

Electric Motor

Task: Design an electric motor that will make a compass needle spin.

What You Should Know

Electric motors turn electricity into motion. In this process, electrical energy is converted into mechanical energy. Many items found in your home, like washing machines, dryers, and refrigerators, have a motor. They use electricity and magnetism to produce motion.

Steps to Follow

Work with a team to complete the steps listed below. A team will have 3 or 4 members.

- Step 1: Research electrical motors, electricity, and magnetism.
- Step 2: Brainstorm ideas about how you might design an electric motor that will make a compass needle spin.
- Step 3: Draw a diagram of your motor.
- Step 4: Construct your motor.
- Step 5: Test and evaluate the performance of your motor.
- Step 6: Identify how to improve the design of your motor.
- Step 7: Make the needed changes.
- Step 8: Retest and re-evaluate your motor.
- Step 9: Share your results.

Terminology You Should Know

battery: an energy source

electrical current: the amount of electric charge that moves past a certain point each second

electromagnet: a magnet made by wrapping a current-carrying wire around an iron core

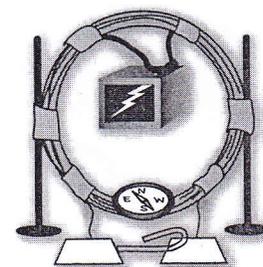
magnetic field: an area that surrounds a magnet where a magnetic force can be detected

magnetism: the property of attracting metals, producing a magnetic field by a magnet or a conductor carrying an electric current

mechanical energy: the energy an object has because of its motion or position

Materials You May Need

- Materials to be determined by students through their research



Task Requirements

- Research: A one- to two-page paper summarizing your research on electrical motors, electricity, and magnetism. Cite your sources. Your paper may include two pictures.
- Model: A labeled drawing of your motor design and explanation of your strategy.
- Results: A record, analysis, and interpretation of test results.
- Conclusion: A summary of the task and what actually happened. It should include the purpose, a brief description of the test procedure, and explanation of results.
- Reflection: Think about your team's choices and the design of your motor. Then complete the "Reflection" handout.
- Evaluation: Think about your behavior and performance as a team member. Then complete the "Self-Evaluation Rubric."