

Scatterplot Detectives

Ask, acquire, plot and communicate a data investigation

GRADE 8 • 8.PS.3

8.PS.3 "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 scatterplots..."

NAME _____

DATE _____

BUILD UNDERSTANDING

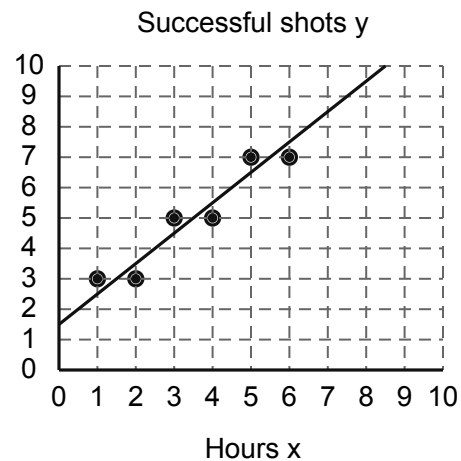
Use a ruler and a device with an XY scatterplot tool. Scatterplots show paired numeric measurements as separate points. Look for positive linear, negative linear or no clear relationship. A reasonable line of best fit follows the center of a linear cloud; it need not pass through every point.

WORKED EXAMPLE

These simulated observations compare hours practiced x and successful shots y . Describe the trend and the drawn fit.

1. Larger x -values tend to have larger y -values.
2. The straight line runs through the middle, with three points above and three below.

Answer: Positive linear relationship; the sample fit is $y = x + 1.5$.



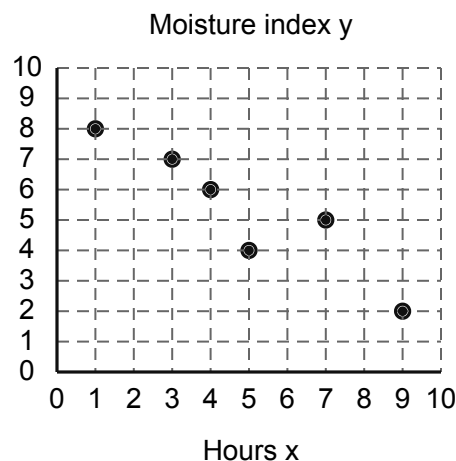
PRACTICE 4 problems

- 1 Formulate a statistical question about these simulated records, each for one student: 2 practice hours, 3 goals; 4 hours, 6 goals; 6 hours, 5 goals; 8 hours, 8 goals; 3 hours, 4 goals; 7 hours, 7 goals. Acquire the data by writing all six ordered pairs. Define both variables and units.

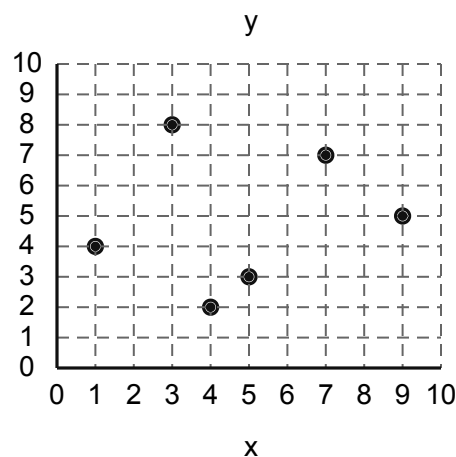
- 2** Plot all six Practice 1 pairs by hand. Sketch one straight line of best fit through the middle of the cloud. Describe and justify the relationship using the plotted points.



- 3** The plotted readings compare hours since watering with a soil moisture index. Describe and justify the relationship. What happens to moisture as time tends to increase?



- 4** Describe the relationship in this scatterplot and justify your conclusion using the whole cloud. Is forcing an upward line through two selected points sensible?



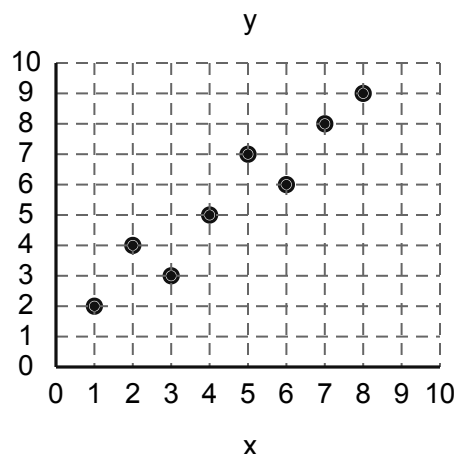
APPLY IT Show your work

- 1** Use a spreadsheet or graphing tool to organize Practice 1 into two numeric columns, one student per row. Create an XY scatterplot with dots only, title and axis units. Show or save it for your teacher. Compare it with your hand plot and record one matching point.

- 2** Answer your Practice 1 statistical question in a short report. Cite two data points or regions of the cloud, describe the relationship and explain why these six records cannot prove that practice causes more goals for every student.

CHALLENGE One step up

A new set of practice records is graphed here. Sketch a line of best fit and explain how your line follows the overall cloud without having to touch every point.



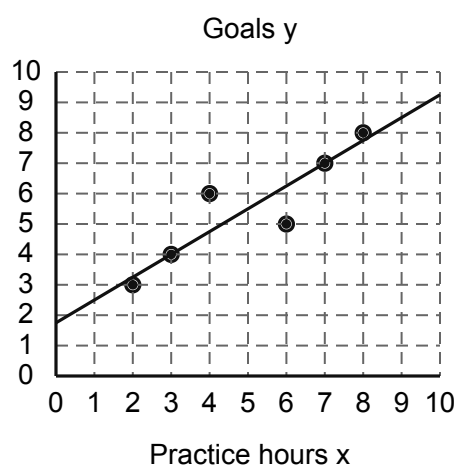
Records are simulated instructional data. Require a student-generated statistical question, all six acquired pairs, hand scatterplot and fit, and a technology-created scatterplot shown or saved in Apply It 1. Assess the report against the student's own question. Accept reasonable alternative fit lines with the appropriate direction and balance; do not require exact regression equations.

PRACTICE 1

Example question: How are practice hours and goals related for these students? Pairs: (2, 3), (4, 6), (6, 5), (8, 8), (3, 4), (7, 7). x: hours; y: goals.

PRACTICE 2

Positive linear relationship. One reasonable fit is $y = (3/4)x + 7/4$; the key shows an example, not the only acceptable line.

**PRACTICE 3**

Negative linear relationship: the cloud slopes downward; later readings tend to have lower moisture values.

PRACTICE 4

No clear relationship: high and low y-values occur across x. A selected pair cannot establish an upward trend for the cloud.

APPLY IT 1

The technology graph must contain the same six pairs with hours on x and goals on y. Example check: (6, 5).

Do not sort only one column or connect the observations. Different axis limits are acceptable if points and units stay accurate.

APPLY IT 2

These six records suggest a positive association: (2, 3) is low while (8, 8) is high, with variation such as (6, 5). This small observational sample does not prove cause.

Other differences between students can affect both variables. Keep conclusions limited to the data.

CHALLENGE

One reasonable fit is $y = x + 1$. It follows the upward center with two points above, two below and four on it.

