LESSON MAKER PRO

Units Tell Stories

Use units to make sense of rates, costs, and graphs.

HIGH SCHOOL · MT.CORE.ALG.MOD.3

MT.CORE.ALG.MOD.3 "Choose and interpret measurement units in formulas, graphs, and data displays to understand problems and to guide problem-solving in modeling situations..."

NAME _____ DATE _____

READ THE UNITS

A rate compares two quantities. To name its units, divide the output units by the input units. In a graph, use the axis labels to name the slope's units.

WORKED EXAMPLE

A booth fills cups at a steady rate. Use the table to find the rate and its units.

CUPS FILLED

Time (min)	Cups
2	18
6	54

1. Change in cups: 54 - 18 = 36.
2. Change in time: 6 - 2 = 4 minutes.
3. Rate: 36/4 = 9 cups per minute.

Answer: 9 cups per minute

PRACTICE 4 problems

1 A bike trip follows d = 14t, where d is miles and t is hours. What are the units of 14?

ANSWER _____

2 A data plan costs C = 25 + 7g, where C is dollars and g is gigabytes. Give the units of 25 and 7.

ANSWER _____

3 A bottle fills at 250 milliliters per minute. Write an equation for its volume V, in milliliters, after t minutes.

ANSWER _____

4 A trail app reports 11 feet per second. Express this speed in feet per minute.

ANSWER _____

APPLY IT Show your work

1 Students are printing tickets for a basketball tournament on the Blackfeet Reservation. Use the table to find the cost per ticket and the cost of 60 tickets at the same rate.

TICKET PRINTING

Tickets	Cost ($)
20	5
40	10

ANSWER _____

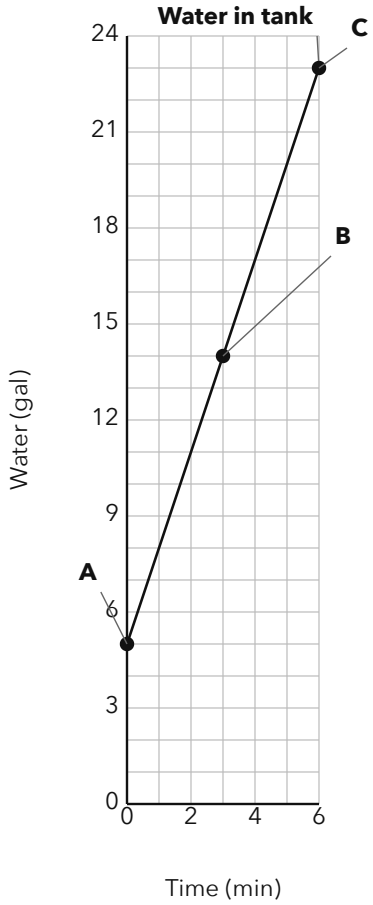
2 For a school video stream, data use is D = 0.75t, where D is gigabytes and t is hours. What does 0.75 measure? How much data does a 5-hour stream use?

WORK SPACE

ANSWER _____

CHALLENGE One step up

The graph shows water entering a tank at a steady rate. State the starting amount and filling rate, with units. Predict the amount after 7 minutes.



WORK SPACE AND ANSWER

Units Tell Stories

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A bike trip follows d = 14t, where d is miles and t is hours. What are the units of 14?	**miles per hour**
2	A data plan costs C = 25 + 7g, where C is dollars and g is gigabytes. Give the units of 25 and 7.	**25: dollars; 7: dollars per gigabyte**
3	A bottle fills at 250 milliliters per minute. Write an equation for its volume V, in milliliters, after t minutes.	**V = 250t**
4	A trail app reports 11 feet per second. Express this speed in feet per minute.	**660 feet per minute**

PART 2 · APPLY IT

1. **$0.25 per ticket; $15 for 60 tickets** Divide $5 by 20 tickets to get $0.25 per ticket. Multiply $0.25 by 60 tickets to get $15.
2. **0.75 gigabytes per hour; 3.75 gigabytes** The coefficient gives data use per hour. Substitute t = 5: D = 0.75(5) = 3.75 gigabytes.

CHALLENGE

Starting amount: 5 gallons; filling rate: 3 gallons per minute; after 7 minutes: 26 gallons

Accept equivalent unit notation, such as mi/h or $/GB. For the challenge, extending the graph's steady rate beyond the displayed time gives 5 + 3(7) = 26 gallons.