Goldie at Home Activity: Electric Automobile

Activity Overview: Did you know Des Moines is the birthplace of the first electric carriage (later shortened to car)? This hair-raising activity explores harnessing the power of static electricity to move an object much like an electric car. This was a popular vehicle choice for Iowa drivers in the early 1900s, along with steam and gas-powered machines. Although their popularity faded, alternative energy vehicles have returned again to Iowa roadways.

Connection to Iowa History

In 1890, Iowan William Morrison created the first successful American electric carriage (car). The car was built in his basement workshop, referred to as "the Cave" on 5th Avenue in between Locust Street and Grand Avenue in downtown Des Moines. Morrison's electric contraption could carry up to 12 passengers, cruise at 14 miles per hour and needed to be recharged after 50 miles of driving. The newly-created vehicle was first shown to the public during the 1890 Seni Om Sed parade in Des Moines, meaning Iowans were the first to witness the use of this vehicle.

Milburn Electric Cars

The State Historical Museum of Iowa is home to a **1919 Milburn Electric Automobile**. The vehicle was purchased in 1919 by Iowa Gov. George W. Clarke and driven in Des Moines and Adel by his wife, Arletta Clarke. Another famous passenger in their car was their grandson, Niles Kinnick. The Milburn Electric was considered the most affordable electric car on the market at the time for $1,485, although Ford's Model T cost only $440. Keep in mind the average annual salary in 1915 was $633. Electric cars were great for city drivers because of how quietly they ran, but the cars were not useful for rural families who needed to travel long distances. Owners of electric cars had to purchase charging station for their homes. If taking a long trip, they could switch out their batteries for new ones at select stores. Learn more about **early electric car charging stations**.

What is static electricity?

This activity harnesses the power of static electricity to move a metal can. When you create friction between your hair and the balloon, invisible electrons with a negative charge build upon the surface of the balloon. These electrons have the power to pull light objects, like the can. This building up of power closely resembles how a battery in an electric car would operate.

Instructions

1. **Mark.** Establish a starting line for can rolling. The starting line can be marked by tape on the floor or by putting a broom down, so everyone starts from the same place.

2. **Prepare the area**. Create a pathway for the cans to roll. Make sure there is a large, clear area in front of the starting line. It is recommended to use a ruler or yardstick to measure the distance of the pathway and make distance markers. To do this, you can use a sheet of paper, write a distance (like 1 foot) with a marker or pen and tape the distance marker.

Instructions continued on next page

Materials

- Balloon
- Empty aluminum can
- **Worksheet**
- **Optional**: tape, marker or pen, ruler, paper

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Instructions continued

3. **Place cans.** Each person needs one empty aluminum can. Put the empty cans on their sides at the starting line.

4. **Blow.** Take a deep breath and blow up the balloon.

5. **Create static electricity.** Everyone will take a turn rolling their cans from the same location. The first person will place the blown-up balloon onto their head, and run it back and forth over their hair for 90 seconds to create static electricity.

6. **Move and record.** After the 90 seconds, quickly hold the charged balloon close to the can. The can will start to roll away from the static electricity. Mark the spot where the static electricity stops moving the can.

7. **Taking turns.** Each person will have three attempts to move their can. You can record the distance of each attempt on a **worksheet** if you would like to keep track.

8. **Win!** After the third attempt, the person's can that moved the farthest wins the contest.

9. **Questions to Spark Learning**
   - How do you think Iowans reacted when they witnessed the first electric car at the 1890 Seni Om Sed parade? What makes you say that?
   - Why do you think electric cars were popular at the beginning of the last century?
   - What would be the pros and cons of owning the Milburn Electric Car?
   - Would you like to own an electric car? Why or why not?
   - What are the benefits of electric cars? What are the downsides?

10. **Additional Resources**

Explore these resources below to learn more about electric cars.

- **See a Milburn Electric Car up close with a video from the Thayer School of Engineering at Dartmouth**
- **Timeline: History of the Electric Car by PBS**
- **History of the Electric Car by the Department of Energy**
- **1919 Milburn Electric Automobile**

Goldie at Home: Electric Automobile Worksheet

Keep track of how far your aluminum can rolls with the help of static electricity. Use the worksheet below to write down the distances of each participant's test rolls.

Participant 1

Test Roll #1 _____

Test Roll #2 _____

Test Roll #3 _____

Participant 2

Test Roll #1 _____

Test Roll #2 _____

Test Roll #3 _____

Participant 3

Test Roll #1 _____

Test Roll #2 _____

Test Roll #3 _____