Student Learning Advisory Service

Contact us

Please come and see us if you need any academic advice or guidance.

Canterbury

Our offices are next to Santander Bank

Open

Monday to Friday, 09.00 – 17.00
E: learning@kent.ac.uk
T: 01227 824016

Medway

We are based in room G0-09, in the Gillingham Building and in room DB034, in the Drill Hall Library.

Open

Monday to Friday, 09.00 – 17.00
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The Student Learning Advisory Service (SLAS) is part of the Unit for the Enhancement of Learning and Teaching (UELT)

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This leaflet has been produced in conjunction with **sigma** Network for Excellence in Mathematics and Statistics Support

sigma Σ network for excellence in mathematics and statistics support

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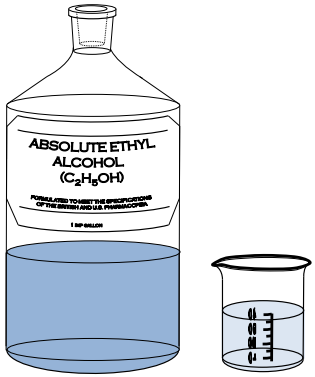
AT A GLANCE/ PHARMACY CALCULATIONS INCREASING A % SOLUTION

Calculating how much ingredient to add to a product to achieve a higher desired concentration.*



Example 1

How much ingredient A should you add to 100mL of a 10% v/v solution to increase it in strength to a 20% v/v solution?

Method

Step 1: Use $c_1 \times v_1 = c_2 \times v_2$ — percentages cancel out

$$90(\%) \times 100 = 80(\%) \times x$$

NB: When increasing a concentration use the initial and desired % amounts of the **base**, not the ingredient

Therefore, in this case, ingredient = 20%, so **base** = 80% (100-20=80)

Step 2: Transpose for x and solve

$$x = \frac{90 \times 100}{80} = \mathbf{112.5mL}$$

*** NB:** Applicable to % v/v and % w/w strengths only

Step 3: Subtract the total original volume from the new volume

$$112.5mL - 100mL = \mathbf{12.5mL} \text{ (of ingredient A)}$$ ✓

Example 2

What quantity of ingredient B should you add to 200mL of a 20% v/v solution to increase it in strength to a 50% v/v solution?

Method

Step 1: Use $c_1 \times v_1 = c_2 \times v_2$ percentages cancel out

$$80(\%) \times 200 = 50(\%) \times x$$

Step 2: Transpose for x and solve

$$x = \frac{80 \times 200}{50} = \mathbf{320mL}$$

Step 3: Subtract the total original volume from the new volume

$$320mL - 200mL = \mathbf{120mL} \text{ (of ingredient B)}$$ ✓

Example 3

What weight of ingredient C should you add to 120g of a 2% w/w concentration to increase it in strength to a 4% concentration?

Method

Step 1: Use $c_1 \times v_1 = c_2 \times v_2$ percentages cancel out

$$98(\%) \times 120 = 96(\%) \times x$$

Step 2: Transpose for x and solve

$$x = \frac{98 \times 120}{96} = \mathbf{122.5g}$$

Step 3: Subtract the total original volume from the new volume

$$122.5g - 120\text{g} = \mathbf{2.5g} \text{ (of ingredient C)}$$ ✓

Q1

How much ingredient D should you add to 400mL of a 5% v/v solution to increase its strength to a 20% v/v solution?

Q2

What quantity of ingredient D should you add to 1.2L of a 2.5% v/v solution to increase its strength to a 10% v/v solution?

Q3

You have 80g of a 15% concentration of ingredient E. What weight of ingredient E should you add to increase its strength to 20%?

Q4

How much of ingredient F will be required to increase the strength of 1.5L of a 1% v/v solution to a 10% solution?

Q5

What weight of ingredient G should be mixed with 2500mg of an 8% w/w concentration of ingredient G to increase it in strength to 20%?

Answers

Q1 = 75mL. **Q2** = 100mL. **Q3** = 5g. **Q4** = 150mL.
Q5 = 375mg