

HARNESSING THE SUN'S ENERGY

GRADE LEVEL

6th-8th grade

OBJECTIVE

Students will investigate a solar panel's ability to produce volts and amps by collecting data with series vs. parallel circuits and angles of light collection.

PURPOSE OF ACTIVITY

Read or Listen
Identify Details
Apply Skills

21st CENTURY SKILLS

Critical Thinking
Collaboration

COGNITIVE LEVEL

Strategic Thinking
Extended Thinking
Skills and Concepts

CLASS TIME

50 minutes

MATERIALS

- Protractor
- 2-3 small [solar panels](#)
- Two [alligator clips](#)
- [Voltmeter](#)
- 1.5 volt [motor](#)
- Student Sheet

PROCEDURE

1. Show pictures of solar panels. Find ones that the students may be familiar with in your area. This [link](https://www.youtube.com/watch?v=bF3OyQ3HwfU) (<https://www.youtube.com/watch?v=bF3OyQ3HwfU>) has more pictures.
2. Ask the students to write down three observations and then ask three questions. Have them ask most of their questions without providing answers.
3. The students then answer the questions on the Student Sheet.
4. Demonstrate the use of the [voltmeter](#) (<https://www.youtube.com/watch?v=bF3OyQ3HwfU>). Use 20 mv for most solar panels.
5. Students should experiment with three different ways to increase the electric output from the solar panels. One test should establish the best angle for the solar panel, and the other two should be some combination of the panels.

CRITICAL THINKING QUESTIONS

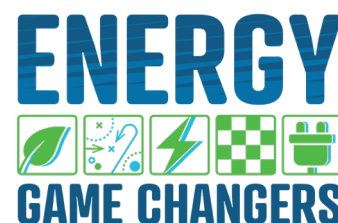
What are some constraints to using solar energy?

Cost of solar panels, amount of electricity the panels can produce, number of days of adequate sunlight.

Why is solar energy attractive?

The energy source is free, solar energy produces little or no emissions, current energy sources do produce emissions, solar energy costs less than other sources.

Adapted from: <https://energy.utah.gov/energy-education/curriculum/>



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energygamechangers.myenergykit.org

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Look at the solar panel pictures. What are three observations?

1.

2.

3.

Now ask three questions about what you see. Is there something you want to understand better?

1.

2.

3.

Where do you think the energy comes from? In your own words explain the process.

How can you get the most energy from the solar panels you have? List three variables you could test.

1.

2.

3.

You are going to use a voltmeter to measure the volts that are put out by the solar panels. Choose one of your variables and test it. Do the same with two other variables. You will need to make multiple readings for each of your variables.

VARIABLE TESTED	VOLTS

Summarize your experiments by writing a hypothesis about how you can increase the electrical strength of solar panels.

Claim:

Evidence:

Reasoning: