LESSON MAKER PRO

Models in Motion

Predict and explain real-world trends

GRADE 8 · 8.DS.B.4

8.DS.B.4 "Use a provided linear model to make predictions based on bivariate measurement data. Interpret the meaning of the slope and y-intercept in context."

NAME _____ DATE _____

READ THE MODEL

In a model y = mx + b, substitute an x-value to predict y. The slope m tells how much y changes for each increase of 1 in x, and b is the predicted y-value when x is 0.

WORKED EXAMPLE

A model for savings is y = 7x + 13, where x is chores done and y is dollars saved. The table shows two measurements. Predict savings after 16 chores, then explain the slope and y-intercept.

CHORES AND SAVINGS

Chores (x)	Dollars (y)
11	90
14	111

1. Substitute 16 for x: y = 7(16) + 13.
2. Calculate: y = 125.
3. Savings rise $7 per chore; the model starts at $13.

Answer: $125; slope: $7 per chore; y-intercept: $13 before any chores

PRACTICE 4 problems

1 Pages read after x days follow y = 5x + 8. Predict the total after 6 days.

ANSWER _____

2 Battery charge y (%) after x hours follows y = 84 - 8x. What does the slope mean?

ANSWER _____

3 A bike rental's total cost y ($) after x hours follows y = 2x + 15. What does the y-intercept mean?

ANSWER _____

4 An order's total cost y ($) for x smoothies follows y = 6x + 10. Predict the cost of 4 smoothies and explain the y-intercept.

ANSWER _____

APPLY IT Show your work

1 Controller charge y (%) after x minutes follows y = 4x + 22. Use the table. At 8 minutes, how does the measured charge compare with the prediction?

CONTROLLER CHARGE

Minutes (x)	Charge (%)
2	30
6	46
8	51

ANSWER _____

2 A model predicts players still online x hours after a game event starts: y = 60 - 5x. Predict the number after 9 hours. Explain the slope and y-intercept.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Models from two friends' gaming data predict total hours played after x days. Alex: y = 3x + 6. Blair: y = 2x + 12. When do their predictions match, and what total do both predict?

WORK SPACE AND ANSWER

ANSWER KEY

Models in Motion

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Pages read after x days follow y = 5x + 8. Predict the total after 6 days.	**38 pages**
2	Battery charge y (%) after x hours follows y = 84 - 8x. What does the slope mean?	**The predicted charge drops 8 percentage points per hour.**
3	A bike rental's total cost y ($) after x hours follows y = 2x + 15. What does the y-intercept mean?	**The predicted cost is $15 at 0 hours.**
4	An order's total cost y ($) for x smoothies follows y = 6x + 10. Predict the cost of 4 smoothies and explain the y-intercept.	**$34; the predicted cost is $10 with 0 smoothies.**

PART 2 · APPLY IT

1. **The measured charge is 3 percentage points lower than predicted.** The model predicts 4(8) + 22 = 54%. The table shows 51%, which is 3 percentage points lower.
2. **15 players; the prediction falls by 5 players per hour and starts at 60 players.** Substitute x = 9 to get y = 60 - 5(9) = 15. The slope is -5 players per hour, and the y-intercept is 60 players at the start.

CHALLENGE

After 6 days, both predict 24 hours.

Accept equivalent wording for slopes and y-intercepts when the units and direction of change are clear. For the controller comparison, accept "3% lower" only if the student clearly means 3 percentage points.