LESSON MAKER PRO

Model Messages

Read what a linear model says about a situation.

HIGH SCHOOL · AI-S.ID.7

AI-S.ID.7 "Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data."

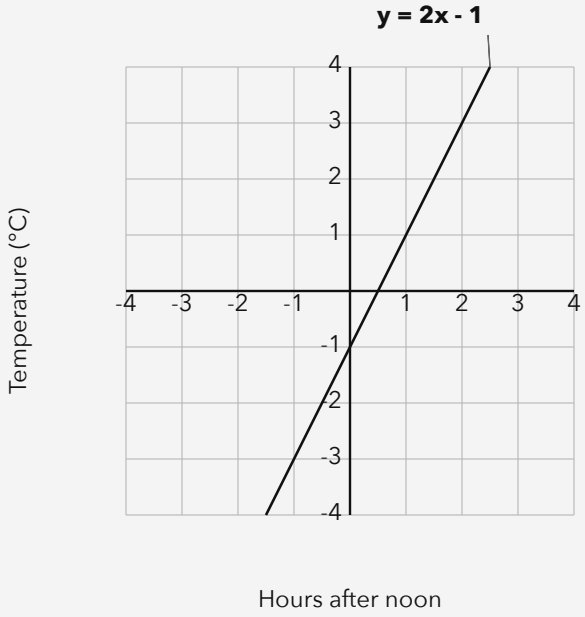
NAME _____ DATE _____

SLOPE AND INTERCEPT

In y = mx + b, the slope m tells how much y changes when x increases by one unit. The intercept b tells the value of y when x is 0, or the starting amount.

WORKED EXAMPLE

The graph shows y = 2x - 1, where x is hours after noon and y is temperature in °C. Interpret the slope and y-intercept.



1. Identify m = 2 and b = -1.
2. The temperature increases 2°C each hour.
3. At noon, x = 0 and the temperature is -1°C.

Answer: The temperature rises 2°C per hour. At noon, the temperature is -1°C.

PRACTICE 4 problems

1 For y = 6x + 9, x is the number of stickers sold and y is dollars earned. Interpret the slope and intercept.

ANSWER _____

_____

2 For y = -4x + 28, x is hours after a laptop is unplugged and y is battery percent. Interpret the slope and intercept.

ANSWER _____

_____

3 For y = 7x, x is miles walked in a charity event and y is dollars earned. Interpret the slope and intercept.

ANSWER _____

_____

4 For y = -8x + 56, x is weeks and y is dollars left on a gift card. Interpret the slope and intercept.

ANSWER _____

_____

APPLY IT Show your work

1 A school club earns money from concert tickets using $y = 3x + 45$, where x is tickets sold and y is dollars earned. Interpret the slope and intercept.

WORK SPACE

ANSWER _____

2 An online art contest pays a student an advance and earnings for digital designs sold. Use the table to write a linear model, then interpret its slope and intercept.

DIGITAL DESIGN EARNINGS

x, designs sold	y, earnings ($)
0	18
4	30
8	42

ANSWER _____

CHALLENGE One step up

Two tutoring apps pay student creators for completed practice sets. App A uses $y = 5x + 20$. App B uses $y = 8x + 5$. Here, x is completed sets and y is dollars earned. At what value of x will the earnings match? Which app has the higher starting earnings, and which grows faster? Explain using slope and intercept.

WORK SPACE AND ANSWER

Model Messages

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	For y = 6x + 9, x is the number of stickers sold and y is dollars earned. Interpret the slope and intercept.	**The earnings increase by $6 per sticker sold. The starting earnings are $9 when 0 stickers are sold.**
2	For y = -4x + 28, x is hours after a laptop is unplugged and y is battery percent. Interpret the slope and intercept.	**The battery level drops 4 percentage points per hour. The battery level is 28% when the laptop is unplugged.**
3	For y = 7x, x is miles walked in a charity event and y is dollars earned. Interpret the slope and intercept.	**The earnings increase by $7 per mile walked. The starting earnings are $0.**
4	For y = -8x + 56, x is weeks and y is dollars left on a gift card. Interpret the slope and intercept.	**The gift card balance drops by $8 each week. The starting balance is $56.**

PART 2 · APPLY IT

1. **The club earns $3 for each ticket sold. The club starts with $45, such as a donation, before selling tickets.** The slope is 3, so earnings rise $3 per ticket. The intercept is 45, so y is $45 when x is 0.
2. **y = 3x + 18. Earnings increase by $3 per design sold, and the student earns $18 when 0 designs are sold.** Earnings rise $12 when sales rise 4 designs, so the slope is 3. The table shows an intercept of 18.

CHALLENGE

The earnings match at x = 5 sets, when y = $45. App A has the higher starting earnings because its intercept is $20, compared with $5 for App B. App B grows faster because its slope is $8 per set, compared with $5 per set for App A.

Accept equivalent wording for increase, decrease, rate, and starting amount. For the challenge, require both x = 5 and the matching earnings of $45.