

Line Fit Lab

Draw a reasonable model and judge how well it fits.

GRADE 8 • 8.FGR.6.1

8.FGR.6.1 "Show that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, visually fit a straight line..."

NAME _____

DATE _____

REASON WITH THE MODEL

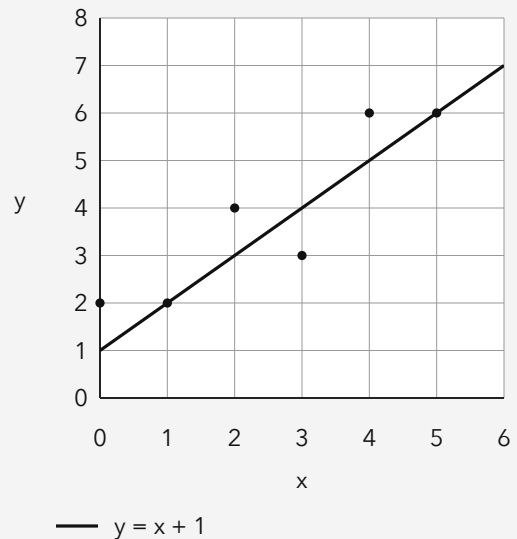
A fit line follows the overall trend of a scatter plot; it need not pass through every point. Look for small vertical gaps and points on both sides. Different reasonable fit lines are possible. In this worksheet, within 1 unit includes a gap of exactly 1.

WORKED EXAMPLE

A student proposes $y = x + 1$ for these observations. Judge the fit visually.

1. The observations have a positive, roughly linear trend.
2. At $x = 3$, observed $y = 3$ and predicted $y = 4$: the vertical gap is 1.
3. Every gap is at most 1; three points are above, one below, and two on the line.

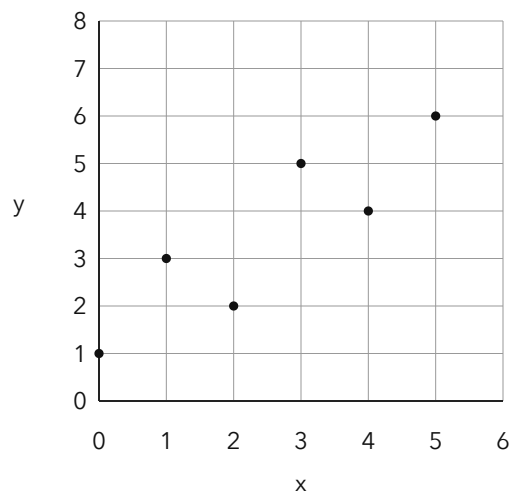
Answer: This is a reasonable informal fit.



PRACTICE 4 problems

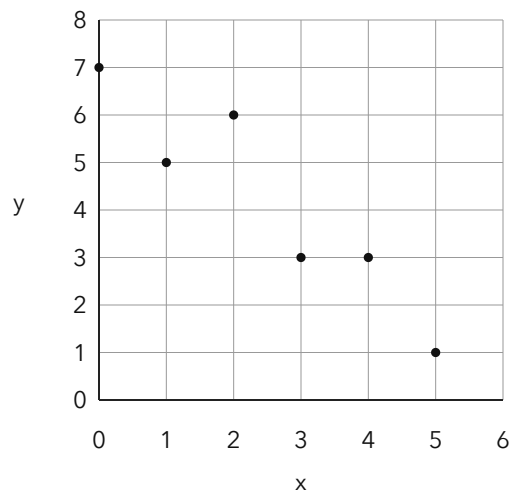
- 1** Draw your own straight fit line through the middle of this scatter plot. Describe the association and use two vertical gaps to justify your fit.

ANSWER _____



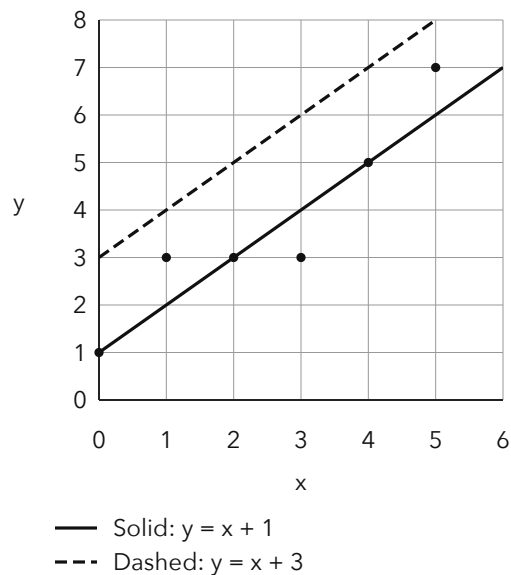
- 2** Draw a straight fit line for these observations. Describe the association. Check two points to explain why your line is reasonable.

ANSWER _____



- 3** Compare the solid and dashed models for these data. Which fits more closely? Support your choice with the gaps at $x = 1$ and $x = 4$.

ANSWER _____



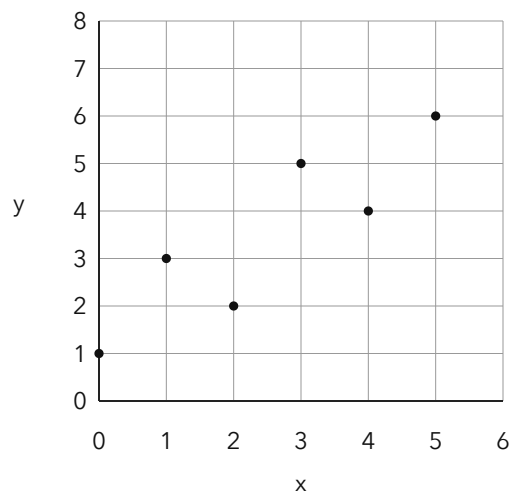
- 4** A model predicts $y = 5$ when $x = 2$. The observation is $(2, 7)$. Find the vertical gap. Does it satisfy a rule that a close point must be within 1 unit?

ANSWER _____

APPLY IT Show your work

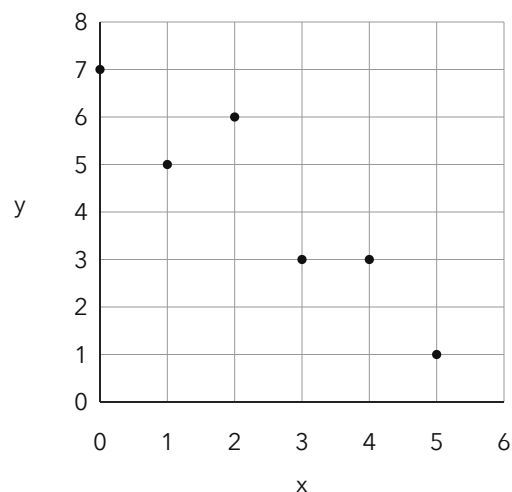
- 1** The dots are sample observations: x is hours of practice and y is a skill score. Draw a fit line. Use it to predict the score at $x = 2.5$. Explain why this is an estimate.

REASONING AND ANSWER



2

For a cooling sample, x is minutes and y is degrees above room temperature. Draw a line that fits these observations. Predict y at $x = 4.5$ and describe the trend.

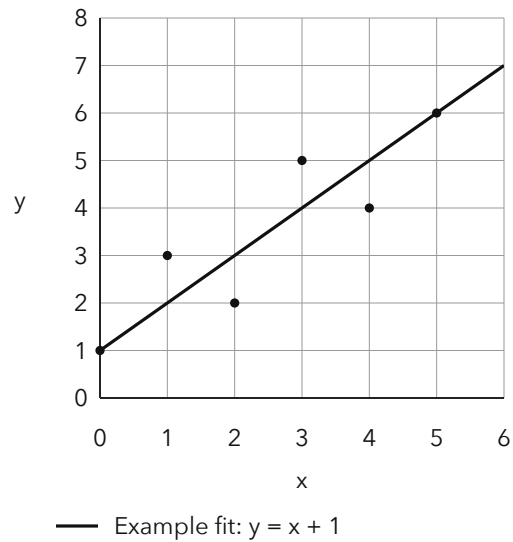
REASONING AND ANSWER**CHALLENGE** One step up

A student connects every scatter point with short segments and calls the result a straight-line model. Explain the problem and describe a better method.

WORK SPACE AND ANSWER

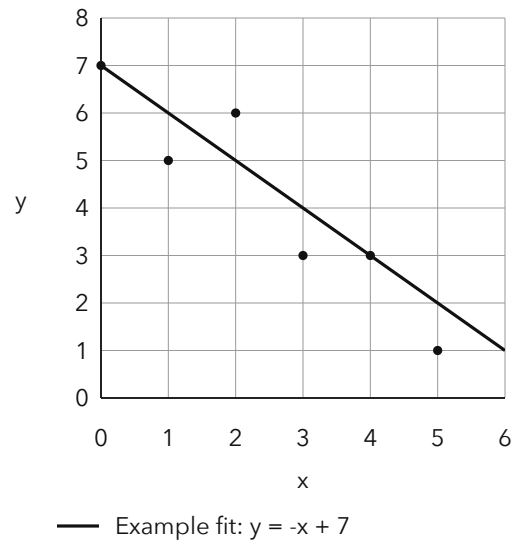
PRACTICE 1

Example: $y = x + 1$, a positive association. At $x = 1$ the gap is 1, and at $x = 4$ it is 1. All six gaps are at most 1, with points on both sides.



PRACTICE 2

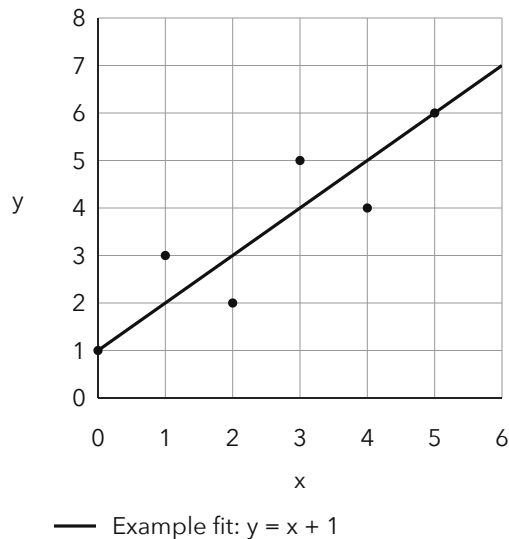
Example: $y = -x + 7$; negative association. At $x = 1$ and $x = 2$, the gaps are each 1. All gaps are at most 1, with points above and below.



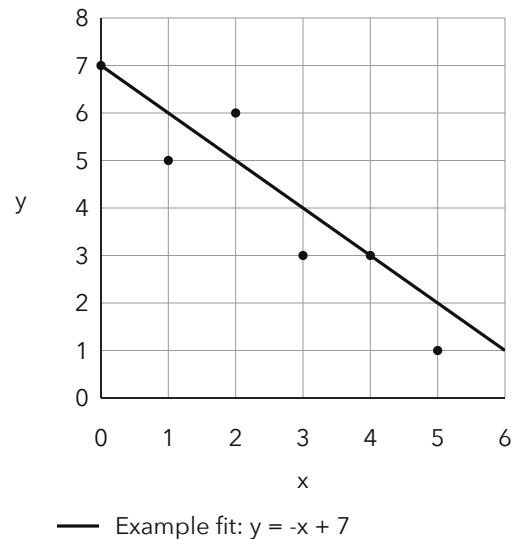
APPLY IT 1

Example fit $y = x + 1$ predicts 3.5 score units. The dots vary around the line, so the model gives an estimate, not a guaranteed score.

Read the height of the chosen line at $x = 2.5$. Accept a nearby prediction consistent with a reasonable student line.

**APPLY IT 2**

Example fit $y = -x + 7$ predicts 2.5 degrees above room temperature at 4.5 minutes. Temperature difference decreases as time passes. Accept predictions consistent with a reasonable decreasing fit line through the middle of the data.

**PRACTICE 3**

Solid $y = x + 1$ fits more closely. At $x = 1$ and $x = 4$, its gaps are 1 and 0; dashed $y = x + 3$ has gaps 1 and 2. The dashed line lies above all six observations.

PRACTICE 4

Gap = $|7 - 5| = 2$ units. No, $2 > 1$.

CHALLENGE

A zigzag through observations is not one straight-line model. Draw one line through the overall trend, then judge vertical gaps and whether points fall on both sides.

Fit lines in the key are examples, not unique answers. Accept other straight lines following the central trend with small gaps and observations reasonably distributed above and below; ask students to support their choices with actual gaps. Do not require a regression calculation. Predicted scores or temperatures must follow the student line.