

# Renewable Energy







# Our Blue Marble: Renewable Energy

## Activity 1: Solar Energy

**Objective:** Students will set up a circuit powered by solar energy.

### Materials Needed:

Use the Solar Charger Project #6. The 3 kits shipped to be split between Activities 1 and 2. You will specifically use the Snap Circuits Green Alternative Energy Kit. It contains:

- ✓ B7- Solar Cell
- ✓ M6- Meter
- ✓ B4- Rechargeable Battery
- ✓ 2 snap wires
- ✓ Black Jumper Wire
- ✓ Red Jumper Wire
- ✓ Assembled Pivot Stand

### Summary of Student Action:

Solar energy is the primary source of energy for the Earth. People can capture the power of the Sun by turning it into electricity with solar panels. Solar panels absorb energy from the Sun that can be used to move electrons and create an electric current. Students will use a solar cell as an energy source in a circuit.

### Setup Instructions:

- Set out two of the Snap Circuit Green Alternative Energy Kits and the corresponding instruction manuals.
- From one or both kits, group the components for the Solar Project #6 together next to the base grid.

### Additional Notes:

- Encourage students to use care when assembling circuits.
- When using the pivot stand, make sure it is connected to the base, so it does not fall over.





# Our Blue Marble: Renewable Energy

## Activity 1: Solar Energy

### Activate Your Knowledge:

What are renewable resources? Is solar energy a renewable resource? Renewable resources are resources that get refilled as quickly as they are used so they will not run out. When renewable resources are used to make energy, it is known as renewable energy. One type of renewable energy is solar energy. Solar energy is energy that comes from the sun. You can feel solar energy when you are outside in the sunlight and you feel warmer. Plants use solar energy to grow and make food that organisms, like humans, depend on to survive. Solar energy can also be used to make electricity. Electricity is another kind of energy that we use to power our homes, schools, and communities. See if you can use solar energy to create electricity!

### Materials You Will Need:

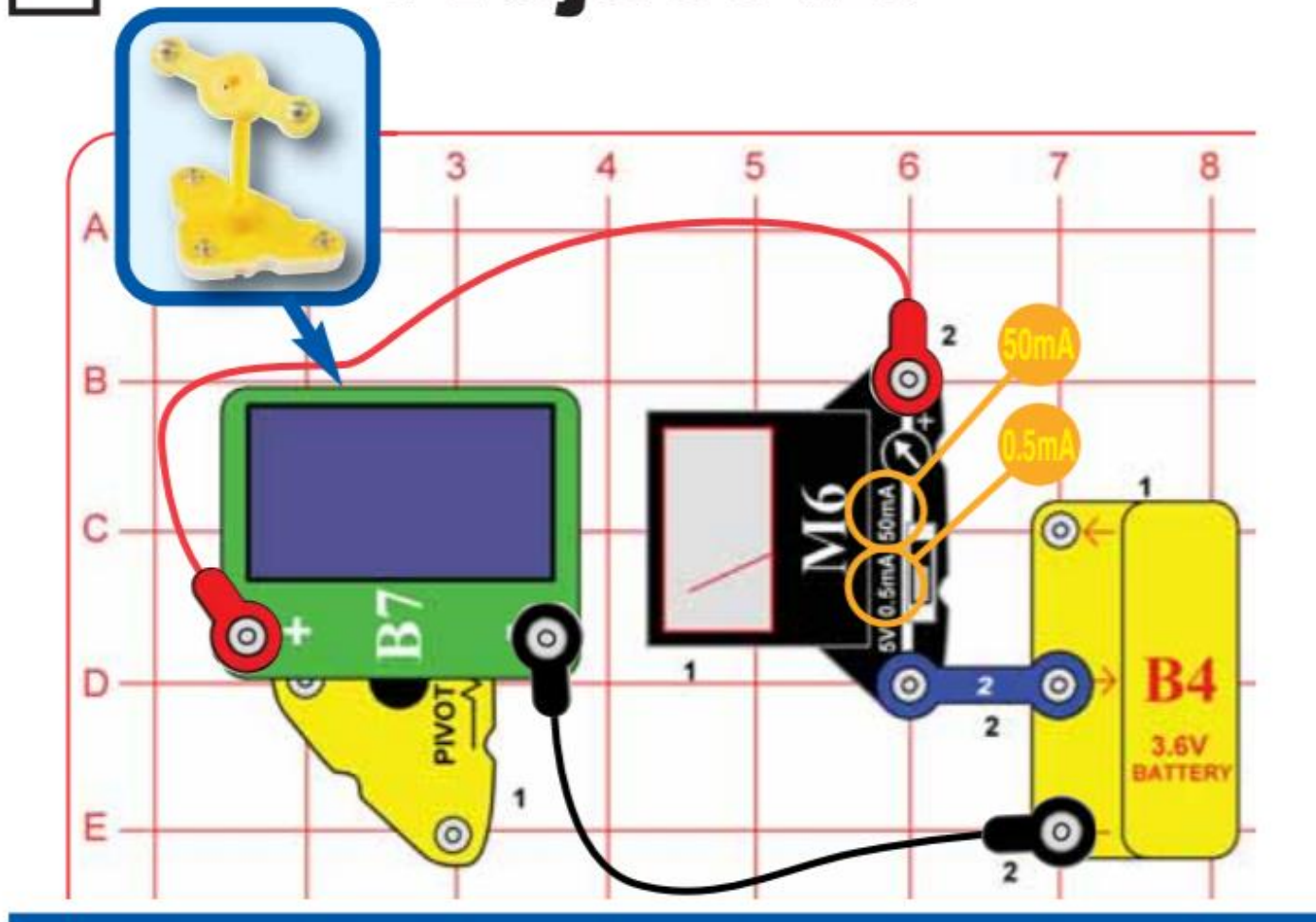
- ✓ 1 B7- Solar Cell
- ✓ 1 M6 - Meter
- ✓ 1 B4 – rechargeable battery
- ✓ 2 snap wires
- ✓ 1 black jumper wire
- ✓ 1 red jumper wire
- ✓ 1 assembled pivot stand

### Procedures:

1. Follow the diagram in the instruction manual or the included image to set up your circuit pieces. Make sure you snap all pieces to the base grid.
2. Set the Meter (M6) piece to 0.5mA or 50mA.
3. Adjust the solar panel's position on the pivot point and move the pieces and the base grid (as necessary) so the solar panel is in full sunlight or near a light bulb.
4. Observe the Meter (M6). What happens? How does the meter change when the solar panel is moved?



# Solar Charger Project #6



Source: <https://www.elenco.com>





# Our Blue Marble: Renewable Energy

## Activity 2: Wind Energy

**Objective:** Students will set up a circuit powered by wind energy.

### Materials Needed:

Use the Windmill Project #8. The 3 kits should be split between Activities 1 and 2. You will specifically use the Snap Circuits Green Alternative Energy Kit. It contains:

- ✓ M6-Meter
- ✓ Assembled pivot stand
- ✓ M4-Motor
- ✓ Wind fan
- ✓ Red jumper wire
- ✓ Black jumper wire

### Summary of Student Action:

Students will experiment with wind energy to see it is another renewable resource that can be used to generate electricity. Energy in wind can be used to turn windmills that are connected to generators. When this happens, the motion of the windmill is converted into electricity. Students will set up a circuit that uses a windmill as an energy source.

### Setup Instructions:

- Set out two of the Snap Circuit Green Alternative Energy Kits and the corresponding instruction manuals.
- For one or both kits, group the components for the Windmill Project (#8) next to the base grid.

### Additional Notes:

- Direct the students to use care when assembling circuits.
- When using the pivot stand, make sure it is connected to the base so it does not fall over.





# Our Blue Marble: Renewable Energy

## Activity 2: Wind Energy

### Activate Your Knowledge:

What are renewable resources? Is wind energy a renewable resource? Renewable resources are resources that get refilled as quickly as they are used so they will not run out. When renewable resources are used to make energy, it is known as renewable energy. One example of renewable energy is wind energy, and it can be used to generate electricity. Energy in wind can be used to turn windmills. When the wind turns the windmill, the generator is turned. When the generator is turned, energy is created in the form of electricity. Electricity is the energy that we use to power our homes, schools, and communities. See if you can use wind energy to create electricity!

### Materials You Will Need:

- ✓ 1 M6 - Meter
- ✓ 1 assembled pivot stand
- ✓ 1 M4 – Motor
- ✓ 1 wind fan
- ✓ 1 red jumper wire
- ✓ 1 black jumper wire

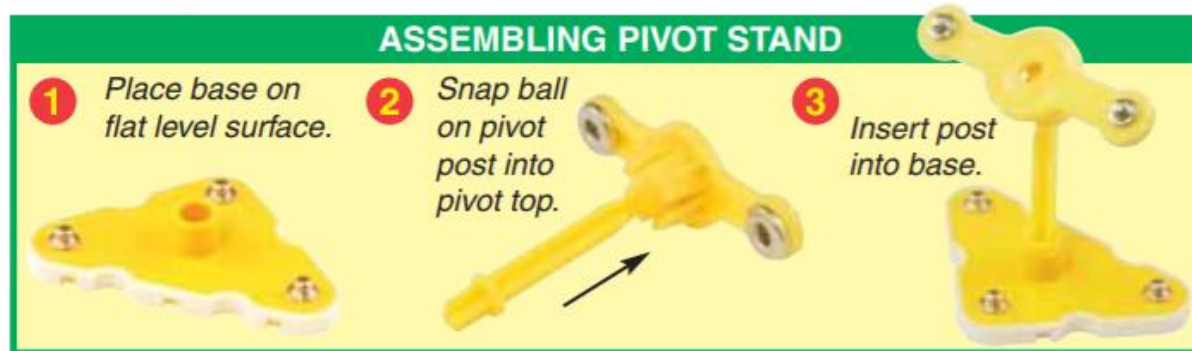
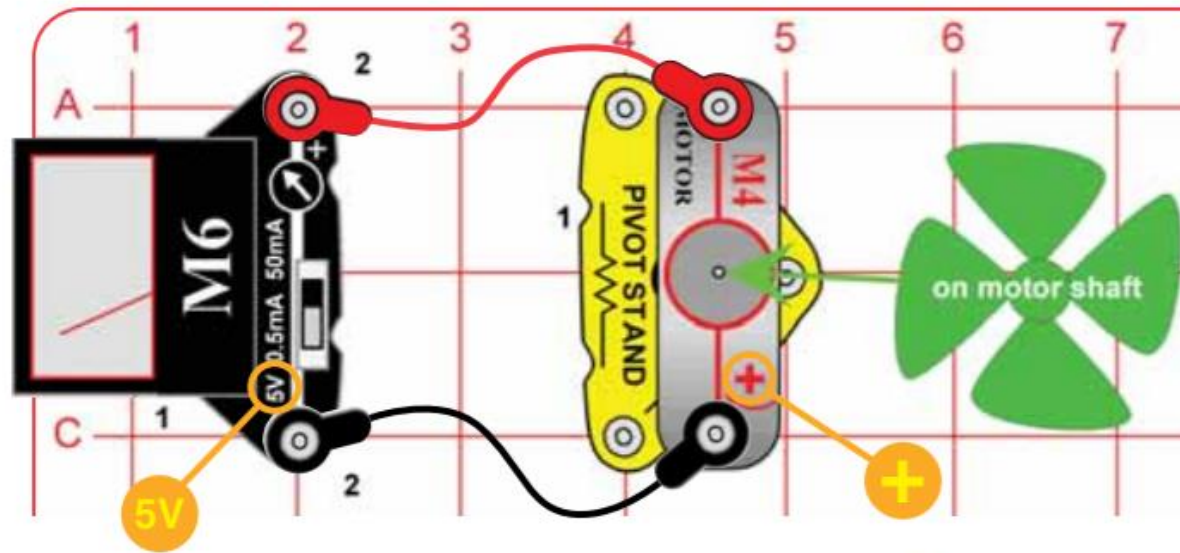
### Procedures:

1. Follow the diagram in the instruction manual or the included image to set up your circuit pieces. Make sure you snap all pieces to the base grid. We will use a fan to represent our wind mill.
2. Set the Meter (M6) piece to 5V
3. Try turning the fan by blowing on it or flicking it with your finger. If necessary, you can adjust the fan's position using the pivot stand.
4. Observe the Meter (M6). What happens? How does the meter change when the fan spins? What if the fan spins the opposite direction?



# Wind Energy

## Project #8



Source: <https://www.elenco.com>