1) a) 9:00 = 8km/hr
14:00 = 15km/hr
difference = 7km/hr

b) 08:00 to 13:00 = 5 hours

c) 9 km/hr – 5km/hr = 4km/hr

d) 12:45

2) a) sunflower 1 = 96cm
sunflower 2 = 90cm
difference = 6cm

b) sunflower 1 = 65cm
sunflower 2 = 62cm

c) week 6 = 10cm difference

d) sunflower 1: 90cm – 71cm = 19cm
growth of sunflower 2: 80cm – 67cm = 13cm

Sunflower 1 grew the most, growing 6cm more than sunflower 2.

1) a) True. Coffee started with the higher temperature of 84°C and ended with the higher temperature of 25°C.

b) False. At approximately $1\frac{1}{2}$ minutes and 12 minutes, the temperatures of the two drinks was the same.

c) True. This difference occurred on minute 5.

d) True. The coffee dropped by 59°C and the tea dropped by 49°C.

e) False. It took the coffee 4 minutes to reach 45°C and it took the tea approximately $5\frac{1}{2}$ minutes to reach 45°C. Therefore, the difference is more than 1 minute.

f) False.

53°C – 32°C = 21°C

1) a) This line graph does not match the description for the following reasons:

If the balloon had been anchored to the ground before 9:00am, its height in metres at 8:00am would have been 0m, not 120m.

If the balloon rose gradually into the air, the graph would have shown its height increasing, not decreasing.

If the balloon returned to the ground after 6 hours, the graph would have shown its height then as 0m.

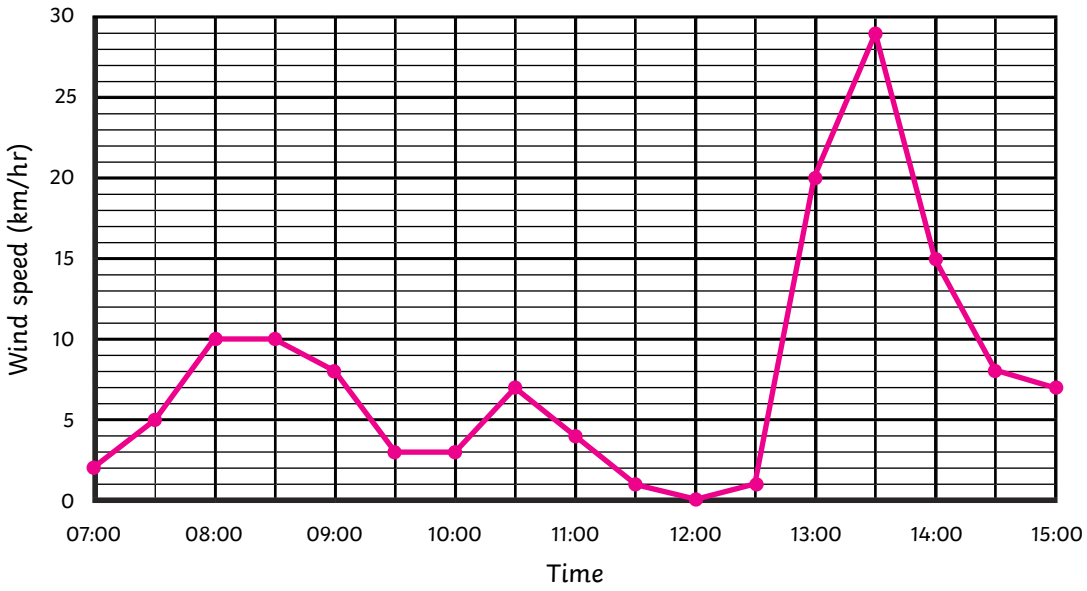
b) This line graph does not match the description because it shows that the temperature increased again after 14:00 instead of gradually cooling and remaining at a steady, lower temperature.

c) This line graph does match the description because the water level in the water butt decreases from 8:00 as it is used to water the plants at the garden centre over the day but at 14:00 the water level begins to increase again as water is added to the water butt.

2) Descriptions and line graphs will vary. Accept answers where only one of the descriptions is a correct match to the line graph drawn by the child.

1)

A Line Graph to Show Wind Speed over Time



a) What was the difference in wind speed at 9:00 compared to 14:00? _____

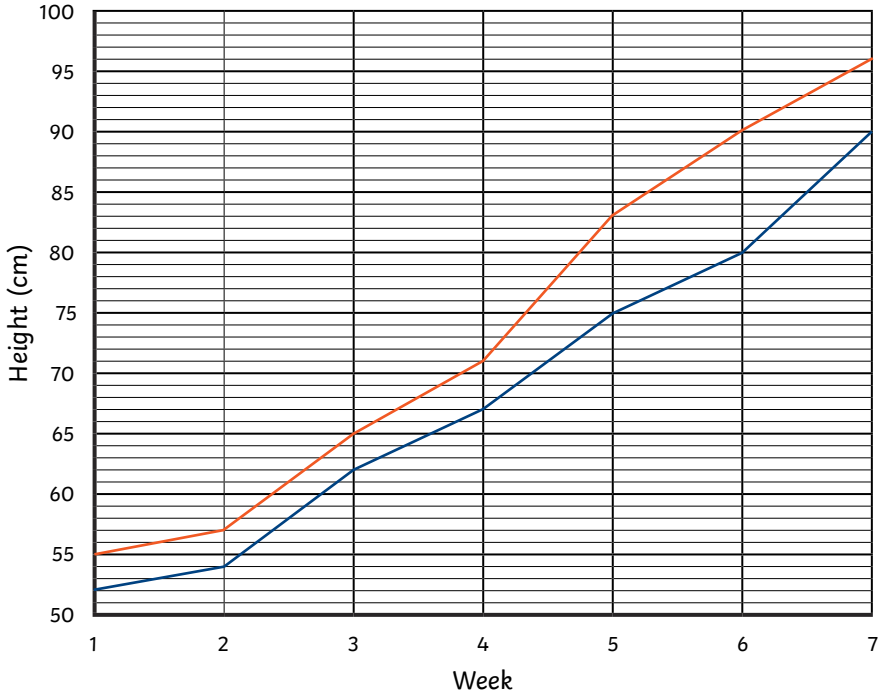
b) How many hours did it take for the wind speed to become twice as fast as it had been at 08:00? _____

c) How much did the wind speed decrease between 08:45 and 10:15 _____

d) At what time did the wind speed first reach 11km/hr? _____

2)

A Line Graph to Show the Height of Two Sunflowers over Time



Key/Legend

= height of sunflower 1

= height of sunflower 2

a) How much taller had sunflower 1 grown than sunflower 2 by the end of the time shown?

_____

b) What height had each sunflower reached after 3 weeks?

_____

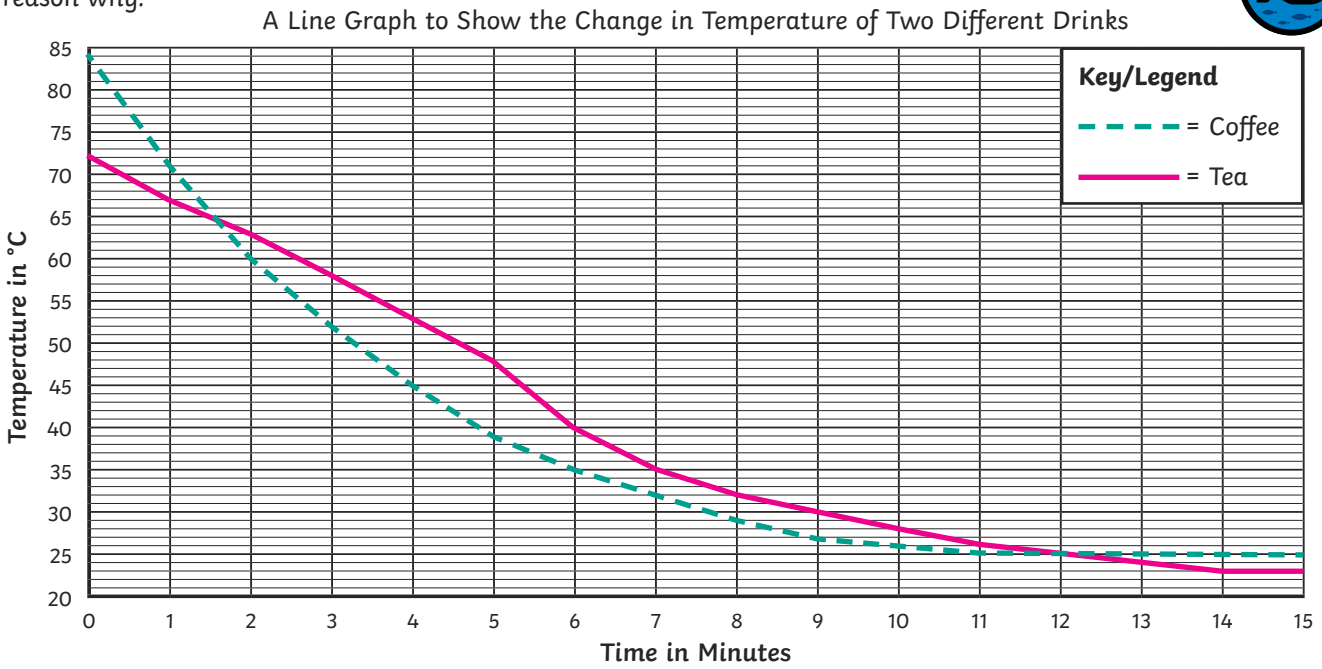
c) In which week was the difference in height between the sunflowers the greatest? Give the difference in centimetres.

_____

d) Compare the growth of both sunflowers from the start of week 4 to the end of week 5. Which sunflower grew the most and by how much?

_____

1) Decide if the statements about the line graph are true or false. If they are false, explain the reason why.



a) The drink that started with the higher temperature ended the 15 minutes with the higher temperature.

b) The two drinks never had the same temperature at the same time.

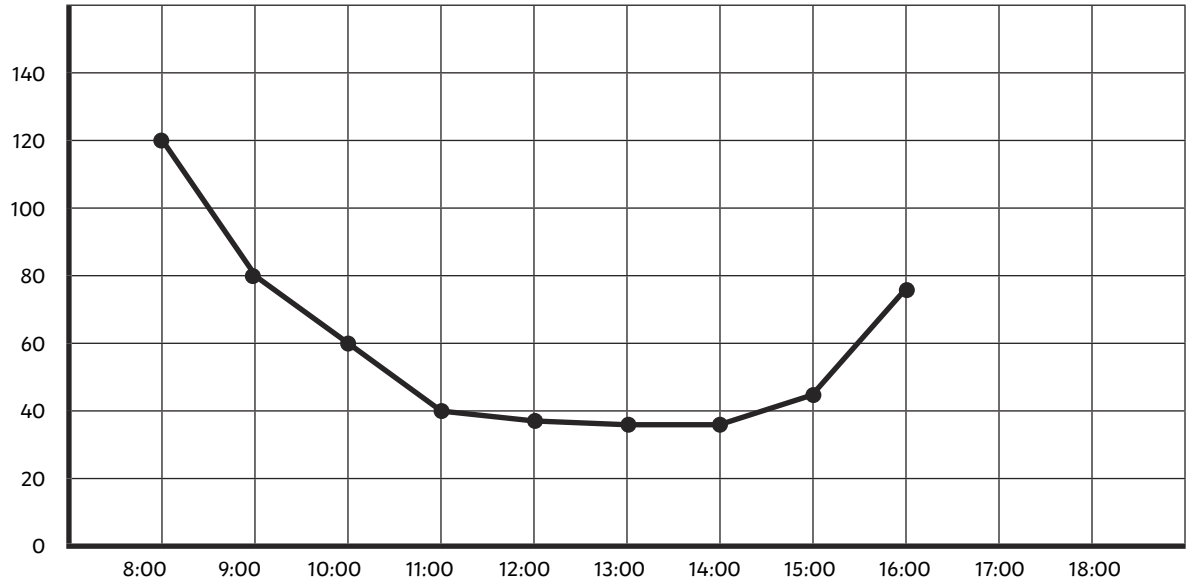
c) The greatest difference between the temperature of the two drinks after they started cooling was 9°C.

d) The coffee dropped more in temperature over the 15 minutes than the tea.

e) It took 1 minute longer for the tea to reach 45°C than it did the coffee.

f) From minute 4 to minute 8, the tea's temperature changed by 23°C.

1)

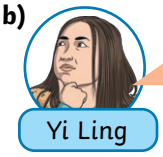


These children described a line graph before the title and the labels of the axes were removed. Which of their descriptions could have been about this line graph? Under each description, give reasons to explain why you think their description matches or does not match the line graph.

a)

My line graph shows the journey of a hot-air balloon. The y-axis is labelled 'Height in Metres'. The balloon was anchored to the ground before it took off at 9:00. It then left the ground and rose into the air gradually. After 6 hours in the air, the hot-air balloon returned to the ground.

b)

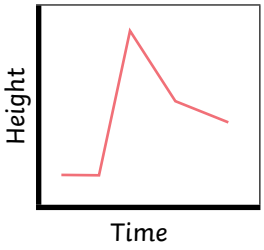


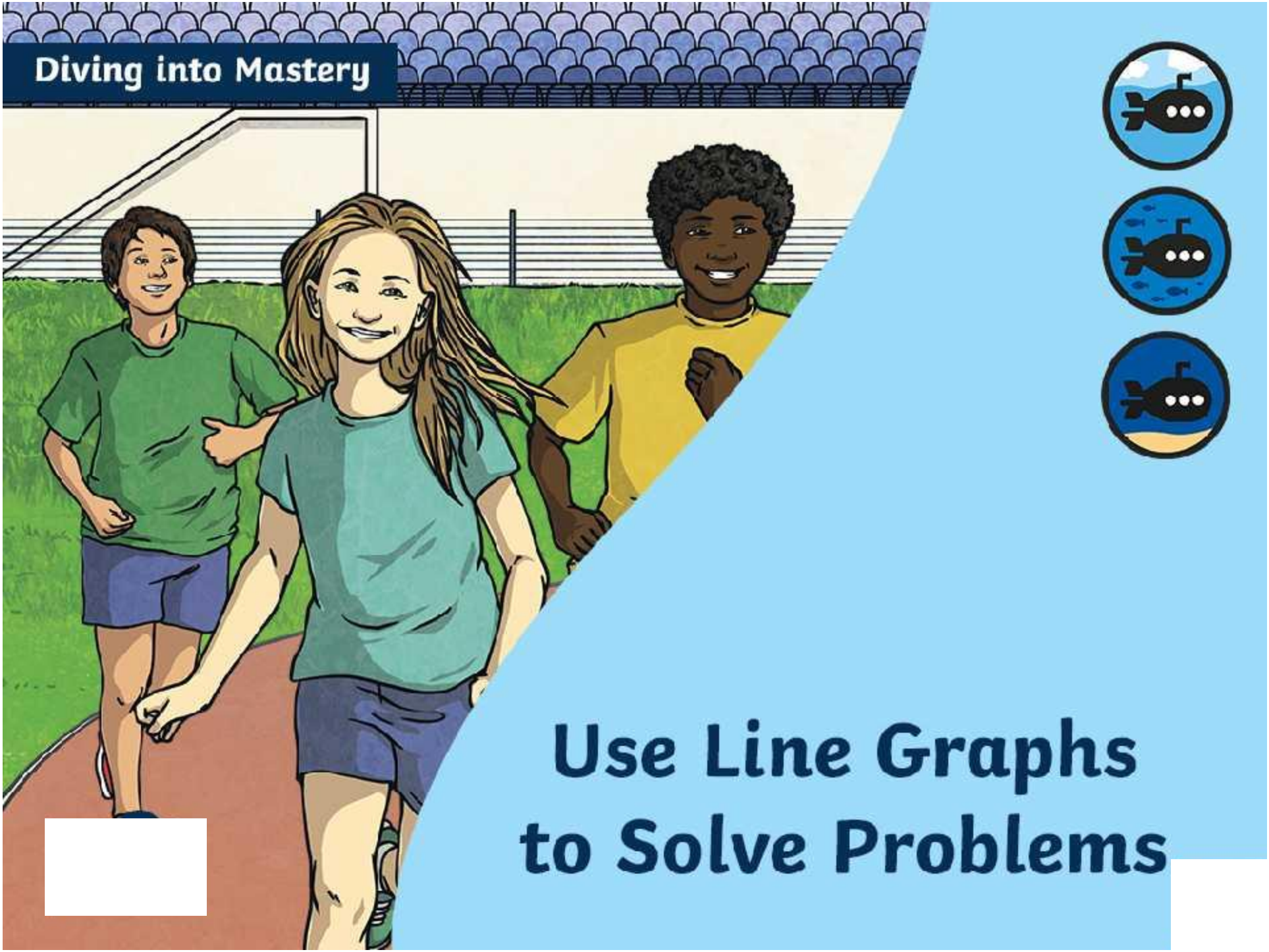
My line graph shows the temperature of a cup of coffee. The y-axis is labelled 'Temperature in °F'. The cup of coffee was made at 8:00 and cooled off gradually over the next few hours until it reached a steady, lower temperature.

c)

My line graph shows the amount of water in a garden centre's water butt. The y-axis is labelled 'Volume of Water in Litres'. Water was taken out of the butt from 8:00 and used throughout the day to water the plants in the garden centre. The butt was topped up from a hosepipe between 14:00 and 16:00 until the garden centre closed.

2) Draw a fully-labelled line graph, like the example, that could describe the journey of a hot-air balloon. Label the x-axis 'Time' and the y-axis 'Height'. Then, write two different descriptions: one that matches your line graph and one that is incorrect. Challenge a friend to spot which of the descriptions correctly matches the line graph and explain why.




Diving into Mastery
Use Line Graphs
to Solve Problems

Diving into Mastery Guidance for Educators

Each activity sheet is split into three sections, diving, deeper and deepest, which are represented by the following icons:

Diving

Deeper

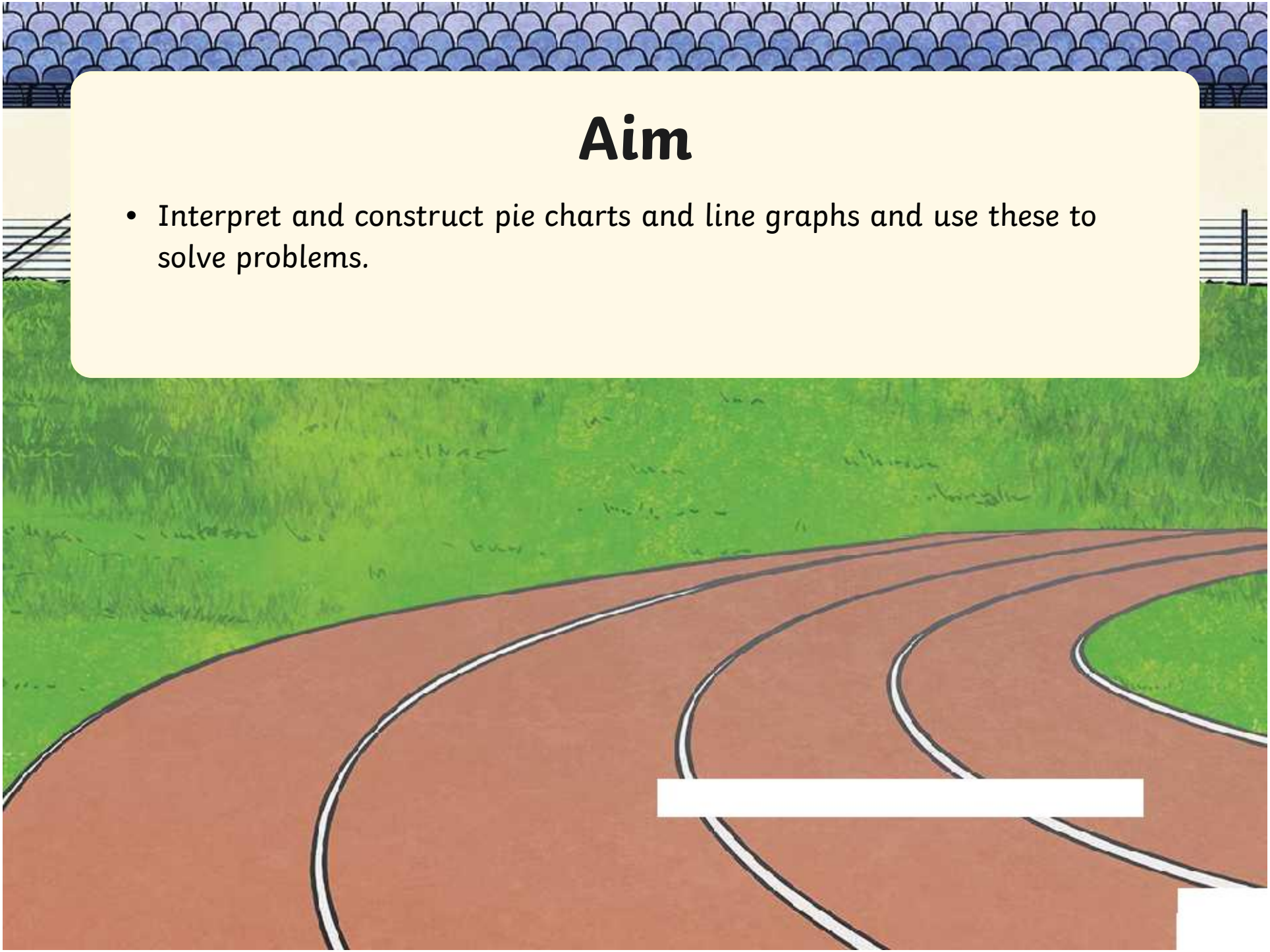
Deepest

These carefully designed activities take your children through a learning journey, initially ensuring they are fluent with the key concept being taught; then applying this to a range of reasoning and problem-solving activities.

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.

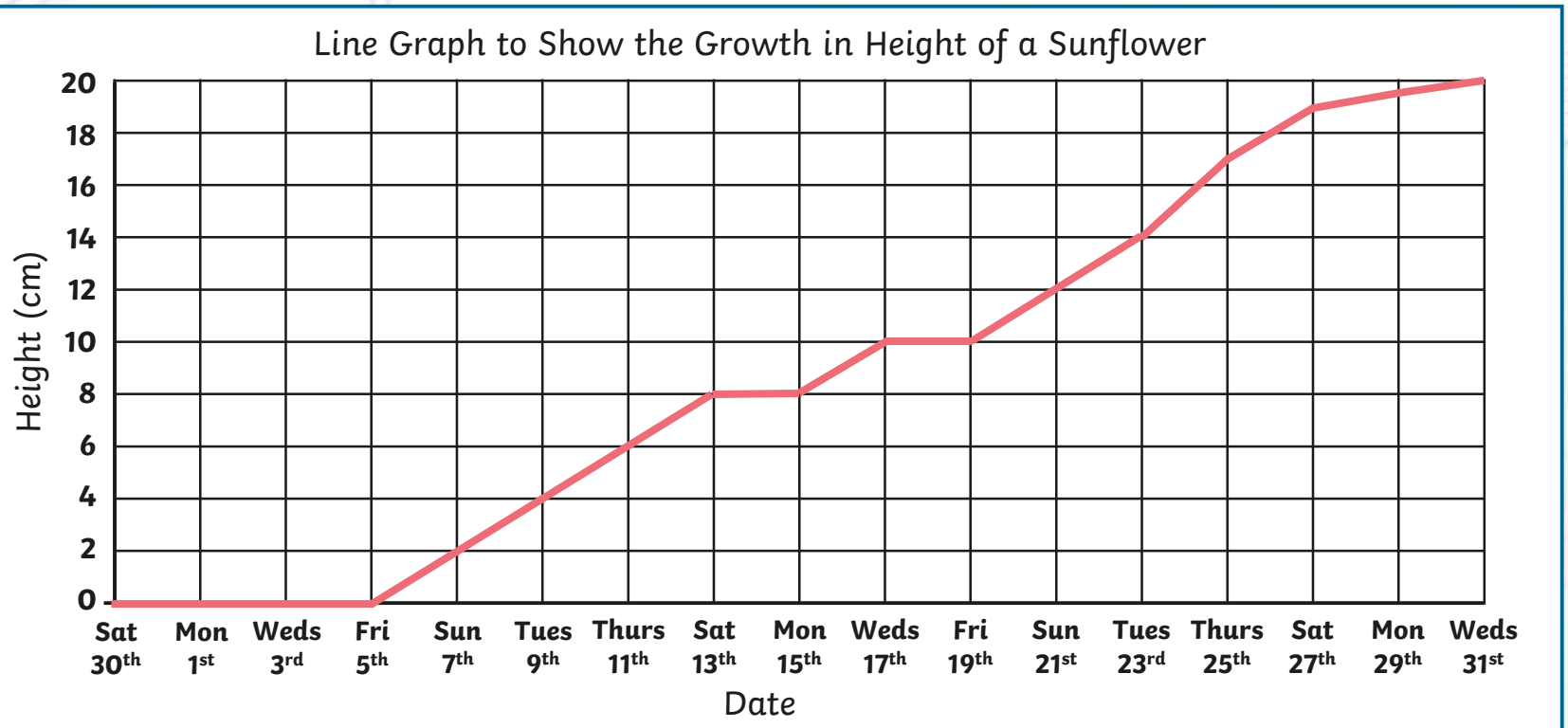
Aim

- Interpret and construct pie charts and line graphs and use these to solve problems.



Use Line Graphs to Solve Problems

Diving

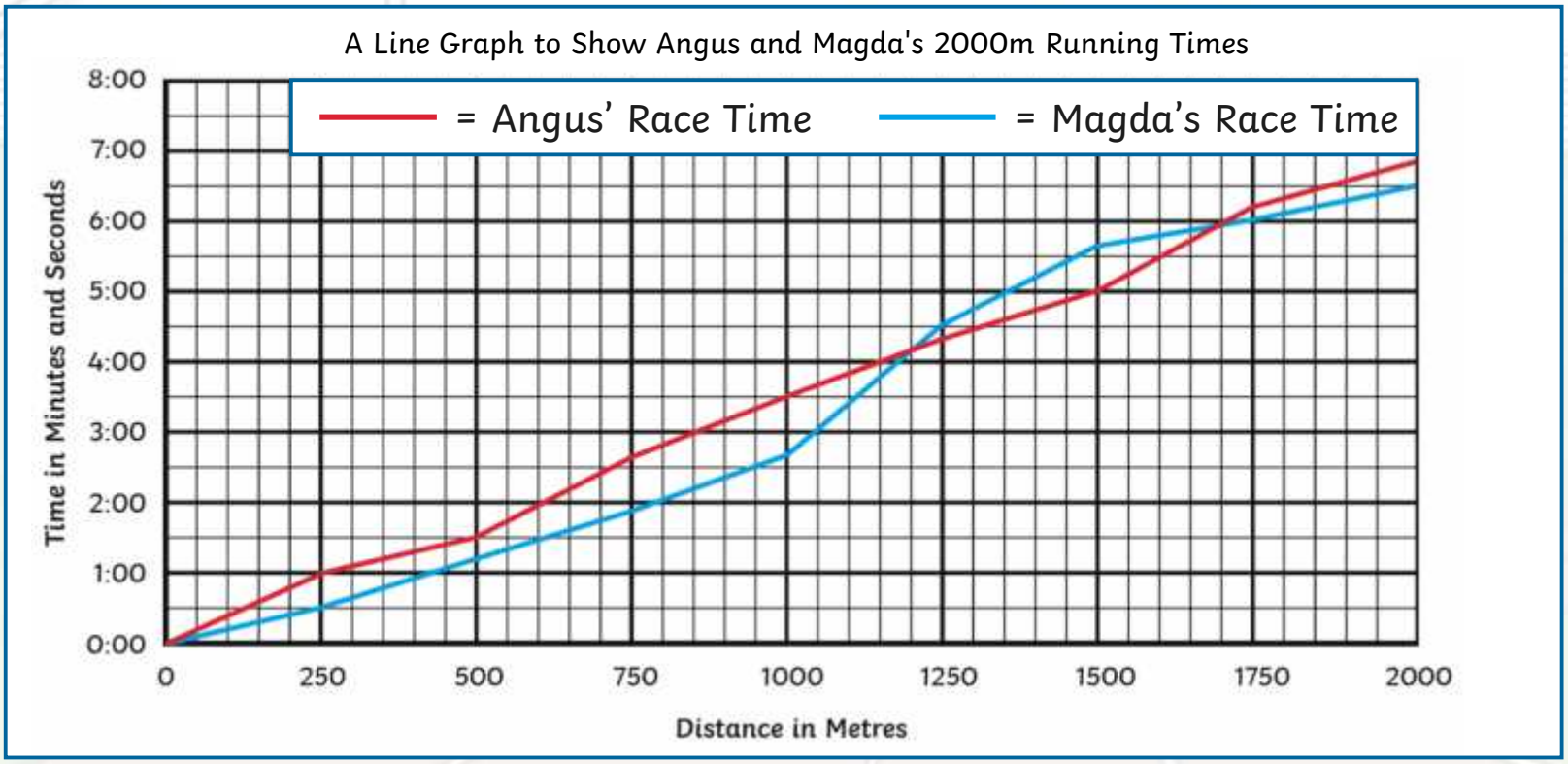


How many days did it take for the sunflower to grow to 20cm from when the first shoot appeared?

26 days

Use Line Graphs to Solve Problems

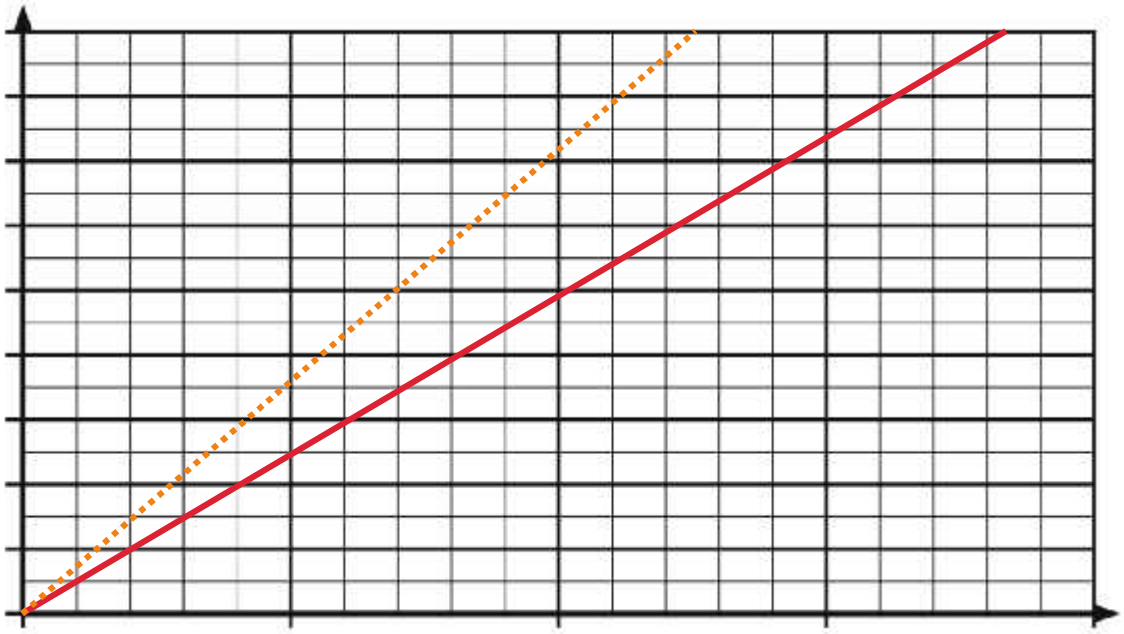
Deeper



After two minutes, Magda had run 200m further than Angus.

Decide if each statement about the line graph is true or false. If it is false, explain the reason why.

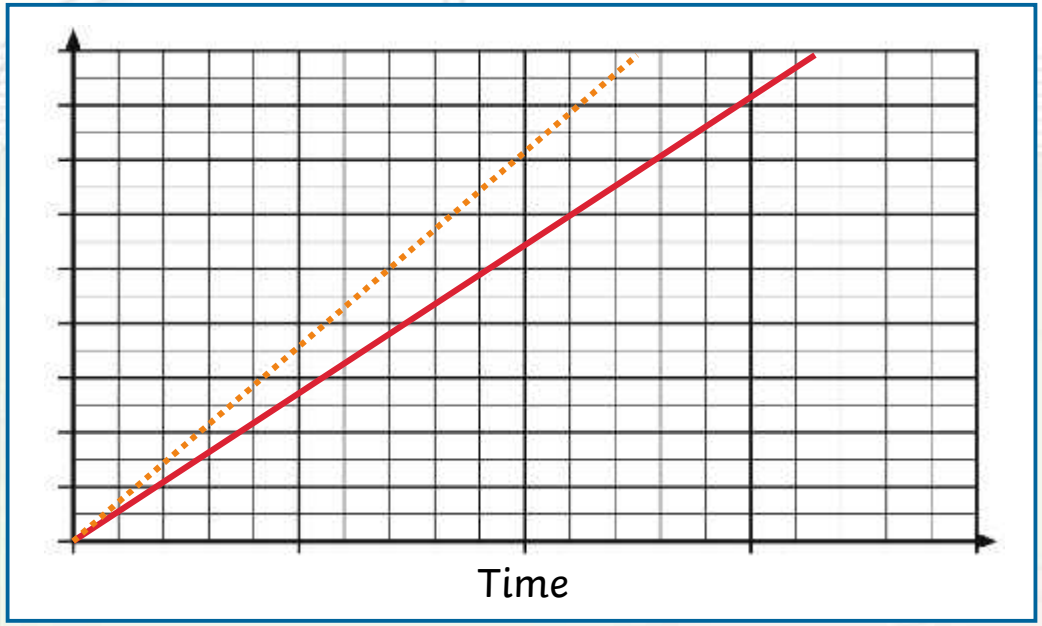
Use Line Graphs to Solve Problems | Deepest



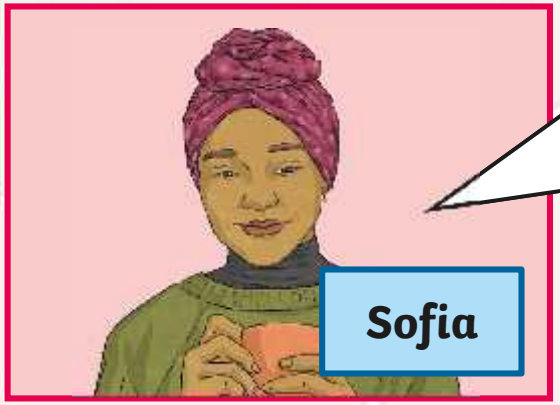
Some children described a line graph before the title and the label of the y-axis were removed.

Give reasons to explain why you think each child's description either matches or does not match the line graph.

Use Line Graphs to Solve Problems | Deepest

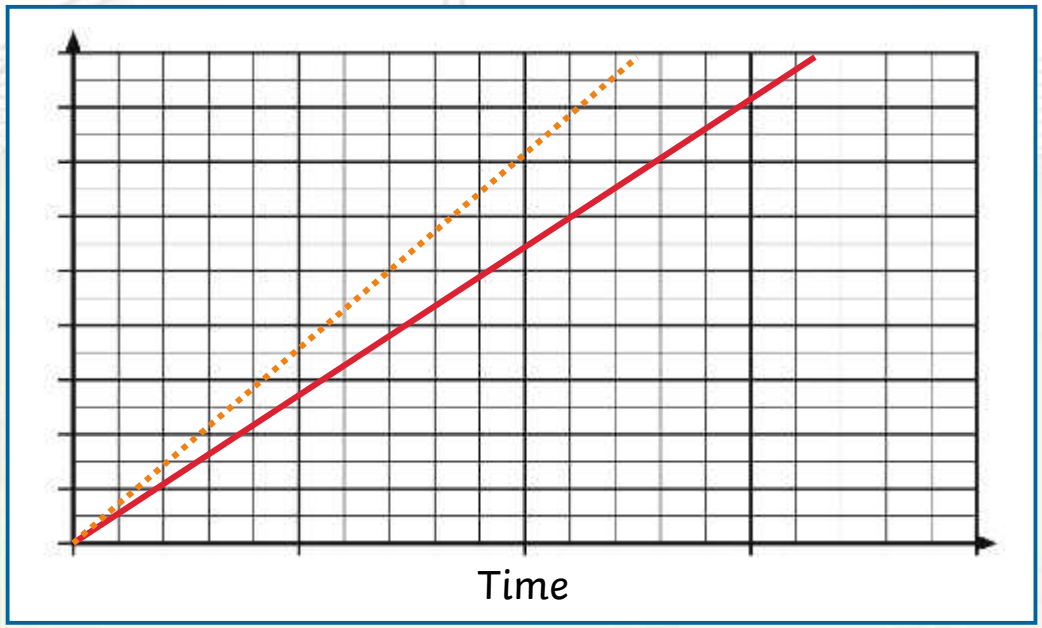


Sofia's description does not match the line graph because you would expect the temperature to decrease (not increase) as the drinks were allowed to cool.

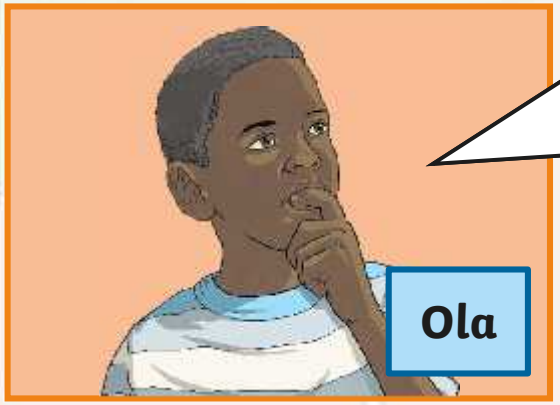


My line graph shows the temperatures of a mug of hot chocolate and a cup of tea that I made. The y-axis is labelled 'Temperature'. I made both drinks from boiling the water in a kettle. Then, I allowed them both to cool for 30 minutes.

Use Line Graphs to Solve Problems | Deepest

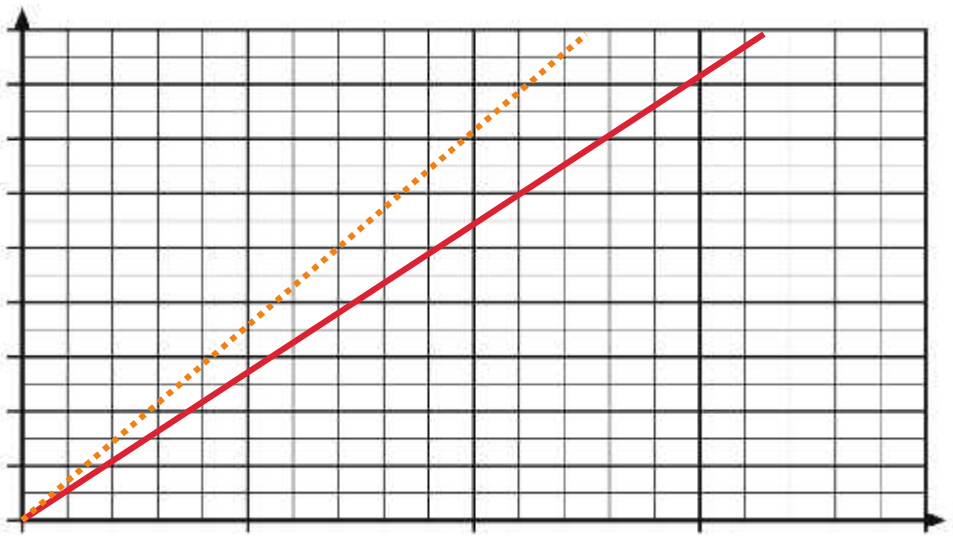


Ola's description could match this line graph as one of the lines shows that one of the balloons climbed more quickly and reached a greater height before the other one.

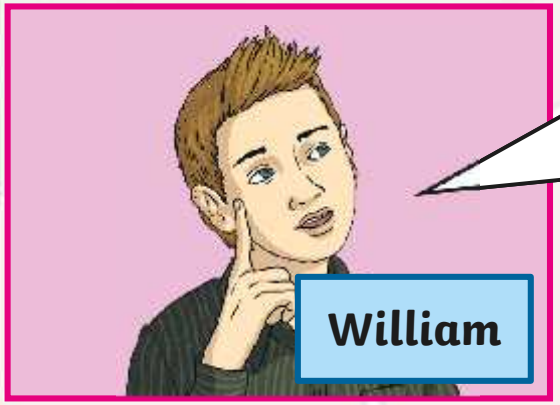


My line graph shows the journey of two hot-air balloons. The y-axis is labelled 'Height'.
Both balloons took off at the same time. One of the balloons climbed higher into the air more quickly than the other.

Use Line Graphs to Solve Problems | Deepest



William's description does not match the line graph. If one of the cyclists had stopped for a rest, it would mean that, for that period of time, the distance would not have increased but the time would have. This would result in a flat line for a section of the graph.



My line graph shows the race between two cyclists. The y-axis is labelled 'Distance'.
Both cyclists rode off at the same time.
One of the cyclists stopped for a five-minute rest.

Use Line Graphs to Solve Problems

Dive in by completing your own activity!