

Representation glossary · per one

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Use after readiness; examples are teaching, not independent evidence.

Rate and unit rate

A rate names two quantities and units. A unit rate expresses one named quantity per 1 of the other. Five liters per minute means 5 liters for each 1 minute.

Direction

Liters per minute and minutes per liter answer different questions. At 5 liters per minute, 1 liter takes $\frac{1}{5}$ minute in the same constant-rate model.

Equivalent labeled pairs

Divide both quantities by the same positive number to make the requested denominator 1. Keep units attached.

Liters	Minutes
15	3
5	1
1	$\frac{1}{5}$

Fraction as division

Three liters in four minutes gives $\frac{3}{4}$ liter per minute. This is meaningful for volume. Fractional counts of whole objects describe averages in a rate model; they do not mean cutting an object.

Representation glossary · fair comparison

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Common basis

Compare rates with the same quantity units and direction, or compare matching amounts of time/goods. Dollars per item compares cost for one item; items per minute compares output in one minute.

Interpret the goal

Lower dollars per item means lower unit cost. Higher items per minute means greater output rate. A reciprocal comparison is valid when correctly interpreted: less time per item means faster output.

Tie

Twelve meters in four seconds and fifteen meters in five seconds both give 3 meters per second. The constant speeds tie even though totals differ.

Missing information

A total output without its time cannot establish an output rate. Ask for the missing denominator or the unit rate.

Conditions

Use constant speed/output when a task states it. Compare identical goods and supplied fees. For whole packs, check whether the required amount can be bought in whole packs. Unit cost alone does not establish quality or suitability.