

Graph Evidence, Careful Inferences

What can the observations reasonably suggest?

GRADE 4 • 4.PS.1.d.iii

4.PS.1.d.iii "Analyze data represented in line graphs and communicate results orally and in writing: make inferences about data represented in line graphs;"

NAME _____

DATE _____

READ, COMPARE, EXPLAIN

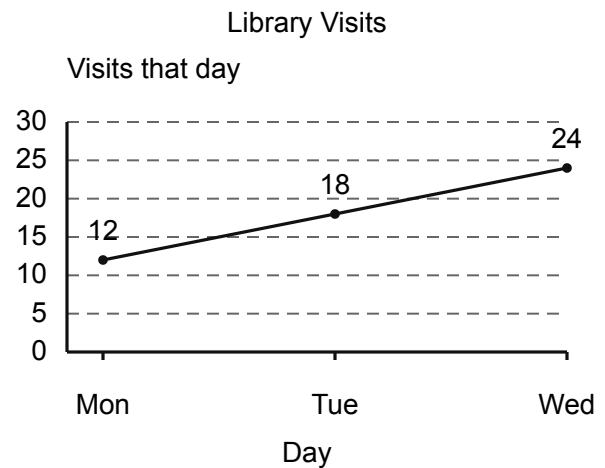
An inference is a reasonable conclusion supported by evidence and what you know. A prediction is an inference about a future observation. Explain which graph values support your thinking. A graph can suggest a pattern without proving a cause or guaranteeing that the pattern will continue.

WORKED EXAMPLE

What might happen to daily library visits on Thursday if the observed pattern continues?

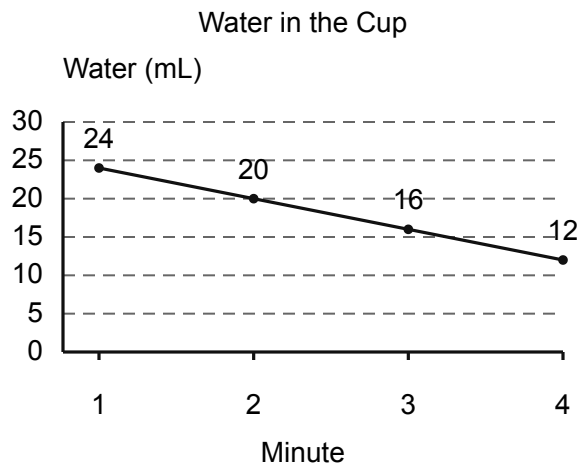
1. Visits increased by 6 each day: $18 - 12$ and $24 - 18$.
2. Continuing that pattern gives $24 + 6 = 30$.

Answer: About 30 visits is reasonable if the increase continues; it is not certain.



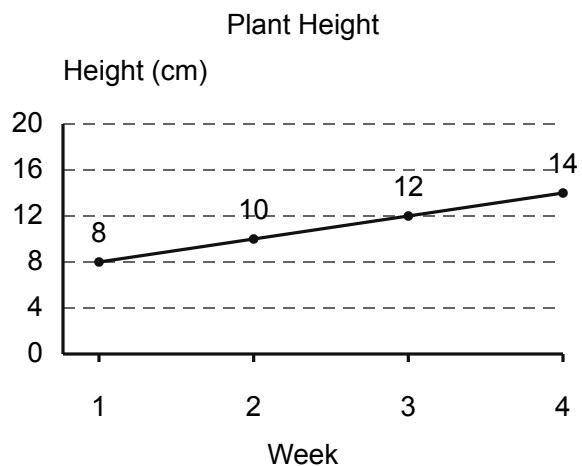
PRACTICE 4 problems

- 1** Use Water in the Cup. The cup has a small drain. Would it be reasonable to expect less water at Minute 5 if the drain keeps working the same way? Explain with two readings.



- 2** Use Water in the Cup in Practice 1. Predict Minute 5 if the same pattern continues. State an event that could make your prediction wrong.

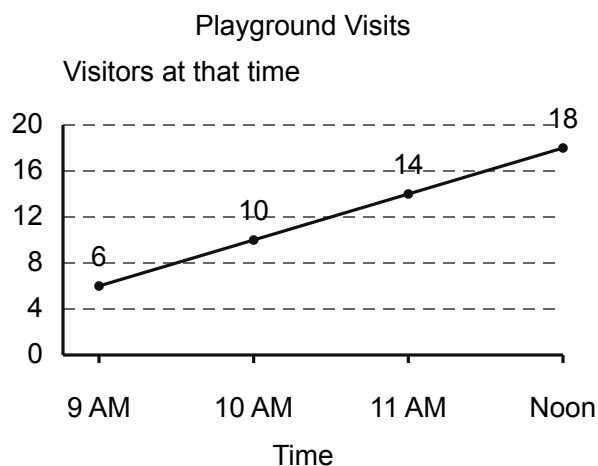
- 3** Use Plant Height. The plant was watered each day. Do these data prove that watering was the only cause of its growth? Explain a reasonable conclusion and a limit.



- 4** Use Plant Height in Practice 3. Is 16 cm a reasonable prediction for Week 5? Explain your assumption without saying the height is certain.

APPLY IT Show your work

- 1** Use Playground Visits. A club is choosing between a morning or near-noon visit and hopes for fewer people. Which time does this day's graph suggest? Explain with values and give one reason another day could differ.



- 2** Use Playground Visits in Apply It 1. Tell a partner whether the graph proves there were exactly 12 visitors at 10:30 AM. Then write what is known and what is only an estimate.

CHALLENGE One step up

Use Water in the Cup in Practice 1. Pat predicts 8 mL next; Jo predicts 20 mL because someone might refill the cup. Which is better supported by the observations alone? Could the other happen? Explain.

Accept reasonable evidence-supported inferences, conditional predictions, and plausible limits. Distinguish observed points, estimates between points and future predictions. Never treat one short sequence as proof of a unique future value or a causal mechanism. Listen for evidence and uncertainty in the oral explanation. Printed dots are recorded observations; connecting segments do not create new measured observations.

PRACTICE 1

Yes. Water fell from 24 mL at Minute 1 to 12 mL at Minute 4, dropping 4 mL each minute. Continued draining suggests less water.

PRACTICE 2

8 mL if another 4 mL drains. The prediction could fail if someone adds water or blocks the drain.

PRACTICE 3

The plant grew from 8 cm to 14 cm while it was watered. The graph does not prove watering was the only cause; light or other conditions may also matter.

PRACTICE 4

Yes, if the same 2 cm weekly growth continues. Conditions or growth rate could change, so 16 cm is not guaranteed.

APPLY IT 1

Morning is suggested: 6 visitors at 9 AM versus 18 at noon. Weather or schedules could make another day different.

Require the stated evidence and reasoning; accept equivalent correct wording.

APPLY IT 2

No. The observations are 10 at 10 AM and 14 at 11 AM. Twelve at 10:30 would be an estimate if the change were steady, not a measured value.

Require the stated evidence and reasoning; accept equivalent correct wording.

CHALLENGE

Pat's 8 mL follows the observed 4 mL drops. Jo's 20 mL is possible if water is added, but that new event is not supported by the displayed observations.