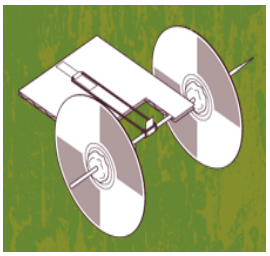

Engineer an Electric Car

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Adapted from "Customized Car", Design Squad – PBS and Intel Education. Developed with funding from the American Council of Engineering Companies of Virginia and the MathScience Innovation Center.

Question

Can you design and build an electric car that can travel at least ten feet?

Grade/Subject

Grade Six Science, Life Science, Physical Science,
Virginia Standards of Learning: (2010) 4.3, 6.1, 6.2, LS.1, PS.1, PS.6, PS.10, PS.11.

Background

For the design process to be successful, students must not give up if at first unsuccessful. Continue to make design changes until you have successfully met the challenge. In this activity students build a battery-powered car, make a working circuit, and put the design process's try-try-again approach into practice. Once this challenge is met the cars may be designed to meet new challenges.

Safety

Remember to follow your regular classroom rules for lab safety.

Materials

- 1 1.5 – volt AA battery
- 2 Compact discs
- Piece of corrugated cardboard 5-1/2 inches square
- 2 Wires with alligator clips attached
- 4, ¼ inch faucet washers
- 4, ½ inch faucet washers
- 1, 1 to 1-1/2 inch faucet washer
- Motor with attached gear that runs on 1.5 volt AA battery
- Poster putty
- 2 Wooden skewers
- Scissors
- 4 Paper clips
- 2 Rubber bands
- 2 Soda straws

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- Tape (masking or duct)

Procedure

1. Look at the materials and brainstorm the design of your car by asking these questions.

- How will you attach the motor and battery to the car body?
- Where do the motor and battery need to be in order to move the car?
- Why do you need to make good connections between the battery, motor, and wires?
- The motorized wheel attaches directly to the shaft coming out of the motor so how will the unmotorized wheels be connected to the car?
- How will the wires be run so they don't interfere with how the car moves?
- What should be done to make sure the wires stay well connected to the battery and motor?

2. After reviewing the materials and thinking about how to use them, build your design.

3. Test out your car and if problems occur, redesign your car to correct the design flaws.

Data Analysis/ Results

Record the distance each car is able to travel. Cars should be tested several times and the best trial distance out of five test drives is the design.

Conclusion / Questions

1. What about the winning design made it go a farther distance?
2. What changes can be made on your design to increase distance?
3. How can you make your car go faster? Straighter?
4. What could be done to stabilize your car if you were to race over rough terrain?

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References

Lesson activity adapted from “Customized Car”, Design Squad – PBS and Intel Education.

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Information on educational programs available to students, teachers and school divisions and procedures for registering for programs.
http://mathsciencecenter.info

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