**Vanishing Volume**

**DESCRIPTION:**   
When 50mL of water are added to 50mL of ethanol in a 100mL graduated cylinder, there are only ~97mL of liquid. Ethanol and water molecules are attracted to each other through hydrogen bonding. The two molecules pack closer together with each other than they do with just themselves.

**TOPICS COVERED:**- intermolecular forces  
- hydrogen bonding  
- physical change  
- miscibility  
- mixtures

**MATERIALS NEEDED:**- two 50mL graduated cylinders  
- 100mL graduated cylinder  
- 95% ethanol  
- distilled water

**PROCEDURE:**1. Measure out exactly 50mL of 95% ethanol in a 50mL graduated cylinder  
2. Measure out exactly 50mL of water in a 50mL gradated cylinder  
3. Pour both liquids into a 100mL graduated cylinder

**ADDITIONAL COMMENTS:**Food coloring can be added to help visualize. Get students involved by having them read the graduated cylinders, it’s a good time to reinforce how they are read.

**SAFETY:**   
Safety goggles should be worn at all times.

**REFERENCES:**Meszaros, M. “The Lost Volume.” *Caroline Biological Supply Company*. Accessed May 31, 2013. <http://www.carolina.com/teacher-resources/Interactive/chemistry-lost-volume-demonstration/tr10785.tr>

**STORY:**   
Ask students what 50 + 50 is equal to. This sets up an expectation for them.