Making a Stock Salt Solution

The stock solution we wish to use for this activity is a 10% solution; measured as weight per volume (% w/v). From this stock solution you will make diluted samples for use in the activity.

A 10% w/v solution means that there will be 10 grams of salt for every 100 mL of resulting *solution*. This is not the same as adding 10 grams of salt ***to*** 100 milliliters (mL) of water, although for the purpose of this activity, the end result would be close. Absolute precision in the preparation of the stock solution is not critical, but care should be taken to avoid unnecessary errors.

Making the solution is quite simple, especially if you have a metric balance and a metric vessel such as a graduated cylinder, a beaker with volumes marked or even most modern kitchen measuring cups.

To make a 10% solution:

- add 10 grams of salt into your measuring cup (or lab vessel) and
- add warm water until there is 100 milliliters of total solution.
- Stir or shake to mix the solution and
- allow it to cool to room temperature before use.

You can easily adjust the numbers for the volume of stock solution you think you may need – 20 grams of salt to make 200 mL, 50 grams of salt to make 500 mL, and so on. The number of trials that will be attempted in your class will determine the total volume needed, but you can make a fair amount of trial solutions starting with 200 mL, or so, of stock solution.

If you do not have a metric balance or scales, you can adapt the tools you have at hand. 1-1/2 teaspoons (level) will provide 10 grams of salt, for instance and a level tablespoon would then provide about 20 grams of salt.

A typical soft drink, tea, sports drink, or filtered water bottle holds 20 fluid ounces (more when you fill it past the beginning of the neck). 20 fluid ounces is just under 600 mL, so a 10% solution can be made by putting three (3) level tablespoons of salt into a 20-ounce bottle, then adding water until the level comes just above the narrowing of the neck of the bottle. If you have a 1-liter bottle, use 5 tablespoons and fill with water until the level just passes the rounded shoulder of the bottle and enters the neck; double the amount of salt for a 2-liter bottle.

Helpful conversions and combinations to make a 10% (w/v) salt solution

Add:	To:
10 grams salt	Fill vessel to total of 100 mL solution
1.5 level teaspoon (10 grams) salt	Fill vessel to total of 100 mL solution
3 level Tablespoons (60 grams) salt	Near top of 20-ounce plastic soft drink bottle (less for 20-ounce plastic Coke™bottle); makes 600 mL
1/4-cup salt	Near top of 20-ounce plastic soft drink bottle (less for 20-ounce plastic Coke™bottle); makes 600 mL
7 level Tablespoons salt	1/2-way up the neck of a typical plastic 1-liter drinking water bottle; makes a little more than 1-liter
1-2/3 cup salt	To neck of gallon jug; makes 1 gallon of water