LESSON MAKER PRO

Start and Change

Find what stays steady in a linear pattern.

HIGH SCHOOL · MT.CORE.ALG.LIN.3.a

MT.CORE.ALG.LIN.3.a "Represent linear functions using tables, graphs, equations, and verbal situations, while using technology strategically. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities by:..."

NAME _____ DATE _____

THE BIG IDEA

A linear function changes by the same amount for each equal step in the input. Divide the change in output by the change in input to find the rate. The initial value is the output when the input is 0.

WORKED EXAMPLE

Use the table to find the rate and initial value. Write an equation.

x	y
0	9
1	16
2	23

1. From x = 0 to x = 1, y increases by 16 - 9 = 7.
2. The rate is 7/1 = 7.
3. When x = 0, y = 9, so the initial value is 9.

Answer: Rate: 7; initial value: 9; y = 7x + 9.

PRACTICE 4 problems

1 For y = 4x + 6, find the rate and initial value.

ANSWER _____

2 For y = -2x + 8, find the rate and initial value.

ANSWER _____

3 A club starts with 13 members and gains 6 each month. Let x be months and y be members. Write an equation. Name the rate and initial value.

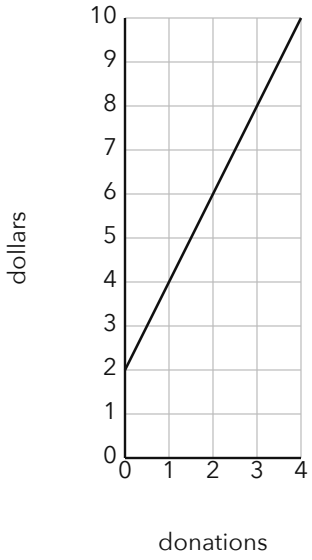
ANSWER _____

4 A battery starts at 80% and loses 5 percentage points each hour. Let x be hours and y be the battery percentage. Write an equation. Name the rate and initial value.

ANSWER _____

APPLY IT Show your work

1 Students at Salish Kootenai College model the dollars y in a fundraiser jar after x equal donations. Use the graph to find the starting amount and dollars added per donation. Write an equation.



ANSWER _____

2 For a community cleanup near Blackfeet Community College, students track bags collected after x hours. Use the table to find the starting number of bags and the hourly rate. Write an equation.

Hours, x	Bags, y
0	4
1	7
2	10

ANSWER _____

CHALLENGE One step up

Plans A and B have the same value when x = 4. Plan A starts at 10 and increases by 3 per unit. Plan B increases by 5 per unit. Write an equation for each plan, then explain in one sentence how you found Plan B's initial value.

WORK SPACE AND ANSWER

ANSWER KEY

Start and Change

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	For y = 4x + 6, find the rate and initial value.	**Rate: 4; initial value: 6.**
2	For y = -2x + 8, find the rate and initial value.	**Rate: -2; initial value: 8.**
3	A club starts with 13 members and gains 6 each month. Let x be months and y be members. Write an equation. Name the rate and initial value.	**y = 6x + 13; rate: 6 members per month; initial value: 13 members.**
4	A battery starts at 80% and loses 5 percentage points each hour. Let x be hours and y be the battery percentage. Write an equation. Name the rate and initial value.	**y = -5x + 80; rate: -5 percentage points per hour; initial value: 80%.**

PART 2 · APPLY IT

1. **Starting amount: $2; rate: $2 per donation; y = 2x + 2.** The line crosses the y-axis at 2 and rises 2 dollars for each donation.
2. **Starting amount: 4 bags; rate: 3 bags per hour; y = 3x + 4.** At 0 hours there are 4 bags. The total increases by 3 bags each hour.

CHALLENGE

Plan A: y = 3x + 10. Plan B: y = 5x + 2. At x = 4, Plan A equals 22, so Plan B must start at 2 because 5(4) + 2 = 22.

Accept equivalent equations and units. For the graph, students may find the rate using any two clear points on the line.