Unit Rate Problems

Work each problem the unit rate way, then check it the scale factor way.
Compare unit rates in the same units.

Name _____ Date _____

Words we use

say the math word, then the plain English

WORD	PLAIN ENGLISH	WHAT YOU DO
Scale factor	How many times bigger or smaller.	Divide the new amount by the old one, then multiply both amounts by it.
Better buy	The lower price for one.	Find each unit rate in the same units and pick the smallest.
Unit rate	How much for one.	Find it, then multiply.
Proportional	Always multiplies by the same number.	Say the thread sentence.
y = rx	Output equals unit rate times input.	Write it when the story has a steady rate.

Part A Both ways

1. A recipe uses $1\frac{1}{2}$ cups of flour for 12 cookies. Flour for 30 cookies? Unit rate way, then scale factor way.

2. A team scores 18 points in 4 minutes. Points in 10 minutes? Both ways.

3. A car goes 150 miles on 5 gallons. Miles on 12 gallons? Gallons for 420 miles?

Part B Better buy

CHOICES	UNIT RATES	BETTER BUY
Chips: 12 oz for $3.00, or 20 oz for $4.40		
Cereal: 10 oz for $2.50, 16 oz for $3.84, 24 oz for $6.00		
Juice: 64 oz for $3.20, or 96 oz for $4.32		

Part C Emily

1. Emily leaves at 8:25 and has gone $\frac{3}{4}$ mile by 8:29:30. School is 3.42 miles away; the bell is at 8:50. Which unit rate do you want, and why? Find it. Does she make it?

Part D Unit 1 review

1. Write the unit's sentence from memory.

2. Name the four places to find the unit rate, and how you read it in each.

3. What are the two graph tests? What do (0, 0) and (1, r) mean?

Part E Exit ticket

1. 18 points in 4 minutes at a steady pace. Points in 10 minutes?

2. What is a better buy?

Answer key

Part A. 1. $\frac{1}{8}$ cup per cookie, $3\frac{3}{4}$ cups; or $2.5 \times 1\frac{1}{2} = 3\frac{3}{4}$ cups. 2. 4.5 a minute, 45 points; or $2.5 \times 18 = 45$. 3. 30 miles per gallon; 360 miles; 14 gallons.

Part B. \$0.25 and \$0.22, the 20-oz bag. \$0.25, \$0.24, \$0.25, the 16-oz box. \$0.05 and \$0.045, the 96-oz bottle.

Part C. Minutes per mile, because she knows the miles. $\frac{3}{4} \times \frac{4}{3} = 1$, so $4\frac{1}{2} \times \frac{4}{3} = 6$ minutes per mile. $3.42 \times 6 \approx 20\frac{1}{2}$ minutes, arriving about 8:45:30. Yes.

Part D. 1. A proportional relationship always multiplies by the same number, the unit rate. 2. Table: divide output by input. Graph: the point at 1. Equation: the number next to x. Words: how much for one. 3. Straight, and through the origin. (0, 0): zero in, zero out. (1, r): one in, the unit rate out.

Part E. 1. 45 points. 2. The lower price for one.