

## Visual Models of Solutions and Concentrations

**Recommended grades level(s)** 9-12

**Time Duration:** - 50 minutes

**Objective(s):**

The learner will be able to discuss pure solutions.

The learner will be able to discuss dilute solutions.

The learner will be able to discuss concentrated solutions.

The learner will be able to discuss the volumetric changes which occur.

**Materials and/or Resources:**

4 300ml beaker

Different colored glass or plastic spheres (size ranges 1 mm to 8 mm)

Stirring rod

**Background Information:**

It is difficult for students to understand the concept of solutions and concentrations. The purpose of this project is to give students a hands-on model to work with which will demonstrate the manner in which solutions are formed.

**Procedures:**

Each lab table station is provided with four 300 ml beakers. Each beaker contains one size and one color of glass or plastic spheres. The spheres range in size from 1 mm. to 8 mm. in uniform increments, each size sphere having its own color.

The students are led to understand that the beakers represent single molecules of pure substances.

The students first record the volumes of each of the beakers and enter this information into their data tables.

The students are then told to pour the beaker of smallest spheres into the beaker of largest spheres and mix well with a glass stirring rod. The new combined volume is then recorded in the data table. (The students note that the smaller spheres tend to fill in the spaces between the larger spheres, thus demonstrating the addition of a solid to a liquid forming a solution.

Students are encouraged to make many combinations of different sizes and colors of spheres and to record the volumetric changes.

**Development Resources:**

<http://askweric.org/cgi-bin/printlesson.cgi/Virtual/Lessons/Science/Chemistry/CHM0050.html>