

Find a unit rate — learn

Find a requested unit rate and explain which quantity is measured per one of the other quantity.

A rate relates two quantities with their units. A unit rate describes one unit of a named quantity. To find liters per minute, divide liters by minutes. To find minutes per liter, reverse the direction. Divide both quantities by the same positive number so the named denominator becomes 1. A fraction of a liter is meaningful; a fraction of a whole delivered card is an average in a constant-rate model. The rates in this collection are stated constant-rate models, not claims that every real process stays constant.

Worked model

At a constant rate, a pump fills 15 liters in 3 minutes. To find liters per minute, split 15 liters into 3 equal time groups: 15 divided by 3 = 5 liters for each 1 minute. Both quantities are divided by 3. The table keeps liters and minutes labeled. For minutes per liter, divide 3 by 15: 1/5 minute per liter. The two answers have different meanings; the question determines the direction.

Liters	Minutes
15	3
5	1
1	1/5

Worked example

Use the pump model. Explain why 5 liters per minute and 1/5 minute per liter can both be correct. Which answers the question How many liters in one minute?

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Guided task 1

At a constant rate a printer makes 24 labels in 4 minutes. Find labels per minute. First name the quantity that must become 1, then divide both quantities.

Guided task 2

A dispenser pours 3 liters in 4 minutes at a constant rate. Find liters per minute. Write a fraction and explain its meaning. Could this be described as $\frac{4}{3}$ liters per minute? Explain.
