TEACHER KEY

You Wouldn't Want to Live Without Electricity!
Student Discussion Guide

Chapters: Introduction & If the Lights Went Out:

1. Think about all the things you do every day that require electricity. Imagine you no longer have electricity. Write a summary of "An Afternoon in My Life Without Electricity." Start from when you get home from school and end when you go to bed.

   Answers vary and could include: get a cold drink out of the refrigerator, heat dinner in the microwave, use laptop to do homework, watch Netflix on TV, ect.

2. Make a list of 10 things in your home that need electricity to work. Think about things that need to plug in, charge or use batteries to work.

   Answers vary and could include: phone, computer, refrigerator, hot water heater, TV, video games, electric tooth brush, lights, etc.

3. Electricity can be dangerous! Imagine an alien from space landed in your backyard. Give the creature three tips about being safe with electricity.
   - Don't touch or poke anything into electrical socket
   - Switch off socket before pushing plugs in or pulling plugs out.
   - Don't touch bare wires.
   - Don't get electrical equipment wet.

Chapter: Light & Heat

4. More than 100 years ago, people did not have electricity for light. What is the connection between heat and light?

   Prior to electricity, if you wanted light, you had to start a fire or light a candle or oil lamp.

5. What are some of the things people have burned to produce light in the 16th through the mid-19th century?

   Burning wood, candle, oil, kerosene or gas lamp, coal

Chapter: Tingles & Sparks

6. The ancient Greeks first discovered static electricity without knowing it. Thales of Miletus noticed that by rubbing a piece of amber, small feather would stick to it. Where do we experience static electricity in our everyday world?

   Rubbing a balloon on our hair, socks sticking to our clothes when they come out of the dryer, a spark or shock when we touch something metal after scuffing our feet on the floor.

   Students could try the "You Can Do It" experiment at the top of page 11.

Chapter: Thunder and Lighting

7. Benjamin Franklin developed a lightning rod that would protect buildings from lightning strikes. Even today all tall buildings have them. Using words and a picture, explain how they work.

   A metal rod is attached to the roof. It is connected with a conductor to a grounding rod. When lightning strikes, the electricity travels harmlessly down the rod into the ground.

Chapters: Putting Electricity to Work

8. Electricity can now be generated and stored. Inventors began looking for ways to use it. As they build electric machines, they discover there is a connection between electricity and magnetism.

Chapter: Fossil Fuel Power

9. Much of the world's electricity is made from burning natural gas and coal. At the power plant, these fossil fuels are used to boil water. This changes water's state of matter from a liquid to a gas (steam).

10. Why is burning fossil fuels harmful to our environment?

    Burning fossil fuels produces carbon dioxide, one of the major contributors to climate change.

Chapter: Going Green

11. Other than fossil fuels, what other energy sources can be used to generate electricity. What is one advantage all these resources have in common?

    Wind, waves (tidal energy) solar, underground heat (geothermal), falling water (hydropower), plants (biomass), nuclear. These resources can generate electricity with no or little carbon dioxide being released.

Chapter: Save the Planet

12. Page 28 lists 3 ways to save electricity. Make a list of at least 3 additional ways you can save energy every day.

    Answers will vary by student, but could include: Take shorter showers, turn off the water when brushing your teeth, only running the dishwasher or clothes washer/dryer when full.

13. In your opinion, what is the most valuable thing people have invented that uses electricity? Explain why.

    Answers will vary by student