LESSON MAKER PRO

# Trend Detectives

*Use scatterplot data to describe, support, and predict relationships.*

**GRADE 8 · 8.PS.3.e**

**8.PS.3.e** "Analyze and justify the relationship of the quantitative bivariate data represented in scatterplots."

NAME _____ DATE _____

## READ THE PATTERN

A scatterplot shows pairs of numerical values. Describe whether the pattern is positive, negative, or has no clear association, then support your claim by comparing how the values change. If points follow a steady pattern, use that trend to make a reasonable estimate.

## WORKED EXAMPLE

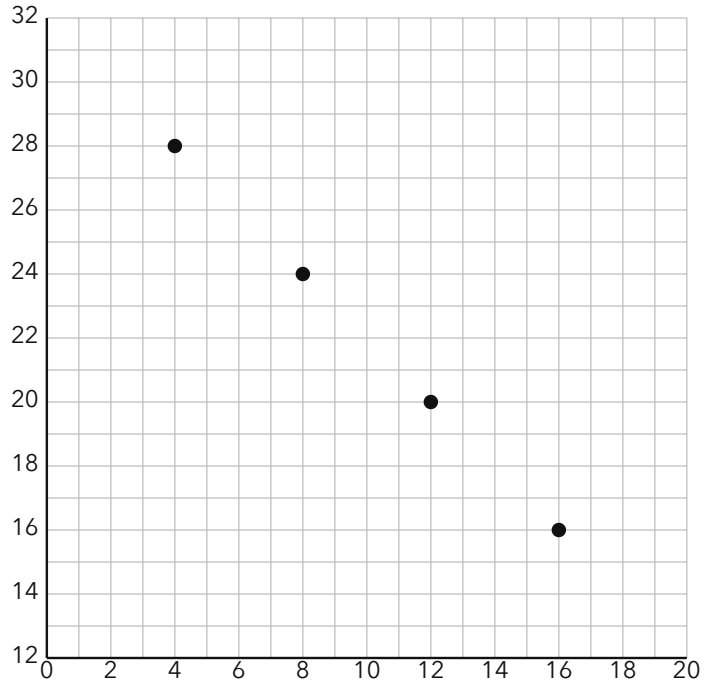
A scatterplot includes the points (21, 41), (22, 44), and (23, 47). Analyze the relationship.

1. From the first point to the last point, x increases from 21 to 23.
2. Over the same change, y increases from 41 to 47.
3. The change is +2 in x and +6 in y, so y rises 3 units for each x unit.

**Answer: The relationship is positive and linear. As x increases, y increases at a steady rate of 3 y-units per x-unit.**

## PRACTICE 6 problems

**1** Read the actual scatterplot below. Its horizontal axis is x and vertical axis is y; each grid square is 1 unit. The four plotted pairs are (4, 28), (8, 24), (12, 20), and (16, 16). Describe the relationship and justify your answer using two plotted points and the direction of the pattern.




**ANSWER** _____

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**2** A scatterplot has points (5, 18), (7, 35), (9, 14), (11, 38), and (13, 26). Describe the relationship.

**ANSWER** _____

**3** A scatterplot has points (4, 12), (8, 16), (12, 20), and (16, 24). Describe the relationship, then predict y when x = 28.

**ANSWER** _____

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**4** A scatterplot has points (4, 40), (8, 35), (12, 30), and (16, 25). How does y change when x increases by 4? Describe the relationship.

**ANSWER** _____

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**5** A scatterplot has points (5, 9), (10, 14), (15, 19), (20, 24), (25, 40). Which point is an outlier?

**ANSWER** _____

**6** Scatterplot A has points (4, 8), (8, 16), (12, 24), and (16, 32). Scatterplot B has points (4, 29), (8, 11), (12, 35), and (16, 17). Which scatterplot shows a stronger linear relationship? Justify your answer.

**ANSWER** _____

## APPLY IT Show your work

**1** A basketball player plots practice minutes, x, and successful free throws, y. The points are (10, 8), (15, 12), (20, 16), and (25, 20). Describe the relationship and estimate the number of successful free throws after 30 practice minutes.

WORK SPACE

**ANSWER** _____

**2** A student plots the number of late-night phone notifications answered, x, and a next-day focus score, y. The points are (5, 45), (10, 40), (15, 35), and (20, 30). Describe the relationship and use the trend to estimate the focus score for 25 notifications.

WORK SPACE

**ANSWER** _____

## CHALLENGE One step up

A scatterplot of practice sets completed, x, and quiz score, y, has points (4, 58), (8, 63), (12, 68), (16, 73), (20, 48), and (24, 83). A student says, "There is no positive relationship because the point (20, 48) goes down." Is the student correct? Explain your reasoning.

WORK SPACE AND ANSWER

**ANSWER KEY** # Trend Detectives

**GRADE 8 · 8.PS.3.e**

## PART 1 · PRACTICE

| # | PROBLEM | ANSWER |
|---|---|---|
| 1 | Read the actual scatterplot below. Its horizontal axis is x and vertical axis is y; each grid square is 1 unit. The four plotted pairs are (4, 28), (8, 24), (12, 20), and (16, 16). Describe the relationship and justify your answer using two plotted points and the direction of the pattern. | **Negative linear relationship. The plotted points slope downward from left to right; e.g., from (4, 28) to (8, 24), x increases by 4 while y decreases by 4.** |
| 2 | A scatterplot has points (5, 18), (7, 35), (9, 14), (11, 38), and (13, 26). Describe the relationship. | **There is no clear association. As x increases, y does not consistently increase or decrease.** |
| 3 | A scatterplot has points (4, 12), (8, 16), (12, 20), and (16, 24). Describe the relationship, then predict y when x = 28. | **Positive linear relationship; y = 36 when x = 28.** |
| 4 | A scatterplot has points (4, 40), (8, 35), (12, 30), and (16, 25). How does y change when x increases by 4? Describe the relationship. | **y decreases by 5 when x increases by 4. The relationship is negative and linear.** |
| 5 | A scatterplot has points (5, 9), (10, 14), (15, 19), (20, 24), (25, 40). Which point is an outlier? | **(25, 40) is the outlier.** |
| 6 | Scatterplot A has points (4, 8), (8, 16), (12, 24), and (16, 32). Scatterplot B has points (4, 29), (8, 11), (12, 35), and (16, 17). Which scatterplot shows a stronger linear relationship? Justify your answer. | **Scatterplot A. Its points lie exactly on an increasing line, while Scatterplot B has no consistent pattern.** |

## PART 2 · APPLY IT

1. **Positive linear relationship; about 24 successful free throws.** For every 5 more practice minutes, the number of successful free throws increases by 4. Continuing the pattern from 25 minutes to 30 minutes gives 24.
2. **Negative linear relationship; the estimated focus score is 25.** Each increase of 5 notifications matches a decrease of 5 focus-score points. Extending the trend to 25 notifications gives 25.

**CHALLENGE**

**No. The data show a positive linear trend except for the outlier (20, 48). In the other points, y increases by 5 when x increases by 4.**

Accept equivalent descriptions such as upward or downward linear trend. For estimates, accept the stated value when students extend the consistent pattern shown by the data. For Practice 1, require actual reference to the displayed scatterplot: downward left-to-right pattern and a correct pair comparison support the negative linear claim. The vertical scale begins at 12; each grid square still represents one unit. Remaining coordinate-list analyses are retained as additional numerical reasoning.