LESSON MAKER PRO

Unit Sense Lab

Track units, scales, and starting values.

HIGH SCHOOL · HSN-Q.A.1

CCSS.Math.Content.HSN-Q.A.1 "Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays."

NAME _____ DATE _____

UNITS GUIDE THE MATH

Write units with each number as you solve. In a formula, multiply or divide the units along with the numbers. On a graph, check both the starting value and the value of one interval before you read a point.

WORKED EXAMPLE

A 17-mile trip takes 1/2 hour. At the same rate, how far can the traveler go in 6 hours?

1. Find the rate: 17 miles / (1/2 hour) = 34 miles per hour.
2. Multiply rate by time: 34 miles per hour x 6 hours.
3. The hours cancel, leaving miles: 204 miles.

Answer: 204 miles

PRACTICE 6 problems

1 Convert 2.5 hours to minutes.

ANSWER _____

2 Use d = rt. A runner moves at 18 meters per second for 45 seconds. Find d.

ANSWER _____

3 A 3.6-liter drink mix is shared equally among 12 bottles. How many milliliters go in each bottle?

ANSWER _____

4 On a temperature graph, the labels 10°C, 20°C, and 30°C are each two grid intervals apart. What does one grid interval represent?

ANSWER _____

5 A graph of monthly bus rides has a y-axis that begins at 200 rides instead of 0 rides. What does the bottom of the graph represent?

ANSWER _____

6 Use density = mass / volume. A sample has a mass of 360 grams and a volume of 90 cubic centimeters. Find its density.

ANSWER _____

APPLY IT Show your work

1 You stream music using 2.4 GB of data each hour. You listen for 3.5 hours. How much data do you use?

WORK SPACE

ANSWER _____

2 You travel 126 miles to a concert. Your car uses 1 gallon of gas for every 28 miles, and gas costs $7 per gallon. What is the gas cost for the trip?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A graph shows battery charge during an event. The bottom horizontal line is labeled 40%, and each grid interval represents 5 percentage points. A point is 3 grid intervals above the bottom line. What is the battery charge? Explain how the graph's starting value affects your answer.

_____

_____

ANSWER KEY # Unit Sense Lab

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Convert 2.5 hours to minutes.	**150 minutes**
2	Use d = rt. A runner moves at 18 meters per second for 45 seconds. Find d.	**810 meters**
3	A 3.6-liter drink mix is shared equally among 12 bottles. How many milliliters go in each bottle?	**300 milliliters**
4	On a temperature graph, the labels 10°C, 20°C, and 30°C are each two grid intervals apart. What does one grid interval represent?	**5°C**
5	A graph of monthly bus rides has a y-axis that begins at 200 rides instead of 0 rides. What does the bottom of the graph represent?	**200 rides, the lowest displayed value**
6	Use density = mass / volume. A sample has a mass of 360 grams and a volume of 90 cubic centimeters. Find its density.	**4 grams per cubic centimeter**

PART 2 · APPLY IT

1. **8.4 GB** Multiply the data rate by the time: 2.4 GB/hour x 3.5 hours = 8.4 GB. Hours cancel, leaving gigabytes.
2. **$31.50** First find gallons used: 126 miles / 28 miles per gallon = 4.5 gallons. Then multiply 4.5 gallons by $7 per gallon to get $31.50.

CHALLENGE

55%. The graph starts at 40%, so add 3 x 5 percentage points: 40% + 15% = 55%.

Accept equivalent unit notation, such as m/s or g/cm3. For the graph-origin problem, accept answers that clearly state that 200 rides is the first displayed value, not zero.