

Electricity Travels in Loops

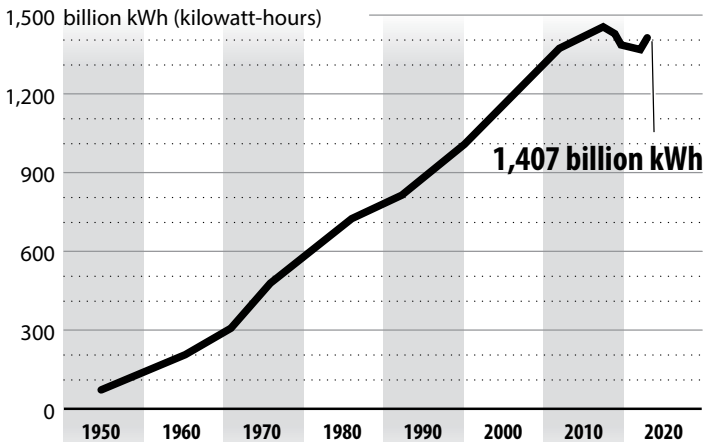
Electricity travels in closed loops, or **circuits** (from the word circle). It must have a complete path from the power plant through the wires and back.

If a circuit is open, the electricity can't flow. When we flip on a light switch, we close a circuit. The electricity flows through the light and back into the wire. When we flip the switch off, we open the circuit. No electricity flows to the light. It flows straight through the switch.

We Use Electricity Every Day

Electricity does a lot of work for us. We use it many times each day. It lights our homes, warms and cools our rooms, and helps us keep them clean. It runs our TVs, DVD players, video games, computers, and fax machines. It cooks our food and washes the dishes. It can power our lawn mowers and leaf blowers. It can even run our cars. We use a lot of electricity every year.

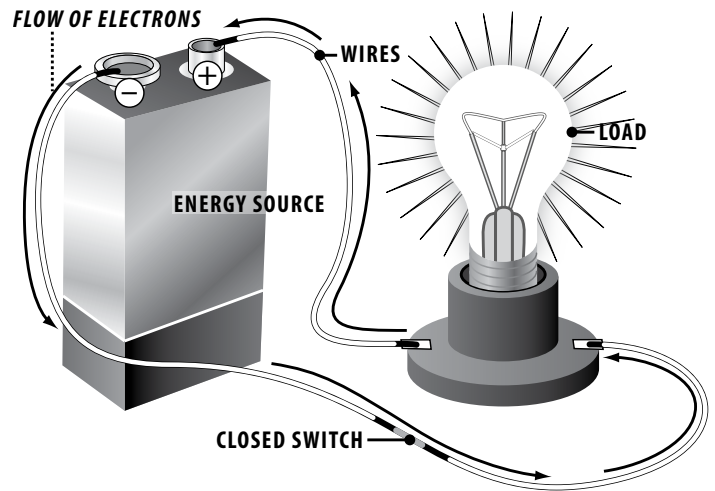
Residential Electricity Use



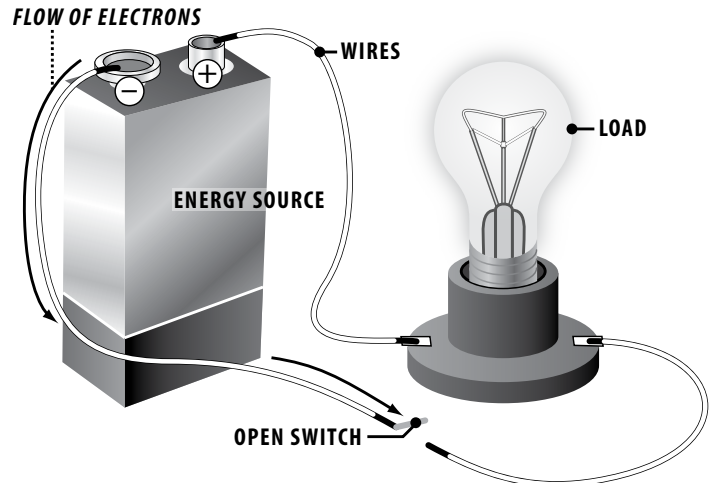
Data: Energy Information Administration



Electric Circuits



A closed circuit is a complete path allowing electricity to flow from the energy source to the load.



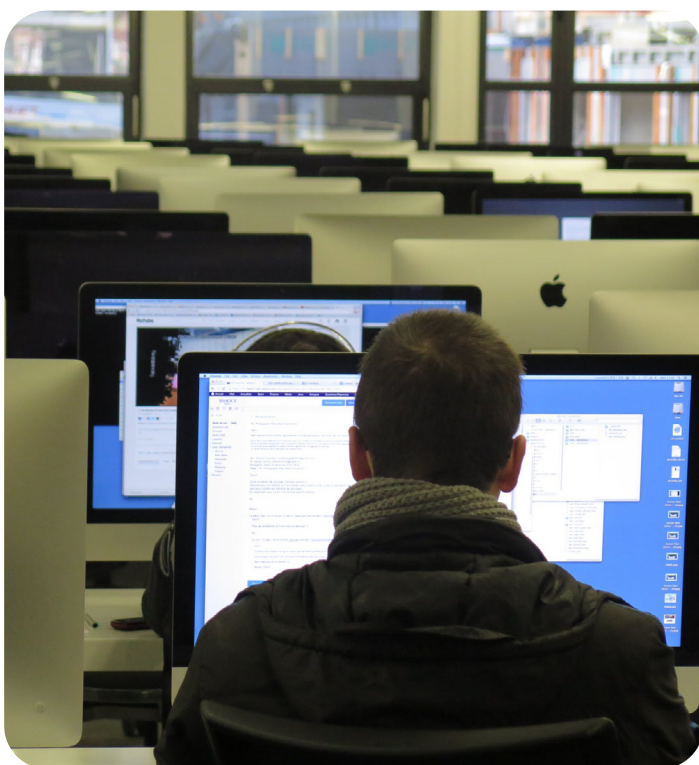
An open circuit has a break in the path. There is no flow of electricity because the electrons cannot complete the circuit.

Watt's That?

We use electricity to perform many tasks. We use units called watts, kilowatts, and kilowatt-hours to measure the electricity that we use.

A **watt** is how much electric power an appliance uses. Every appliance requires a different number of watts to work correctly. We measure smaller devices like hair dryers, coffee pots, and phone chargers in watts. A **kilowatt** is 1,000 watts. It is used to measure larger amounts of electricity for appliances like refrigerators, air conditioning systems, and solar panels on your roof.

A **kilowatt-hour** (kWh) measures the amount of electricity used in one hour. We pay the electric utility company for our electricity by the kilowatt-hour. They will send us a bill for our monthly use. Most homes pay about 13 cents per kilowatt-hour, and most schools pay about 11 cents. You can look up how many kilowatt-hours you use and how much you pay on your bill.



Learn the ABCs - Appliances are Big Consumers

Appliances, machines, and electronic devices use over 18 percent of a school's energy. Any appliance that is designed to change temperature uses a lot of energy. These devices can include items like a refrigerator, washer, water heater, dryer, dishwasher, water fountain, or even vending machine. There are many more smaller devices and machines that are plugged in in every classroom. When you add all of these up, it can be a lot! You can help save energy at school by:

- Turning off appliances and machines when you aren't using them;
- Keeping the doors closed as much as possible on refrigerators and freezers—know what you want before you open the doors;
- Being aware that many machines use energy even when turned off—save energy by unplugging them;
- Inspecting and dusting air vents to remove dust; and
- Replacing seals on refrigerators and freezers if they do not seal tightly.

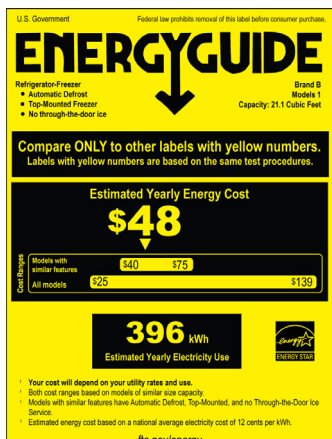
When the school or your family members shop for a new appliance or electronic device, they should think of more than just the purchase price. They should also think about how much it will cost to run the device, because they will pay their bills to use it each month for the next 10 to 20 years. An energy efficient appliance will usually cost more to purchase, but it will save money in energy costs each month. An energy efficient model is almost always a better deal in the long run.

Avoid Sticker Shock

School leaders or folks at home will want to look for two labels when they buy a new appliance or machine. The first way to save money is by looking for the **ENERGY STAR**[®] label. This label guarantees that the product saves energy. ENERGY STAR[®] appliances and electronics use special technologies that use less energy and water than standard models. A list of energy efficient appliances can be found on the ENERGY STAR[®] website at www.energystar.gov.



Another way to determine which appliance is more energy efficient is to look at their **EnergyGuide** labels. The government requires most appliances to display bright yellow and black EnergyGuide labels in the store. These labels do not tell which appliance is the most efficient, but they will show how much energy it can use in a year and how much it costs to operate it. When shopping, it is helpful to compare these yellow labels to help determine which machine is the best for you.



Environmental Impacts

Generating, transporting, and using all this electricity to power our lives makes a big impact on our environment. Most of our electricity is generated using nonrenewable sources like coal, natural gas, and uranium. Locating, removing, transporting, and using those sources requires energy, too.

When coal and natural gas are burned to make electricity, carbon dioxide is released into the atmosphere. When too much of it builds up in the atmosphere, it leads to **climate change**.

The atmosphere around the Earth works just like a blanket on your bed by trapping heat and holding it in. Water vapor, carbon dioxide, and other gases are called **greenhouse gases** because they absorb thermal energy (heat). This is called the **greenhouse effect**, and it's what keeps us from freezing to death when we are too far away from the sun. But just like too much candy, too much of the greenhouse effect is not a good thing. Burning fossil fuels and releasing too much carbon dioxide is causing the atmosphere and also the oceans to get warmer than they should be.

Every time we turn on the lights, or run an electric appliance, we are responsible for releasing more carbon dioxide into the atmosphere. There are some things we really must use, like medical equipment to keep us healthy and refrigerators to make sure our food is safe to eat. But there are plenty of other choices we can make about our energy use each day that can impact the environment in a good way. Open a window instead of running the air conditioner. Read a book instead of watching TV. Eat cold pizza for a snack instead of using the microwave. Once you start thinking about the choices you can make, you will be surprised at how much you can do.

Electrical Safety

Electricity is amazing. It gives us heat and light, and runs appliances—our TVs, computers, refrigerators, hair dryers, gaming systems, and washers. Electricity can also be dangerous. It can cause fires and injuries, even death.

Here are some rules for using electricity safely:

- Don't insert anything into an outlet except a plug.
- Don't pull on the cord to unplug an appliance, hold the plug and pull.
- Dry your hands before you plug in or unplug a cord.
- If a plug is broken or a cord is cut or worn, don't use it.
- Don't plug too many cords into one outlet.
- Turn off a light or unplug it before changing a light bulb.
- Never touch the inside of an appliance while it's plugged in.
- Keep appliances away from water. Don't use a hair dryer if there's water in the sink nearby.
- If there's a big storm, turn off the TV and computer.
- Don't touch any power lines outside.
- Some power lines are buried underground. If you are digging and find a wire, don't touch it.
- Don't fly a kite or climb a tree near a power line.

