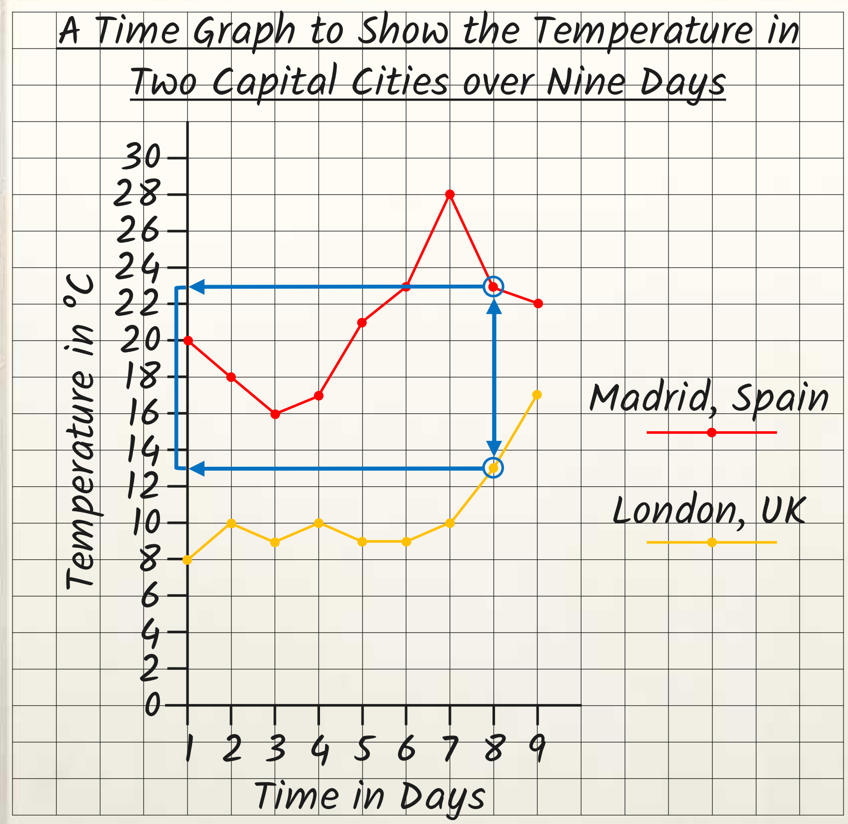
Ms Jones is so impressed with how well Class 4 are doing in their geography lesson that she shows them this graph as a challenge.

Using this double time

What was the difference in temperature between London and Madrid on day 8?

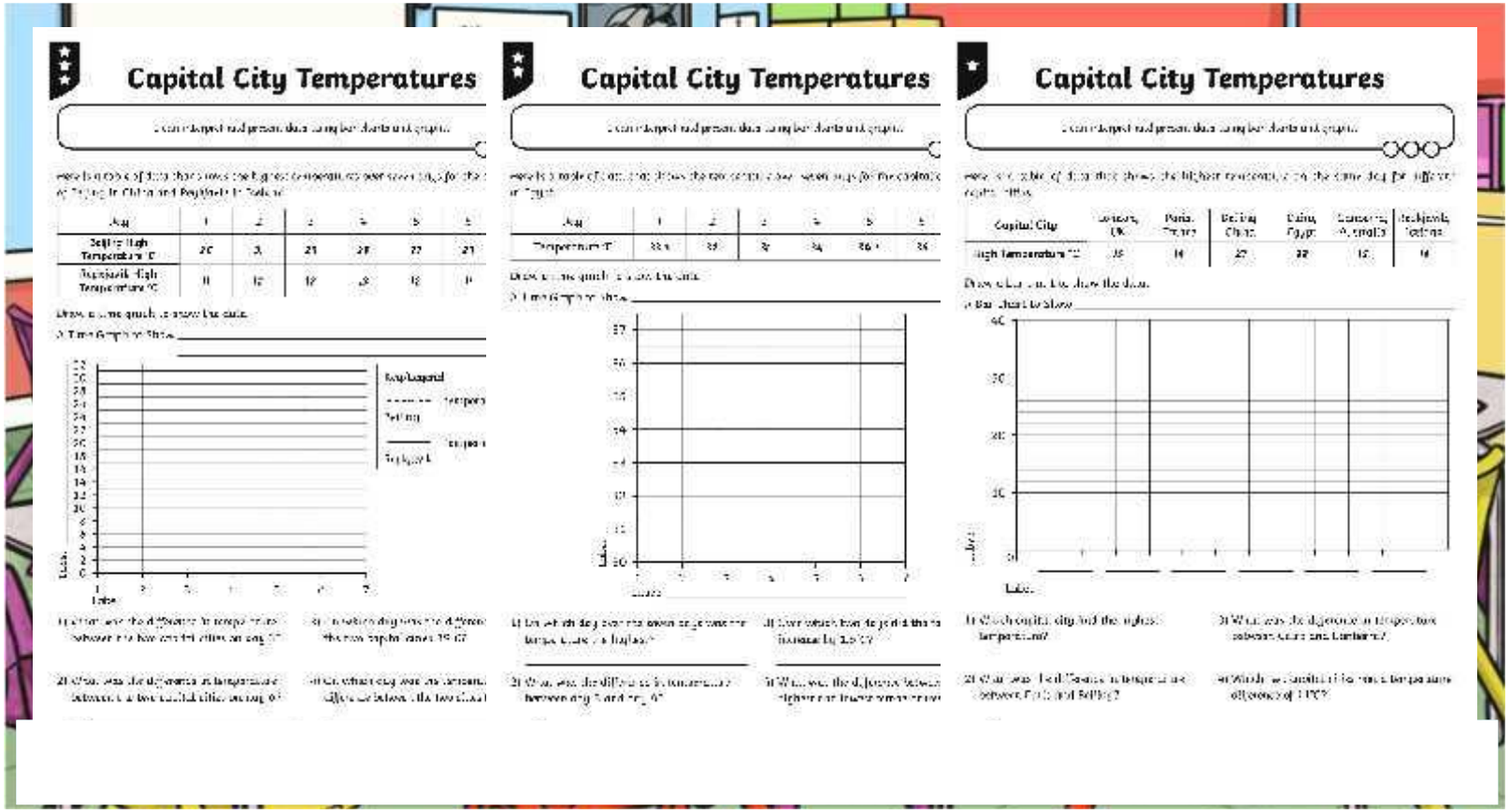
time period.

10°C



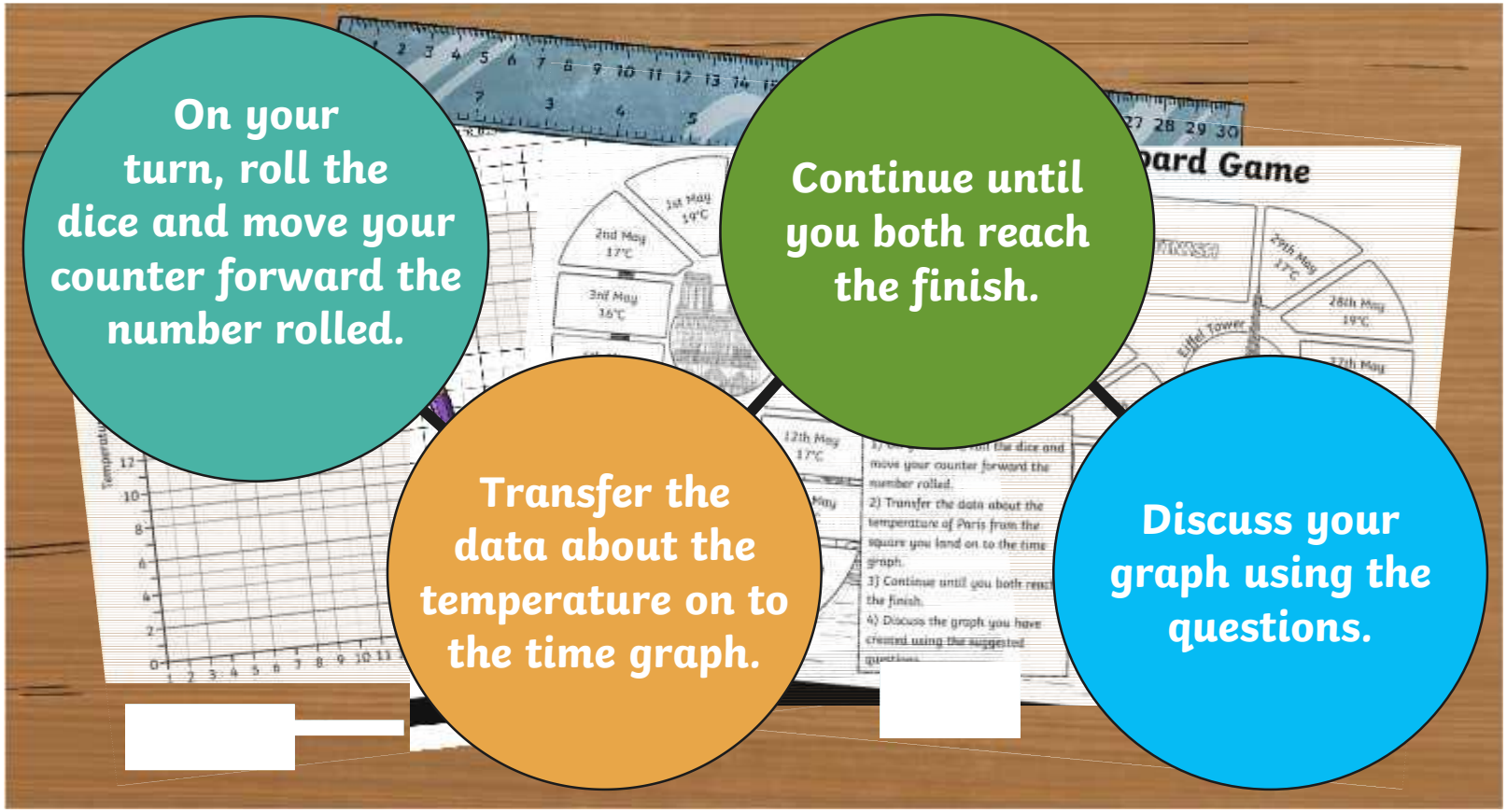
Capital City Temperatures

Use your marvellous maths skills to complete these activity sheets:



Temperature Graph Game

Work in pairs to complete this terrific temperature challenge:

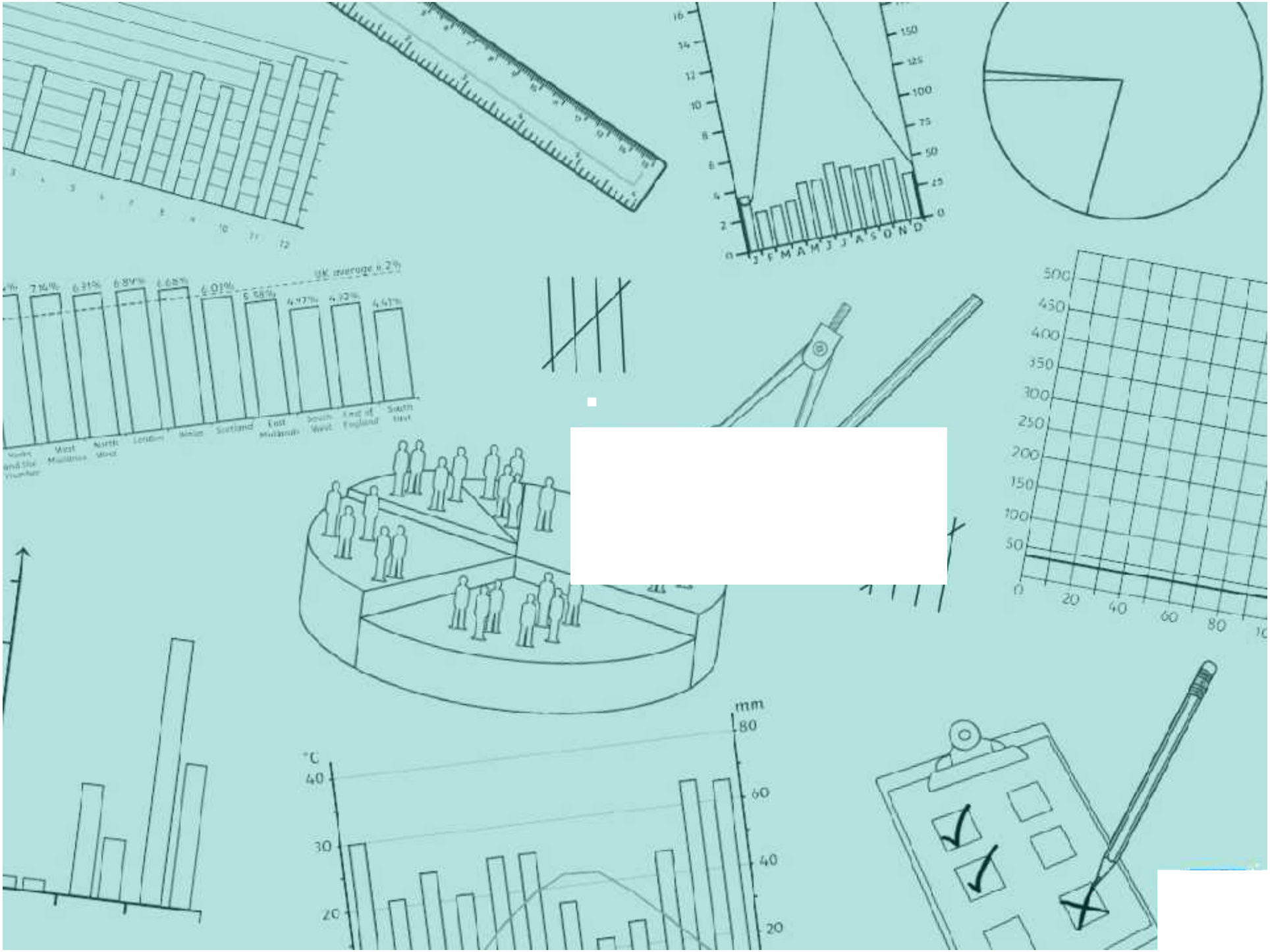


Aim

- 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.


J F M A M J J A S O N D
UK average = 2%
mm
°C

Capital City Temperatures

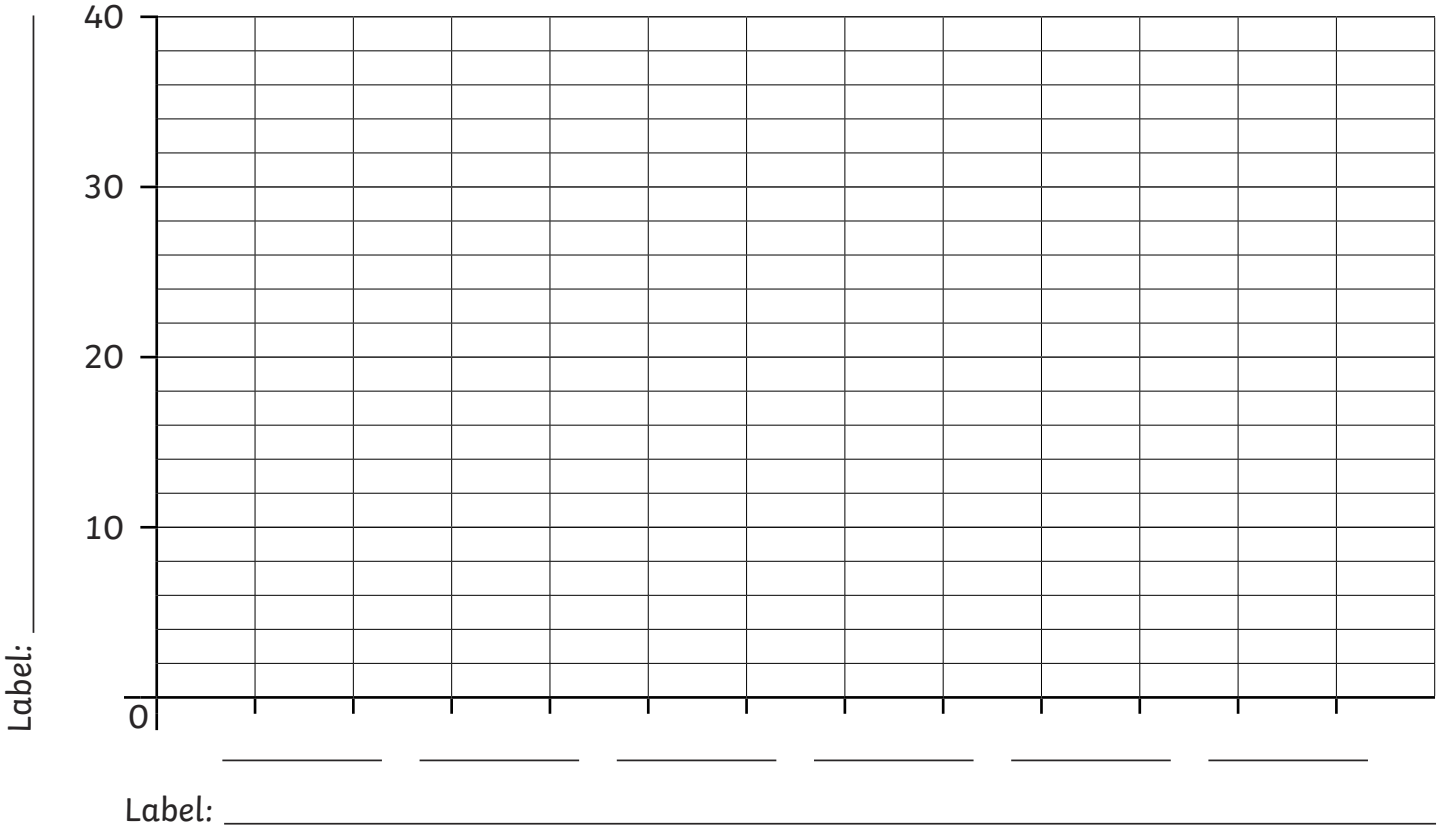
I can interpret and present data using bar charts and graphs.

Here is a table of data that shows the highest temperature on the same day for different capital cities.

Capital City	London, UK	Paris, France	Beijing, China	Cairo, Egypt	Canberra, Australia	Reykjavik, Iceland
High Temperature °C	16	19	27	33	15	10

Draw a bar chart to show the data:

A Bar Chart to Show _____



1) Which capital city had the highest temperature?

_____

2) What was the difference in temperature between Paris and Beijing?

3) What was the difference in temperature between Cairo and Canberra?

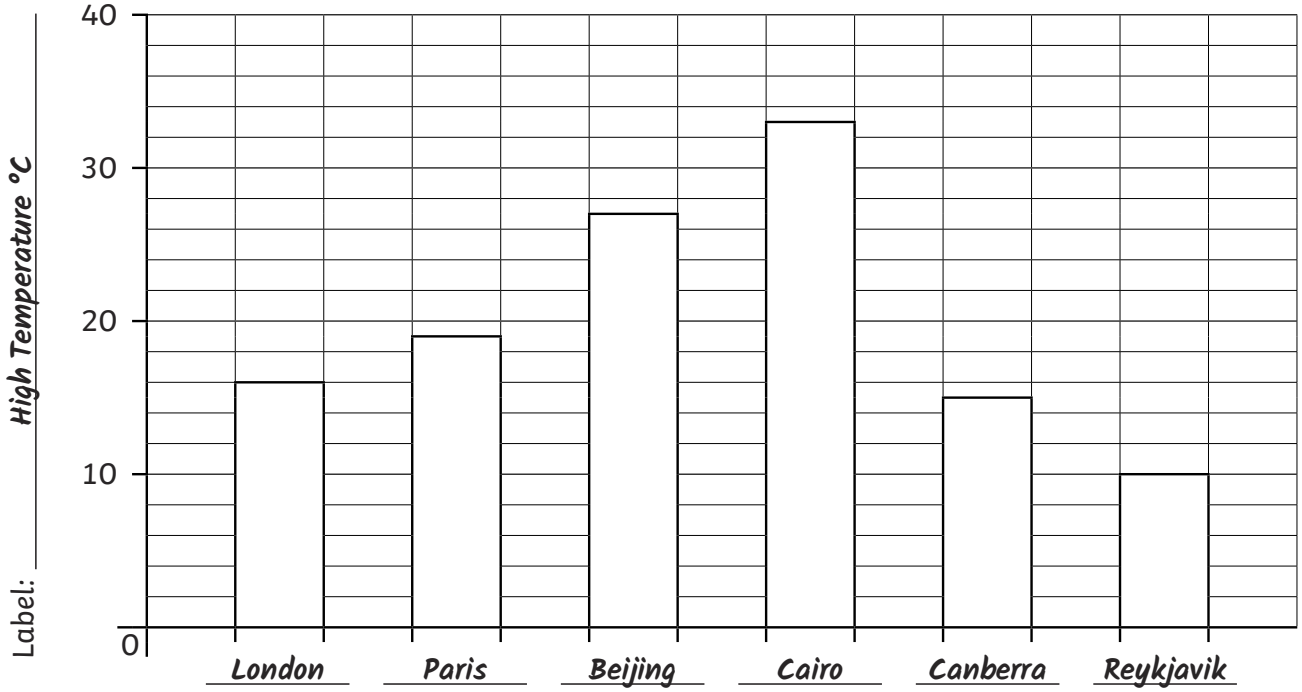
_____

4) Which two capital cities had a temperature difference of 11°C?

Capital City Temperatures **Answers**

Question	Answer
	Draw a bar chart to show the data:

A Bar Chart to Show *the Highest Temperatures on the Same Day for Different Capital Cities*



Label: *Capital City*

1.	Which capital city had the highest temperature?
	Cairo
2.	What was the difference in temperature between Paris and Beijing?
	8°C
3.	What was the difference in temperature between Cairo and Canberra?
	18°C
4.	Which two capital cities had a temperature difference of 11°C?
	London and Beijing

Capital City Temperatures

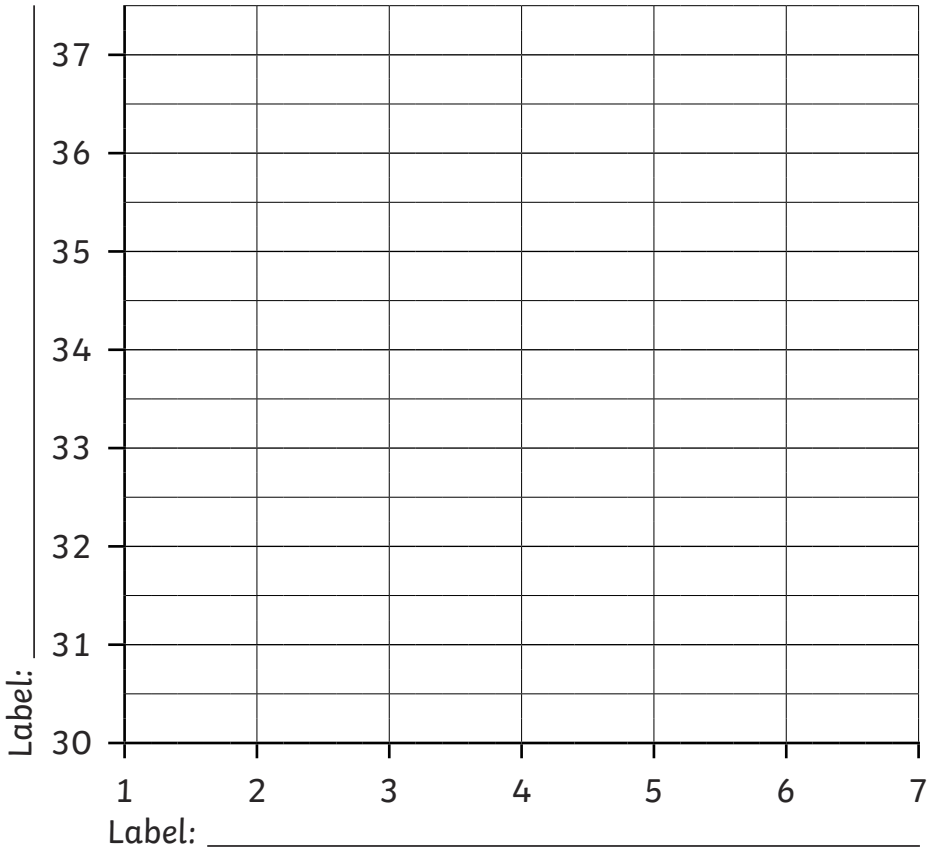
I can interpret and present data using bar charts and graphs.

Here is a table of data that shows the temperature over seven days for the capital city of Cairo in Egypt.

Day	1	2	3	4	5	6	7
Temperature °C	33.5	32	31	34	34.5	36	37

Draw a time graph to show the data:

A Time Graph to Show _____



1) On which day over the seven days was the temperature the highest?

_____

2) What was the difference in temperature between day 3 and day 4?

_____

3) Over which two days did the temperature increase by 1.5°C?

_____

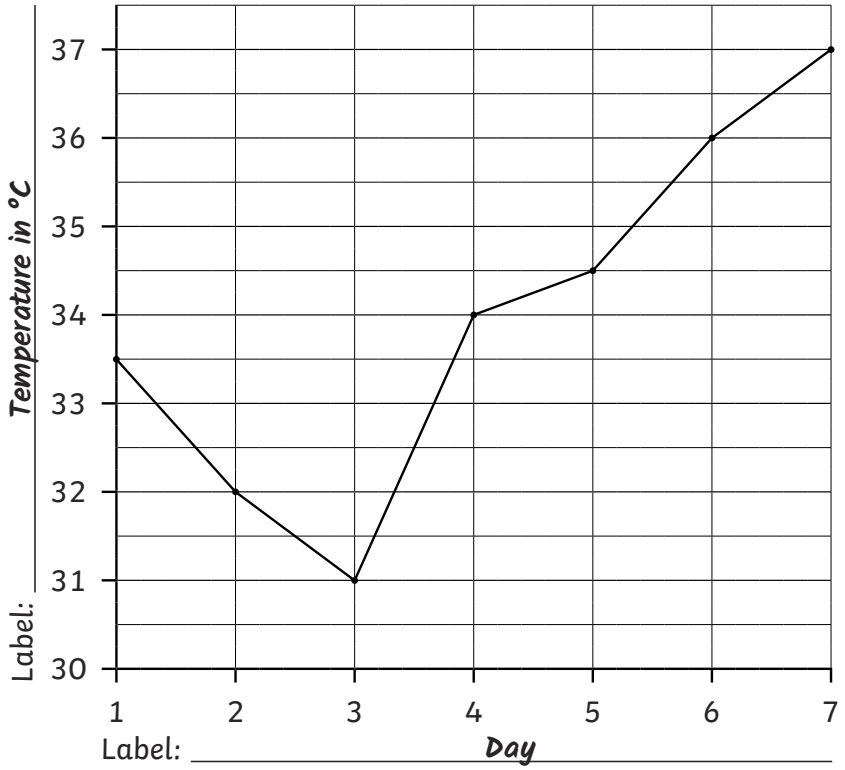
4) What was the difference between the highest and lowest temperatures?

_____

Capital City Temperatures **Answers**

Question	Answer
	Draw a time graph to show the data:

A Time Graph to Show *the Temperature over Seven Days for the Capital City of Cairo in Egypt*



1.	On which day over the seven days was the temperature the highest?
	day 7
2.	What was the difference in temperature between day 3 and day 4?
	3°C
3.	Over which two days did the temperature increase by 1.5°C?
	day 5 to day 6
4.	What was the difference between the highest and lowest temperatures?
	6°C

Capital City Temperatures

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

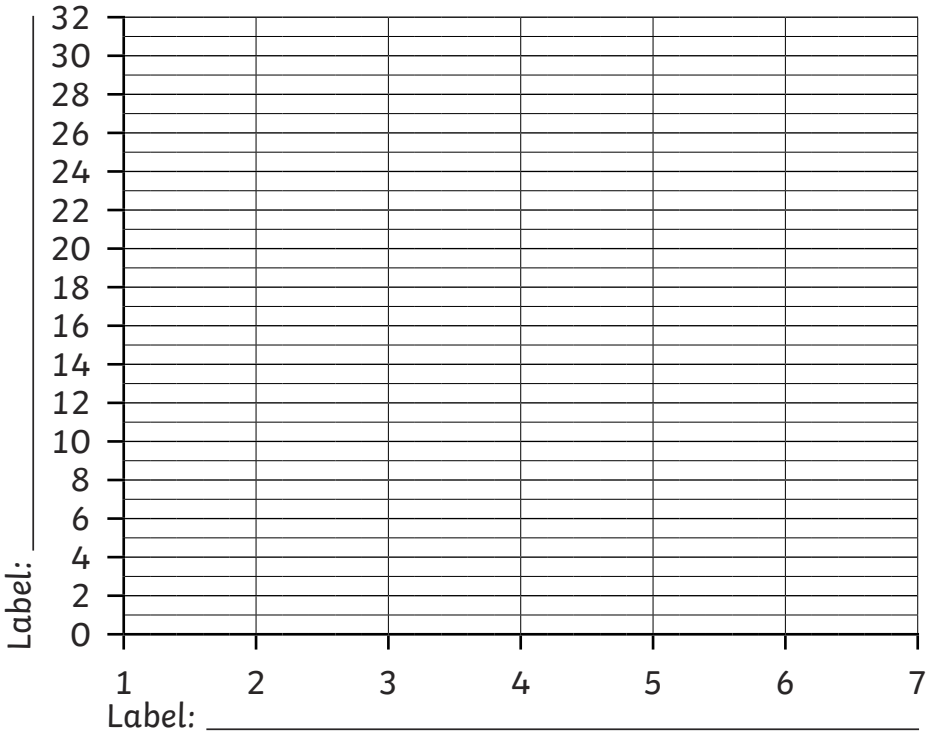
Here is a table of data that shows the highest temperatures over seven days for the capital cities of Beijing in China and Reykjavik in Iceland.

Day	1	2	3	4	5	6	7
Beijing High Temperature °C	28	31	29	28	27	29	30
Reykjavik High Temperature °C	11	12	12	13	12	11	10

Draw a time graph to show the data:

A Time Graph to Show _____

_____



Key/Legend

- - - -•- - - = temperature in Beijing

——•—— = temperature in Reykjavik

1) What was the difference in temperature between the two capital cities on day 3?

_____

2) What was the difference in temperature between the two capital cities on day 6?

_____

3) On which day was the difference between the two capital cities 19°C?

_____

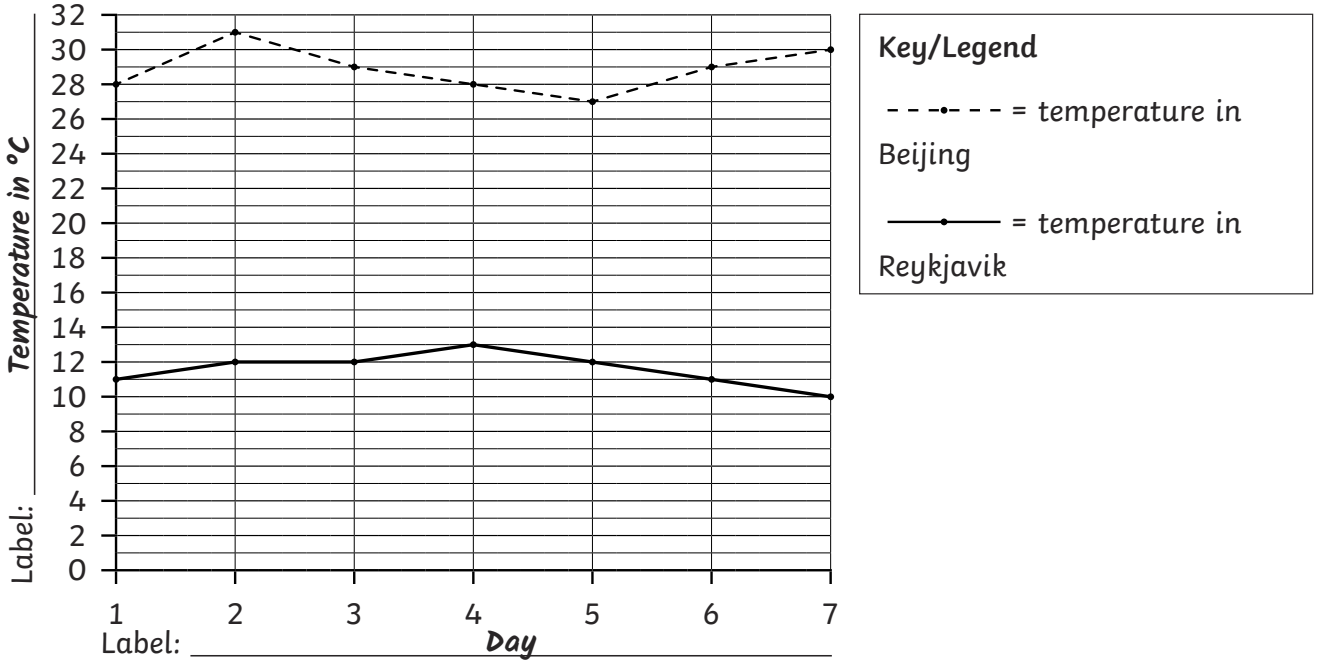
4) On which day was the temperature difference between the two cities the greatest?

_____

Capital City Temperatures **Answers**

Question	Answer
	Draw a time graph to show the data:

A Time Graph to Show *the Highest Temperatures over Seven Days for the Capital Cities of Beijing in China and Reykjavik in Iceland*



1.	What was the difference in temperature between the two capital cities on day 3?
	17°C
2.	What was the difference in temperature between the two capital cities on day 6?
	18°C
3.	On which day was the difference between the two capital cities 19°C?
	day 2
4.	On which day was the temperature difference between the two cities the greatest?
	day 7

1) *Ensure graphs are clearly titled and labelled with appropriate increments and accurately plotted line.*

2) a) What day was the temperature the highest? *Sunday*
b) Between which two days did the temperature change the most? *Wednesday and Thursday*
c) What was the difference between the two lowest temperatures? *1°c*

---

1) Look at this time graph showing the difference between the highest temperatures over seven days in two capital cities.
Tick the correct statements.

- ☐ The difference between the highest and lowest temperature shown in Reykjavik, is bigger than the highest and lowest temperature shown in Beijing.
- ☑ The difference between the two cities on day six was 18 degrees.
- ☑ The day with the smallest difference between the two cities were days four and five.

2) Carolina says, "The biggest temperature difference was 31 degrees."
Explain her mistake.
She has read the highest temperature rather than compared the 2 lines.
What should she have done instead?
Identified the widest gap between the 2 lines or read the data to find the 2 sets of data the furthest apart on a single day.

---

1) Naseem collects data showing the average temperatures in 6 capital cities on the same day.

City	London	Paris	Beijing	Cairo	Canberra	Reykjavik
Temperature in Celsius	16°c	19°c	27°c	33°c	15°c	10°c

He says, "I should represent this as a line graph as temperature is a type of continuous data."
Is he correct?
No – in this case it is not continuous because it's about different cities.
How else could he represent his data?
Children may suggest a bar chart or table.
Explain why you think this would better.
They are both batter ways of showing discrete data. A line graph should show change over time which is not the data in this table.

2) How could Naseem use a line graph to compare the average temperatures in the different cities?
Children could suggest showing temperature changes over a week in each city and plotting them as separate lines on one graph.

1) Draw a time graph to show the change in temperature over seven days in Cairo, Egypt.

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Temperature in Celsius	33.5°C	32°C	31°C	34°C	34.5°C	36°C	37°C

2) a) What day was the temperature highest? _____

b) Between which two days did the temperature change the most? _____

c) What was the difference between the two lowest temperatures? _____

1) Look at this time graph showing the difference between the highest temperatures over seven days in two capital cities.

Tick the correct statements:

- ☐ The difference between the highest and lowest temperature shown in Reykjavik, is bigger than the highest and lowest temperature shown in Beijing.
- ☐ The difference between the two cities on day six was 18 degrees.
- ☐ The day with the smallest difference between the two cities were days four and five.

Carolina says, "The biggest temperature difference was 31 degrees."
Explain her mistake.

_____

_____

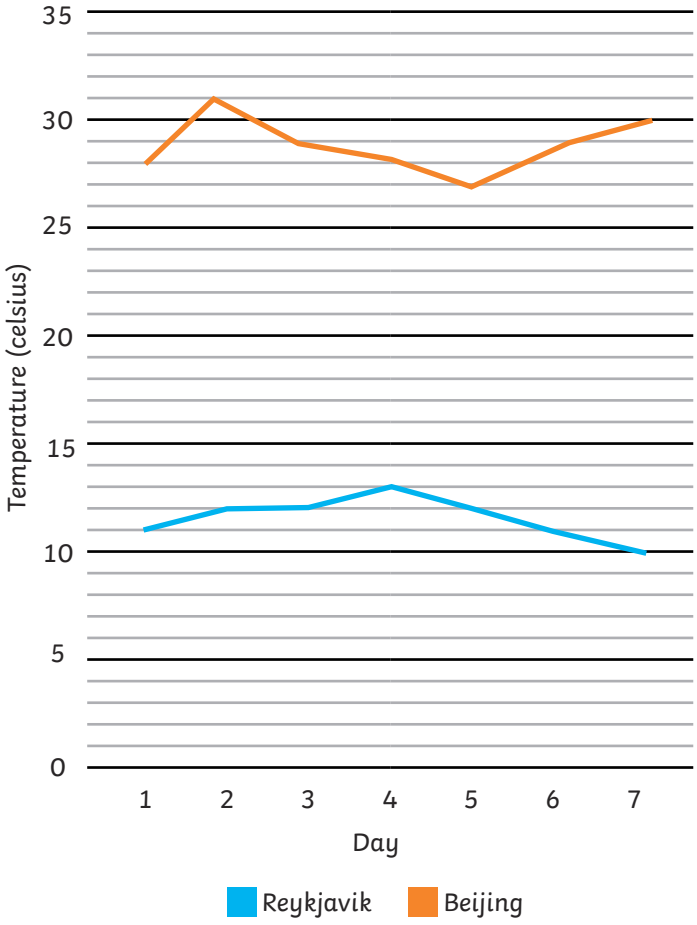
_____

What should she have done instead?

_____

_____

_____



1) Naseem collects data showing the average temperatures in 6 capital cities on the same day.

City	London	Paris	Beijing	Cairo	Canberra	Reykjavik
Temperature in Celsius	16°c	19°c	27°c	33°c	15°c	10°c

He says, "I should represent this as a line graph as temperature is a type of continuous data."
Is he correct?

How else could he represent his data?

Explain why you think this would better

2) How could Naseem use a line graph to compare the average temperatures in the different cities?

3) Research (or collect your own) temperature data about your town or city over a week and plot it as a line graph. Write 3 questions for a partner to answer from your graph.

1) Draw a time graph to show the change in temperature over seven days in Cairo, Egypt.

Day	Temperature in Celsius
Monday	33.5°C
Tuesday	32°C
Wednesday	31°C
Thursday	34°C
Friday	34.5°C
Saturday	36°C
Sunday	37°C

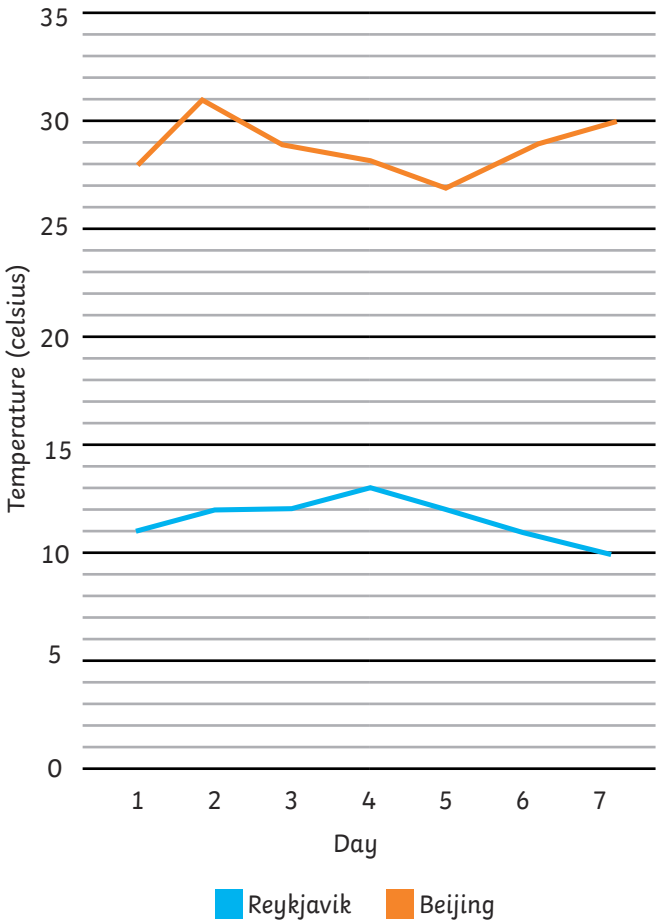
2) a) What day was the temperature highest?
b) Between which two days did the temperature change the most?
c) What was the difference between the two lowest temperatures?

1) Draw a time graph to show the change in temperature over seven days in Cairo, Egypt.

Day	Temperature in Celsius
Monday	33.5°C
Tuesday	32°C
Wednesday	31°C
Thursday	34°C
Friday	34.5°C
Saturday	36°C
Sunday	37°C

2) a) What day was the temperature highest?
b) Between which two days did the temperature change the most?
c) What was the difference between the two lowest temperatures?

1) Look at this time graph showing the difference between the highest temperatures over seven days in two capital cities.

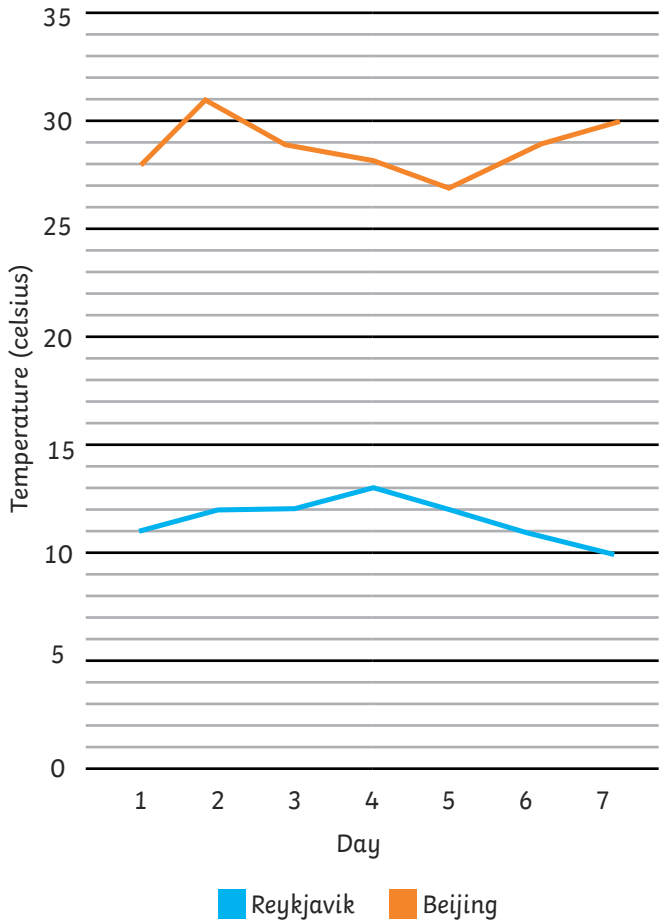


Tick the correct statements:

- ☐ The difference between the highest and lowest temperature shown in Reykjavik, is bigger than the highest and lowest temperature shown in Beijing.
- ☐ The difference between the two cities on day six was 18 degrees.
- ☐ The day with the smallest difference between the two cities were days four and five.

2) Carolina says, "The biggest temperature difference was 31 degrees."
Explain her mistake.
What should she have done instead?

1) Look at this time graph showing the difference between the highest temperatures over seven days in two capital cities.



Tick the correct statements:

- ☐ The difference between the highest and lowest temperature shown in Reykjavik, is bigger than the highest and lowest temperature shown in Beijing.
- ☐ The difference between the two cities on day six was 18 degrees.
- ☐ The day with the smallest difference between the two cities were days four and five.

2) Carolina says, "The biggest temperature difference was 31 degrees."
Explain her mistake.
What should she have done instead?

1) Naseem collects data showing the average temperatures in 6 capital cities on the same day.

City	Temperature in Celsius
London	16°C
Paris	19°C
Beijing	27°C
Cairo	33°C
Canberra	15°C
Reykjavik	10°C

He says, "I should represent this as a line graph as temperature is a type of continuous data."
Is he correct?
How else could he represent his data?
Explain why you think this would better.

2) How could Naseem use a line graph to compare the average temperatures in the different cities?

3) Research (or collect your own) temperature data about your town or city over a week and plot it as a line graph. Write 3 questions for a partner to answer from your graph.

1) Naseem collects data showing the average temperatures in 6 capital cities on the same day.

City	Temperature in Celsius
London	16°C
Paris	19°C
Beijing	27°C
Cairo	33°C
Canberra	15°C
Reykjavik	10°C

He says, "I should represent this as a line graph as temperature is a type of continuous data."
Is he correct?
How else could he represent his data?
Explain why you think this would better.

2) How could Naseem use a line graph to compare the average temperatures in the different cities?

3) Research (or collect your own) temperature data about your town or city over a week and plot it as a line graph. Write 3 questions for a partner to answer from your graph.

Paris Temperature Graph Board Game

START

1st May
19°C

2nd May
17°C

3rd May
16°C

4th May
18°C

5th May
19°C

6th May
20°C

7th May
16°C

8th May
17°C

9th May
21°C

10th May
20°C

11th May
15°C

12th May
17°C

13th May
19°C

14th May
23°C

15th May
21°C

16th May
18°C

17th May
20°C

18th May
16°C

19th May
17°C

20th May
18°C

21st May
19°C

22nd May
20°C

23rd May
21°C

24th May
22°C

25th May
23°C

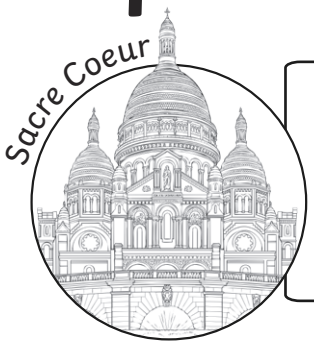
26th May
22°C

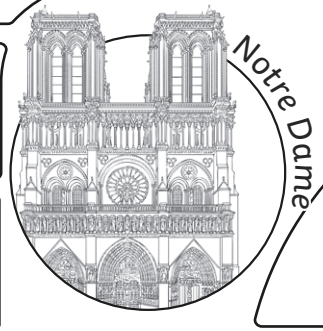
27th May
21°C

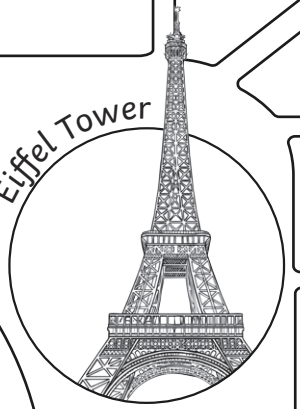
28th May
19°C

29th May
17°C

FINISH



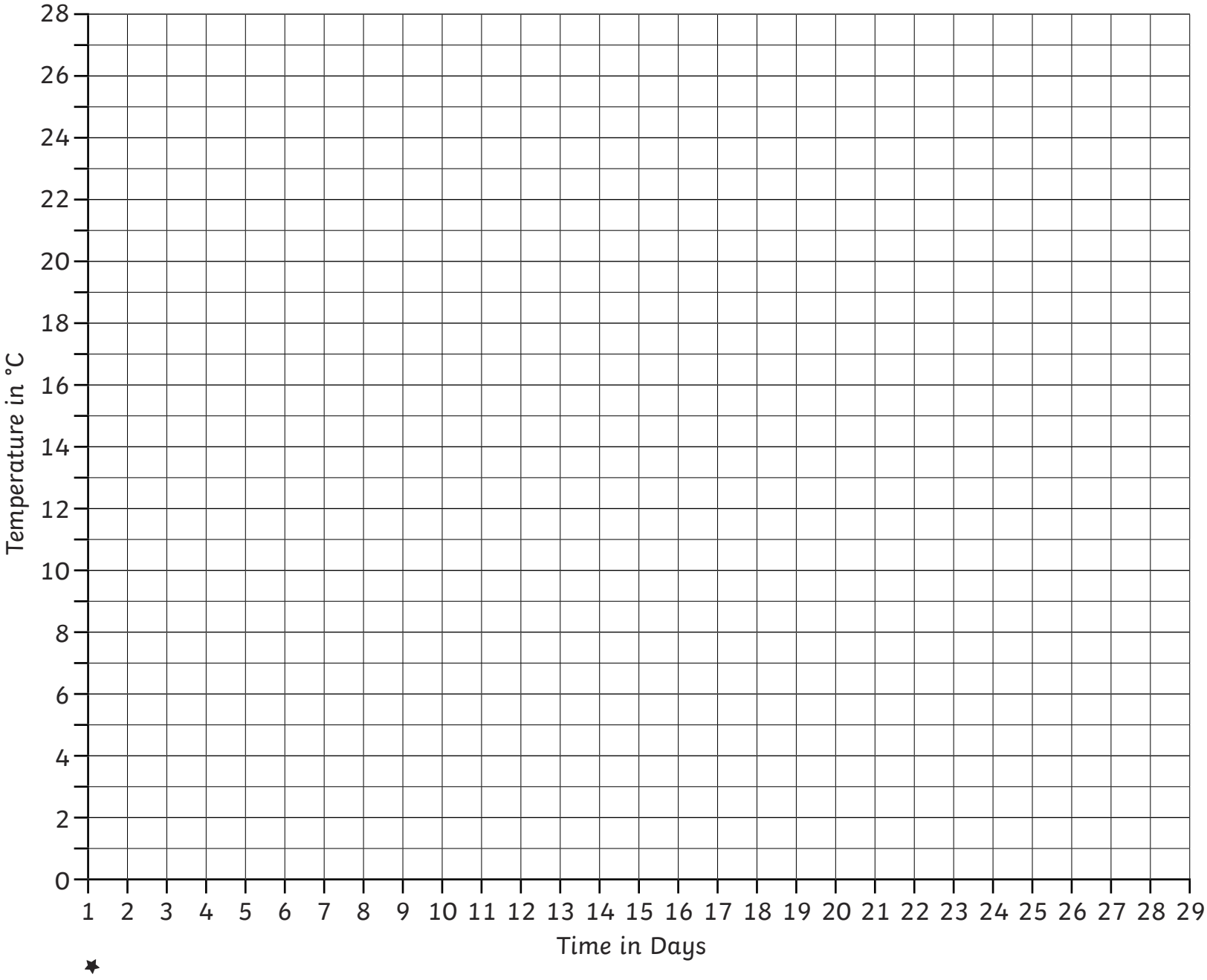




How to Play

1) On your turn, roll the dice and move your counter forward the number rolled.
2) Transfer the data about the temperature of Paris from the square you land on to the time graph.
3) Continue until you both reach the finish.
4) Discuss the graph you have created using the suggested questions.

A Time Graph to Show the Daily Temperature in Paris over the Month of May



Questions to Discuss

What was the warmest day of the month in Paris?

What was the coolest day of the month in Paris?

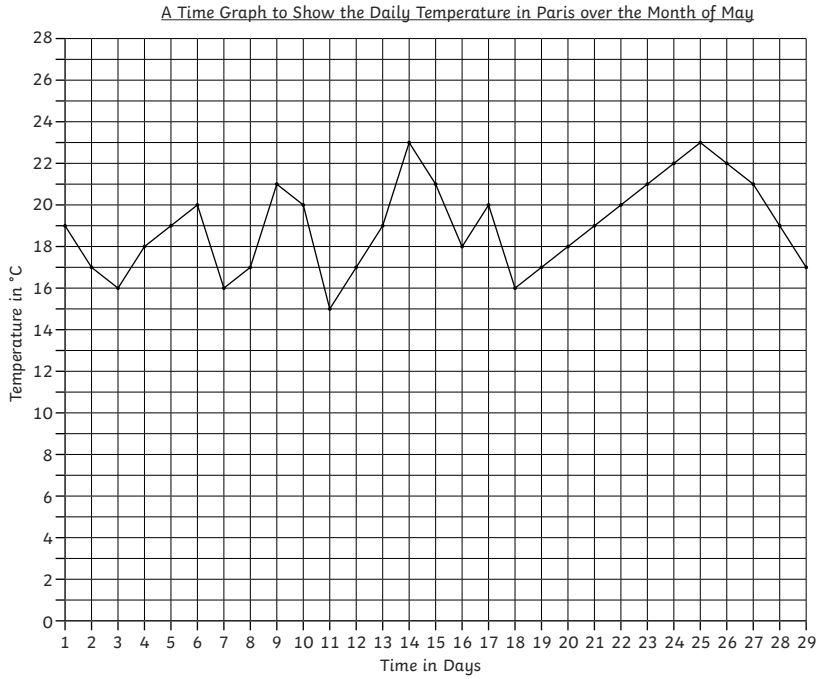
What was the difference in the temperature between the warmest and coolest day?

Did the temperature in Paris get warmer or colder over the first half of the month?

How would you describe the weather in Paris during May? Can you identify days where the weather might have been sunny or cloudy?

Paris Temperature Graph Board Game **Answers**

Question	Answer
Transfer the data about the temperature of Paris from the square you land on to the time graph.	



What was the warmest day of the month in Paris?
14th and 25th May
What was the coolest day of the month in Paris?
11th May
What was the difference in the temperature between the warmest and coolest day?
8°C
Did the temperature in Paris get warmer or colder over the first half of the month?
Overall, it got warmer but some days were colder.
How would you describe the weather in Paris during May? Can you identify days where the weather might have been sunny or cloudy?
Multiple answers

Statistics | Capital City Temperatures

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 | Capital City Temperatures

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 | Capital City Temperatures

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 | Capital City Temperatures

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 | Capital City Temperatures

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 | Capital City Temperatures

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 | Capital City Temperatures

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 | Capital City Temperatures

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.		