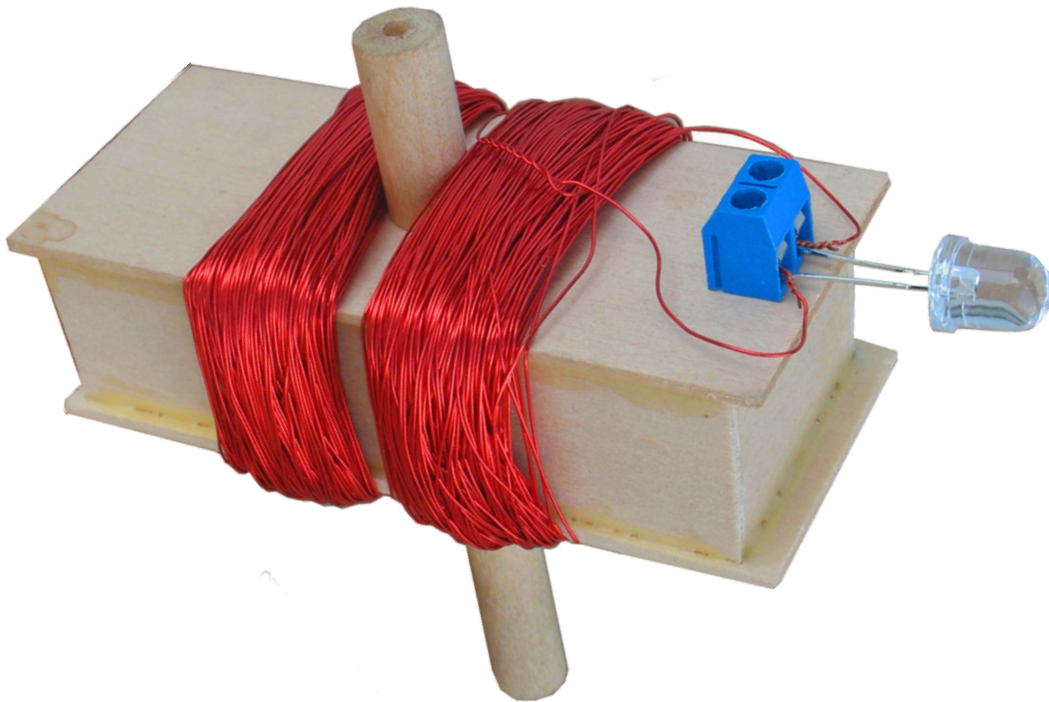


Wooden Generator

Instructions and Tutorial



List of materials

- Two bottom and top wood boards, (90mm x 43mm x 1mm with a 10mm hole in the center)
- Two large side boards (83mm x 23mm x 1mm)
- Two small side boards (40mm x 23mm x 1mm)
- Rotor (A wood dowel with a hole in the center to hold the magnet)
- Strong magnet
- Sand Paper
- Two LED lamps that may be used separately or together.
- Terminal Block to connect the wires and LED lamps.
- Spool of 200 feet magnet wire

Product Code: KITWG

An electric generator is a device that converts mechanical energy to electrical energy. In a generator, a moving magnet will push the free electrons in a conductor back and forth. Movements of electrons along a conductor are called electricity. Since in this type of electricity electrons swing back and forth, we also call it alternative electricity and show it with symbol AC. Home electricity is an AC electricity with frequency of about 50 Hertz; In other words, electrons swing back and forth 50 times per second.

In a wooden generator, the main structure is made of wood. The only non wooden parts are the magnet and the wire. The instructions bellow will help you make a working wooden electric generator using the materials available in the Small Wooden Electric Generator kit of MiniScience.com.



Wooden Generator

Construction procedures:

- Place the bottom board on a flat surface.
- Glue one edge of a large side board and place it vertically along one of the long sides on the bottom board. Center it.
- Glue two edges of a small side board and place it vertically along one of the short sides of the bottom board so that it will also connect to the previous long side and support it.
- Glue two edges of the second small side board and place it vertically along the other short side of the bottom board. This also will support the long side.



- Apply glue to the long edge of the second long side board and vertical edges of the previous two small side boards. Now place the second long board on the remaining long edge of the bottom board.
- Align all the vertical side boards while the glue is still wet. Make sure the side walls of the box form a perfect rectangle. Apply additional glue if needed and then let the glue to dry.

- Insert the magnet in the hole of the rotor wood dowel. Since the diameter of the magnet and the diameter of the hole are both 13mm (1/2 inch), it should make a perfect fit. However, in some cases you may need to use a sand paper to enlarge the hole or use some glue to secure the magnet in place. Small amounts of glue are always recommended so that the magnet cannot move later.



- Make sure the box glue is dried and then insert the rotor in the hole of the bottom board. Now the magnet is completely in the box.

Wooden Generator

Construction procedures:



- Apply glue to the top edges of the box.



- Place the top board while the rotor wood dowel goes through its hole. Lower the top board until it touches the glued edges and complete (close) the box.

- While the glue is still wet, make necessary alignment of the edges. Apply additional glue if needed.
- Make sure the wood dowel rotor can spin freely.
- Let the glue dry.



- Now that the box is ready, you can start wrapping the magnet wire.
- Leave about 15 cm (6 inch) of the magnet wire and then proceed to wrap the magnet wire around the box. (Be sure to begin wrapping at least 15cm in from the beginning of the wire or else you will run into a problem later on. You will need this end as one of your contact wires.)
- Wrap the wire at least 230 turns in one side of the wood dowel, then continue to wrap on the other side of the wood dowel until you finish the wire.
- (Note that the direction of wrapping wire does not change and you will not cut the wire at any time.)



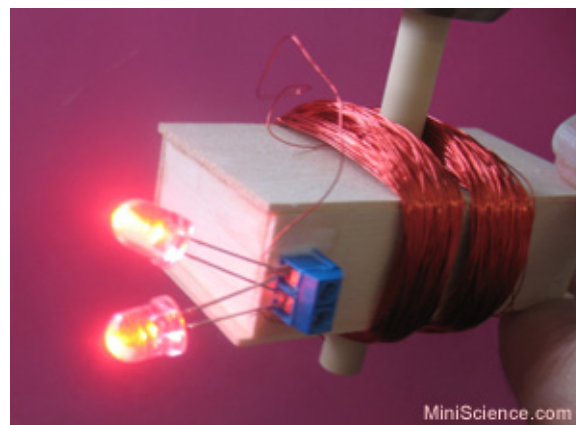
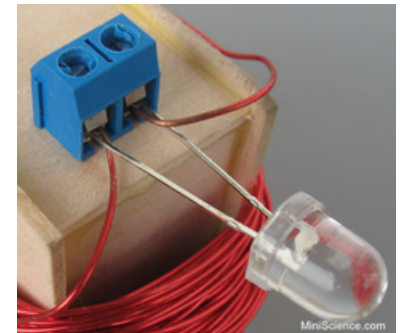
Wooden Generator

Construction procedures:



- Carefully insert the terminal block in one end of the box. (The pins can enter the wood by some force and jiggling). Apply some glue under the terminal block and let it dry.
- Use a sandpaper to remove the insulation from 3 centimeters of each end of the wire. (Insulation is in the form of clear or red paint covering the wire)
- Bend and twist the bare wire ends to give it some volume. Then insert each end in one of the holes of the terminal block. Temporarily use masking tape or rubber band to hold the wires in place.

- Insert the pins of one LED lamp into the holes of the same terminal block. (Each pin will enter one hole).
- Optionally insert the second LED lamp so that the short pin of the second LED and the long pin of the first LED will enter the same hole. Make sure that the crossing pins do not touch each other.
- Tighten the screws on the terminal block so that the wires and LED lamps are held tightly.



- Test your wooden generator by spinning the wood dowel rotor as fast as you can. The LED lamps must blink. If you cannot get a light, check all the connections and try again.