

## 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

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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 (UFLT)

## Acknowledgments

All materials checked by Dr Scott Wildman, Dr Cleopatra Branch, Jerome Durodie and Andrew Lea, Medway School of Pharmacy, Anson Building, Central Avenue, Chatham Maritime, Chatham, Kent. ME4 4TB.

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



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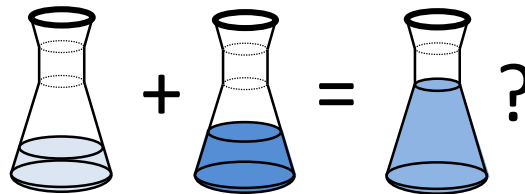
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# AT A GLANCE/ PHARMACY CALCULATIONS MIXING CONCENTRATIONS

Calculating the strength of a mixture of two different concentrations.



### Example 1

If you mix 100mL of a 5% v/v concentration of drug A with 200mL of a 20% v/v concentration of drug A, what will the final % strength be?

### Method

**Step 1:** Calculate the amount of drug A in each concentration

$$\frac{5}{100} \times 100\text{mL} = 5\text{mL} \quad \& \quad \frac{20}{100} \times 200\text{mL} = 40\text{mL}$$

**Step 2:** Add the two amounts together

$$5\text{mL} + 40\text{mL} = 45\text{mL}$$

**Step 3:** Add the two volumes together

$$100\text{mL} + 200\text{mL} = 300\text{mL}$$

**Step 4:** Put total amount over total volume

$$\frac{45\text{mL}}{300\text{mL}}$$

**Step 5:** Use  $c_1/v_1 = c_2/v_2$  to convert to a percentage

$$\frac{45\text{mL}}{300\text{mL}} = \frac{x}{100\text{mL}}$$

**Step 6:** Transpose for  $x$  and solve

$$x = \frac{45 \times 100}{300} = 15\% \text{ v/v} \checkmark$$

### Example 2

You mix 1.2L of a 0.2% w/v solution of drug B with 600mL of a 1 part in 2000 w/v solution of drug B. What will the final % strength be?

#### Method

**Step 1:** Calculate the amount of drug B in each concentration

$$\frac{0.2}{100} \times 1200\text{mL} = 2.4\text{g} \quad \& \quad \frac{1}{2000} \times 600\text{mL} = 0.3\text{g}$$

**Step 2:** Add the two amounts together

$$2.4\text{g} + 0.3\text{g} = 2.7\text{g}$$

**Step 3:** Add the two volumes together

$$1200\text{mL} + 600\text{mL} = 1800\text{mL}$$

**Step 4:** Put total amount over total volume

$$\frac{2.7\text{g}}{1800\text{mL}}$$

**Step 5:** Use  $c_1/v_1 = c_2/v_2$  to convert to a percentage

$$\frac{2.7\text{g}}{1800\text{mL}} = \frac{x}{100\text{mL}}$$

**Step 6:** Transpose for  $x$  and solve

$$x = \frac{2.7 \times 100}{1800} = 0.15\% \text{ w/v} \checkmark$$

### Example 3

You mix 5ml of a 2mg/mL solution of drug C with 10mL of a 0.05% w/v solution of drug C. What will the final strength be in %?

#### Method

$$\textcircled{1} \frac{2\text{mg}}{\text{mL}} \times 5\text{mL} = 10\text{mg} \quad \& \quad \frac{0.05}{100} \times 10\text{mL} = 5\text{mg}$$

$$\textcircled{2} 10\text{mg} + 5\text{mg} = 15\text{mg} \quad \& \quad 5\text{mL} + 10\text{mL} = 15\text{mL}$$

$$\textcircled{3} \text{ by } c_1v_1 \dots \frac{15\text{mg}}{15\text{mL}} = \frac{100\text{mg}}{100\text{mL}} = \frac{0.1\text{g}}{100\text{mL}} = 0.1\% \text{ w/v} \checkmark$$

#### Q1

You mix 150mL of a 5% v/v concentration of drug D with 150mL of a 15% v/v concentration of drug D. What will the final % strength be?

#### Q2

You mix 0.6L of a 0.2% v/v concentration of drug E with 1.2L of a 0.5% v/v concentration of drug E. What will the final % strength be?

#### Q3

You mix 64mL of a 40% w/v concentration of drug F with 96mL of a 1 part in 8 w/v concentration of drug F. What will the final % strength be?

#### Q4

You mix 1250mL of a 1 part in 5000 w/v concentration of drug G with 2250mL of a 0.2mg/mL concentration of drug G. What will the final % strength be?

#### Q5

You add 200mL of a 0.3% v/v concentration of drug H to 600mL of a 1 part in 200 parts concentration of drug H. What will the final strength be in mcL/mL?

#### Answers

**Q1** = 10% v/v. **Q2** = 0.4%. **Q3** = 23.5% w/v.

**Q4** = 0.02% w/v. **Q5** = 4.5 mcL/mL