



How Light Intensity Affects Solar Cell Output

Activity Summary

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DESCRIPTION: Students will expose solar cells to a light source from different distances and measure the output with a multimeter. They will compare and contrast the outputs that the different distances produce.

GRADE LEVEL(S): 6, 7, 8

SUBJECT AREA(S): Science, energy, renewable resources, inquiry, electricity, solar power

ACTIVITY LENGTH: 40 minutes

LEARNING GOAL(S): After the completion of this lab, students will be able to describe how the light intensity affects solar cell output, have practiced using a multimeter, and have analyzed collected data.

STANDARDS MET:

Oregon:

- 6.2P.2 Describe the relationships between: electricity and magnetism, static and current electricity, series and parallel electrical circuits.
- 7.2E.1 Describe and evaluate the environmental and societal effects of obtaining, using, and managing waste of renewable and non-renewable resources.

SCIENCE KIT MATERIALS LIST:

- Solar cell
- Multimeter
- Resistor (or small load)

OTHER MATERIALS LIST:

- 250-500 W camping or shop lights
- Meter stick/ruler
- “Measuring Solar Cell Output—Light Intensity” student handout

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Vocabulary:

- Solar cell
- Photovoltaic
- Voltage
- Power

Student Background:

- Students should have a basic understanding of electricity, including the concept of voltage
- Students should have a working understanding of how to use a multimeter

Educator Background:

- It is helpful if teachers have a basic understanding of voltage, current and power.
- Recall the SI units for measuring voltage, current, power and resistance are as follows:
 - Voltage: Volts (V)
 - Current: Amps (A)
 - Power: Watts (W)
- The relationship between these quantities is the power formula:
 - Power = Current x Voltage [$P = IV$]

Lesson Details:

1. Pass out the “Measuring Solar Cell Output—Light Intensity” student handout and materials to each student group.
2. Have students work through the procedure included on the handout.
3. Wrap up with a class discussion about what students observed.

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