Writing y = rx

A proportional relationship always multiplies by the same number, the unit rate. Written down, that is y = rx: the output equals the unit rate times the input.

1 THE VOCABULARY

Words we use

Equation a math sentence with an equals sign.

Variable a letter for an amount that can change.

y = rx output = unit rate × input.

r the unit rate; the number next to x.

- Watch out for these.
- Reading rx as r plus x. Letters side by side mean multiply.
- Multiplying when you should divide. Know the output and want the input? Divide by r.
- Putting the unit rate in the wrong place: it is the number next to x, never added on.
- Reading r at the wrong point on a graph. Go over to an input of 1.

2 THE METHOD

Write and use y = rx

1. FIND r table: divide. Graph: read the output at x = 1. Words: how much for one.
2. WRITE IT y = rx with your number, or letters from the story: c = 3.20g.
3. FORWARD know x, want y: multiply by r.
4. BACKWARD know y, want x: divide by r.

> WHY DIVIDING GOES BACK
> The equation multiplies the input by r. Dividing by r undoes that. 3.20 × 15 = 48, so 48 ÷ 3.20 = 15.

3 GAS AT $3.20 A GALLON

c = 3.20g

r = 3.20	dollars for each gallon
c = 3.20g	cost equals 3.20 times gallons
c = 3.20 × 12 = 38.40	12 gallons: forward, multiply
g = 48 ÷ 3.20 = 15	$48: backward, divide
t = m + 1.5m = 2.5m	the bus driver: morning plus afternoon
g = 0.3125c	the other way to write it: gallons for each dollar

> THE EXIT TICKET
> Tickets at $7.50: c = 7.50t. Six tickets: 7.50 × 6 = $45.

> SAY IT OUT LOUD
> y = rx. The output equals the unit rate times the input.

Unit 1, Lesson 5 in one line: y = rx says the output equals the unit rate times the input, and r is the one number that never changes.