Making Solutions Practice Problems:

1. How would you prepare 100 ml of a 30% (w/v) solution of polyethylene glycol (PEG)?

   Use the formula X g in 100 ml = %
   Weigh out 30 g of PEG and dissolve it in < 100 ml water.
   When dissolved add water up to 100 ml.

2. How would you prepare 50 ml of a 9% (w/v) solution of NaCl?

   Use the formula X g in 100 ml = % but divide by 2 since in 50 ml.
   Weigh out 4.5 g of NaCl and dissolve it in < 50 ml water.
   When dissolved add water up to 50 ml.

3. How would you prepare 200 ml of 70% (v/v) solution of ethanol from a stock of 95% ethanol?

   Use the formula CV=CV
   (95%) (V) = (70%) (200 ml)
      V = 147.37 ml

4. How would you prepare 200 ml of 0.3 M NaCl? (NaCl MW = 58.44)

   Use the formula mw g / l = 1 M
   58.44 g / l = 1 M
   to go from liter (l) to 200 ml then go from 1 M to 0.3 M
   Answer is 3.5 g / 200 ml = 0.3 M NaCl

5. How is 50 ml of 20 millimolar (mM) sodium hydroxide (NaOH MW = 40) prepared?

   Use the formula mw g / l = 1 M
   40 g / l = 1 M
   to go from liter (l) to 50 ml then go from 1 M to 1000 mM and then from 1000 mM to 20 mM
   Answer is 0.04 g / 50 ml = 20 mM NaOH

6. How would you prepare a 1 l stock solution of 1M Tris pH 7.5? (FW = 121.21)

   Use the formula mw g / l = 1 M
   121.21 g / l = 1 M

Diluting Solutions Practice Problems:

1. You have a 20% stock solution of glucose. For your experiment, you need 2 ml of 5 % glucose. How much of the 20% stock solution will you transfer?

   Use the formula CV=CV
   (20%) (V) = (5%) (2 ml)
   V = 0.5 ml

2. How many microliters of a 20% SDS solution is required to prepare a 1.5 ml solution of 0.5% SDS?

   Use the formula CV=CV
   (20%) (V) = (0.5%) (1.5 ml)
   V = 0.0375 ml or 37.5 µl

3. From a stock solution of 1 M Tris, how would you prepare 400 ml of 0.2 M Tris?

   Use the formula CV=CV
   (1 M) (V) = (0.2 M) (400 ml)
   V = 80 ml

4. How much do you need of 2 M NaCl to prepare 4 ml of 50 mM NaCl?

   Use the formula CV=CV
   (2 M) (V) = (50 mM) (4 ml)
   Note that M ≠ mM so first convert M to mM
   (2000 mM) (V) = (50 mM) (4 ml)
   V = 0.1 ml or 100 µl

5. How would you prepare 50 ml of 0.2 N HCl from a stock solution of 1 N HCl?

   Use the formula CV=CV
   (1 N) (V) = (0.2 N) (50 ml)
   V = 10 ml