Science is all around us - it determines how matter behaves when it comes in contact with other matter and forces. Sometimes science demonstrations look like magic… until you learn the science behind them!

Here are a few science demonstrations that you can do on your own at home or in the classroom. Visit www.sciencemagicvideos.com to learn more.

Chilly Rescue

Challenge a friend to use a string to rescue an ice cube from a glass of water without getting their hands wet. Tell them that they may use anything on the table except the dishes or utensils.

You will need a glass of cold water, an ice cube, a piece of string or thread, and a salt shaker.

Float the ice cube in the glass of water. Hang one end of the string over the edge of the glass. Place the other end of it on the ice cube. Sprinkle a little salt on the ice cube and string and wait for one minute.

Unbelievably, the string freezes onto the ice cube. Gently pull on the string and lift the ice cube out of the water.

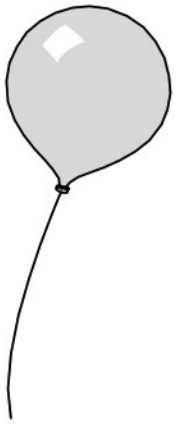
Why? When the salt strikes the ice, it lowers the freezing point of the water to a little below 32 degrees F. This causes the surface of the ice cube to melt a little. As the ice refreezes, it traps the string. Science magic!

the Scientific Process

Scientists follow a series of steps when when trying to solve a problem. This "Scientific Process" is outlined below.

Keep these procedures in mind when YOU are looking for a solution to a question! (Hint: a *hypothesis* is your best guess or assumption for the solution.)

1) Write down the problem.
2) Research.
3) Form a hypothesis.
4) Conduct an experiment to test hypothesis.
6) Evaluate hypothesis.



Inflation

Harness the power of chemistry to inflate a balloon! You will need vinegar, a soda bottle with narrow neck, baking soda, a small funnel, pen, and a balloon.

Try this: Fill the balloon with a tablespoon of baking soda. This is easy if you place the mouth of the balloon over the small end of the funnel and use the pen to force the powder through the narrow neck of the funnel.

Again, use the funnel to pour about an inch of vinegar into the bottle. Allowing the filled balloon to hang down, carefully stretch the mouth of the balloon over the ridged mouth of the bottle. Hold the bottle with attached balloon at arms length and raise the balloon and shake so the baking soda and vinegar mix. Science magic!

Why does the balloon expand? A chemical reaction occurs between the vinegar and baking soda, releasing carbon dioxide.

Air Pressure

LEVITATION

Use your magic touch (and a hair drier) to float a ping pong ball in mid-air!

Find a hair drier and ping pong ball from around the house. Hold the hair drier so the nozzle points straight up. Turn the drier on, then set the ping pong ball in the center of the air stream. Ta-da! You are witnessing the **Bernoulli effect**.

Why? The air moves fastest in the center of the jet of air, so pressure her is low. If the ball ever drifts to one side, it is soon pushed into the middle again by the higher pressure where the air is slower at the edges of the air stream.

The Swiss mathematician Daniel Bernoulli observed that whenever air moves, its pressure drops. In fact, the faster air--or liquid--moves, the more pressure drops. The same effect enables birds and aircraft to fly and sailing ships to sail into the wind.

BONUS - Try to duplicate this experiment using your LUNG POWER instead of the hair drier.

Light and Optics

Refraction

Have you ever noticed that a swimming pool always looks shallower than it is, or that a fish appears large underwater than out of the water? This happens because light rays bend when they pass from one transparent substance to another--in this case, from water to air. This effect is called refraction.

Refraction occurs because light travels at different speeds through transparent materials. Refraction can be very useful. Lenses are specially shaped pieces of glass that refract light in a precise way.

Try this: Get a pen or pencil and a glass of water. Place the pen halfway into the water and look directly at the point where the pen or pencil meets the water. Does it appear to bend? Of course, we know that it really isn't bent, it's just the principal of *refraction* fooling our eyes.

Liquids - Buoyancy

Risin' Raisins

Drop a few raisins in 7-Up or ginger ale and they quickly sink to the bottom. But, at the sound of your voice, some rise to the surface, only to fall back again at your command.

Why? Soda contains carbon dioxide gas, which collects as bubbles that rise to the surface. Gas bubbles rise because the buoyant force of the soda water is greater than the weight of the bubbles. The rough surface of a raisin provides many points of attachment for bubbles or gas. As bubbles collect on a raisins surface, it becomes more and more buoyant until it finally rises to the surface of the ginger ale.

The gas inside the bubble expands as the bubble rises to the surface an the pressure on it lessens. When the bubble reaches the surface, it expands even more. The thin film of liquid surrounding it is stretched too thin to hold the gas inside, and the bubble breaks, releasing the gas to the air.

The raisin falls back to the bottom, where it remains until a new batch of bubbles collects on its surface.

Liquids - Density

EGGSASPERATED

That's what your friends will be after you ask them to explain this science magic puzzler! An egg appears to remain suspended in the center of a glass of water, though others can't duplicate your feat.

Do this: Fill a jar half full of water and stir in salt until no more will dissolve. Drop the egg into the salt water and it will float. Carefully pour plain water over the egg and the jar may be filled while the egg still floats on the salt water, under the plain water.

The egg is able to float in midwater because the egg is buoyed upward with a force equal to the weight of the volume of liquid it displaces. Salt water is heavier than the egg and so the egg floats on it. However, the egg sinks in the less-dense plain water.

Think about it: Would it be harder to tread water in a freshwater lake or the saltwater ocean (provided both were warm, and the water was calm)?