

Line of Best Fit

Fit straight lines to scatter plot data.

GRADE 8 • MA.8.DP.1.3

MA.8.DP.1.3 "Given a scatter plot with a linear association, informally fit a straight line."

NAME _____

DATE _____

FIND THE MIDDLE TREND

A fitted line should follow the overall middle of the points, with points spread above and below it when possible. Choose two points that are far apart on the trend, find the slope, then use a point to find the starting value.

WORKED EXAMPLE

A scatter plot includes the points (1,4), (3,8), and (5,12). Fit a straight line.

1. Use (1,4) and (5,12): slope = $(12 - 4)/(5 - 1) = 8/4 = 2$.
2. Use (1,4): $4 = 2(1) + b$, so $b = 2$.
3. Write the fitted line: $y = 2x + 2$.

Answer: $y = 2x + 2$

PRACTICE 6 problems

- 1** A scatter plot has points (0,1), (2,5), (4,9), and (6,13). Fit a straight line.

ANSWER _____

- 2** A scatter plot has points (2,10), (4,8), (6,6), and (8,4). Fit a straight line.

ANSWER _____

- 3** The points in a scatter plot cluster near the line $y = 3x + 2$. Estimate y when $x = 6$.

ANSWER _____

- 4** A scatter plot has points (2,4), (4,5), (6,6), and (8,7). Fit a straight line.

ANSWER _____

- 5** A scatter plot has points (1,7), (3,11), and (5,15). Which line is the best fit? A. $y = 2x + 3$ B. $y = 2x + 5$ C. $y = x + 6$

ANSWER _____

- 6** A scatter plot has points (2,4), (4,7), and (6,8). The fitted line is $y = x + 2$. Is the point (4,7) above or below the line?

ANSWER _____

APPLY IT Show your work

- 1** A student records hours of game practice, x , and score on a skills challenge, y . The scatter plot includes $(2,58)$, $(4,66)$, $(6,74)$, and $(8,82)$. Fit a line, then use it to predict the score after 5 hours of practice.

WORK SPACE

ANSWER _____

- 2** A wireless game controller's battery level, y , is tracked after x hours of play. The scatter plot includes $(1,90)$, $(3,70)$, $(5,50)$, and $(7,30)$. Fit a line, then predict the battery level after 6 hours.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A scatter plot has points $(2,6)$, $(4,12)$, $(6,14)$, and $(8,20)$. Two students suggest $y = 2x + 3$ and $y = 2x + 5$. Which line is a better fit? Compare the total vertical distance from the points to each line in your explanation.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A scatter plot has points (0,1), (2,5), (4,9), and (6,13). Fit a straight line.	$y = 2x + 1$
2	A scatter plot has points (2,10), (4,8), (6,6), and (8,4). Fit a straight line.	$y = -x + 12$
3	The points in a scatter plot cluster near the line $y = 3x + 2$. Estimate y when $x = 6$.	20
4	A scatter plot has points (2,4), (4,5), (6,6), and (8,7). Fit a straight line.	$y = 1/2x + 3$
5	A scatter plot has points (1,7), (3,11), and (5,15). Which line is the best fit? A. $y = 2x + 3$ B. $y = 2x + 5$ C. $y = x + 6$	B. $y = 2x + 5$
6	A scatter plot has points (2,4), (4,7), and (6,8). The fitted line is $y = x + 2$. Is the point (4,7) above or below the line?	Above the line

PART 2 • APPLY IT

- $y = 4x + 50$; 70 points** The score rises 8 points for every 2 hours, so the slope is 4. Using (2,58) gives $y = 4x + 50$, and $x = 5$ gives 70.
- $y = -10x + 100$; 40%** The battery level drops 20 percentage points every 2 hours, so the slope is -10. Using (1,90) gives $y = -10x + 100$, and $x = 6$ gives 40.

CHALLENGE

$y = 2x + 3$. Its vertical distances are 1, 1, 1, and 1, for a total of 4. For $y = 2x + 5$, the distances are 3, 1, 3, and 1, for a total of 8.

Accept algebraically equivalent forms of each fitted-line equation. For the challenge, require the choice $y = 2x + 3$ and a comparison showing total vertical distances of 4 and 8.