# THE FUNNY WATER

## A. Question: *What does it take to float?*

## B. Materials Needed:

1. Two identical beakers, two identical watch glasses
2. One small and one large candle
3. Alcohol (methyl, ethyl, or isopropyl)

## C: Procedure:

1. Fill beaker A about ¾ full of water and beaker B with the same amount of alcohol and cover them with the with glasses (do not reveal to students that the liquids are different).
2. Show the students the two candles: drop the smaller candle into beaker A and the larger one into beaker B.
3. Ask: "Why does one candle float and the other sink?" and "What will the candles do if they are placed in the opposite beakers?"
4. Drop the large candle in beaker A and the small one in beaker B.
5. See what happens.

## D: Anticipated Results:

The students should expect to see, that despite the size of the candle, both will float in the water. When the candles are placed in the alcohol each will sink, despite their size.

## E: Thought Questions for Class Discussion:

1. Why does the candle float in beaker A?
2. Why does the candle sink in beaker B?
3. What does sinking or floating depend on?

## F: Explanation:

The alcohol has a lower density than water. This is why the candle sank in the alcohol and stayed afloat in water. Some students may suggest that it sank in beaker B because it is larger or longer than the other piece that stayed afloat. But then, after switching the pieces of candle around, the larger candle stays afloat in the water and the smaller one sinks in beaker B. This most likely will give students a clue, that the liquid in beaker B is some kind of "funny water." This liquid may be methyl, ethyl or isopropyl alcohol. All of these have a density of around 0.76 whereas, the density of water is 1. That of wax is 0.85.

Density is defined as the ratio of mass and volume of a substance. It is scientifically represented as D= M/V in which D= Density, M= Mass and V= Volume. Whether something sinks or floats depends on the relative density of the object compared to that of the liquid into which it is submerged. Any object that has a density between that of water (1) and that of alcohol (0.76) may be used for this demonstration.