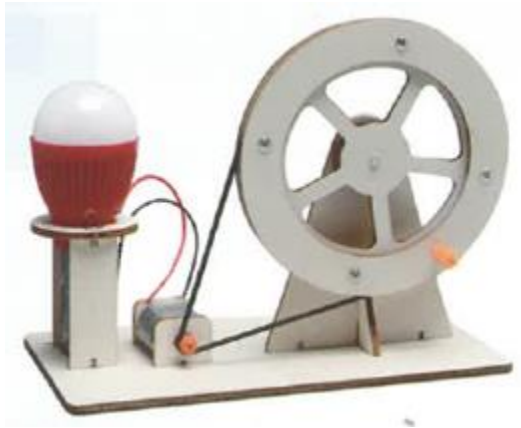
Wooden Hand Crank Electricity Generator –
Educational STEM Science Kit for Kids

T-M132



The **Wooden Hand Crank Electricity Generator** operates on the principle of electromagnetic induction. The generator lamp is primarily composed of two main parts: wooden panels and the generator. This small-scale scientific project not only enhances children's learning, hands-on skills, and independent thinking but also provides real scientific knowledge in an engaging and enjoyable way. It inspires curiosity and fosters a lasting interest in exploring the endless possibilities of the scientific world.

Experimental Principles:
The Wooden Hand Crank Electricity Generator operates on the principle of electromagnetic induction. In this process, a coil generates an induced electromotive force within a rotating magnetic field. The generator's basic structural components include the stator and the rotor.

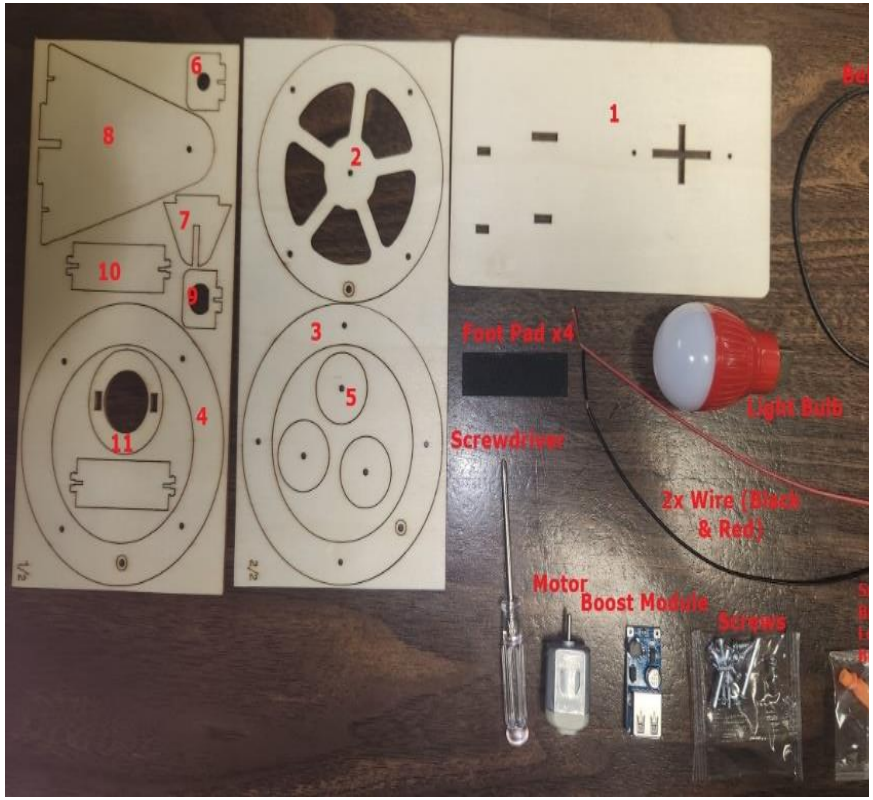
- The stator typically consists of a permanent magnet, creating the magnetic field.
- The rotor is a coil, which rotates within this magnetic field when driven by an external force.

As the coil rotates, it cuts through the magnetic lines of force, generating an induced electromotive force. If the internal coil forms a closed circuit with an external circuit via a brush, this force drives a current through the circuit, demonstrating the fundamental principles of electricity generation.

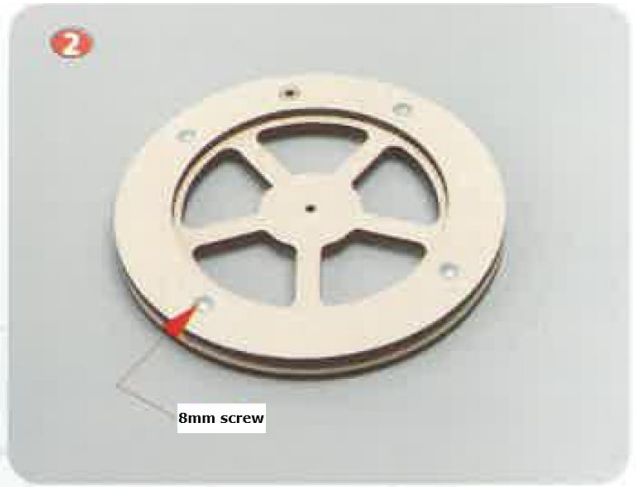
To Guardians (Parents):

1. This product is designed for use by children aged 8 years and above. It is not suitable for children under 8 years old.
2. Parents are advised to guide their children during assembly, ensuring they follow the instructions provided on the packaging and in the manual. Modifications or alterations are not permitted.
3. To prevent motor overheating and potential burns, ensure that the circuit and motor poles are connected correctly.
4. Loose wires should not be inserted into other output sockets.

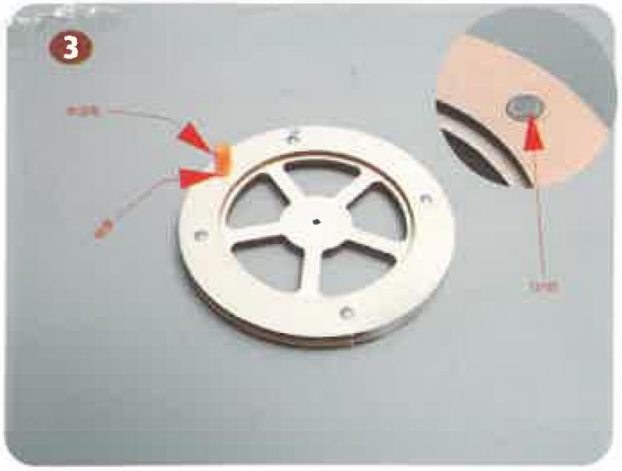
Let me know if you need further refinements!



Recognize the material



"Fix boards 2, 3, and 4 with 8mm screws. (Note: Board 2 should be in the middle)."

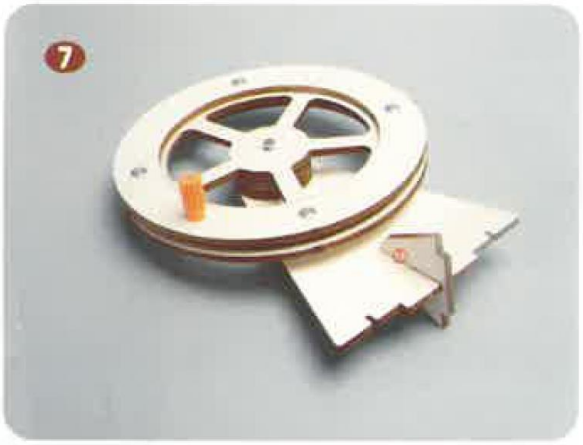


Install the T21 nail and long gear as shown.

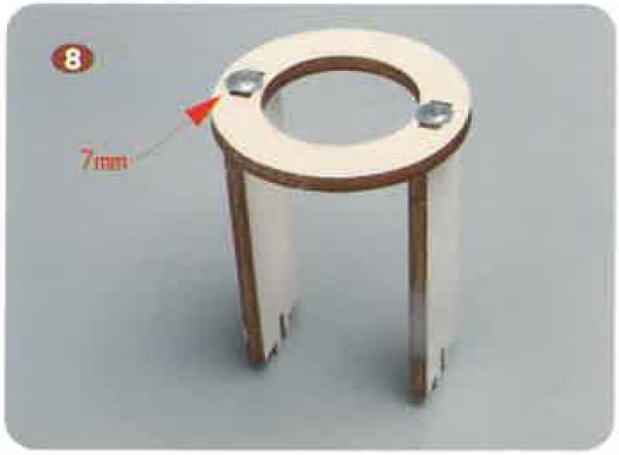
Use the T21 nail to secure Board 5 in the middle of Step 3, as shown.

Install the large pulley as shown in the picture

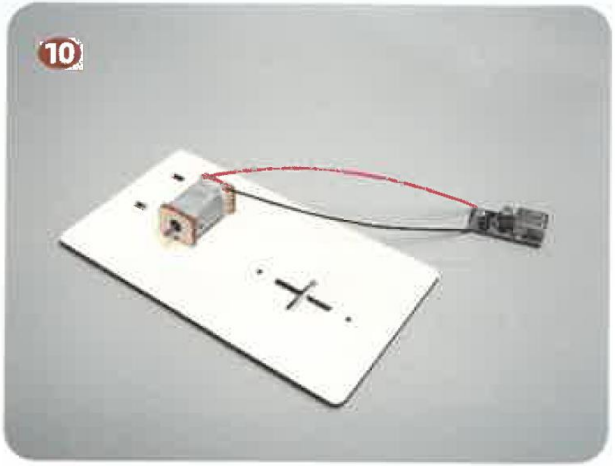
Install plate No. 6 as shown in the picture



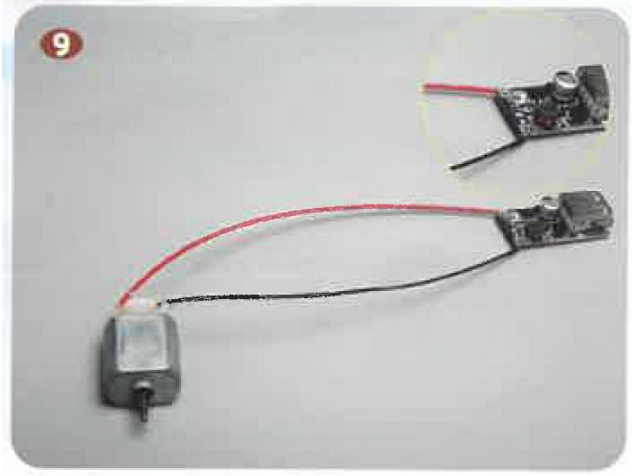
Install board No. 7 as shown in the picture



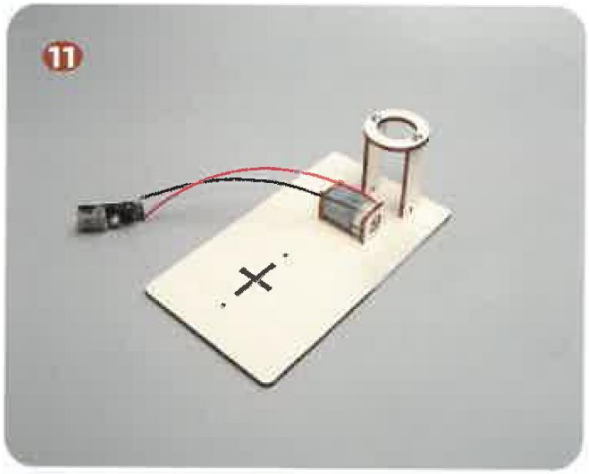
Install Boards No. 10 and 11 as shown in the picture, and fix them with 7mm screws



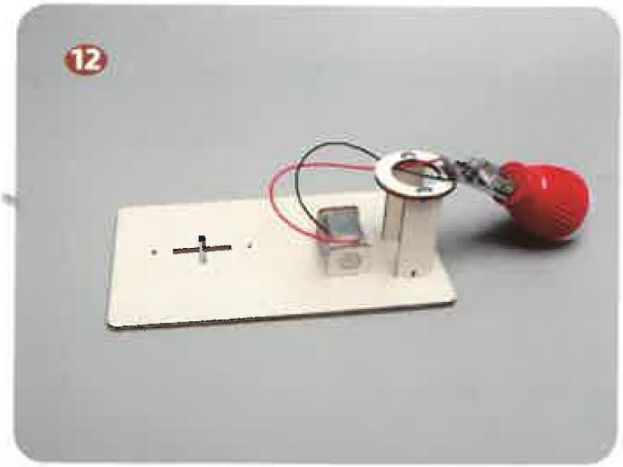
Fix the motor onto Board No. 1 as shown in the picture, securing it with 4mm screws.



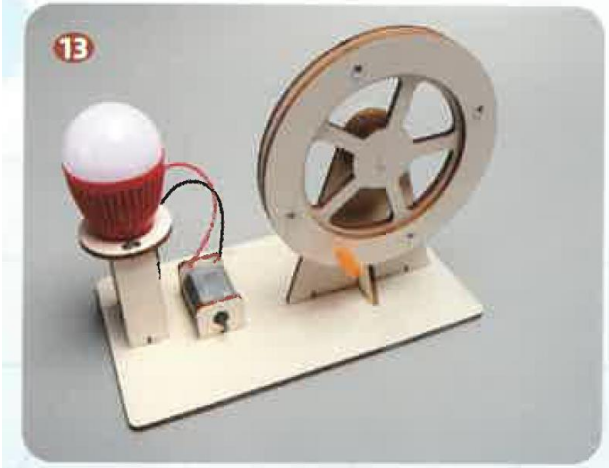
Connect the motor to the booster module using the wires as shown in the picture.



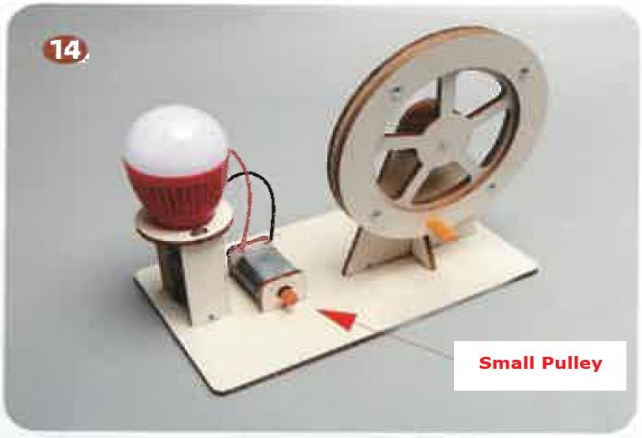
Fix step 8 on board No. 1 as shown in the picture and use 7mm screw fixation



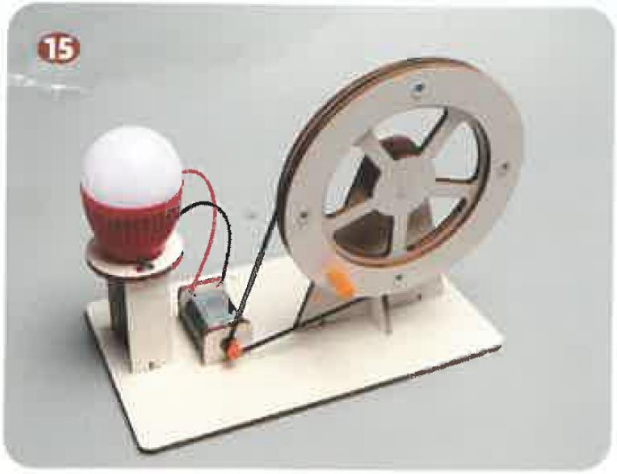
Install the light bulb as shown in the picture



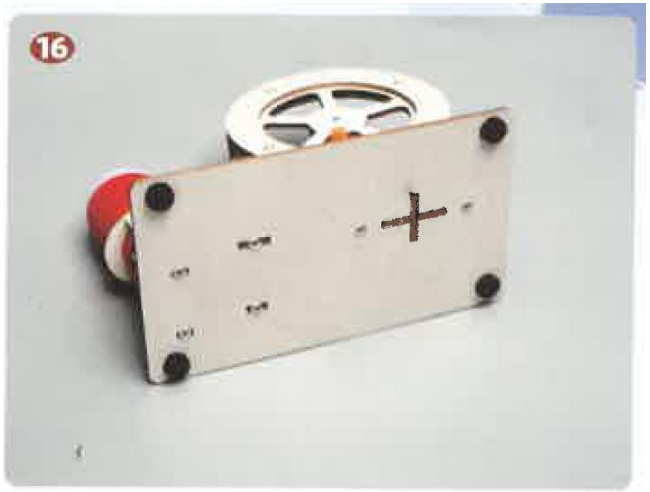
Fix step 7 on Board No. 1 as shown in the image, using a 7mm screw for fixation.



Install the small pulley as shown in the picture



Install the rubber band as shown in the picture



Install the foot pads as shown in the picture (installation completed)

Knowledge expansion:

1. **Thermal Power Plant**
   Thermal power plants generate electricity by using heat to produce steam. When fuel is burned, the heat turns water into steam, which drives a turbine to convert thermal energy into mechanical energy. The turbine spins a generator, which then converts the mechanical energy into electrical energy.

2. **Hydroelectric Power Plant**
   Hydroelectric power plants harness the power of flowing water to generate electricity. Waterwheels or turbines are driven by the movement of water, which powers a generator. These plants are often built with structures made from earth, stone, or concrete to prevent flooding and manage water flow.

3. **Nuclear Power Plant**
   Nuclear power plants use the thermal energy generated by the fission of nuclear fuel in reactors. The heat from this reaction is used to produce steam, which drives a turbine to convert thermal energy into mechanical energy. This process is similar to the one used in thermal power plants, where the nuclear reactor functions like a boiler.

4. **Wind Power Plant**
   A wind power plant, also known as a wind farm, generates electricity by harnessing the power of the wind. Wind turbines are used to convert wind energy into mechanical energy, which is then transformed into electrical energy. Wind power plants are considered a form of renewable energy.

5. **Tidal Power Plant**
   Tidal power plants generate electricity by using the rise and fall of tidal sea levels or the movement of tidal currents. This form of hydropower exploits the energy produced by ocean tides to generate electricity.

6. **Geothermal Power Plant**
   Geothermal power plants generate electricity by using underground hot water, steam, or high-temperature rock as a primary energy source. These plants tap into the Earth's natural heat to generate steam, which drives a turbine to produce electricity.