

Grade 7 • Unit 2 Worksheet

Introducing Proportional Relationships

Name: _____

Date: _____

Part A • Warm-up: Constant Ratios

Decide whether each table shows a proportional relationship. If yes, give k (constant of proportionality, y/x).

1. Table A: $x = 2, 4, 6, 8$; $y = 6, 12, 18, 24$.

Proportional? ☐ Yes ☐ No. $k =$ _____

2. Table B: $x = 1, 2, 3, 4$; $y = 3, 5, 7, 9$.

Proportional? ☐ Yes ☐ No. If no, what is the pattern?

Part B • Equations from Tables

3. A car travels at a constant speed. In 3 hours it goes 165 miles.

a. Constant of proportionality (speed in miles per hour) = _____

b. Equation: distance = _____ $\times$ time

c. Fill in the table.

d. How long to travel 440 miles? _____ hours

Time (hr)	Distance (mi)
1	?
3	165
5	?
t	?

4. Recipe: 3 cups of flour for every 2 cups of sugar.

If F = cups of flour and S = cups of sugar, write TWO equations relating F and S (one solving for each).

How are the two constants of proportionality related? _____

Part C • Graphs of Proportional Relationships

5. A line passes through the origin (0, 0) and the point (4, 10).

- a. Is this a proportional relationship? ☐ Yes ☐ No
- b. Constant of proportionality $k =$ _____
- c. Equation: $y =$ _____ x
- d. When $x = 6$, $y =$ _____. When $y = 35$, $x =$ _____.

6. Which of these graphs CAN'T represent a proportional relationship? Circle ALL that apply.

- a) A straight line through the origin
- b) A straight line through (0, 5) and (2, 9)
- c) A curve passing through the origin
- d) A straight line from (0, 0) through (3, 9) and (5, 15)

Why are the ones you circled NOT proportional?

Part D • Proportional vs Non-Proportional

7. Smoothie Shop A charges \$6 for 8 oz, \$9 for 12 oz, \$12 for 16 oz. Smoothie Shop B charges \$6 for 8 oz, \$8 for 12 oz, \$10 for 16 oz.

- a. Which shop has a proportional price-to-size relationship? _____
- b. For that shop, the price per ounce is \$ _____ per ounce.
- c. For the other shop, calculate price-per-ounce at each size. What do you notice?

8. Tyler claims: "My age in years and my brother's age in years are proportional because we both get one year older every year." Do you agree?

Test his claim. Say Tyler is 7 and his brother is 4. What is the ratio? When Tyler is 12, what's his brother's age? What's the new ratio?

Is the relationship proportional? ☐ Yes ☐ No. Explain.

Part E • Multi-Representation

9. A printer prints 12 pages per minute. Represent this relationship in FOUR ways.

a. Equation (pages p in terms of minutes m): _____

b. Words (the unit rate sentence): _____

Complete the table:

Minutes (m)	Pages (p)
1	?
3	?
?	60
10	?

d) Sketch the graph (label axes, mark at least 2 points and the origin):

Part F • Thinking Deeply

10. Jada and Han are arguing. The equation $y = 4x$ is proportional. Jada says "the constant is 4." Han says "the constant is $\frac{1}{4}$ because $x = (\frac{1}{4})y$."

Who is correct?

Explain how both can be true.
