

# Energy, Power, and Photovoltaics

**Author:** Bruce Howard

**Subject:** Science

**Grade Level:** 5-9

## VITAL INFORMATION

<b>Site:</b>	CLC at Wheeling Jesuit University, Wheeling WV
<b>Mission Scenario:</b>	See individual lessons: "Photovoltaic Cells" & "Power Your Own Lunar Base"
<b>Time Required:</b>	See individual lessons: "Photovoltaic Cells" & "Power Your Own Lunar Base"
<b>Objective(s):</b>	See individual lessons: "Photovoltaic Cells" & "Power Your Own Lunar Base"
<b>Summary:</b>	These two lessons examine aspects of converting sunlight energy into electrical energy from an engineering design perspective.
<b>Application to Mission Preparation:</b>	See individual lessons: "Photovoltaic Cells" & "Power Your Own Lunar Base"

## TEACHING THE LESSON

- Learning Activities:**
1. [Photovoltaic Cells/ Angle of Light\\*](#)
  2. [Power Your Own Lunar Base\\*](#)

<b>Subject Matter Overview:</b>	See individual lessons: "Photovoltaic Cells" & "Power Your Own Lunar Base"
<b>Materials:</b>	See individual lessons: "Photovoltaic Cells" & "Power Your Own Lunar Base"
<b>Preparation:</b>	See individual lessons: "Photovoltaic Cells" & "Power Your Own Lunar Base"

**Lesson Management:** See individual lessons: "Photovoltaic Cells" & "Power Your Own Lunar Base"

**Teaching Tips:** See individual lessons: "Photovoltaic Cells" & "Power Your Own Lunar Base"

**Student Instructions:** See individual lessons: "Photovoltaic Cells" & "Power Your Own Lunar Base"

**Student Worksheets:** See individual lessons: "Photovoltaic Cells" & "Power Your Own Lunar Base"

## **ASSESSMENT & EXTENSIONS**

### **Standards compiled from learning activities:**

#### **USA- National Science Education Standards**

- **Chapter Chapter 6:** Science Content Standards
- **Grade Level :** 5-8
- **Content Standard B:** Physical Science: As a result of their activities in grades 5-8, all students should develop an understanding of
  - **Ability/ Concept :** Transfer of energy
    - **Detail :** Energy is a property of many substances and is associated with heat, light, electricity, mechanical motion, sound, nuclei, and the nature of a chemical. Energy is transferred in many ways.
    - **Detail :** Light interacts with matter by transmission (including refraction), absorption, or scattering (including reflection). To see an object, light from that object--emitted by or scattered from it--must enter the eye.
    - **Detail :** Electrical circuits provide a means of transferring electrical energy when heat, light, sound, and chemical changes are produced.
    - **Detail :** In most chemical and nuclear reactions, energy is transferred into or out of a system. Heat, light, mechanical motion, or electricity might all be involved in such transfers.
    - **Detail :** The sun is a major source of energy for changes on the earth's surface. The sun loses energy by emitting light. A tiny fraction of that light reaches the earth, transferring energy from the sun to the earth. The sun's energy arrives as light with a

range of wavelengths, consisting of visible light, infrared, and ultraviolet radiation

**Assessment/Rubrics:** See individual lessons: "Photovoltaic Cells" & "Power Your Own Lunar Base"

**Extension Activities:** See individual lessons: "Photovoltaic Cells" & "Power Your Own Lunar Base"