Your 4-H ELECTRIC Project

When you work with electricity, you have to make many important decisions. To make the best decisions, you have to know about electricity and electric safety. This 4-H project can help. Some of the skills you can learn and activities you can do in this project are listed below. Check your favorites. Then, work with your 4-H leaders and parents to make a 4-H project plan of what you want to do and learn this year.

☐ Learn the difference between AC and DC current.
☐ Learn how electricity flows through a circuit.
☐ Learn how to create static electricity.
☐ Learn about conductors and insulators.
☐ Learn about electric safety.
☐ Make an exhibit or poster about electric safety rules.
☐ Complete a service project using project skills learned.
☐ Give a project demonstration in a 4-H club meeting.
☐ Other ___________________________________________________________________

Types of Energy

Nearly everyone is familiar with the word ENERGY, yet few people know what it really is. Energy, simply put, is the rate at which work is done. Work is the effort to produce or accomplish something.

There are six forms of energy. Look in books and on the Internet to find out more about each type. Use the spaces to the right to write an example of each type of energy. Share what you learn in a 4-H meeting.

Mechanical ________________________  Electrical  ________________________  Radiant (light)  ________________________  Thermal (heat)  ________________________  Nuclear   ________________________  Chemical  ________________________

Try This—Static Electricity Balloon Magic

Everything we see is made up of tiny parts called atoms. Atoms are made up of even smaller parts called protons, electrons and neutrons. They are very different from each other in many ways. One difference is their charge. Protons have a positive (+) charge. Electrons have a negative (-) charge. Neutrons have no charge.

Usually atoms have the same number of electrons and protons. When this happens, the atom has no charge: it is neutral. But if you rub things together, electrons can move from one atom to another. Some atoms get extra electrons and have a negative charge. Other atoms lose electrons and have a positive charge. When charges are separated like this, it is called static electricity.

Here is an experiment to see how static electricity works. You'll need balloons and thread. Then, follow the directions. Be sure to record your observations in your 4-H project folder and share what you learn with your 4-H friends.

What To Do:
• Inflate and knot the end of a balloon.
• Rub the balloon against your hair for about one minute.
• Place the “rubbed” side of the balloon against the wall. Release the balloon. What happens?

Now Try This:
• Inflate and tie knots in the end of two balloons.
• Tie the balloons together with a long piece of thread.
• “Charge” each balloon by rubbing them with nylon, wool or on your clothing for one minute.
• Hold the thread in the middle with your arm stretched out so that the balloons are the same distance from the middle of the thread.
• Let the balloons hang freely. What happens?
“Shocking” Search
Listed below are several words related to electricity. Look in books or on the Internet to learn more about these words. Record what you learn on a separate sheet of paper. Share it with your 4-H friends and keep it in your 4-H project folder. Then, look for the words in the puzzle.

B E I A C F G X T U E H G S E R Z D
K T N T Y W Q G G L O P B G V N J A
X J S O Y E V B B G O Y R E E H P E
D N U R X Q G H H F Y A Z T V A R W
A C L P P V R A Z E H G U G T S X N
A G A W T U M D T C O N D U C T O R
S C T T O N E E L P H P H D A R T
P R O T O N K O L M O Z J M B L T E
L Q R B Y G F V L E O V B A X E N R
H I V G B P Q C A P C F T E R L Y E
S U E L C U N W D P A T G Y J F T P
O Y S M G E M M S X E T R X P Y F M
F E N V U L T L A R B M O O W D S A
J R I U Q Q J L Y R A F S M D Y N J
D X F H F N Z N D A Y H E G I E H B

Career Scavenger Hunt
By asking others, researching on the Internet or reading a book or magazine—search for a job that uses electric skills and knowledge. Here’s what you are looking for.

1. Job Title ___________________________________________
2. Job Description _____________________________________
   __________________________________________________
   __________________________________________________
3. Education Required __________________________________
   __________________________________________________

Demonstration Ideas
- Create static electricity from mechanical friction.
- Demonstrate how to electroplate metal.
- Demonstrate which common materials are conductors and which are insulators.
- Demonstrate how lightning is produced.

Safety Hazard Hunt
Look in books or on the Internet to learn more about electric safety in the home. Make a checklist of safety hazards. Use the checklist to conduct a “Safety Hazard Hunt” in your home. If you find a hazard, tell an adult and work to correct it.

Service Ideas
- Conduct an electric safety hazard hunt in your home and the homes of friends and neighbors.
- Make and display posters about electric safety.
- Teach younger children about electric safety.

Staying Safe
You are around electricity all day long. So, it’s important that you know how to use electricity safely. Listed below are a few safety tips. Look in books or on the Internet to find other tips. Make a poster about electric safety. Share it in a 4-H meeting and display it in a public place.

- Never climb utility poles.
- When unplugging electrical appliances, pull by the plug, not by the cord.
- Never fly a kite near power lines or during an electrical storm.
- Never touch a downed power line.
- Never touch an electrical appliance or plug in anything electric if you’re standing in water or if your hands are wet.
- Never use electric tools outside in the rain or on wet surfaces.

Additional Resources
Making decisions is an important part of working with electricity. This activity sheet has given you the opportunity to explore things to think about as you make decisions in the electric project. You’ve experimented with electrons, learned about electric safety and done other cool things. But this is just the beginning! Use the resources listed below to continue learning about the electric project.

- School & public libraries
- People who know about electricity, such as science teachers or people work for your electric cooperative
- 4-H project groups
- The 4-H electric Web page: [http://www.utextension.utk.edu/4h/projects/electric.htm](http://www.utextension.utk.edu/4h/projects/electric.htm)

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