What Makes It Proportional

A proportional relationship always multiplies by the same number, the unit rate. Proportional comes from portion, a share. The table test: divide each output by its input and look for the same number in every row.

1 THE VOCABULARY
Words we use

Proportional always multiplies by the same number.
Proportion two ratios that are equal.
Input, output what you start with, what you get.
Table matching inputs and outputs, one row each.

- Watch out for these.
- Checking only one or two rows. Check every row.
- Dividing input by output instead of output by input. Pick one way and keep it.
- Missing a fee: if zero in does not give zero out, it is not proportional.
- Thinking a table that goes up by the same amount each row must be proportional. Bowling goes up by $5 each game and is not.

2 THE METHOD
The table test

1. DIVIDE each output by its input, every row.
2. COMPARE the same number every row means proportional; a change means not.
3. NAME THE NUMBER that is what the relationship multiplies by (Lesson 3 names it).
4. ZERO CHECK nothing for nothing: zero in must give zero out.

WHY A FEE BREAKS IT
A proportional relationship multiplies the input. Zero times anything is zero. A $3 shoe fee means zero games still costs $3, so the relationship is adding, not just multiplying.

3 TWO TABLES
Lemonade and bowling

0.75 ÷ 1, 1.50 ÷ 2, 2.25 ÷ 3, 3.00 ÷ 4	lemonade: 0.75 every row
proportional	always multiplies by 0.75
8 ÷ 1 = 8, 13 ÷ 2 = 6.5, 18 ÷ 3 = 6	bowling: a different number each row
not proportional	the $3 shoe fee is there at zero games
$\frac{1.50}{2} = \frac{3.00}{4}$	a proportion: two equal ratios from the lemonade table

THE EXIT TICKET
2 hours $30, 4 hours $60, 5 hours $80. 15, 15, then 16. One row breaks it: not proportional.

SAY IT OUT LOUD
Divide each output by its input. Same number every row? Proportional.