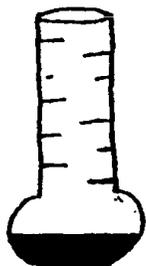


SCIENTIST

Test Tube Slide



Materials: Dowel Rod
Wooden Bead or ball
Pipe Cleaner
Paint
Glue
Pen

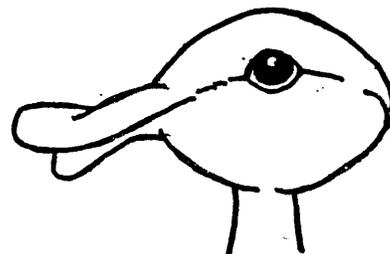
Cut the dowel rod into two 3" pieces. Paint white and when dry, mark lines on it. Paint ball or bead red. Glue on bottom of rod. Glue pipe cleaner on back.

Animal Magic

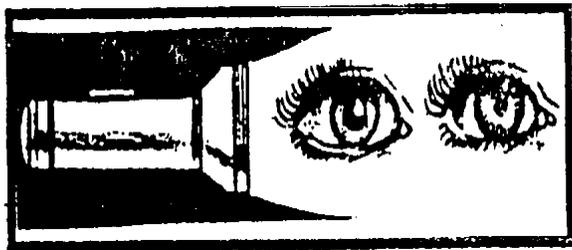
What creature have we here?

If you said a rabbit you were right. If you said a duck you were right, too.

It all depends on whether the left part of the picture strikes you as being the duck's bill before it strikes you as being a rabbit's ears.



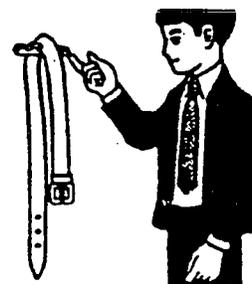
Parts Of The Eye



If you have blue eyes, it means the iris is blue. The iris is the covering in front of the eye. The size of the opening in it is regulated by muscles. The amount of light entering causes the muscles to constrict or relax involuntarily. Look into a mirror. Note the size of the pupils. They are the black circles in the center. Now have someone shine a flashlight into your face. Watch the size of your pupils. Did the iris close down the opening? How does this help you to see better?

Floating Beam

It would seem impossible to balance clothes peg with a leather belt hung over it on the tip of your finger. But the force of gravity can apparently be overcome. The secret is a small nick which you cut slantwise in the peg. The belt, which you squeeze firmly into the nick, leans so far sideways because of this slant, the center of gravity in the peg and belt together is shifted under the tip of the finger and balance is obtained.



Floating Ball Trick

Hold a table tennis ball over the end of a soda straw, tip head back, and blow hard. Release the ball. It will stay suspended above the straw as long as you blow.

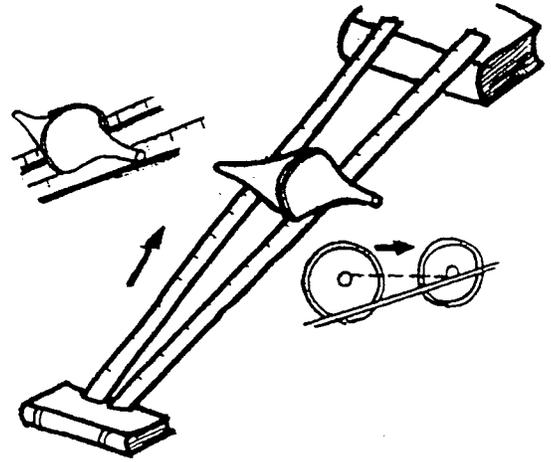
Air Pressure Experiment

You need two drinking straws and a small bottle filled with water. Have a boy put both straws in his mouth, with the end of one straw in the water and the other outside the bottle. Now ask him to suck water out of the bottle. He can't - because the air pressure in his mouth is equalized by the air coming in through the outside straw.

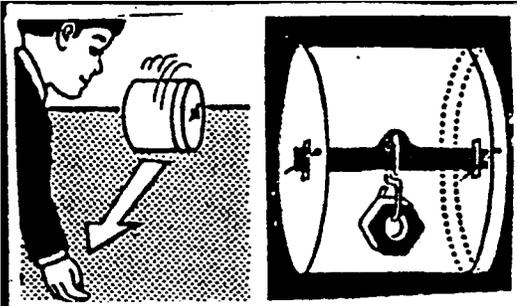
Uphill Funnels

You can make a "gravity-defying" device out of two large funnels taped together as shown. With two yardsticks and books of different thicknesses, form a track that's lower and narrower at one end than the other. After a little adjustment of the space between the two tracks (to accommodate the side of the funnels), place the funnels at the lower end. They roll "uphill" toward the higher end!

Actually they don't roll upward at all. If you look at the system from one side, you'll see that the center of the funnels (looking directly into one of the spouts) actually goes down as they roll. The illusion works because the sides of the funnels slope upward, allowing the center of the funnels to go down while the track goes up.



Boomerang Tin



Make slits $\frac{1}{2}$ " wide in the middle of the bottom and lid of a round tin. Push a piece of thick rubber the same length as the tin through the slits, and tighten it from the outside with pins. Hang a nut of about 2 ounces on to the center of the piece of rubber with a paper clip. If you roll the tin several yards forwards, it will return at once. The force of the gravity prevents the nut from joining in the rolling movement of the tin. It hangs upright under the rubber and winds up at each rotation. A force is produced in the rubber by the tension which causes the backward movement.

Blow Hard Trick

Place three small bits of paper on the back of your hand. Let anyone select one of the pieces. Claim that you can control your breath so as to only blow away the chosen one. It sounds impossible.

Solution: Place two fingers on the other two bits of paper, then blow the chosen one away.

Balancing Trick

Materials: 2 table forks a drinking glass a coin chosen for its size.

Point the prongs of the forks in an inward direction and thrust them together so that the forks are interlocked. Press a coin between the upper prongs from the inner side. Rest the coin on the far side of the glass rim so the handles of the fork extend in your direction. By properly adjusting the forks, you can make the coin balance on its side, keeping the forks balanced on it.

The handles of the forks serve as a counter balance for the coin and prongs. Precarious though it looks, it is like adjusting weights on an ordinary pair of scales, the only difference being the materials used.

Invisible Writing

laxative tablet 1 tb rubbing alcohol
cotton balls household ammonia

Mash the laxative tablet into the tablespoon of alcohol. Be sure the tablet is entirely dissolved. Write a message on the paper with paintbrush dipped into the solution. As the solution dries, the writing will disappear. To develop the message: dampen the cotton ball with liquid ammonia and dab it on the page. The writing will reappear.

Rock Candy

glass jar or drinking glass	piece of cotton string
pencil or stick	paper clip
food coloring (optional)	1 c Water
2 c Sugar	additional sugar

Tie a short piece of cotton string to the middle of the pencil or stick. Attach a paper clip to the end of the string for a weight. Moisten the string very lightly, and roll in a bit of sugar (this will "attract" the sugar crystals from the syrup to the string). Place the pencil or stick over the top of the glass or jar with the string hanging down inside.

Heat the water to boiling, and dissolve the 2 cups of sugar into it. For the biggest crystals FAST, heat the sugar water solution a SECOND time, and dissolve as much additional sugar as you can into it. Add a few drops of food coloring to the solution if desired.

Pour the solution into the prepared glass or jar and leave undisturbed for a couple of days. Depending on how much sugar you were able to dissolve into the water, you should start to see crystals growing in a few hours to a few days.

Above from the Greater St. Louis Area Council 2000 Pow Wow Book

A Fog Making Machine

Use a plain glass gallon jug, a stopper to fit it and a bicycle pump. Put a small amount of water or alcohol (which works even better) in the jug. Bore a hole through the stopper in the mouth of the jug. After a few strokes of the pump, remove the stopper quickly. There will be a loud pop and you will see that a cloud will form in the jug. To get "fair weather", all you need to do is replace the parts as they were, and pump air back into the jug. The reason the cloud was formed is that in pumping air into the jug, the temperature was raised, making it possible for the air to hold more moisture. When the top was removed, the air expanded and cooled. This cool air could not hold as much moisture, thereby forming a cloud.

Magic Apples

Suspend two apples (or like items) so they hang about 1/2 inch apart. When they are absolutely still, blow hard between the apples. The apples will move together. The air pressure between them is lessened so the surfaces are pushed together.



Balloon And Can Race

Each team will need a balloon for every Cub and a fruit can for each team. Each team will have a chair on each end of the room. Each team is divided with half of the team behind each of that team's chairs. The can is placed on a chair. One boy holds the balloon in the can and blows it up enough to make the can stick on around the balloon. He then carries the balloon, with the can hanging on, to the other chair. He then deflates his balloon and the next boy inflates his own balloon and carries it and the can back to the original chair. The first team to switch places wins.

Pencil In A Bottle

Materials: A clear glass juice bottle, one with a smaller neck (experiment to find one that works best)
Pitcher of water Stiff cardboard
Pencil Scissors
Ruler

What to do: Cut a square of cardboard five inches on each side. Fill the bottle all the way to the rim with water. Press the cardboard over the opening and carefully turn the bottle upside down, making sure no water spills out. Very carefully, slide the cardboard from under the opening. Amazingly, the water won't pour out. Now gently push the pencil up into the bottle; right through the water's surface. The water still won't fall out!

Physics at work: The air around us is made up of huge numbers of molecules that are constantly colliding with each other and everything else, like little billiard balls. The force of the earth's gravity pulls down on the water, which is why it normally pours out of a container held upside down. But there is another force pushing up on the water's surface, and that force is air molecules colliding with the water's surface. The combined upward collisions of millions of air molecules produce an upward push. The upward push due to this air pressure is greater than the downward pull of gravity, so the water doesn't fall. So why doesn't this happen whenever you try to pour something from a bottle? The reason is that as you tilt the bottle, a space develops, allowing air to get behind the liquid that is balancing the air pressure from the bottle's opening. Now gravity has nothing to fight, so the liquid falls.

Paper Plate Puzzle

If you cut a $\frac{1}{4}$ slice out of a paper plate, set the plate on a table, and roll a marble around the plate's rim, in which direction will the marble go when it gets to the cut edge? Will it continue to curve inward, go straight ahead or curve outward?

The action of the marble follows Newton's first law of motion: a body in motion will continue in a straight line unless a force is applied to it to move it out of the straight line. When you give the marble a push, it would roll in a straight line, but the curved edge of the paper plate supplies the force to push it into a circular path. As soon as the push is removed, the marble rolls in a straight line.

Lemon "Juice"

Materials: Lemon
Short piece of copper wire
Steel paper clip

What to do: Straighten the paper clip and poke one end through the rind into the lemon. Poke the copper wire into the lemon, too, near the paper clip but not touching it. Hold the ends of the wire and the clip close together and touch them both to your tongue. Do you feel a tingle?

Physics at work: The lemon juice provides a path for the exchange of electrons between the two wires. Your wet tongue completes the circuit for the flow of electrons, and current flows across your tongue. You feel the current as a tiny tingle.

Air Cannon Hockey

This game will demonstrate air pressure. Use round cardboard oatmeal boxes. Cut a hole the size of a penny in the tops. Fasten the lid back to the box tightly. Use a table for a field, with a goal at either end. Have a boy sit at each end of the 'field' with a cannon (box) and put a Ping-Pong ball in the middle of the table. By tapping the back of the box and aiming it at the ball, try to score by putting the ball through your opponent's goal. The Webelos leader can demonstrate the effectiveness of his oatmeal box cannon by using it to put out a candle. Fill cannon with smoke, then aim at candle, tap back of box, and flame will be put out. These cannons are effective up to about six feet.

Air Power Pop Up

Materials: Empty narrow cardboard tea box (Celestial Seasonings)
Balloon Art supplies to decorate
Pencil Tape
Bathroom tissue tube Scissors

- Tape the original opening shut. Make a new "top" in one narrow end of the box by cutting along 3 sides.
- Use a pencil to poke a hole in the front of the box near the bottom.
- Have Scouts blow up their balloons a few times to stretch them , then insert balloon into the box with the open end through the hole
- Set the cardboard tube inside the box and close the top.
- Blow into the balloon through the open end and the cardboard tube pops up.
- Decorate the tube and box in a creative way.

Make Your Own Refrigerator

Supplies: Unglazed clay flower pot
bowl of water
unopened bottle of pop
a stone.

1. Soak the clay pot in water
2. Fill the bowl almost full of water
3. Put the drink bottle in the water and put the clay pot upside down over it
4. Place the stone over the hole in the clay pot.

What happens: As water evaporates from the clay pot it takes heat away, so the object underneath will become cool. The clay pot will soak up water as it dries out so your refrigerator will last longer.

Above from Circle Ten Council 1999 Pow Wow Book