



Archimedes and the Adventure in the Backyard



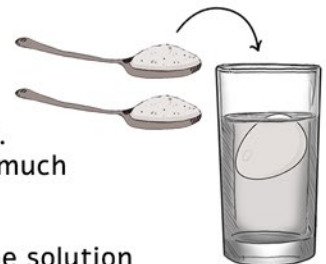
The Floating Egg

Home experiment

- > Put an egg in a glass and fill it with water (about 3/4 of the height). What happens to the egg? - It sinks into the water [fig.1].
- > Take the egg out of the glass and add about two tablespoons of salt. Mix well until the salt is dissolved in the water. If some of the salt sinks, it is also fine. This means that no more salt can be dissolved - and that the solution is saturated. Return the egg to the glass. What happens to the egg this time? - It floats [fig.2].
- > **Why is it happening?**



[fig.1]



[fig.2]

The egg's substance's density is greater than "ordinary" tap water. Therefore the egg sank to the bottom. The density describes how much material (mass) it has relative to its volume.

When we added the salt to the water, we changed its density. If the solution is concentrated enough, it will pass the density of the egg and thus the egg will float on the surface of the saltwater.

The Water Cycle

Home experiment

- > On the top half of a large clear plastic bottle, draw the sun and clouds with a water-resistant marker. On its bottom half draw a river, soil, or puddles. Pour 1/4 cup of water into the bottle. You can color the water with food coloring if you like. Close the cap and place it by a window [fig.3].
- > Over the next few days monitor the water cycle in the bottle. Even if you can't always spot every phase, the changes always happen.
- > **What happens in the bottle and how is it similar to the water cycle in nature?**



[fig.3]

The closed bottle heats up and so does the water at the bottom, which evaporates and turns from a liquid to vapor (gas). At this point, you may notice that the water line at the bottom of the bottle has dropped slightly.

When water vapor is surrounded by cooler air molecules or touches the cooler bottle's wall, it returns to its liquid form and forms clouds. This process is called condensation.

When a lot of water vapor has thickened and the clouds are heavy, visible drops are formed, which are heavy enough to fall back as precipitation. At this point, you will surely notice water droplets formed on the inner wall of the bottle [fig.4].



[fig.4]

In nature - rain, snow, sleet, or hail fall from the sky and are collected in lakes, oceans, rivers, or streams, and are even absorbed into the soil. In water-saturated soils with precipitation or in ones that do not absorb water (eg. concrete), puddles accumulate, which in time evaporate into the air again.

