Math Diversion 926

P. Reany

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> Lifelong learning is no longer a luxury but
> a necessity for employment.
> — Jay Samit

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Source: The Ether of Great Mathematical Ideas
Title: Water is evaporated from salt water
 Presenter: Patrick
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1 The Problem

How much water must be evaporated from 1000 milliliters of a 2% salt solution to get a 10% salt solution?

(Concentrations here are mass-to-volume concentrations, measured in g/mL units, same as the last problem.)

2 The Solution

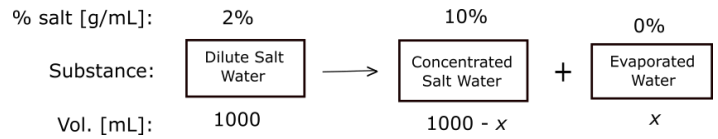

Figure 1. Water is evaporated from salt water to concentrate it.

1) Conservation of volume is already accounted for in the diagram.
2) Next, we write down the mass conservation of salt equation:

$$(0.02)(1000) = (0.10)(1000 - x) + (0.0)x\,. \tag{1}$$

The solution for x is 800 mL.