**Activity A: Determining density of plastic materials by comparing with water density.**

**(a)**  **(b)**  **(c)**  **(d)** 

**Figure 1. Examples of plastics. (a) polyethylene (PE), (b) polypropylene (PP), (c) polystyrene (PS) and (d) polyvinyl chloride (PVC)**

**Materials:** Glass beaker of 250 cm3, samples of different plastic materials (PE, PP, PS, PVC)

**Procedure:** Study the plastic objects and formulate hypotheses about their density in comparison with that of water. Write down your hypotheses.

**Hypotheses:**........................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................................

Propose a procedure by which you can verify and compare the density of the above plastic materials with that of water. You can look up water density in the chemical tables. Describe the procedure in words.

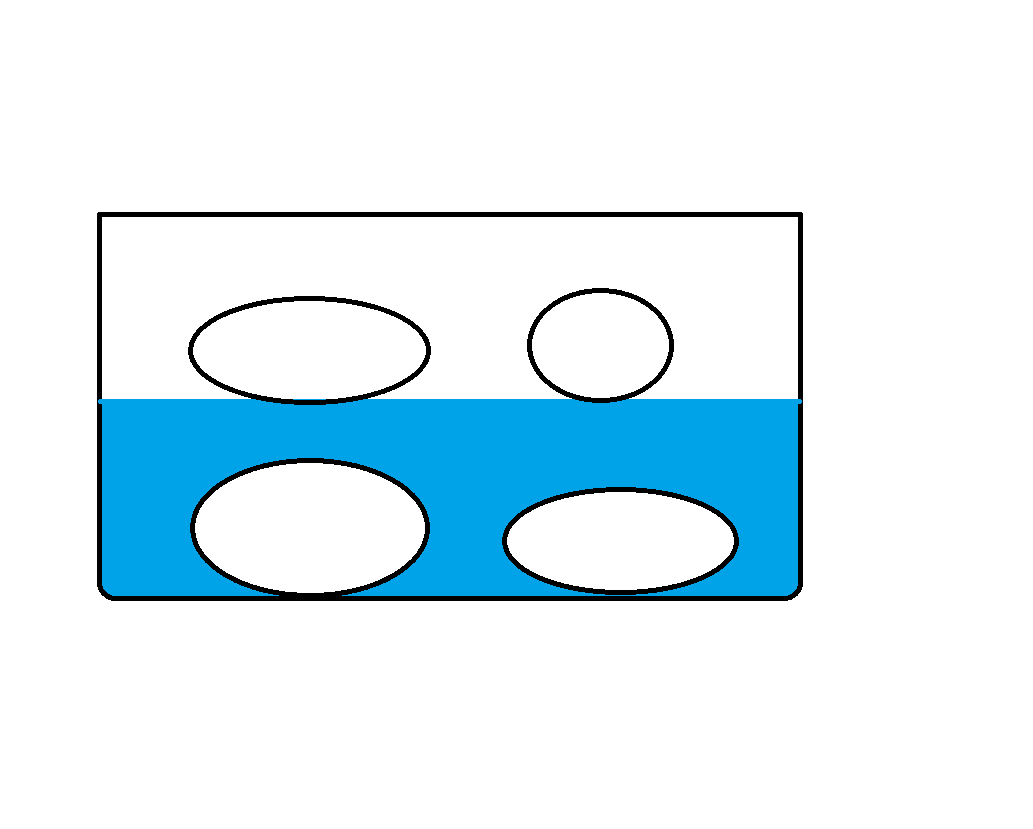
**Procedure:**....................................................................................................................................................................................................................................................................................................................................................................................................................................... ................................................................................................................................................... ......................................................................................................................................................................................................................................................................................................

**Problem solving task:** Devise a procedure for the exact determination of density of selected plastic materials.

...................................................................................................................................................................................................................................................................................................... ...................................................................................................................................................................................................................................................................................................... ......................................................................................................................................................................................................................................................................................................

**Findings:**

1. In the picture below, there is the result of the experiment to determine density of different plastic materials of PE, PP, PVC, PS. Write the names of the materials into the bubbles in such a way that it complies with the findings of the experiment.

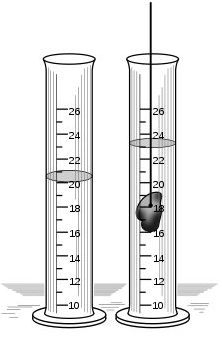


2. Complete the text with the following expressions:

*floats on water*  *falls to the bottom of the beaker*  *bigger*  *smaller*

The density of water is \_\_\_\_\_\_\_\_ g/cm3. Polyethylene \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, therefore its density is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ than that of water. Polystyrene \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, therefore its density is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ than that of water. Polyvinyl chloride \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, therefore its density is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ than that of water. Polypropylene \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, therefore its density is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ than that of water.

3. How can we find out the volume of an irregularly shaped object (sample of plastic)? The picture below can inspire you.



How do we calculate density of the object? ρ = \_\_\_\_\_\_\_\_\_\_

Compare the calculated density with the one in the tables.