

1

Answer the questions in your own words.

1. What are the three parts of an atom? **protons, neutrons, electrons**
2. When is electricity created? **when electrons move between atoms**
3. Name a few examples of static electricity. **rubbing a pullover against an object, dragging feet on a carpet, lightning**
4. Name a few examples of current electricity. **electrical appliances, like a toaster, TV set, computer etc..**
5. What does a battery have in it to keep it charged? **liquid or paste with a chemical in it**
6. What are good conductors? Give examples. **copper, aluminum, steel**
7. What are good insulators? Give examples. **rubber, glass, plastic, dry wood**
8. How is an electric current created? **when electrons move through a conductor**
9. How can you stop a current from flowing? **put a switch into the circuit**
10. A current that flows back and forth is called **alternating current** .
11. How can a wire produce heat? **electric current can be slowed down by resistance; this causes friction, which causes heat**
12. How is the wiring in buildings and other objects protected? **through fuses**
13. What can electric shock lead to? **heart failure, burn your skin**
14. What should you do during a thunderstorm? **stay away from open fields and high places**
15. How is electricity measured? **in watt**
16. How much is one horsepower? **750 watts**
17. How is mechanical energy transformed to electrical energy? **with a generator**
18. How do river power stations work? **water pushes a blade of a turbine which is connected to a generator**
19. What does a transformer do? **changes the voltage**
20. How is electricity transported from one place to another ? **through power lines**

**Multiple Choice Task**

Choose the correct answer for each question

1. **A kilowatt-hour is the energy**
  - a. of one hundred watts for one hour.
  - b. of one watt for one hour.
  - c. of ten light bulbs for one hour.
  - d. of a thousand watts for one hour.**
2. **Fuses protect wiring from**
  - a. changing the flow of electrons.
  - b. exploding.
  - c. becoming too hot.**
  - d. producing too much electricity.
3. **A current that flows in both directions is called**
  - a. an undercurrent.
  - b. a direct current.
  - c. an alternating current.**
  - d. a changing current.
4. **A transformer**
  - a. is a power line that transforms electricity.
  - b. protects your house from too much voltage.
  - c. changes the amount of watts a device uses.
  - d. changes the voltage of electricity.**
5. **Generators are used to**
  - a. transform electrical energy into mechanical energy.
  - b. transform steam into electrical energy.
  - c. transform mechanical energy into electrical energy.**
  - d. transport energy to houses.
6. **Static energy**
  - a. stays in one place.**
  - b. always moves in a closed circuit.
  - c. does not have any electrons.
  - d. is only produced by lightning.
7. **In a thunderstorm you should stay inside a car because lightning**
  - a. only hits the metal of the car.**
  - b. hits the tires, which have a lightning rod.
  - c. always hits the glass windows.
  - d. only hits trees and high buildings.
8. **Conductors are materials that**
  - a. electricity cannot pass through.
  - b. lead electricity to the ground.
  - c. electricity passes through easily.**
  - d. you wear to protect yourself.

3

Match the words with their definitions.

<b>A</b>	source
<b>B</b>	blade
<b>C</b>	fuse
<b>D</b>	friction
<b>E</b>	current
<b>F</b>	wire
<b>G</b>	circuit
<b>H</b>	lightning
<b>I</b>	generator
<b>J</b>	conductor
<b>K</b>	appliance
<b>L</b>	copper
<b>M</b>	turbine
<b>N</b>	steam
<b>O</b>	plug in
<b>P</b>	liquid
<b>Q</b>	transformer
<b>R</b>	steel
<b>S</b>	socket
<b>T</b>	resistance

<b>I</b>	machine that produces electricity
<b>D</b>	the heat that is produced when you rub objects against each other
<b>N</b>	white gas that water produces when it boils
<b>G</b>	a complete circle
<b>P</b>	fluid, watery substance
<b>B</b>	flat metal object that water flows against
<b>T</b>	material that stops electricity going through it
<b>K</b>	electrical object that you use in the house
<b>R</b>	strong metal that can be formed
<b>C</b>	piece of wire that stops the flow of electrons
<b>M</b>	a motor that moves a special wheel around
<b>J</b>	material in which electrons move freely
<b>O</b>	to connect an electrical object to the electricity supply of a house
<b>E</b>	the flow of electricity through a piece of metal
<b>H</b>	powerful flash of light in the sky
<b>S</b>	place in the wall where you can plug something in
<b>A</b>	where something comes from
<b>L</b>	reddish brown metal that lets electricity pass through easily
<b>Q</b>	machine that changes electricity from one voltage to another
<b>F</b>	thin piece of metal

4

TRUE or FALSE. Decide if the following statements are TRUE or FALSE and tick them off. If the statement is False write the correct sentence into the box.

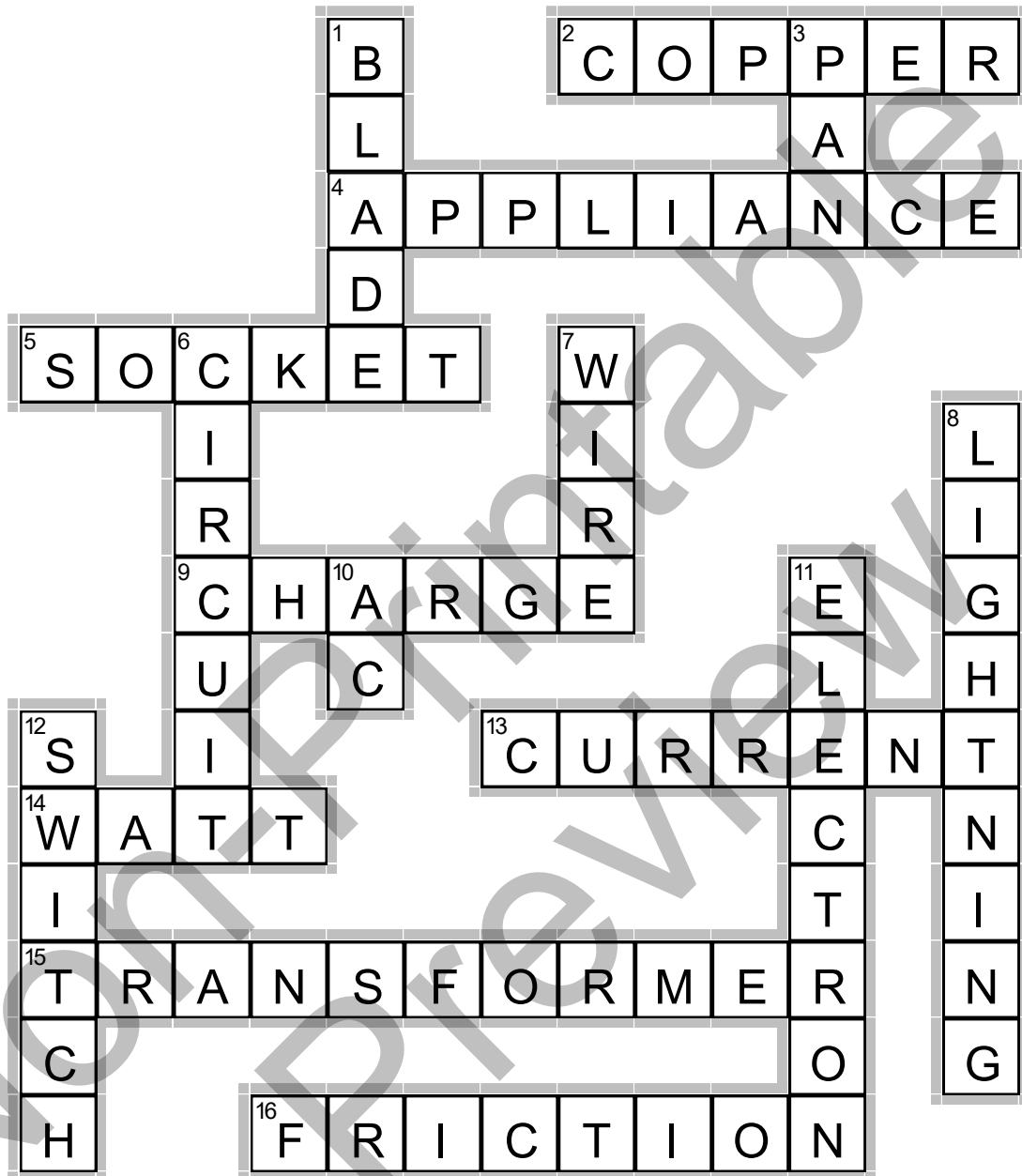
		T	F	Correct Statement
1	Current electricity needs a closed circuit.	✓		
2	Low voltage power lines carry electricity over long distances.		✓	<b>Electricity is carried over longer distances through high-voltage power lines.</b>
3	1,000 watts are the same as one horsepower.		✓	<b>A horsepower is 750 watts.</b>
4	Some countries use water to push turbine blades.	✓		
5	Normally, an atom has as many protons as it has electrons.	✓		
6	Normal, everyday batteries have 220 volts.		✓	<b>An everyday battery you use at home has no more than 12 volts.</b>
7	One of the safest places during a thunderstorm is your car.	✓		
8	A battery has two positive charges.		✓	<b>A battery has a positive and a negative charge.</b>
9	Generators are used to transform light into heat.		✓	<b>Generators transform mechanical into electrical energy.</b>
10	Electrons are negatively charged particles of an atom.	✓		
11	Copper is a good conductor.	✓		
12	An electric current can be slowed down by resistance.	✓		

**5**

**Match the beginnings of the sentences with the endings. There are TWO endings you will not need.**

<b>A</b>	Power lines transport electricity
<b>B</b>	Many machines in our homes
<b>C</b>	Chemicals in a battery become weaker
<b>D</b>	When you put a wire between both ends of a battery
<b>E</b>	During a thunderstorm, you should
<b>F</b>	A switch in a circuit
<b>G</b>	Copper and other metals
<b>H</b>	Many electrical devices in our homes
<b>I</b>	When you rub two objects against each other
<b>J</b>	Turbines in power stations are used
<b>K</b>	A battery has liquid or paste in it
<b>L</b>	Special switches, called fuses,

<b>D</b>	a current flows.
<b>L</b>	protect the wiring in homes and buildings.
<b>H</b>	use current electricity to function.
<b>G</b>	are good insulators
<b>C</b>	and stop it from producing energy.
	you produce current electricity.
<b>J</b>	to make a generator rotate.
<b>A</b>	over very long distances.
<b>E</b>	stay away from open fields and high places.
<b>I</b>	you produce static electricity.
	to bring electricity to your house.
<b>K</b>	that helps produce electric charges
<b>F</b>	stops electrons from moving
<b>B</b>	have special wiring for protection.



7

Fill in the missing words from the box. There are TWO words you will not need.

When electrons move through a **(1) conductor**, an electric current is created. A current that always flows in one direction is called a direct current (DC). A battery for example, produces a **(2) direct** current. A current that flows back and forth is called an **(3) alternating** current (AC).

Electrons cannot jump freely through the air to a positively **(4) charged** atom. They need a **(5) circuit** to move. When a source of energy, like a **(6) battery**, is connected to a light bulb, the electrons can move from the battery to the light bulb and back again. We call this an electric circuit.

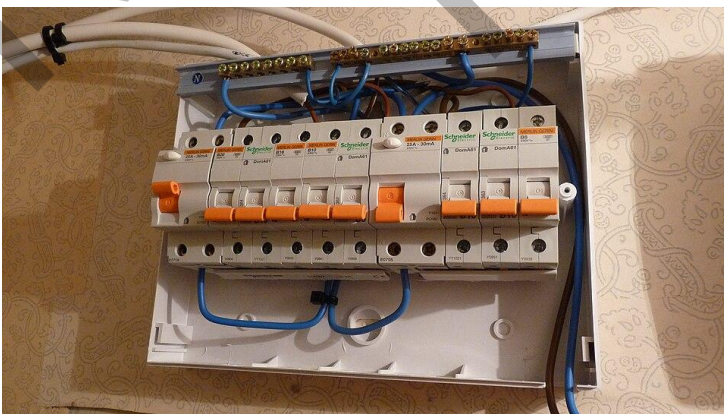
Sometimes there are many circuits in an electrical **(7) device** that make it work. A TV set or a computer may have millions of parts that are **(8) connected** to each other in different ways.

You can stop the current from flowing by putting a **(9) switch** into the circuit. You can open the circuit and stop electrons from moving.

A piece of metal or **(10) wire** can also be used to produce heat. When an electrical current passes through, such metal it can be slowed down by **(11) resistance**. This causes **(12) friction** and makes the wires hot. That's why you can toast your bread in a toaster or dry your hair with warm air from a hairdryer.

In some cases, wires can become too hot if too many electrons flow through them. Special switches, called **(13) fuses**, protect the wiring in many buildings.

alternating  
battery  
charged  
circuit  
conductor  
connected  
current  
device  
direct  
electrons  
friction  
fuses  
resistance  
switch  
wire



**A fusebox that can shut down electricity in a house**

Image: [Dmitry G](#), [CC BY-SA 3.0](#), via Wikimedia Commons

8

Fill in the missing words from the box. There are THREE words you will not need.

bolts - charges - clouds - common - current - damage -  
 devices - electricity - flash - particles - released - rod -  
 strikes - surface - thunderstorm - upwards - wires

## Lightning

Lightning is a form of electricity that is set free during a storm. Energy is suddenly **(1) released** in a cloud when charges are built up. Although lightning is most **(2) common** in tropical and subtropical regions, it can happen wherever hot air mixes with cold air. Thunderstorms produce about 8 million lightning **(3) bolts** a day.

Water droplets and ice crystals in a cloud have electric **(4) charges**, positive and negative ones. Lightning occurs when too many negative charges build up in a cloud and positive charges develop on the ground.

The particles want to meet and race towards each other. A **(5) flash** of lightning is a sign of this meeting. Such a charge of light can be very hot, up to 20,000 degrees Celsius. It can be up to 5 km long. Large **(6) clouds** produce more electric charges and eventually a very strong electrical **(7) current**.

Lightning can also occur between two clouds or within a single cloud. In rare cases, negative charges can form on the ground and lightning moves **(8) upwards**, as is the case when a rocket starts.

Lightning **(9) strikes** very quickly - several times within a second, but single bolts of lightning are impossible to see with a naked eye. A series of such bolts appear as a single flash.

Lightning can do **(10) damage** to buildings, cars or other objects when it hits. It can also kill or injure human beings. During a **(11) thunderstorm** people should stay away from doors, windows and electrical devices. You should also stay away from phones and **(12) wires** because lightning can travel through them. When you're in the open do not try to protect yourself by hiding under a tree.

You can protect your house or other buildings surrounding your home by installing a lightning **(13) rod** on the roof. It attracts the lightning that would otherwise hit the building and leads it to the **(14) surface**.