

Track the Change

Ask a question, acquire data, build a graph and explain changes.

GRADE 4 • 4.PS.1

4.PS.1 "The student will apply the data cycle (formulate questions; collect or acquire data; organize and represent data; and analyze data and communicate results) with a focus on line graphs..."

NAME _____

DATE _____

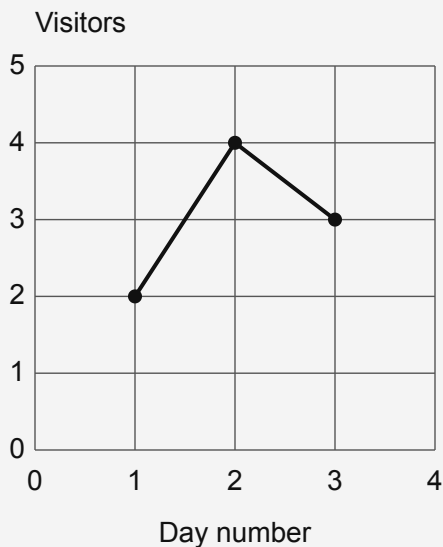
FOLLOW THE DATA CYCLE

Ask a question about change over time. Acquire ordered observations and record units. Draw a line graph with a title, labeled axes and equal whole-number increments. Plot each observation, then connect neighboring observations with straight segments. Use the data to explain changes; a prediction is a reasoned possibility, not a known result.

WORKED EXAMPLE

At another library, visitors on days 1, 2 and 3 numbered 2, 4 and 3. A complete line graph is shown. Find the change from day 2 to day 3.

Visitors: three observed days



1. Read day 2 as 4 visitors and day 3 as 3 visitors.
2. Compute $4 - 3 = 1$.
3. The number decreased by 1 visitor.

Answer: A decrease of 1 visitor.

PRACTICE 4 problems

- 1** Before reading the observation table in task 2, write a question about how after-lunch library use changes across five school days. State what data you would need and when it should be counted.

ANSWER _____

- 2** Acquire the five observations from this fictional librarian’s log. Copy them into a compact day/count list. State the unit and why the same counting period matters.

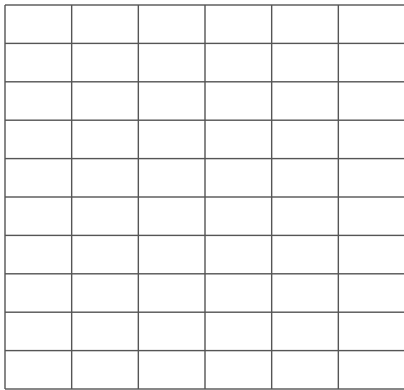
FICTIONAL LIBRARY LOG: SAME AFTER-LUNCH PERIOD

Day number	Visitors
1	8
2	12
3	10
4	16
5	18

ANSWER _____

- 3** Use all five observations from task 2 to construct a line graph below. Add a title, label both axes, and choose equal whole-number scale increments. Put days in order and connect only neighboring observed points with straight segments.

Title: _____ Label both axes and the scale.



ANSWER _____

- 4** Use your graph. Which day had the most visitors? Between which neighboring days was the greatest increase? Give the counts that justify both answers.

ANSWER _____

APPLY IT Show your work

- 1** From day 1 to day 5, how many more visitors were counted? Separately, find the total counted on days 2 and 3 and compare it with day 4. Show both calculations.

2

Tell a partner your answer to the question you wrote in task 1. Cite at least two counts and describe the overall trend and the one decrease. Then record the explanation here.

CHALLENGE One step up

Predict the count on day 6. State a pattern or assumption supporting your prediction and explain why it is uncertain. Do not add the prediction as an observed point on your graph.

PRACTICE 1

Example: How does the number of after-lunch library visitors change during five school days? Count visitors over the same after-lunch time period on each day.

PRACTICE 2

Days 1-5: 8, 12, 10, 16, 18 visitors. Unit: visitors. Using the same counting period makes comparisons meaningful.

PRACTICE 4

Day 5 had 18, the greatest count. The greatest increase was day 3 to day 4: $16 - 10 = 6$ visitors.

APPLY IT 1

10 more; the two-day total is 6 greater than day 4. $18 - 8 = 10$. Days 2 and 3 total $12 + 10 = 22$; $22 - 16 = 6$. Counts may include the same visitor on different days.

APPLY IT 2

Example: library use generally increased, from 8 visitors on day 1 to 18 on day 5, but fell from 12 to 10 between days 2 and 3. Use the student's formulated question and actual plotted counts; an overall increase does not mean an increase every day.

CHALLENGE

Example: 20 visitors if the most recent increase of 2 repeats. This is uncertain because counts varied, including one decrease. Other nonnegative whole-number predictions with a sensible stated assumption are acceptable.

Assess the complete data cycle: a student question, acquired data, organized and labeled graph, written and oral analysis. The five counts are fictional practice data. Accept equivalent graph scales with equal whole-number increments, accurate values and complete labels. The graph must connect adjacent observations with straight segments; do not extend a fitted line. Prediction answers are conditional and not unique.

PRACTICE 3

Title: Library visitors after lunch. Horizontal axis: day number, 1-5. Vertical axis: visitors, 0-20 in increments of 2. Points: (1,8), (2,12), (3,10), (4,16), (5,18), joined in order.

Library visitors after lunch

