

Electricity Generated by Sunlight

Adapted by Duc Tran, Environmental Science Institute: 11/2010

Source: "Producing Electricity with Sunlight" by *Hands-On Science Activities*, TeacherVision.

<http://www.teachervision.fen.com/electricity/lesson-plan/5795.html>

Grade Levels: 5 – 6; maybe be adjusted for other grades

Objectives

Students will observe, infer, classify, communicate, compare and contrast, formulate hypotheses and research.

Sample TEKS

§112.16. Science, Grade 5: 2C, 2D, 2F, 2G, 3A, 4A, 6A, 6B, 6C

§112.18. Science, Grade 6: 2C, 2D, 2E, 3A, 3B, 3C, 4A, 7A, 7B

Materials (per group of 2-3 students)

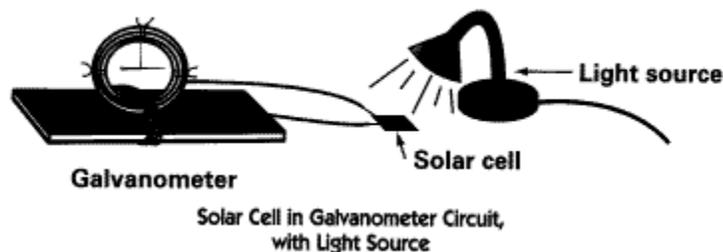
- 5 solar cells
- Galvanometer
- Lamp (light source)
- Connecting wires

Background

In recent years, scientists have been trying to find new sources of electricity to replace the rapidly diminishing fossil fuel resources such as coal and petroleum. One of the more promising sources is solar energy, energy from the sun.

Activity

1. Divide the class into groups of 2 or 3 students. Provide each group with solar cells, a galvanometer, lamp and connecting wires.
2. Students connect the solar cell to the galvanometer and then shine a bright light onto the solar cell. Refer to the image below.



3. Students observe the solar cell and record their observations. When light strikes the cell, a very small amount of electrical energy is produced, which can be detected by the movement of the needle on the galvanometer.
4. After testing and recording electrical energy output for 1 solar cell, repeat the experiment with 2 solar cells, 3 solar cells, 4 solar cells and then 5 solar cells.

Data Collection

1. Students record readings from the galvanometer and take observations in their science notebooks, documenting electrical energy in units of AMP.
2. Students produce a line graph based on the data. The “Number of Solar Cells” will be plotted on the x-axis and “Electrical Energy” (in AMP) will be plotted on the y-axis.

Class Discussion

1. Solar energy is becoming increasingly important and common in our lives. What are some devices we use that run on solar energy? [Calculators, cameras, and many others also require small amounts of electricity to function.]
2. What are some merits and limitations for using solar cells as primary producers of electrical energy? [Merits: can replace fossil fuel; healthy for environment, etc.][Limitations: work during daylight hours; inhibited by cloudy days; huge areas of solar cells required to produce significant amounts of electrical energy, etc.]
3. Satellites use electricity produced by solar energy to recharge batteries. What are some merits and limitations to this? [Example: A major obstacle to widespread use of solar power is the limited amount of electric current each cell can produce. Huge areas of solar cells are required to produce significant amounts of electrical energy.]