

Math Diversion Problem 937

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Physics intuition completely justifies such a
transgression against rigor.
— Ettore Majorana

Source: <https://www.algebra.com/algebra/homework/word/mixtures/Mixture-problems.lesson>
Title: Changing a Concentration Problem
Presenter: Patrick

1 Problem

How much of the pure acid should be added to 1000 milliliters of a 2% acid solution to get a 4% acid solution? (Concentrations here are volume-to-volume concentrations, measured in [mL/mL] units, same as in Problem 4).

2 Solution

Let's make a diagram to help out.

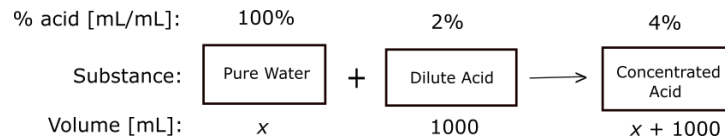


Figure B5. The terms 'dilute' and 'concentrated' are not standard, just convenient to use as labels.

- 1) Conservation of volume is already accounted for.
- 2) Next, we write down the conservation of 'pure' acid equation:

$$(1.00)(x) + (0.02)(1000) = (0.04)(x + 1000). \quad (1)$$

The solution for x is 20.8 mL.