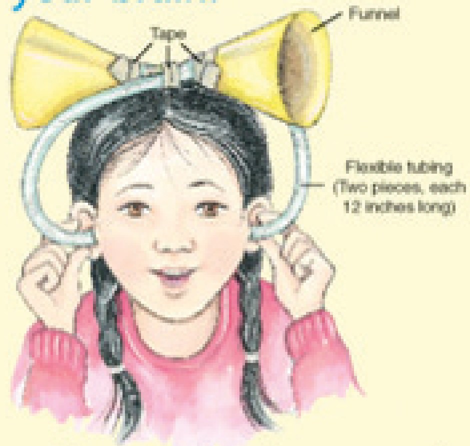
Science Experiments Samples

Try This!

These "ears" may trick your brain.



Turn Sounds Around

By Verlie Hutchens

When my dog barks, I know whether she's at the back door or at the front door. I don't have to be looking at her. I can tell which direction the sound is coming from without seeing her at all.

Many people have had the same experience. How does our brain locate the source of a sound?

A person's ears are not very far apart, but that short distance makes it all possible. Every sound hits each ear a little differently. A sound on the right goes directly into the right ear, but it must travel around the head to reach the left ear. The left ear receives that sound an instant later than the right, and the sound in the left ear is a bit softer.

Ever since the day we were born, our brains have been learning to use these small differences to locate the sounds we hear.

If you reversed the order of the sounds coming into your ears, would your brain know where the sound was coming from? The "mirror ears" shown on this page can turn sounds around in just that way. When you hold the ends of the tubes in your ears as shown, they make the sounds from each side go into the opposite ear. (They may work better for high-pitched sounds.) Follow the illustration to make your own "mirror ears," and listen for yourself.

Illustrated by Mary Kurnick Maass

Try This!

How You Judge Distance

If you want to hit a home run, you have to be able to see how far away the baseball is as it crosses home plate. Your brain has to take a measurement. How does it do it?

This experiment will show you. Use string to hang a paper clip or other small object in a doorway at about chest level. You may need help from an adult to hang it safely.

Pick up a stick, such as a yardstick or broom handle. Take three or four steps away from the paper clip.

Now close one eye and walk toward the paper clip. Try to touch it with the tip of the stick. If you miss, try again, still keeping one eye closed.

Using only one eye, most people will have a hard time touching the paper clip on the first try. Try it again with both eyes open and see if it's easier to do.

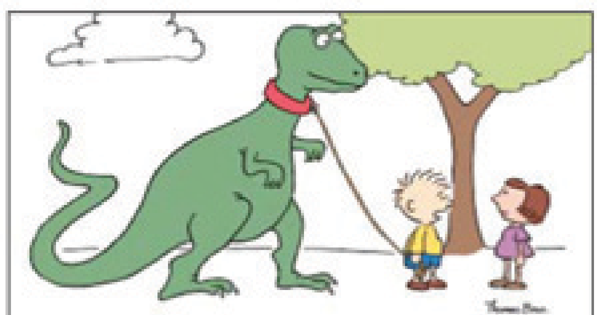
How It Works

In the experiment, you have to judge how far away the paper clip is. Your brain has several ways of doing this.

One simple way depends on how much your eye has to focus. Even with only one eye, this way gives the brain some information about distance, but not much.

As the experiment shows, your brain can judge distance much better when you look at something with both eyes. In fact, your brain has more than one way to use both eyes in judging distance. For example, to see anything clearly, you have to make both of your eyes point at the object. When you look at a nearby object, your eyes turn inward, toward each other. You can feel this happening if you look at the tip of your finger and move your finger toward your nose.

Your brain gets information from the eyes about how much they are pointing toward each other. Using that information, the brain can tell how far away an object is, whether it's a baseball or a paper clip.



"I call him Rex because he wrecks everything he sees."

See more experiments on HighlightsKids.com

Try This!

Check out the chemistry of rust.

before

after

Iron Burns . . . Slowly

By Jack Myers, Ph.D., Senior Science Editor

Sometimes a big load of iron in a ship can get hot. The heat can even set other materials on fire.

That's because the iron is rusting, which means it is burning very, very slowly. Iron rusts in a chemical reaction called *oxidation*. That means the iron reacts with oxygen gas from the air. Oxidation is the chemical reaction that occurs when anything burns in air.

Like most oxidations, rusting gives off heat. But rusting is a slow process that gives off very little heat. It becomes a fire hazard only when a lot of iron is allowed to rust in a closed-up space.

You can do a safe experiment to see the effect of this reaction.

Put a pad of steel (iron) wool into a jar. Pour in some water to wet the steel wool, then pour out water till only a little is left. Water helps the reaction go faster. Now stretch a balloon loosely across the mouth of the jar. (I cut off the neck of a balloon and threw away the neck. Then I used a rubber band to fasten the balloon over the mouth of the jar.)

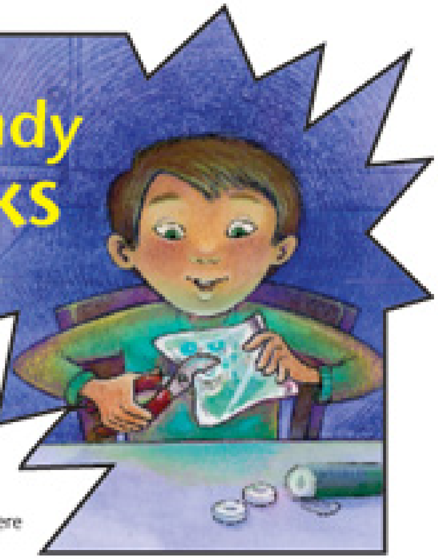
Leave the jar where you can watch it. In a few hours the balloon will begin to bend inward. By the next morning, it will be sucked into the jar. Orange-red rust will be collecting on the steel wool and falling off to the bottom of the jar.

The sucking-in of the balloon shows you that some part of the air was used up to make the rust. Our experiment does not prove that the gas used up was oxygen. But actually, there is no other gas in the air that will react with iron.

I thought that my jar of rusting steel wool did warm up just a little—certainly not enough to be dangerous. But you can see how a room full of rusting steel wool might get very warm. Let's not try that.

Try This!

Making Candy Sparks



What You'll Need

- help from an adult
- Wint-O-Green Lifesavers
- a clear sandwich bag
- pliers
- a dark room, such as a windowless bathroom, where the air is dry, not humid

What to Do

1. Put a Lifesaver into the sandwich bag. The bag will protect your eyes from flying bits of candy.
2. Make the room as dark as possible. (A rug laid along the bottom edge of the door can block out light.)
3. Wait at least two minutes for your eyes to adjust to the darkness.
4. Put the jaws of the pliers over the bag, with the Lifesaver between the crushing parts. Squeeze the pliers to crush the Lifesaver. The candy should give a flash of blue-green light.

How It Works

When a sugar crystal cracks, it releases energy in the form of an electrical spark. Like a tiny lightning bolt, this spark is made up of electrons moving through the air.

In the air, the electrons hit nitrogen molecules and give them some of their energy. Scientists say the nitrogen molecules become *excited*. The nitrogen can't keep that energy. Just as it does in lightning, the nitrogen releases the energy as light. We see only part of the light. Most of it is invisible ultraviolet light.

The ultraviolet light gives some of its energy to wintergreen molecules in the candy. Like the nitrogen, the wintergreen becomes excited. Finally, the wintergreen molecules release the energy as blue-green light.

Try This!

Ice Cube on a Wire

When the pressure's on, ice can get a grip.

For this activity you need a thin strong wire about two feet long. You can find a good one by carefully unraveling a strand from the bundle of thin wires used to make a thicker wire for hanging up a picture frame.

Using this wire and two sticks or pencils, make a one-foot-long wire with a handle at each end. To do it, wind one end of the wire around one stick. Then twist the short end of the wire around the longer end to hold it tightly to the pencil. Repeat these steps to attach the opposite end of the wire to the other stick.

Place an ice cube on top of a tin can. Holding one of the pencils in each hand, press the wire down across the top of the ice cube.

Now comes the only tricky part. You must keep pressing down steadily and firmly—but not so hard that you break the wire. Slowly, the wire will sink into the ice.

It is strange to think that you can cut into ice with a wire. But if you look carefully, you will see that you are not cutting the ice cube into two pieces. The wire ends up threaded right through the ice.

How It Works

Like heat, pressure can prevent water from freezing into ice. Pressure can also melt ice.

If you force a fine wire down hard enough against ice, the pressure underneath the wire can be great enough to melt the ice. As the wire sinks, the water freezes again above the wire.

A thick wire doesn't work. A person would have to press down very hard to create enough pressure under a large wire.

To create an interesting effect, use ten-pound nylon fishing line instead of wire. Fishing line is harder to press into the ice, but it can be more fun because the fishing line is almost invisible in dim light.

Illustrated by Brenda Pepper