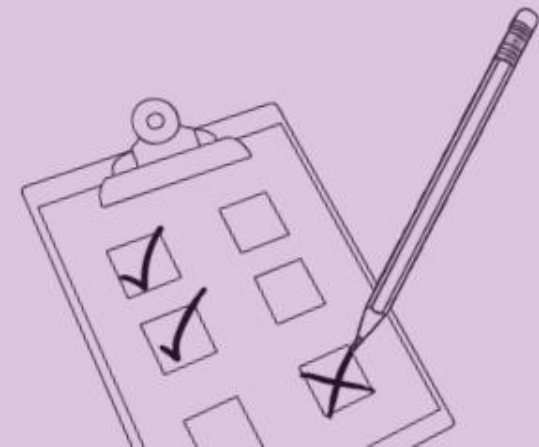
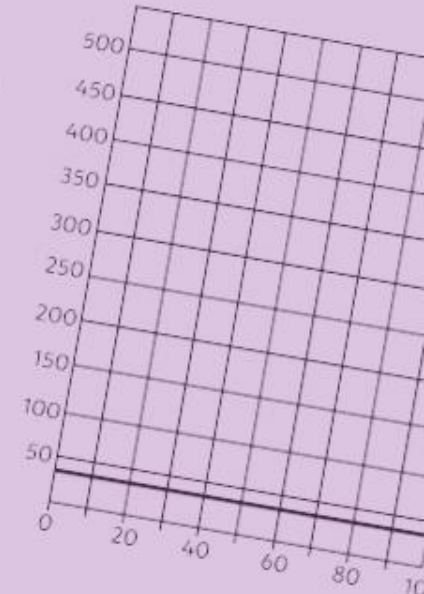
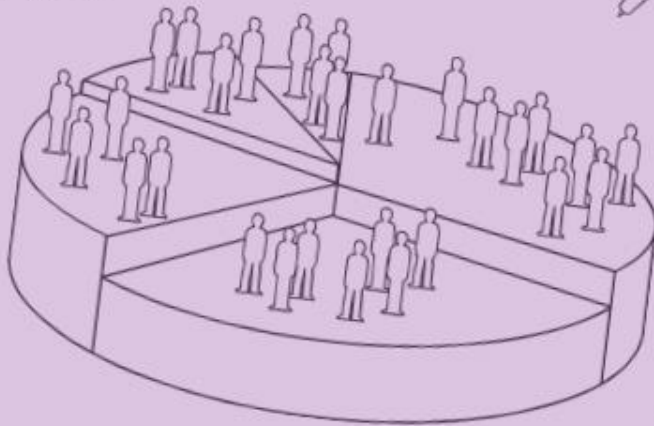


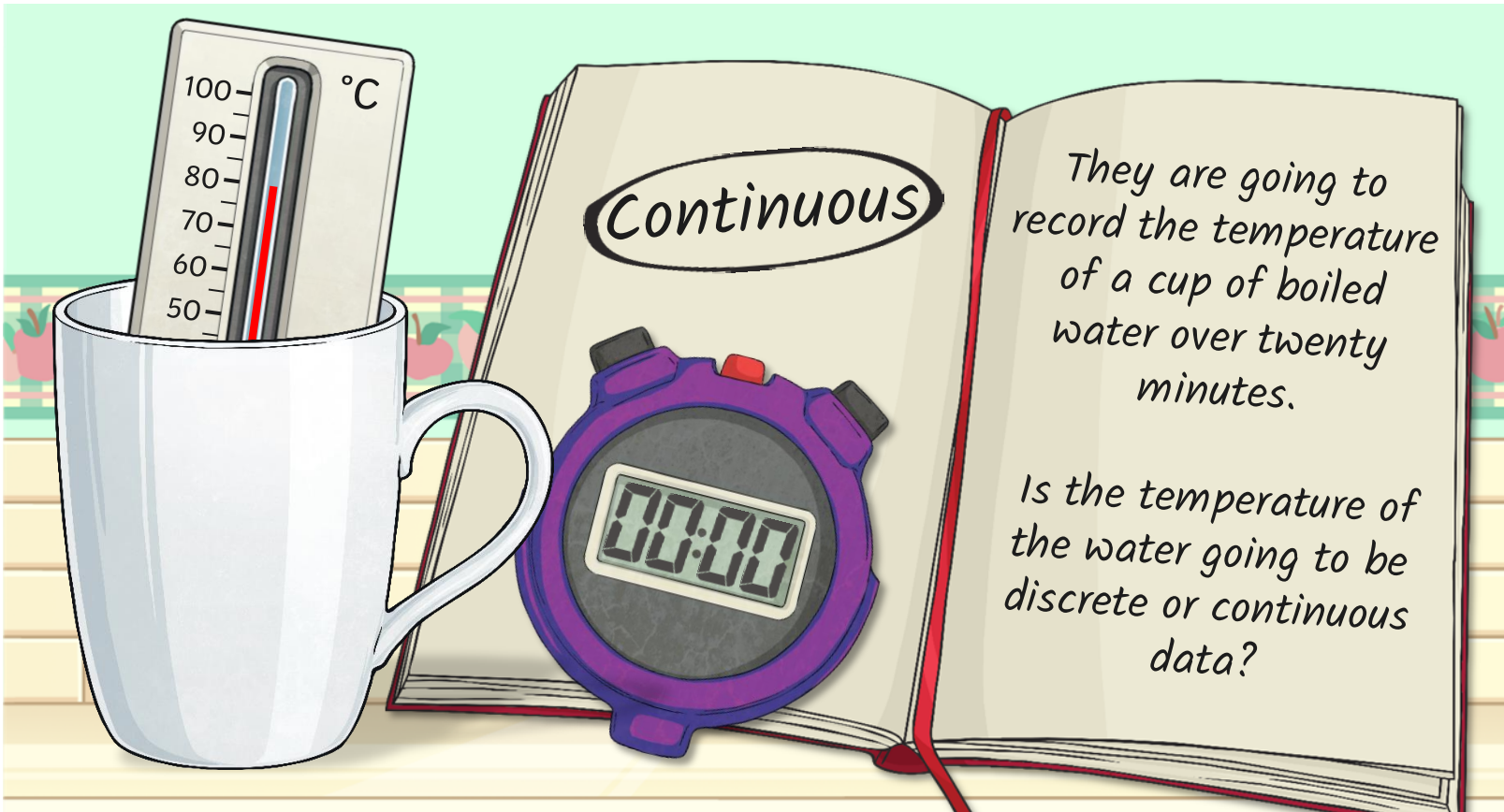
# Hot Drinks Line Graphs



# Temperature Investigation



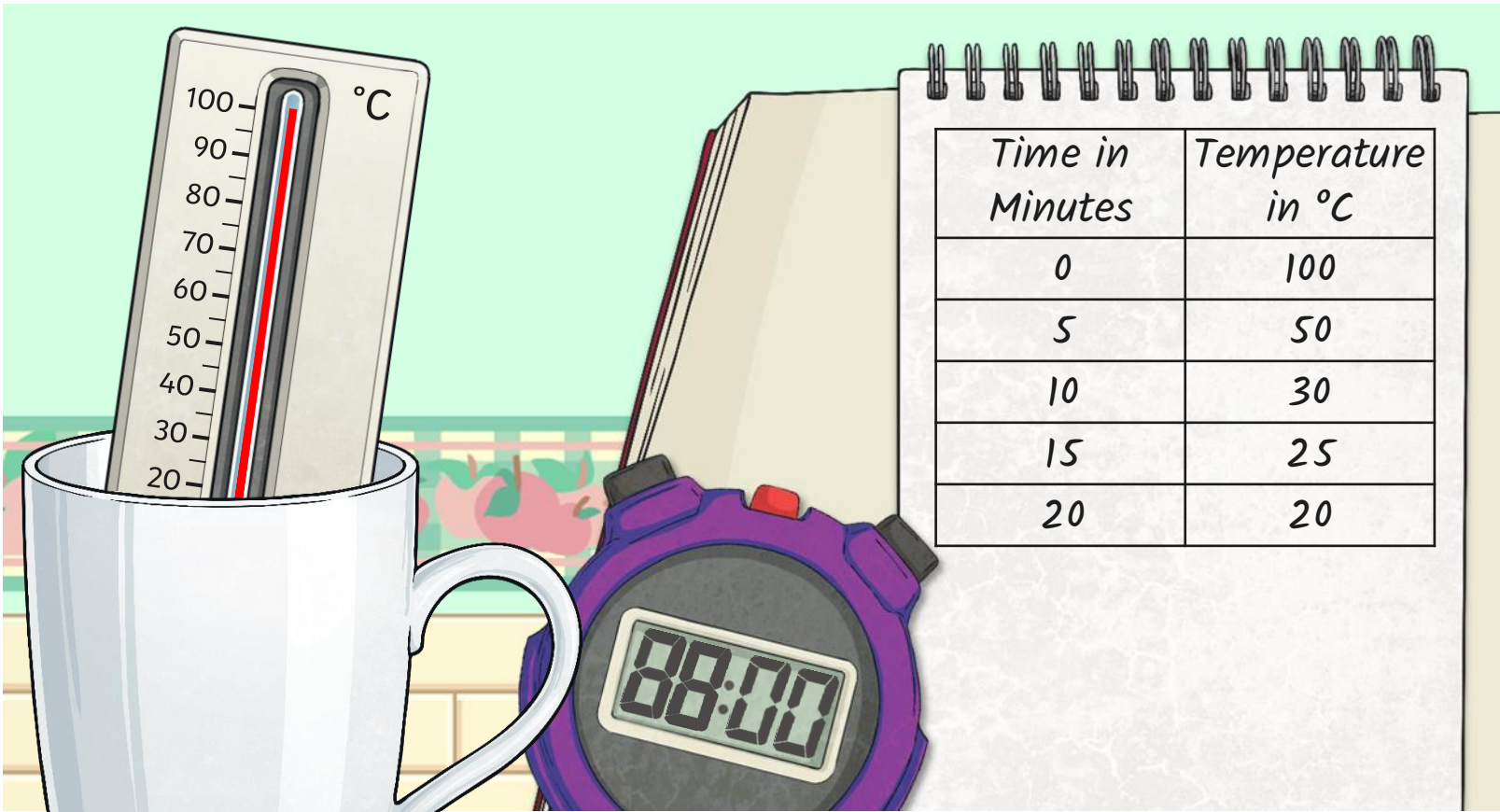
In their science lesson, Class 5 are investigating how the temperature of boiled water changes over time.



# Temperature Investigation



Complete the table showing the results of Class 5's science investigation.



# Temperature Investigation



The children from Class 5 wrote four questions about their data.  
Can you answer them?

*By how many degrees did the water cool over the first five minutes?*

*By how many degrees did the water cool from the tenth minute to the fifteenth minute?*

*By how many degrees did the water cool over the twenty minutes?*

<i>Time in Minutes</i>	<i>Temperature in °C</i>
0	100
5	50
10	30
15	25
20	20

# Temperature over Time



Class 5 repeat their investigation, but this time they record the change in temperature of a cup of coffee over 20 minutes.

Time in Minutes	Temperature in °C
0	84
5	40
10	27
15	23
20	21

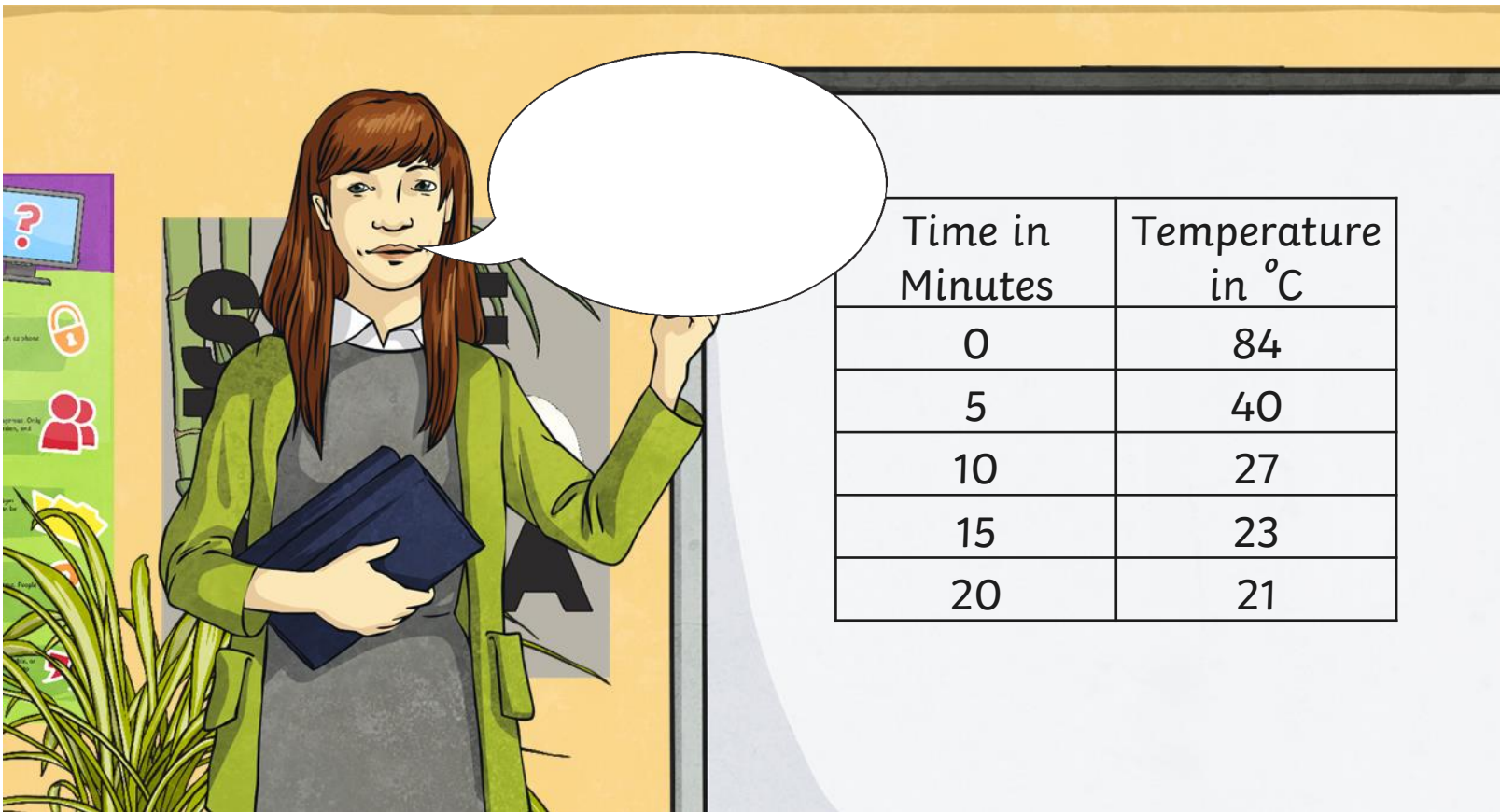
*The time data is called the independent variable.*

*The temperature data is called the dependent variable.*

*How do you think this data could be shown as a graph?*

# Line Graphs

Class 5's teacher, Mrs Chambers, explains to her class that they can draw a line graph of the data.



# Line Graphs

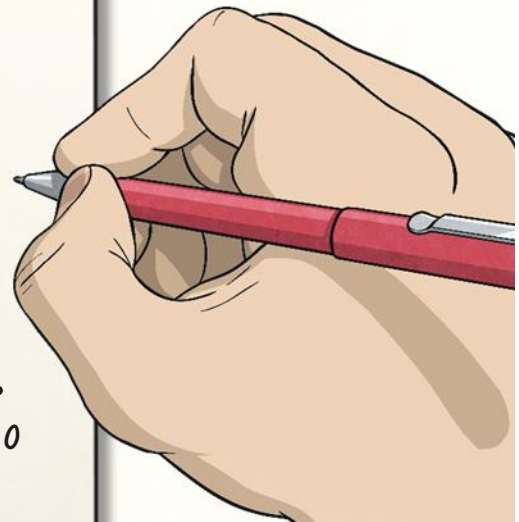
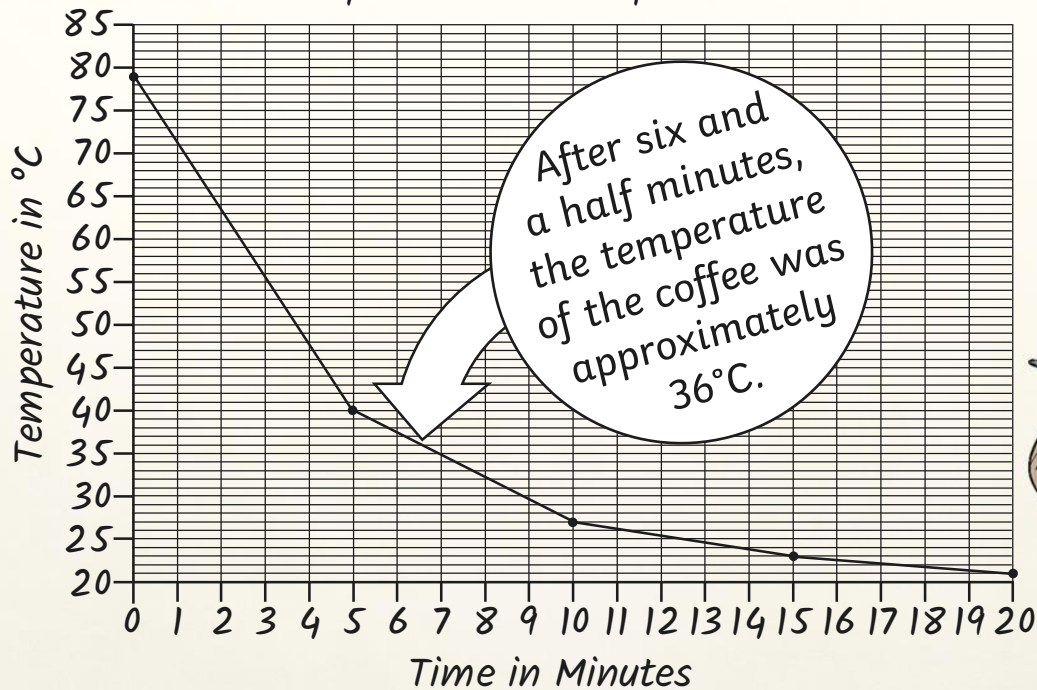
A line graph has a horizontal axis.

In this investigation, the horizontal axis is showing time in minutes.

A line graph also has a vertical axis.

In this investigation, the vertical axis is showing temperature in  $^{\circ}\text{C}$ .

A Line Graph to Show the Change in Temperature of a Cup of Coffee





A line graph can also be used to give us data between the plotted measurements.

Data is plotted on to a line graph in the same way as a coordinate grid. These data plots are then joined with straight lines.

The line shows us visually how the temperature of the coffee changed.

Using the line graph, we can get approximate temperatures of the coffee at any time over the 20 minutes, not just at five minute intervals.

We can see that the temperature of the coffee dropped more quickly at the start of the twenty minutes than at the end.

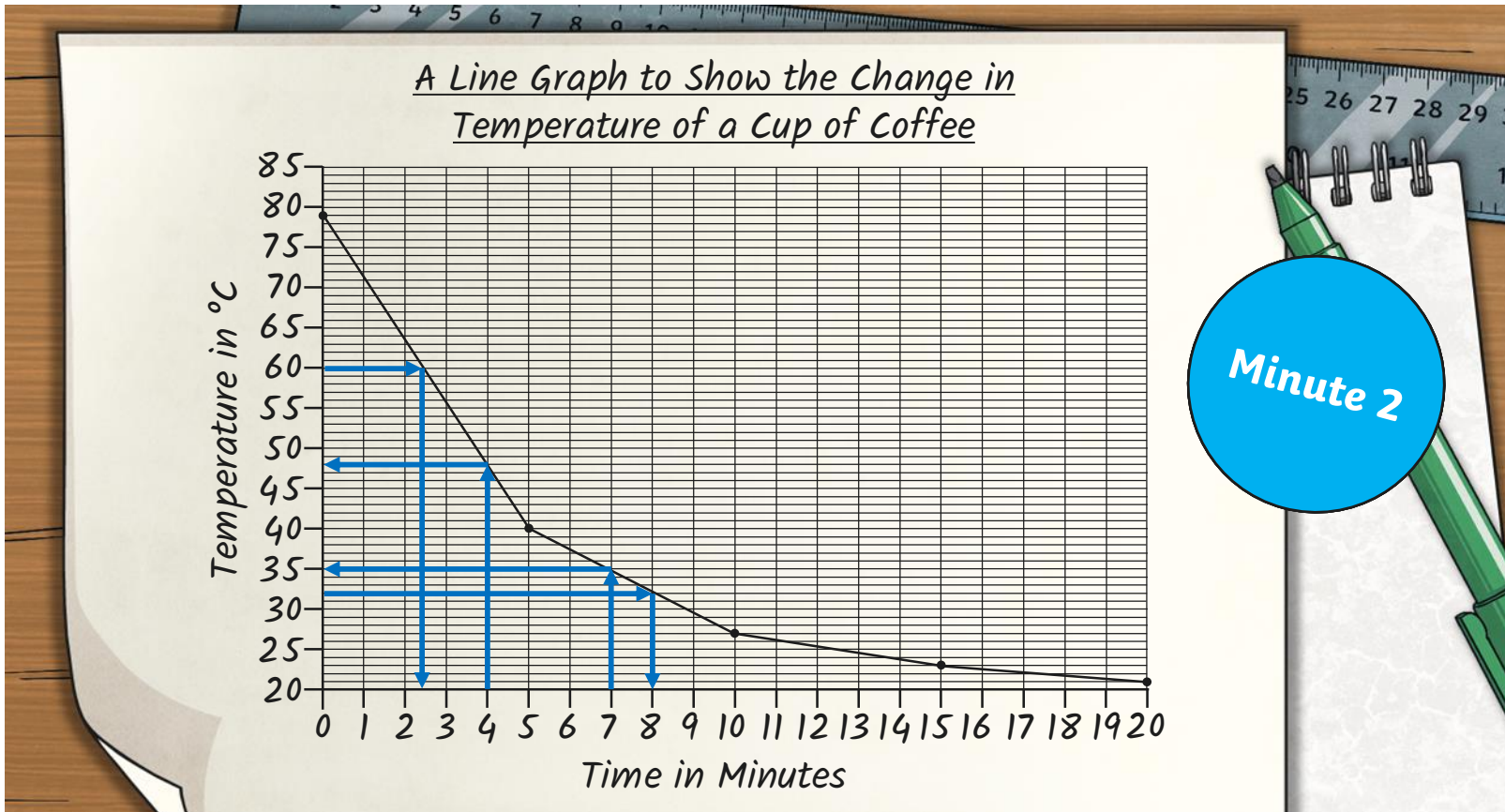


# Line Graph Questions

What was the temperature of the coffee at minute 4 of the investigation?

What was the temperature of the coffee at minute 7 of the investigation?

At which minute of the investigation was the temperature of the coffee  $32^{\circ}\text{C}$ ?



Minute 2

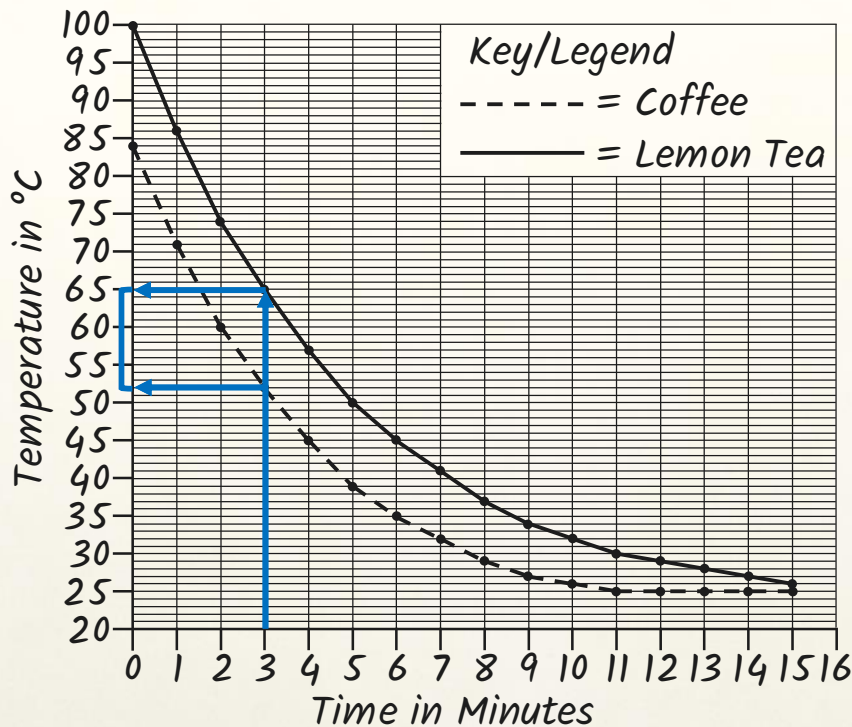
# Line Graph Challenge

Finally, Mrs Chambers shows the children a line graph which shows the change in temperature of two different hot drinks.

Which drink had a higher temperature at minute 3?

What was the difference in temperature of the two hot drinks at minute 3?

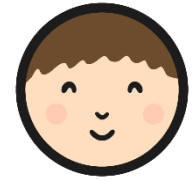
A Line Graph to Show the Change in Temperature of a Cup of Coffee and a Cup of Lemon Tea



13°C



# Hot Drinks Line Graphs



Use your marvellous maths skills to complete these activity sheets:

## Hot Drinks Line Graphs

I can answer questions about data presented in a line graph.

A Line Graph to Show the Change in Temperature of a Cup of Hot Chocolate

Time (min)	Coffee (°C)	Hot Chocolate (°C)
0	85	70
1	78	68
2	72	65
3	68	62
4	65	60
5	62	58
6	60	56
7	58	55
8	56	54
9	55	53
10	54	52
11	53	51
12	52	50
13	51	49
14	50	48
15	49	47

- During which minute was the temperature of the coffee 50°C?
- By how many degrees did the temperature of the hot chocolate cool from minute 5 to minute 8?
- Approximately how long did it take the temperature of the coffee to drop by 10°C?
- For how long was the temperature of the hot chocolate between 40°C and 30°C?
- Which drink had a warmer temperature at minute 10?
- Which drink had more by minute 10?
- What was the difference in temperature between the coffee and hot chocolate at minute 5?
- What was the difference in temperature between the coffee and hot chocolate at minute 8?
- What is the difference in temperature between the coffee and hot chocolate at minute 10?

## Hot Drinks Line Graphs

I can answer questions about data presented in a line graph.

A Line Graph to Show the Change in Temperature of a Cup of Hot Chocolate

Time (min)	Hot Chocolate (°C)
0	75
1	72
2	70
3	68
4	66
5	64
6	62
7	60
8	58
9	56
10	54
11	52
12	50
13	48
14	46
15	44

- What was the temperature of the hot chocolate at the start of the investigation?
- What was the temperature of the hot chocolate at minute 6?
- What was the temperature of the hot chocolate at approximately 30 seconds?
- During which minute was the temperature 68°C?
- By how many degrees did the temperature of the hot chocolate cool from minute 3 to minute 6?
- By how many degrees did the temperature of the hot chocolate cool from minute 7 to minute 10?
- How long did it take the temperature of the hot chocolate to drop by 20°C?
- By how many degrees did the temperature of the hot chocolate cool altogether?
- For approximately how long was the temperature of the hot chocolate between 50°C and 40°C?

## Hot Drinks Line Graphs

I can answer questions about data presented in a line graph.

A Line Graph to Show the Change in Temperature of a Cup of Hot Chocolate

Time (min)	Hot Chocolate (°C)
0	65
1	62
2	60
3	58
4	56
5	54
6	52
7	50
8	48
9	46
10	44
11	42
12	40
13	38
14	36
15	34

- What was the temperature of the hot chocolate at minute 10?
- What was the temperature of the hot chocolate at minute 3?
- At which minute was the temperature 42°C?
- By how many degrees did the temperature of the hot chocolate cool from minute 2 to minute 3?
- By how many degrees did the temperature of the hot chocolate cool from minute 5 to minute 10?
- By how many degrees did the temperature of the hot chocolate cool from minute 5 to minute 6?
- What was the temperature of the hot chocolate at the start of the investigation?
- Approximately, how long did it take the hot chocolate to drop to half of its starting temperature?
- By how many degrees did the temperature of the hot chocolate cool altogether?

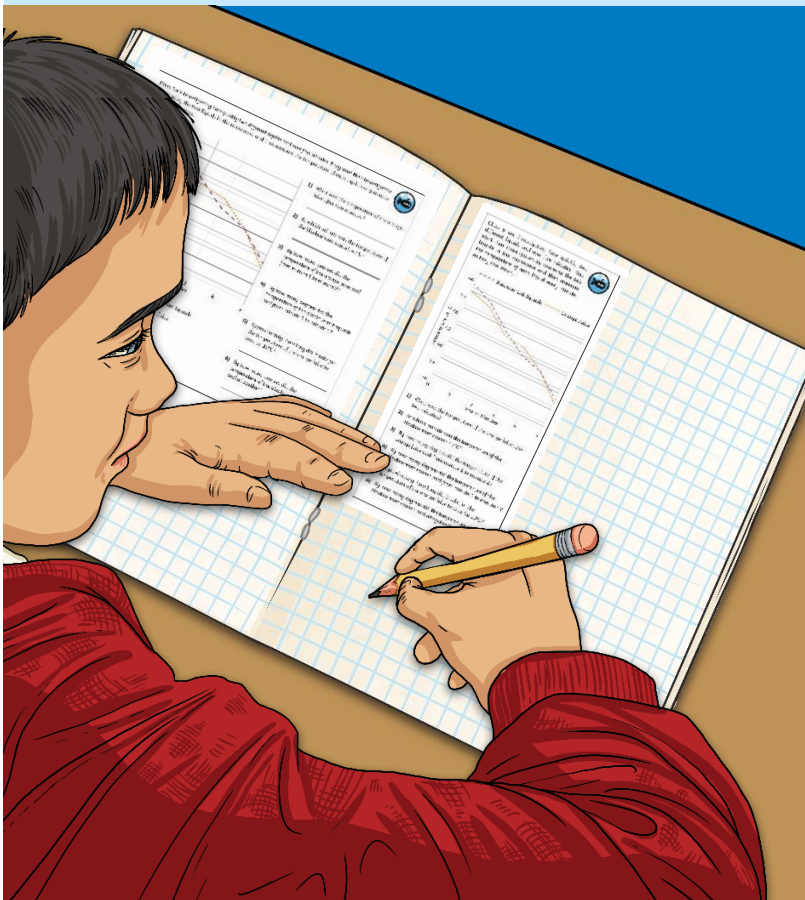
Maths | Year 5 | Statistics | Line Graphs | Lesson 1 of 6 | Hot Drinks Line Graphs

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## Diving into Mastery

Dive in by completing your own activity!



Class 5 are investigating how quickly two different liquids cool over five minutes. They start their investigation by warming the two liquids in the microwave and then measure the temperature of each liquid every minute as they cool down.



- 1) What was the temperature of the orange juice after two minutes?
- 2) At which minute was the temperature of the blackcurrant squash 47°C?
- 3) By how many degrees did the temperature of the orange juice cool from minute 1 to minute 2?
- 4) By how many degrees did the temperature of the blackcurrant squash cool from minute 3 to minute 4?
- 5) Approximately, how long did it take for the temperature of the orange juice to drop by 10°C?
- 6) By how many degrees did the temperature of the blackcurrant squash cool altogether?

Class 5 are investigating how quickly two different liquids cool over five minutes. They start their investigation by warming the two liquids in the microwave and then measure the temperature of each liquid every minute as they cool down.



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- 6) By how many degrees did the temperature of the blackcurrant squash cool altogether?

1) What was the temperature of the orange juice after two minutes?

2) At which minute was the temperature of the blackcurrant squash 47°C?

3) By how many degrees did the temperature of the orange juice cool from minute 1 to minute 2?

4) By how many degrees did the temperature of the blackcurrant squash cool from minute 3 to minute 4?

5) Approximately, how long did it take for the temperature of the orange juice to drop by 10°C?

6) By how many degrees did the temperature of the blackcurrant squash cool altogether?



# Soup Temperature Reveal



Choose a question to answer about the line graph. Click on the box once to check your answer and then again to reveal a part of the picture!

*A Line Graph to Show the Change in Temperature of a Saucepan of Soup*

Time in Minutes	Temperature in °C
0	25
1	27.5
2	30
3	32.5
4	35
5	37.5
6	40
7	42.5
8	45
9	47.5
10	50

Questions on the cards:

- What was the temperature at minute 10?
- What was the temperature increase over ten minutes?
- What was the temperature at minute 5?
- At what minute was the temperature 33°C?
- What was the temperature increase over the first five minutes?
- At what minute was the temperature 37°C?
- What was the temperature at minute 6?
- What was the temperature increase over the final minute?
- At what minute was the temperature 57°C?
- What was the temperature increase over the first two minutes?
- What was the temperature at minute 8?
- What was the temperature at minute 1?