Diluting Solutions

New Concentration = old concentration x $\underline{\text{volume taken}}$
                                           flask volume

Example 1
A 50.0 mL sample of 2.00 mol L^{-1} HCl solution is made up to 1 L with distilled water. What is the new concentration?

New Concentration   = old concentration   x $\underline{\text{volume taken}}$
                                                      flask volume

$\qquad\qquad$ = 2.00 mol L^{-1} x   0.0500 L / 1L

$\qquad\qquad$ **= 0.100 mol L^{-1}**

Solution was diluted 20 x (i.e. is now 1/20 of the original strength)

Example 2

- 2.86g of NaCl was made up to 100mL with distilled water   **A**
- 10.0 mL of solution A was diluted to 250ml   **B**
- 25.0 mL of solution B was diluted to 1000mL   **C**
- 5.00 mL of solution C was diluted to 100mL   **D**

What are the concentrations of the four solutions (in g L^{-1})

A   28.6g / 0.100L

$\qquad$ = 28.6 g L^{-1}

B   250 / 10 = 25 times diluted

$\qquad$ = 28.6 g L^{-1} / 25

$\qquad$ = 1.14 g L^{-1}

C   1000 / 25 = 40 times diluted

$\qquad$ = 1.14 g L^{-1}/ 40

$\qquad$ = 0.0286 g L^{-1}

D   100 / 5 = 20 times diluted

$\qquad$ = 0.0286 g L^{-1}/ 20

$\qquad$ = 0.00143 g L^{-1}