

Solar Educational Kit

The Solar Educational kit from USL is designed to make the students build their own Solar system models and study the principle and characteristics of a Solar PV System



- ◆ Now the students can do experiments with solar energy – the energy source of the future
- ◆ This solar educational kit is designed to let students build their own solar system models.
- ◆ The Solar photovoltaic modules, when placed in direct sunlight, provide the electrical energy for countless practical applications.
- ◆ You can discover the magic of solar energy by experimenting with motion, light and sound.
- ◆ Solar energy applications are limited only by your imagination!

The Solar Educational Kit is an excellent way to teach children about solar energy. The solar educational kit is an easy to use teaching aid suitable for younger children just starting to learn about solar energy.

Let them experiment with solar energy. This kit comes complete with 6 pieces and detailed, step-by-step, illustrated instruction booklet. The instructions and materials will help you to do the following.

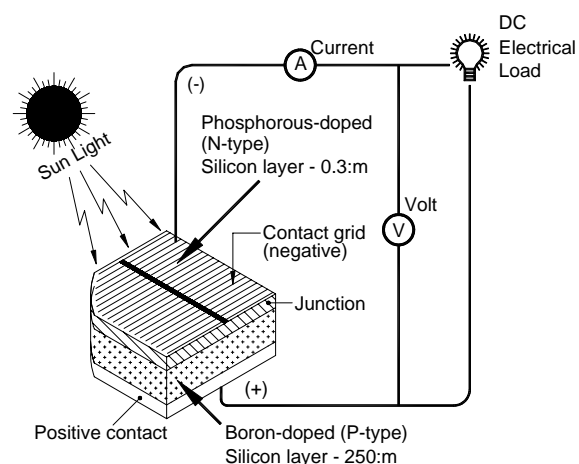
The following appliances are also supplied along with the Solar Educational Kit

- Radio
- Calculator
- Music Bell
- Torch Lamp
- Alarm clock
- Fan
- LED

- Learn how solar panel works
- Make a solar circuit
- Measure Voltage and Current of a Solar panel
- Plot the IV curve of the solar panel.
- Make an electrical circuit
- Learn how to connect different appliances to Solar systems
- Use Solar power to produce the energy for
 - Radio
 - Calculator
 - Music Bell
 - Torch Lamp
 - Alarm clock
 - Fan
 - LED

Principle of Solar Cell Working

The solar cell consists of layers of semi-conductor material with different electronic properties. Silicon is doped with a small quantity of other semi-conducting material to give it a positive or p-type character. A thin layer on the front of the cell is doped with phosphorous to give negative or n-type character. When sunlight falls on the solar cell, light knocks electrons from silicon atoms. The freed electrons have extra energy. Internal electric field pushes electrons to front of the cell. Electric current flows on to other cells or to the load.

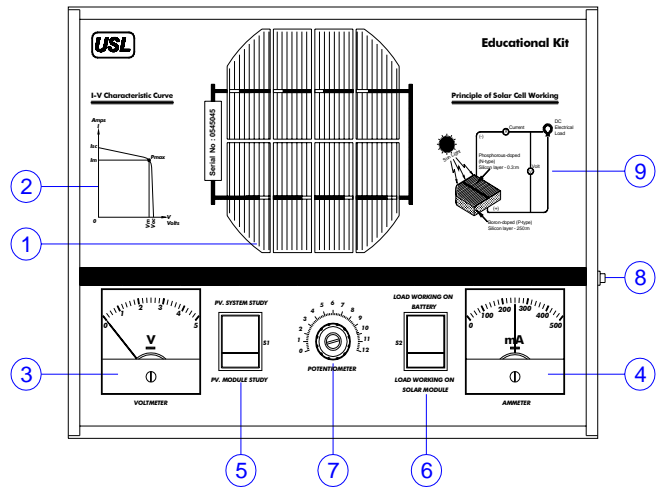


Students and Teachers Project tip

You can use this kit to demonstrate how photovoltaic (solar electricity) works. With this complete kit, you can show how solar cells can be used to produce energy in order to power different devices – a light, chime, torch and even a small radio.

The solar educational kit comes complete with:
Solar cell module with

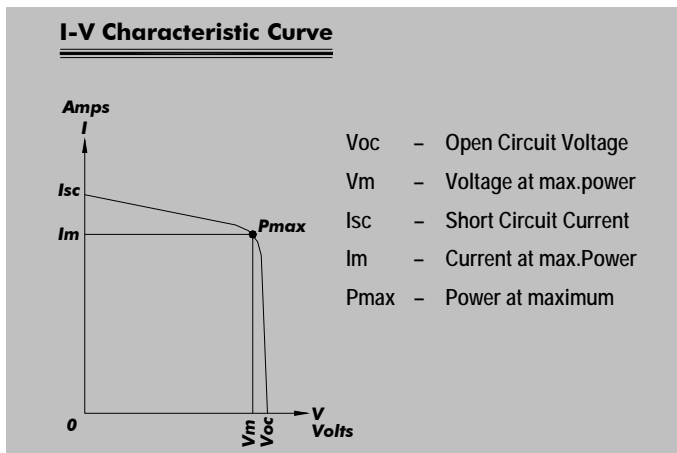
- ◆ A Potentiometer to load the Solar Module
- ◆ A Voltmeter to monitor the Solar Module voltage
- ◆ An Ammeter to monitor the Solar Module Current
- ◆ Provision for connecting different appliances
- ◆ Battery storage



4. MODULE CHARACTERISTIC STUDY

- a. Face the solar module towards the "SUN"
- b. Keep the switch S1 in "PV module study" position
- c. Vary the potentiometer slowly from extreme left position
- d. Observe and record the readings of voltmeter and ammeter at each step position of potentiometer
- e. Plot the graph of I (in Amps) against V (in Volts) using a graph sheet.

1. Solar Cell
2. I-V Curve
3. Voltmeter
4. Ammeter
5. PV System / PV Module Study Switch
6. Load Switch
7. Potentiometer
8. Load socket
9. Principle of Solar Cell working



1. SOLAR PHOTOVOLTAIC SYSTEM STUDY

- a. Keep the potentiometer knob in "O" position
- b. Keep the switch S1 in "PV system study" position
- c. Observe and record the readings of Voltmeter and Ammeter
- d. This shows the battery is getting charged by solar module.

2. DEMONSTRATION OF LOAD EQUIPMENTS ON SOLAR

- a. Keep the potentiometer in "O" position
- b. Keep the switch S1 in "PV module study" position
- c. Keep the switch S2 in "Load working on "Solar Module"
- d. Connect "LOAD" of 3V nominal rating with current consumption less than 0.2 Amps
- e. Switch "ON" the load. Now the load directly works on solar

3. DEMONSTRATION OF LOAD EQUIPMENTS ON BATTERY

- a. Keep the switch S1 in "PV System Study" position
- b. Keep the switch S2 in "Load working on Battery"
- c. Connect load of 3V nominal rating with current consumption less than 0.2 Amps
- d. Switch "ON" the load. Now the load directly works on battery.

