

ELECTRIC VEHICLE MODEL RACE



KEYWORDS

electric vehicles automotive engineering battery technology sustainable transportation energy efficiency

Engineers and technicians in the electric vehicle (EV) industry design cars that run on electricity stored in batteries instead of gasoline. EVs produce less air pollution and fewer greenhouse gases, helping to clean up city air and fight climate change. These workers develop lightweight materials, powerful batteries, efficient motors, and charging systems. They also design smart systems to manage energy use. As more people and companies switch to electric cars, the demand for EV experts is growing rapidly. These green jobs help build a future where transportation is cleaner and more sustainable, making healthier cities for everyone.

AGE RANGE

9-11 years

SMALL GROUPS

(3-4 students)

DURATION

45 minutes

MATERIALS

Chassis:

- Cardboard base (8" x 4")
- 4 wheels (bottle caps or toy wheels)
- 2 wooden skewers for axles
- Straws for axle guides

Electrical Components:

- Small DC motor (3-6V)
- 2 AA batteries + battery holder
- Copper wire (insulated, 22 gauge)
- Small switch (optional)
- Rubber band or balloon for motor coupling

Assembly Tools:

- Hot glue gun (adult use only)
- Electrical tape
- Wire strippers
- Small screwdriver



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Procedure:

Step 1: Build the Chassis

1. Cut cardboard to 8" x 4" rectangle
2. Poke holes for axles 1" from each end
3. Thread wooden skewers through holes
4. Attach wheels to axle ends with hot glue
5. Test that wheels spin freely

Step 2: Motor Mounting

1. Secure motor to back of chassis with hot glue
2. Position so motor shaft can connect to rear axle
3. Use rubber band or balloon piece to couple motor shaft to axle

Step 3: Electrical System

1. Mount battery holder on chassis
2. Connect red wire from battery to motor's positive terminal
3. Connect black wire from battery to motor's negative terminal
4. Add switch in the circuit if desired
5. Secure all connections with electrical tape

Step 4: Testing and Optimization

- Test basic movement
- Adjust weight distribution for better traction
- Experiment with wheel size and motor positioning
- Time races over 10-foot distance

Design Variations:

- **Speed Design:** Lightweight chassis, large rear wheels
- **Power Design:** Add weight over drive wheels for traction
- **Efficiency Design:** Reduce friction, streamline shape

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INSTRUCTIONAL GUIDELINES FOR FACILITATOR

- Supervise electrical connections and battery handling
- Provide pre-cut chassis materials to save time
- Help students understand trade-offs between speed and efficiency
- Connect to automotive engineering careers



LEARNING OUTCOMES

- Understand electric vehicle technology basics
- Learn about automotive engineering careers
- Practice engineering optimization and testing

EXTENSION SUGGESTIONS

- Research real electric vehicle specifications
- Calculate emissions savings from electric cars
- Design improved vehicle chassis