THE DIFFERENT CLAY STICKS

A. Question: *Does floating depend on an object's weight?*

B. Materials Needed:

1. Molding clay and a short wooden stick
2. A technical or equal arm balance
3. Two transparent beakers (glass or plastic)

C: Procedure:

1. Wrap just enough clay around a short wooden stick, so that it would just barely float in water.
2. Place this on one pan of the equal arm balance and weigh off the same mass of clay on the other pan.
3. Roll a cylinder out of this mass of clay. You are now ready for the inquiry demonstration.
4. Show the students the two beakers filled with water and the two clay cylinders (to be placed in water).
5. Show them that they weigh exactly the same, by placing them on each pan of the equal arm balance.
6. Now drop them in the two beakers with water.

D: Anticipated Results:

The students will see that one of the clay cylinders sinks and the other floats.

E: Thought Questions for Class Discussion:

1. Why does one clay cylinder sink and why does the other float?
2. What property is the same for both sticks?
3. What property does it depend on whether an object sinks or floats in a certain liquid?
4. What force is holding the floating object afloat?

F: Explanation:

Although the mass of the two clay cylinders are equal, the volume is definitely not the same. This is because one contains a wooden stick inside. And this is the one that floats. Since the density may be calculated from D= M/V, it can be seen that the density of the floating cylinder is smaller than the one that sinks. The force that holds up the floating cylinder is the buoyant force, which is the mass of the displaced liquid (water in this case). If the mass of the displaced water is the same as the mass of the object, it will float. If the former is less than the mass, the object sinks.