Video Instructions SCAN

MiniScience

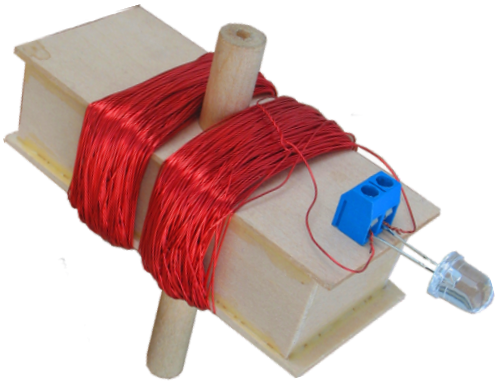
BUILD & LEARN

MODEL KITWG

Wooden Electric Generator

INTRODUCTION

An electric generator converts mechanical energy (motion) into electrical energy. Inside one, a moving magnet pushes the free electrons in a wire back and forth — and that flow of electrons is electricity. Because the electrons swing back and forth rather than flowing one way, this is called **alternating current (AC)**.
Household electricity is AC at about **60 Hz in North America** (50 Hz in many other regions). In this kit the entire
structure is wood — the only non-wood parts are the magnet and the wire.



HOW IT WORKS

Induction

Spinning the magnet inside the coil creates a changing magnetic field that pushes current through the wire. Spin faster → stronger current.

Alternating Current

Asthe magnet turns, its field reverses relative to the coil, so electrons flow back and forth — just like home electricity.

Light-up Test

Wire the coilto the LEDs. Each LED lights on opposite halves of every rotation, proving motion became electricity.

KIT CONTENTS

- 2 top/bottom boards — 90 × 43 × 1 mm (10 mm hole)
- 2 large side boards — 83 × 23 × 1 mm
- 2 small side boards — 40 × 23 × 1 mm
- 1 rotor (wood dowel with magnet hole)
- 1 strong magnet — 13 mm diameter
- 1 spool magnet wire — 200 ft
- 2 LED lamps · 1 terminal block · sandpaper

YOU PROVIDE

- White or wood (PVA) glue
- A flat, clean work surface
- Optional: small voltmeter to measure output
- Optional: hand crank or wheel to spin faster

STEM CONCEPTS

- **Physics:** induction, magnetism, circuits
- **Engineering:** mechanical design & assembly
- **Math:** measurement, turns, rotation speed
- **Technology:** LEDs and electrical connections

TAKE IT FURTHER

- Measure voltage at different spin speeds
- Compare brightness with more or fewer turns
- Build a crank or wheel to drive the rotor
- Wire LEDs in series vs. parallel
- Add a rectifier to convert AC into DC

Order Now

Product URL:
https://shop.miniscience.com/KITWG

MiniScience.com
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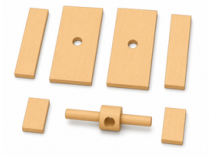
Clifton, New Jersey 07011
Tel: (973) 777-3113

SAFETY

- Strong magnet — keep away from young children, electronics, and magnetic media.
- Wire ends can be sharp; handle with care.



ASSEMBLY PROCEDURE

Before you start: Lightly sand the wood edges with the included sandpaper for clean glue joints, and dry-fit the boards once before gluing anything.

Step 1

Start the box. Glue the bottom board to two long and one short side board into a rectangular frame; keep corners square.

Step 2

Close the frame. Add the second short side board to finish the four walls. Check that the rotor hole stays centered.

Step 3

Mount the magnet. Press the 13 mm magnet snugly into the rotor's hole; add a dab of glue to lock it permanently.

Step 4

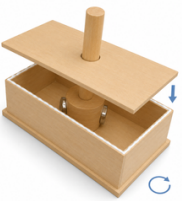
Insert the rotor. Once the box glue is dry, slide the rotor through the bottom hole so the magnet sits fully inside.

Step 5

Glue the top edges. Run glue along the top edges of the four walls, ready for the top board.

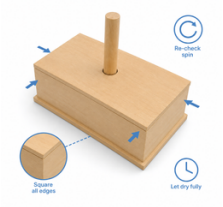
Step 6

Fit the top board. Lower it so the rotor passes through its hole and the edges meet the glue. Confirm it spins freely.



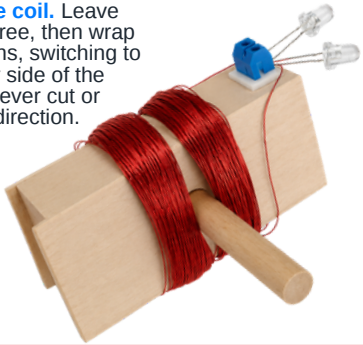
Step 7

Square & dry. While glue is wet, align all edges into a true rectangle, re-check the spin, then let it dry fully.



Step 8

Wind the coil. Leave ~15 cm free, then wrap ~230 turns, switching to the other side of the dowel. Never cut or reverse direction.



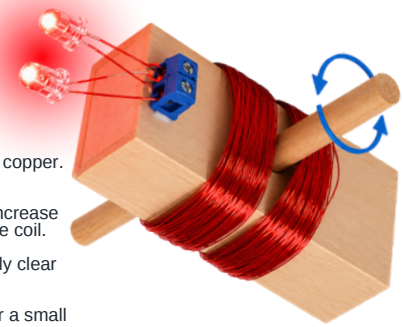
Step 9

Connect the LEDs. Sand ~1 cm of enamel off both wire ends to bare copper, then join them to the LEDs via the terminal block.

Critical: Magnet wire is coated in clear enamel. If you skip sanding the ends bare, no current can reach the LEDs — the #1 reason a finished generator won't light.

TEST YOUR GENERATOR

Spin the rotor by hand — the faster the better. If everything is connected, the LEDs flicker to life, showing you've turned motion into electricity. For steadier light, spin continuously or add a hand crank.



TROUBLESHOOTING

LED won't light	Wire ends still coated — sand them to bare copper. Re-seat the terminal block and spin faster.
Very dim light	Too few turns or slow spin. Add turns and increase speed; confirm the magnet is centered in the coil.
Rotor won't spin freely	Glue crept into a hole. Let it cure, then gently clear the hole so the dowel turns without rubbing.
Coil came loose	Secure the loose end under earlier wraps or a small piece of tape; keep ~15 cm leads