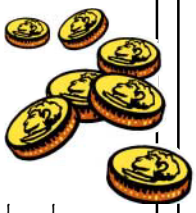
Experiment With Nature

Here are some activities you can try at home or at school. Please ask for permission from a grown-up before you begin.

Is the Glass Really Full?

What you need:
1 clear glass
water
10 to 20 pennies

What to do:
1. Fill a glass to the very top with water, until it will hold no more.
2. Hold the coins on the edge of the glass and carefully start slipping them into the water.
3. Keep adding coins until the water overflows.



What happens and why?
Water molecules have a strong attraction for one another. Inside the glass, the molecules that are surrounded by other molecules are attracted in all directions. But the molecules at the surface have no water above them, so they are strongly attracted downwards by the molecules below them. These attractive forces are strong enough to keep the water from spilling over the top of the glass, even when the level rises quite a bit above the rim of the glass. Eventually the volume of water above the rim of the glass becomes too great for the surface tension to hold, and the water will spill.

Mixing soap, water & pepper

What you need:
Toothpick
Bowl
Liquid dishwashing soap
Pepper
Water

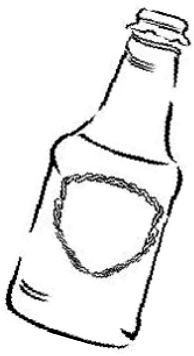
What to do:
1. Fill the bowl with water
2. Sprinkle about a teaspoon of pepper above the water
3. Dip the tip of the toothpick in the liquid soap
4. Place the tip of the toothpick with the soap side into the water.
5. Watch as the pepper *dramatically* backs away from the toothpick.

What happens and why?
The actual science happens because the soap breaks the surface tension of the water, like popping a balloon. It is the water that moves, not the pepper that is floating on it.

Does Water Expand When Frozen?

What you need:
Ice Cubes
Clear Plastic Glass
Small glass bottle with a large mouth
Plastic wrap and a rubber band

What to do:
1. Fill the glass with water until it over flows.
2. Add one ice cube to the glass.
3. Carefully clean up the spilled water and leave the glass undisturbed until the ice melts.
4. Fill the glass bottle with water and cover it with the plastic wrap and rubber band.
5. Put the bottle in the freezer and leave it until the water is frozen solid.



What happens and why?
There will be less water in the glass after the ice melts. This is because the ice will have taken up more room in its frozen form and less room having melted. The frozen water in the bottle will have a peak in the middle showing that it has expanded.