LESSON MAKER PRO

Patterns in Pairs

Describe how two measurements change together.

HIGH SCHOOL · MT.CORE.DATA.INT.6.b

MT.CORE.DATA.INT.6.b "Analyze the relationship between two quantitative data distributions in context that have a linear association. This standard should incorporate cultural context relating to Montana Indigenous Peoples and local communities by: Describing..."

NAME _____ DATE _____

DESCRIBE THE RELATIONSHIP

When paired measurements follow a roughly straight pattern, describe what happens to one variable as the other increases. Compare their changes to find a rate, and include units. A pattern alone does not prove that one variable causes the other to change.

WORKED EXAMPLE

A book drive logs sorting hours and boxes sorted. Describe the relationship.

Sorting hours	Boxes sorted
12	21
14	25
16	29

1. Sorting hours rise by 2 each time.
2. Boxes sorted rise by 4 each time.
3. The rate is 4/2 = 2 boxes per hour.

Answer: As sorting hours increase, boxes sorted increase by 2 boxes per hour.

PRACTICE 4 problems

1 Each pair shows (miles walked, cups of water left): (0, 9), (3, 6), (6, 3). Describe the direction and rate.

ANSWER _____

2 Each pair shows (practice hours, tricks a skater can land): (0, 5), (3, 8), (6, 11). Describe the direction and rate.

ANSWER _____

3 Each pair shows (minutes of music played, battery percent left): (0, 40), (5, 30), (10, 20). Describe the direction and rate.

ANSWER _____

4 Each pair shows (volunteer-hours, bags of litter collected): (0, 0), (5, 10), (10, 20). Describe the direction and rate.

ANSWER _____

APPLY IT Show your work

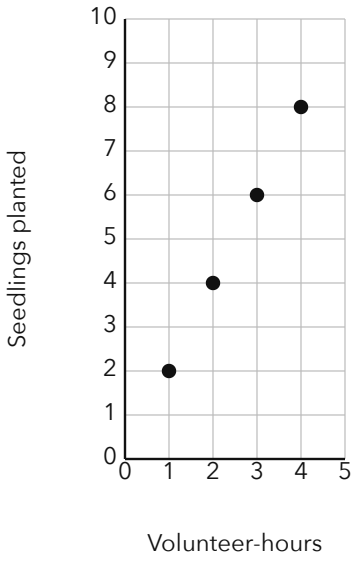
1 At a Montana tribal college's public computer lab, students track a laptop's battery. Describe how charge changes with time, including the rate.

LAPTOP BATTERY

Hours since charge	Battery percent left
0	90
3	75
6	60

ANSWER _____

2 At a public community garden event hosted by a Montana Tribal Nation, each point shows one shift. Describe the relationship between volunteer-hours and seedlings planted, including the rate.



ANSWER _____

CHALLENGE One step up

A student group tracks hours spent editing public event videos and minutes of finished video. Describe the overall relationship and usual rate. Which pair breaks the pattern?

VIDEO EDITING

Editing hours	Finished minutes
0	1
2	5
4	9
6	8
8	17

WORK SPACE AND ANSWER

ANSWER KEY

Patterns in Pairs

HIGH SCHOOL · MT.CORE.DATA.INT.6.b

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Each pair shows (miles walked, cups of water left): (0, 9), (3, 6), (6, 3). Describe the direction and rate.	**As miles walked increase, water left decreases by 1 cup per mile.**
2	Each pair shows (practice hours, tricks a skater can land): (0, 5), (3, 8), (6, 11). Describe the direction and rate.	**As practice hours increase, the number of tricks the skater can land increases by 1 trick per hour.**
3	Each pair shows (minutes of music played, battery percent left): (0, 40), (5, 30), (10, 20). Describe the direction and rate.	**As minutes of music played increase, battery charge decreases by 2 percentage points per minute.**
4	Each pair shows (volunteer-hours, bags of litter collected): (0, 0), (5, 10), (10, 20). Describe the direction and rate.	**As volunteer-hours increase, bags collected increase by 2 bags per volunteer-hour.**

PART 2 · APPLY IT

1. **As time since charging increases, battery charge decreases by 5 percentage points per hour.** The charge falls 15 percentage points in 3 hours, so the rate is 15/3 = 5 percentage points per hour.
2. **Shifts with more volunteer-hours have more seedlings planted, at a rate of 2 seedlings per volunteer-hour.** Each increase of 1 volunteer-hour goes with an increase of 2 seedlings. The points form an increasing straight-line pattern.

CHALLENGE

Finished video minutes generally increase by 2 minutes per editing hour. The pair (6, 8) breaks that pattern.

Accept equivalent descriptions with the correct direction, rate, and units. In the challenge, the usual rate comes from the other four pairs; the data do not explain why (6, 8) differs.