

Student Exploration: Electromagnetic Induction



Prior Knowledge Question (Do this BEFORE using the Gizmo.)

A **wind generator**, such as the one shown at left, uses the power of wind to generate electricity. What do you think is happening inside the wind generator to convert the energy of the spinning blades into electricity? Make your best guess.

A conductive loop is rotated through a magnetic field

Gizmo Warm-up

Usually when you experiment with circuits, you use a battery or another energy source to create a current. But is it possible to generate a current without a battery? You can find out with the *Electromagnetic Induction Gizmo™*.

In the Gizmo, you can drag the wire loop around or use the controls to move the magnet up and down. You can also rotate the wire loop. Experiment with the Gizmo to see how many different ways you can create a current in the wire loop and light the light bulb. Describe your findings below.



By moving the coil towards or away from the magnet quickly, the bulb will light. Also, the rotation of the loop causes the bulb to light.

Activity A: Electromagnetic fields

Get the Gizmo ready:

- Turn on **Show electric field at sensor**.
- Click **Reverse** to move the magnet down and set the **Speed** to 10 cm/s.



Introduction: When electric current runs through a wire, it induces a **magnetic field** near the wire. Similarly, **electric fields** can be created in the process of **electromagnetic induction**.

Question: How do magnets induce electric fields?



Gizmo Answers Electromagnetic Induction

RJ Alexander

A red circular graphic with a gradient, appearing as a semi-circle or a partial ring, located to the right of the author's name.

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