

FORMULA APPLICATION

Four steps make every calculation clear.



NAME _____ CLASS _____ DATE _____

LEARNING GOAL

Use a formula to solve a science problem in four steps, with the right unit every time.

SUCCESS CRITERIA

- ☐ I can follow the four steps in order.
- ☐ I can use a formula triangle.
- ☐ I can put a unit on every quantity.

ENTRY 1

The four steps

Read the models

STEP 1

Write the formula

STEP 2

Put the numbers in, with units

STEP 3

Calculate

STEP 4

Write the answer and unit

MODEL 1

Speed: $d = 120 \text{ m}$, $t = 8 \text{ s}$. Find v .

$$v = d \div t$$

$$v = 120 \text{ m} \div 8 \text{ s}$$

$$120 \div 8 = 15$$

$$v = 15 \text{ m/s}$$

MODEL 2

Force: $m = 3 \text{ kg}$, $a = 4 \text{ m/s}^2$. Find F .

$$F = m \times a$$

$$F = 3 \text{ kg} \times 4 \text{ m/s}^2$$

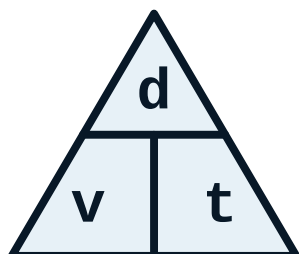
$$3 \times 4 = 12$$

$$F = 12 \text{ N}$$

ENTRY 2

The formula triangle

Cover the one you want



Cover the one you want to find in the formula triangle. What you can still see is the sum: side by side means multiply, one over the other means divide.

Try it. Cover each letter and write what is left.

Cover d

d =

Cover v

v =

Cover t

t =

ENTRY 3

Units key

Keep it beside you

m
metre
distance

s
second
time

m/s
metres per second
speed

kg
kilogram
mass

N
newton
force

J
joule
energy

V
volt
voltage

A
ampere
current

W
watt
power

g/cm³
grams per cubic
centimetre
density

YOUR TURN



NAME _____ CLASS _____ DATE _____

Formula bank

$v = d \div t$

$F = m \times a$

$E = m \times g \times h$

$P = V \times I$

density = mass $\div$ volume

ENTRY

1

Practice

Four steps each time

Q 1 Speed: $d = 240 \text{ m}$, $t = 12 \text{ s}$. Find v .

FORMULA

NUMBERS, UNITS

CALCULATE

ANSWER, UNIT

Q 2 Force: $m = 5 \text{ kg}$, $a = 4 \text{ m/s}^2$. Find F .

FORMULA

NUMBERS, UNITS

CALCULATE

ANSWER, UNIT

Q 3 Gravitational potential energy: $m = 3 \text{ kg}$, $g = 10 \text{ N/kg}$, $h = 5 \text{ m}$. Find E .

FORMULA

NUMBERS, UNITS

CALCULATE

ANSWER, UNIT

Q 4 Power: $V = 12 \text{ V}$, $I = 2 \text{ A}$. Find P .

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NUMBERS, UNITS

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ANSWER, UNIT

Q 5 Time: $d = 90 \text{ m}$, $v = 6 \text{ m/s}$. Find t . Rearrange $v = d \div t$.

FORMULA

NUMBERS, UNITS

CALCULATE

ANSWER, UNIT

Q 6 Mass: $F = 30 \text{ N}$, $a = 5 \text{ m/s}^2$. Find m . Rearrange $F = m \times a$.

FORMULA

NUMBERS, UNITS

CALCULATE

ANSWER, UNIT

GO 2 Go further

Challenge

Q 7 Density: mass = 54 g , volume = 20 cm^3 . Find the density.

FORMULA

NUMBERS, UNITS

CALCULATE

ANSWER, UNIT

Q 8 Distance: $v = 6 \text{ m/s}$, $t = 50 \text{ s}$. Find d . Use the formula triangle.

FORMULA

NUMBERS, UNITS

CALCULATE

ANSWER, UNIT