Topic: electricity
Static electricity experiment: Balloon Fun

http://www.madaboutscience.com.au/store/index.php?main_page=page&id=10

Balloon Fun Stick a balloon to the wall and watch your hair stand on end.

What you will need:
•Balloon
•Piece of fabric (wool works best)

What to do:
1. Blow-up and tie the balloon.
2. Rub it about 20 times with the piece of fabric.
3. Hold the balloon near the wall and watch it stick. You may need to rub the balloon again with the fabric if it doesn't work the first time.
4. Rub the balloon about 20 times again with a piece of fabric.
5. Hold the balloon near your hair and watch it stand on end.

How does it work?
Just like in the plastic straw experiment, rubbing the balloon with the piece of fabric gives it an electrical charge. The electrical charge has the power to attract things. The wall is too heavy to move towards the balloon so the balloon moves towards it. Hair is much lighter and moves towards the balloon.

Topic: Electricity
Static Electricity Experiment

http://www.sciencekids.co.nz/experiments/staticelectricity.html

They say opposites attract and that couldn't be truer with these fun static electricity experiments. Find out about positively and negatively charged particles using a few basic items, can you control if they will be attracted or unattracted to each other?

What you'll need:

•2 inflated balloons with string attached
•Your hair
•Aluminium can
•Woolen fabric

Instructions:

1. Rub the 2 balloons one by one against the woolen fabric, then try moving the balloons together, do they want to or are they unattracted to each other?
2. Rub 1 of the balloons back and forth on your hair then slowly it pull it away, ask someone nearby what they can see or if there's nobody else around try looking in a mirror.
3. Put the aluminium can on its side on a table, after rubbing the balloon on your hair again hold the balloon close to the can and watch as it rolls towards it, slowly move the balloon away from the can and it will follow.

What's happening?

Rubbing the balloons against the woolen fabric or your hair creates static electricity. This involves negatively charged particles (electrons) jumping to positively charged objects. When you rub the balloons against your hair or the fabric they become negatively charged, they have taken some of the electrons from the hair/fabric and left them positively charged.

They say opposites attract and that is certainly the case in these experiments, your positively charged hair is attracted to the negatively charged balloon and starts to rise up to meet it. This is similar to the aluminium can which is drawn to the negatively charged balloon as the area near it becomes positively charged, once again opposites attract.

In the first experiment both the balloons were negatively charged after rubbing them against the woolen fabric, because of this they were unattracted to each other.

Topic: Electricity
Roll a can with static electricity

http://www.sciencebob.com/experiments/staticroll.php

What you will need

* An empty soda can
* blown-up balloon
* A head of hair

What to do

1. Place the can on its side on a flat smooth surface like a table or a smooth floor.

2. Rub the blown up balloon back and forth through your hair really fast.

3. Now the fun part - Hold the balloon close to the can without actually touching the can. The can will start to roll towards the balloon without you even touching it!

Try This Too: While you've got the balloon out, tear up part of a tissue into tiny pieces about 1/4 inch (.5 cm) big. Rub the balloon in your hair again and bring it close to the tissue pieces. They will be attracted to the balloon and then jump away.

How does it work?

This works a lot like our bending water experiment. When you rub the balloon through your hair, invisible electrons (with a negative charge) build up on the surface of the balloon. This is called static electricity, which means "non-moving electricity" The electrons have the power to pull very light objects (with a positive charge) toward them - like the soda can.

Make it an experiment

The project above is a DEMONSTRATION. To make it a true experiment, you can try to answer these questions:

1. Does the size of the balloon change the power of the pull?

2. Does the length of the persons hair effect the power of the static electricity?

3. How much water can you put in the can until the balloon can't pull it anymore?

Topic: Electricity
Bending Water with Static electricity

http://www.sciencekids.co.nz/experiments/bendingwater.html

Here's an easy and fun science experiment that's great for helping kids learn about static electricity. Try bending water with static electricity produced by combing your hair or rubbing it with an inflated balloon, can it really be done? Give it a try and find out!

What you'll need:

•A plastic comb (or an inflated balloon)
•A narrow stream of water from a tap
•Dry hair

Instructions:

1. Turn on the water so it is falling from the tap in a narrow stream (just a few millimeters across but not droplets).
2. Run the comb through your hair just as you normally would when brushing it (do this around 10 times). If you are using a balloon then rub it back and forth against your hair for a few seconds.
3. Slowly move the comb or balloon towards the stream of water (without touching it) while watching closely to see what happens.

What's happening?

The static electricity you built up by combing your hair or rubbing it against the balloon attracts the stream of water, bending it towards the comb or balloon like magic!

Negatively charged particles called electrons jump from your hair to the comb as they rub together, the comb now has extra electrons and is negatively charged. The water features both positive and negatively charged particles and is neutral. Positive and negative charges are attracted to each other so when you move the negatively charged comb (or balloon) towards the stream, it attracts the water's positively charged particles and the stream bends!

Topic: Electricity
Build an electromagnet

http://www.sciencebob.com/experiments/electromagnet.php

What you will need

•A large iron nail (about 3 inches)
•About 3 feet of THIN COATED copper wire
•A fresh D size battery
•Some paper clips or other small magnetic objects

What to do

•1. Leave about 8 inches of wire loose at one end and wrap most of the rest of the wire around the nail. Try not to overlap the wires.

•2. Cut the wire (if needed) so that there is about another 8 inches loose at the other end too.
•3. Now remove about an inch of the plastic coating from both ends of the wire and attach the one wire to one end of a battery and the other wire to the other end of the battery. See picture below. (It is best to tape the wires to the battery - be careful though, the wire could get very hot!)

•4. Now you have an ELECTROMAGNET! Put the point of the nail near a few paper clips and it should pick them up!

•NOTE: Making an electromagnet uses up the battery somewhat quickly which is why the battery may get warm, so disconnect the wires when you are done exploring.

How it works

Most magnets, like the ones on many refrigerators, cannot be turned off, they are called permanent magnets. Magnets like the one you made that can be turned on and off, are called ELECTROMAGNETS. They run on electricity and are only magnetic when the electricity is flowing. The electricity flowing through the wire arranges the molecules in the nail so that they are attracted to certain metals. NEVER get the wires of the electromagnet near at household outlet! Be safe - have fun!

Make it an experiment
The project above is a DEMONSTRATION. To make it a true experiment, you can try to answer these questions:

1. Does the number of times you wrap the wire around the nail affect the strength of the nail?

2. Does the thickness or length of the nail affect the electromagnets strength?

3. Does the thickness of the wire affect the power of the electromagnet?

Topic: Electricity

Lemon Battery

http://pbskids.org/zoom/activities/sci/lemonbattery.html

by Kendra of MO

This clock is citrus-powered!

Materials Needed

•2 lemons
•3 copper wires
•2 large paper clips
•2 copper coins
•a digital clock
•scissors
•knife

Instructions

1. Check with a grown-up before you begin.
2. First, attach one of the paperclips to a wire.
3. Then attach a penny to a second wire.
4. Attach another penny to one end of the third wire, and a paperclip to the other end.
5. Squeeze and roll two lemons to loosen the pulp inside.
6. Make two small cuts in the skins of both lemons an inch or so apart.
7. Put the paper clip that is attached to the wire and the penny into one of the cuts until you get to the juicy part of the lemon.
8. Stick the penny into a hole in the other lemon.
9. Put the other paper clip into the second hole of the lemon with the penny.
10. Then put the last penny into the last open hole.
11. Connect the free ends of the wires to the terminals of the digital clock.
12. Watch how the lemons make enough electricity to turn the clock on. If you've hooked everything up and the clock isn't running, try switching the wires.

Here's how this lemon battery works.

There's a chemical reaction between the steel in the paper clip and the lemon juice. There's also a chemical reaction between the copper in the coin and the lemon juice. These two chemical reactions push electrons through the wires. Because the two metals are different, the electrons get pushed harder in one direction than the other. If the metals were the same, the push would be equal and no electrons would flow. The electrons flow in one direction around in a circle and then come back to the lemon battery. While they flow through the clock, they make it work. This flow is called electric current.

Now it's time to experiment.

Do you think your lemon battery will still work if you change the lemons? Try cutting the lemons in half, or squeezing them and putting the wires in the

lemon juice. Does your battery still work? Since lemon juice is an acid, think about how you can make batteries out of other acids, like orange juice or cola. Or see if your battery will work using a base, like soapy water. Choose one thing to change (that's the variable) and predict what you think will happen. Then test it and see if you come up with some cool discoveries.