An Adventure With Electricity

Brooke Ann Brown

An Adventure With Electricity is dedicated to my daddy for teaching me all about electricity.

Brooke Ann Brown

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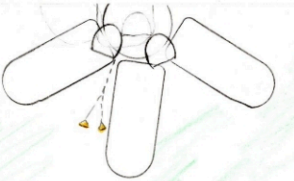
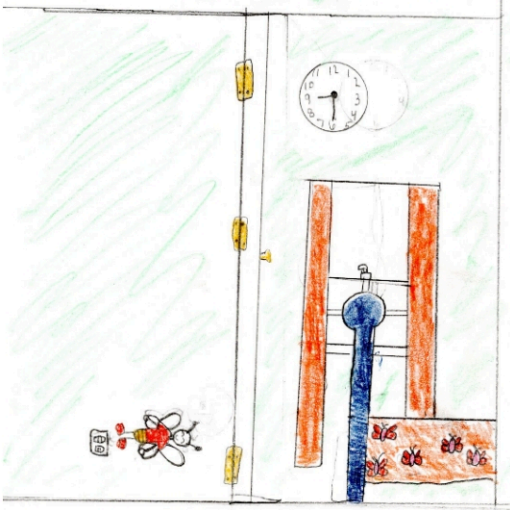
Madison Davis hurriedly rushed into her house. She was going hiking with her friends in an hour. Madison had just finished feeding her cows, and she wanted to get the smelly odor of the barn off of her. She flicked on all the lights and turned on the television for background noise. Glancing quickly at the time, Madison jumped into the shower. After her quick shower, she rushed to her closet, but the clothes she wanted to wear were wrinkled. She plugged in her iron to warm. Madison turned on the hairdryer to dry her hair. After a few minutes, the lights suddenly went out and the hairdryer stopped. Madison rushed to the iron and felt it. It was cooling! "What happened?" Madison shouted. As if to answer her question, a little friendly lighting bug shot out of the outlet.

"Hi, my name is Sparkie. I heard you pondering what just happened. I can answer that question for you if you would like," the little bug squeaked.

"Eek, a talking fire fly! Where did you come from?" Madison screamed in disbelief.


HOME
SWEET
HOME



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“The outlet,” Sparkie answered. “Is it okay for me to continue?”

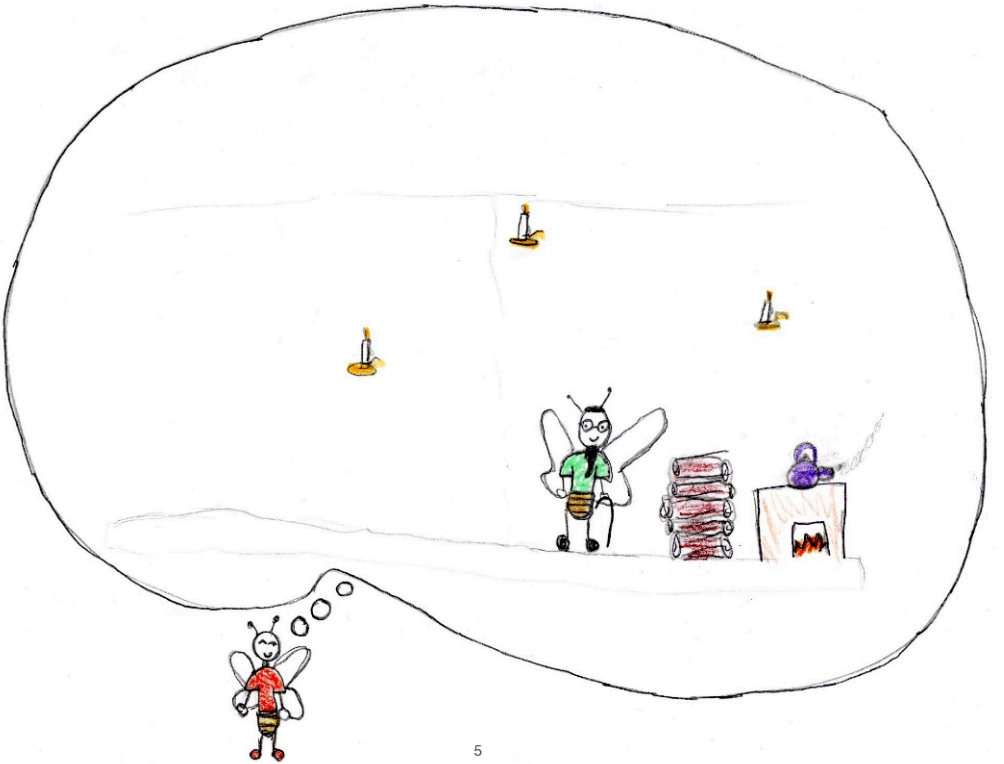
“Okkaayy, I guess as long as you do not land on me,” Madison stammered.

“It is a deal,” answered Sparkie.

“Let me start at the beginning. You are lucky because you are a part of an **electric cooperative,**” Sparkie explained.

“What is an electric cooperative?” Madison asked.

“It is a non-profit **organization** that makes sure people in rural places, like you, have **electricity**,” squeaked Sparkie. “Imagine that your only light was from candles and you cooked your food on a wood-powered stove! That is how my great grandfather lived. It all changed when President Roosevelt established the Rural Electrification Administration in 1935 that let people in rural areas get reliable electricity too,” Sparkie explained. Your cooperative, Horry Electric, was organized on April 25, 1940, and it was energized on January 7, 1941.



“Wow, I am really lucky, but what does this have to do with my loss of power?” Madison inquired.

“I am getting to that,” Sparkie replied. “Today, cooperatives are as strong as ever and have great benefits such as; the cooperative’s members are considered owners, and cooperatives are focused on local people, not profit. For example, cooperatives make sure that the existing infrastructure is current and the materials are purchased at the lowest prices possible. In the form of capital credits, electric cooperatives return their **revenues** back to their members. Horry Electric gives your school teachers grant money for coming up with good ideas for classroom projects that you will enjoy. Women Involved In Rural Electrification offers scholarships for women, like your mother, returning to school to earn college degrees. Every year Horry Electric will pay for high school students to visit the state capital. That is something you can look forward to when you are older.”

“Neat!” remarked Madison.

“Also, your cooperative members see more exciting changes in the future.

I will tell you about some of the changes. In the future, we can expect computers managing and operating the **electric grid** more than they have in the past. This new idea is called the Smart Grid. Using house **solar panels**, homeowners could sell electricity back to the cooperative. Would you like to hear more?" Sparkie asked.

"Yes, I would," Madison answered enthusiastically.

"Okay, say if you had a big storm and your neighbor's electricity goes out. Unfortunately, they do not have a **generator**, but you have an electric car. The car's battery could put electricity back into your neighbor's electric grid, and it would run the house for a short period of time," Sparkie explained.

"Wow, that is really cool! Now that you mention it, I do remember seeing the solar farm on Cultra Road. We are really special here in Horry County," Madison exclaimed.

"Okay, that all makes sense, but how exactly do you get a flow of electricity?" Madison questioned.


Without electric car
With electric car
YAY, Electricity!

“If you want a **current** of electricity, you need something that will produce and **conduct** it,” Sparkie explained.

“What does that?” Madison inquired.

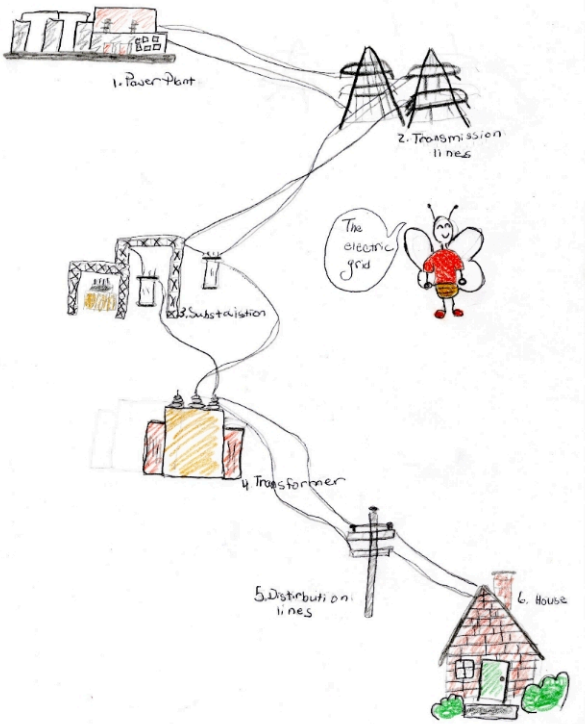
“Good question. A power plant does this. Once the electricity reaches your house it turns around and goes back to the power plant. It does this because electricity must travel in a **circuit** to move” Sparkie replied.

“But how does it do that?” Madison asked.

“Let me put it this way. What happens when you enter a dark room and you flip a switch?” Sparkie asked.

“The room lights up,” Madison answered.

“Exactly, the electricity flows through a wire into your house, to your light bulbs, and then it goes on a different wire that takes the electricity outside. After that it follows on other wires back to the power plant. All those wires are called the electric grid. The electric grid consists of power plants, power lines, and transformers.


1. Power Plant
2. Transmission lines
The electric grid
3. Substation
4 Transformer
5. Distribution lines
6. House

As you might have known, people use power plants to make power, power lines to carry the power to different areas, and transformers to reduce the strong power," Sparkie explained.

"Where are the power lines?" questioned Madison.

"Some are on poles, but yours are underground. The lines underground are protected from the weather. However, if someone has underground power lines it could be dangerous if they dig a deep hole. Lucky for you, Horry Electric Cooperative provides a service called the 811 Plan, where workers will come and mark the utilities so you can dig safely!

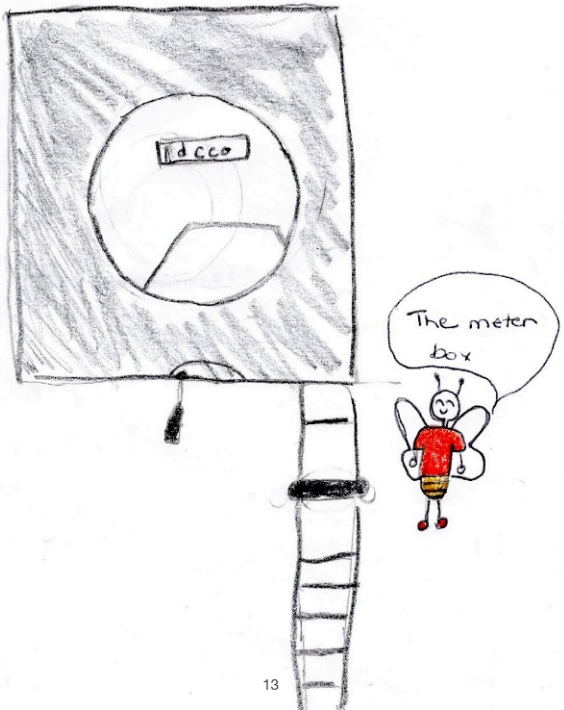
Madison wondered, "Wait. Tell me again how this works."

"Okay," squeaked Sparkie, "the power plant generates the electricity, but it is way too strong to come directly to your house for the hair dryer! It needs to be lessened along the way, hence the electrical grid.

It leaves the power plant through wires to an electric substation. You may have seen one along the road while riding in the car. The substation looks like a bunch of huge metal boxes with strange wires and a high fence around it. A massive amount of power enters the substation. To slow this power down, substations have transformers to lower the power level. After the power is lessened, it is sent on different wires to different locations. The electricity is still too strong to enter into your house so it goes through another transformer to ensure that the electricity is not too much or too little. This part in the circle of electricity is very important because if we did not lower the electricity level, it would blow out our light bulbs. If we lessened it too much the electricity would be insufficient to power our appliances. Then it goes into a meter."

"What is a meter?" Madison asked.

"A meter keeps track of the power that one uses. A meter reader comes to your house every month to see how much electricity a person used.


The meter box

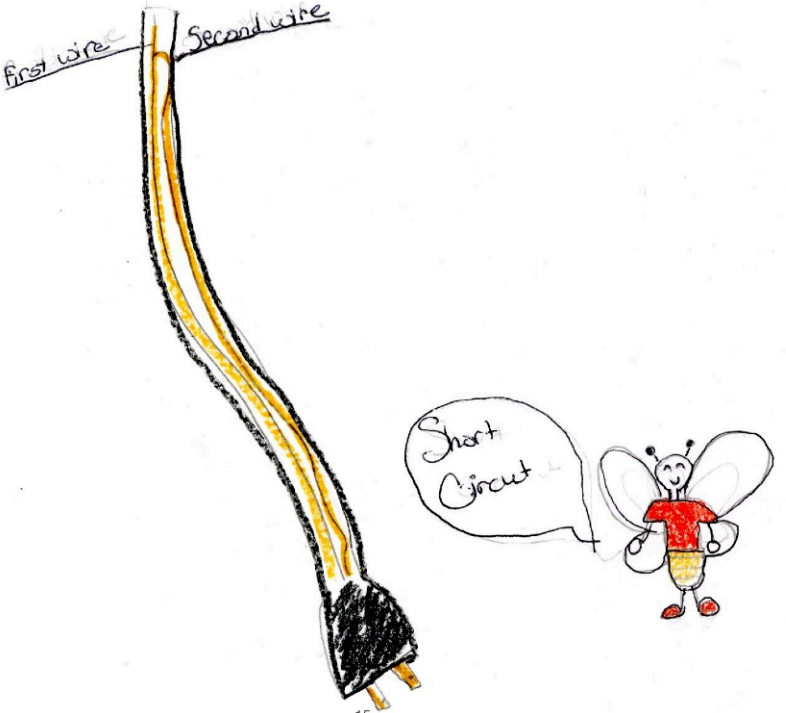
When we flip a switch, we allow electricity through the circuit. In order to save electricity, please be sure to shut off your television or lights when not using them!" Sparkie told Madison.

"Oh yeah, I am really bad about that," Madison sheepishly replied.

"Electricity's final destination in the long cycle is the distribution box or the circuit breaker box. The switches inside the box are called circuit breakers. Circuit breakers can turn the electricity on or break the circuit and turn the power off. These switches can also stop short circuits, which can prevent fires, "Sparkie explained.

"What is a short circuit?" Madison asked.

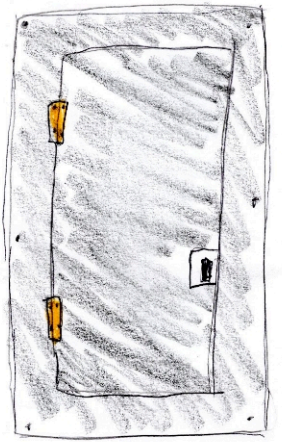
"Let me put it this way, your hairdryer has two wires in the cord. The first wire takes that great amount of electricity to your hairdryer. Your hairdryer uses some of the electricity, so when it returns on the second wire it is weaken. Have you ever had the experience of a pet chewing on a cord?

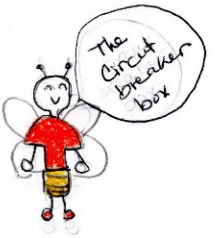

first wire
Second wire
Short Circuit

If you have, the pet might have caused a short circuit. If electricity had a choice it would run on the shortest path. Inadvertently, if the animal's teeth cut through the plastic and one of the wires touches the other wire, it creates a shorter path for electricity to travel on. The electricity goes back to the circuit breaker box. If it continues to circle in this fashion without an **appliance**, the wires will get too hot and create a fire hazard. The circuit box is created to know if the electricity comes back too strong and will flip a switch to stop the circuit. The electricity will not be able to keep circling, voiced Sparkie.

"Now I understand how electricity travels and how to keep safe when using electricity, but what happen to me? I did not have a pet chew on any of my cords," remarked Madison.

"Well, the answer to your question is pretty simple. A hairdryer and an iron require a lot of electricity to run because they create heat. Your circuit box only allows so much electricity out at one time to keep the wires from getting too hot.




The Circuit breaker box

Turning on the iron and hairdryer at the same time was asking for too much electricity at once. That would not be safe, so the circuit box flipped a switch to stop the circuit. If you unplug the iron and flip the switch back on in the circuit box, your hairdryer will work safely again. Electricity is very useful when used appropriately!" Sparkie declared loudly. "Since I am finished teaching you about electricity and electric cooperatives, do you want to go out to your circuit breaker box and turn on the electricity?" Sparkie questioned.

"Yes, I would," Madison replied. Madison and Sparkie walked to the box and flipped the circuit breaker switch. The electricity turned on again.

"Bye Sparkie! Thank you for teaching me all about electricity," Madison expressed.

"You are welcome, Madison. See you later," Sparkie yawned as he curled up for a nap inside the circuit breaker box.

As Madison and her friends started their hike, Madison told them all about her adventure with electricity.

GLOSSARY

Appliance: a machine or light that uses the electricity in an electric circuit
Circuit: a complete circle or path for an electric current to travel in
Conduct: to carry
Current: a flow of electricity through a conductor
Electric cooperative: a privately-owned, non-profit organization that delivers electricity to its members
Electric grid: a network of transmission lines, substations, and transformers that deliver electricity to your house
Electricity: form of energy occurring in elementary particles
Generator: a machine used for converting mechanical into electrical energy
Organization: organized body, system, or society
Revenue: an income
Solar panels: thin plates that turn solar energy directly into electricity

Author and Illustrator's Summary

My name is Brooke Ann Brown. I am a fourth grader, who is educated at home in Aynor, SC. I researched my topic by using the EnlightenSC website, Young Explorer Series Exploring Creation with Chemistry and Physics by Jeannie Fulbright, and God's World Science Series God's Inspiring World published by Rod and Staff Publishers. I also visited www.horryelectric.com and www.electricrate.com to learn all about electric cooperatives. My co-op contact was Ms. Toni Gore at Horry Electric Cooperative. On October 14 and October 22, we discussed the history of Horry Electric and what makes it unique. Ms. Gore provided the solar farm picture for my book. Also, I spoke with Mr. Reed Cooper on what future changes are in store for Horry Electric. Both of them wished me the best of luck in the Children's Book Challenge!