**Experiment**

*Static Electricity—Salt & Pepper (pg. 30)*

What you need:
- salt, pepper, plate, balloon

Blow up the balloon and tie it closed. Pour some salt and pepper onto a plate and stir it around until they are mixed together. Rub the balloon back and forth quickly on the top of your head or on your shirt. Now hold the balloon close to the plate. What happens to the pepper flakes? What happened to the salt flakes?

What happened:
When you rub the balloon on your head or shirt, the friction caused by your hair or shirt rubbing against the balloon causes the electrons from your hair to transfer to the balloon. This gives the balloon a negative charge. When you held the balloon over the plate of salt and pepper, the pepper stuck to the balloon because the pepper has protons and a positive charge. It’s not magic or even the slightest bit futuristic—it’s static electricity!

**Who is Frank Einstein?**

In the 2nd book of the series, Frank Einstein (kid genius scientist and inventor) along with his best friend Watson and Klink and Klang (artificial intelligent robots) are at it again with their arch nemesis, and classmate, T. Edison, to unlock the power behind the science of energy. Frank is working on a design of wireless energy, inspired by the famous inventor Nikola Tesla. Einstein’s invention, the “Electro-Finger” will allow the entire town of Midville to live off the energy grid with free, wireless, and solar energy. However, this puts Frank in direct contact with Edison’s quest to control all the energy resources in Midville. Can Frank and his team stop Edison and his ape, Mr. Chimp in time?

**The Case for STEM Education**

- “60% of U.S. employers are having difficulties finding qualified worked to fill STEM vacancies.” - Council of Foreign Relations
- “54% percent of the nation’s 4th graders and 47% of its 8th graders report that they “never or hardly ever” write reports about science projects. 39% of 8th graders report that they “never or hardly ever” design a science experiment.” - U.S. Department of Labor
- “Out of 65 education systems, American students rank 27th in math and 20th in science.” - U.S. Department of Labor

**What is Arkansas Reads One Book?**

This is a program designed to create a shared reading experience throughout a district at the elementary level. Every student in the district receives a book with a family resource guide. The goal is to create a culture of family reading and
Chapters 1–4
- How are static electricity (pp. 8–9) and lightning (pp. 9–10) similar? Why does rubbing your feet on a rug and touching someone else cause static electricity?
- On pp. 19–22, Frank and Grandpa Al share the difference between nonrenewable energy and renewable energy. What is the difference?
- What are examples of nonrenewable energy? Renewable energy? What do we primarily use now? Brainstorm with a group and come up with ideas for more efficient energy in your community.
- In Chapter 3, there is an example of hydropower. How does it work? Why is this considered a renewable energy source?

Chapters 5–8
- Frank’s parents are traveling within the Arctic Circle, so they were able to witness the Northern Lights (pp. 35–39). What are the Northern Lights? Why can you only see them when you are close to the North Pole?
- Are there Southern Lights near the South Pole? How do you know?
- Frank explains to Watson how a compass works on pp. 38–39. Why does the magnetic end of a compass always point north?

Chapters 9–12
- Why do you think Watson puts up with Frank’s antics?
- Use text evidence to explain the relationship between magnetism and electricity.
- Klink and Klang are examples of artificial intelligence. How are they different from current artificial intelligence?

Chapters 13–16
- Why is T. Edison “not exactly lying” when he says, “We are working on energy prices everyday” (p. 88)?
- Why does Watson rub balloons on his head while on stage (p. 89)?
- What do you think happens when Mr. Chimp crosses the wires in the elephant (pp. 94–95)?

Chapters 17–20
- On pp. 99–101 and 106, we learn about how solar panels work to create electricity. Can you explain how they work?
- Why do you think more people don’t have solar panels?
- Frank’s parents are in Antarctica where the ozone is getting a hole in it (p. 110). What is causing this hole? What are CFCs? How do they affect the ozone?

Chapters 21–24
- At the end of chapter 21, Mr. Chimp signs “Bye, bye, Suckers.” What does he think will happen to the raft? Why?
- Why do you think Mr. Chimp keeps working with Edison?
- When Klank fires his thrusters, is this an example of Newton’s third law? How?

Chapters 25–28
- What does Mr. Chimp mean on page 144 when he signs, “Freedom?”
- Who do you think has influenced Frank more: his parents or Grandpa Al? Explain your answer and use text evidence to back it up.

Science Academic Vocabulary

Static electricity - is an unbalanced charge that is not moving. A common cause of static electricity is the transfer of electrons when two objects are rubbed together.
Electrons - an elementary particle with negative charge.
Fossil fuels - any carbon-containing fuel formed from the remains of prehistoric plants and animals. Coal, petroleum, and natural gas are examples of fossil fuel.

Renewable energy - Renewable energy is made from resources Mother Nature can replace, like wind, water and sunshine. Renewable energy is also called “clean energy” or “green power” because it does not pollute the air or water.
Geothermal energy - Heat from the earth to generate energy.

Hydroelectric Energy - Hydropower is a clean, renewable and reliable energy source which converts kinetic energy from falling water into electricity.

Aurora Borealis - also known as the “Northern Lights,” appear when tiny particles stream out from the Sun and hit Earth’s atmosphere.

Magnetic Field - The magnetic field is the area around a magnet in which there is magnetic force.