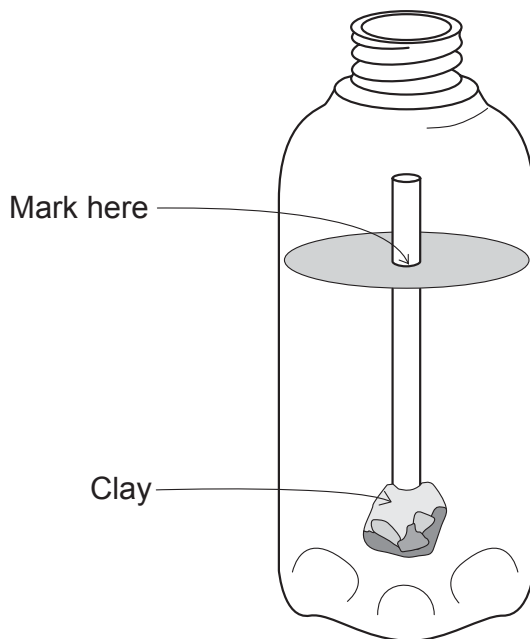


Homemade Hydrometer

Introduction This is a simple hydrometer designed to illustrate the differences in density between water samples. While it can be scaled to provide measurements, its purpose is demonstrative rather than quantitative.

Materials
 Plastic soda straw
 Modeling clay
 1-liter soda bottle
 Tap water
 Strong (5%) salt solution

- Directions**
1. Fill the soda bottle with distilled or tap water. (You may wish to cut the top off the bottle, since retrieving the straw may be difficult otherwise).
 2. Mold a ball of clay onto one end of the soda straw to make the “hydrometer”. The amount of clay is determined by trial and error. You want enough clay to cause the straw to float “low” in the fresh water, but not completely submerged.
 3. Float the hydrometer in the fresh water and try to mark the straw at the interface between the air and water. When the hydrometer is placed in a water sample and floats to this mark, the water sample should be 0% salt.



4. Empty the 1-liter bottle (or just get a second one) and fill it with 5% salt water.

5. Float the “hydrometer” in the salt water. It should float noticeably higher than in the fresh water. If you want to try to quantify your measurements, mark the straw as in step 3. When the hydrometer floats to the level of this mark, the water it is in should be about 5% ($5^{\circ}/\text{oo}$) salt.
6. The hydrometer will work as a simple illustration tool as is, but if you want to put a scale on it you may do so. You should have 2 marks on the straw – one that represents 0% and one that represents 5%. Simply mark the straw in even increments between these 2 marks to represent the different salinity measurements. For example, if the hydrometer floats to a mark halfway between the 0 and 5% marks, the water should have a salt concentration of 2.5% ($= 25^{\circ}/\text{oo}$).

Note that while the salinity in an estuary may be fairly low in places, the range of ocean salinities is typically narrow ($30 - 35^{\circ}/\text{oo}$), and this hydrometer may not be able to detect such small differences.

References

The following website offers instructions on building the same type of hydrometer:

<http://www.soinc.org/events/waterqual/salinometer.htm>