



OVERVIEW

Let's explore the solar lights that we use in our gardens! We will analyze and document as much as we can about the solar light before, during, and after taking it apart.

GRADES: 4-12

MATERIALS: Solar walkway lights, screwdriver set, multimeter, pen and paper to write down thoughts and observations.



DO

1. Examine your solar light. Document in detail it's physical attributes or the things that you can see, such as color, size, shape, weight, and texture.
 - Play with the solar light. How does it work?
 - Write down your observations and ideas.
 - Draw a systems-level diagram or a visual model of the light's components, and their interactions. Sketch and describe how you think the solar light works.
2. Carefully take the solar light apart. Draw and write down your observations.
 - Use your senses to understand what is going on inside the solar light.
 - Write down any questions that you may have.
3. Do some research. Look at some of the components. Do they have part numbers?
 - Using a search engine (like Google), look up the part number.
 - Write down the resource and what you found about the part.
4. Let's do some design research. Looking back on what you've experienced from the previous step, examine the design choices (number of screws, wiring, materials, etc.) of the solar light.
 - Write down some speculations on why the design choice was made.



REFLECT AND APPLY

1. Looking back on what you've done, can you explain through writing and drawing how the solar light works based on the information gathered? Has your perception changed from your observation in step 3? How?
2. Through research from step 3, were you able to answer some of your questions? Write down and discuss.
3. Based on current events, can you find a connection between the solar industry and things that are happening in your community?

4. Create: What kind of projects can you make using solar lights? Maybe a solar-powered jack o' lantern? How would that work? Write down your ideas.

MAKER CHALLENGE

Invent a way to use solar lights to make your life or community better. There are two ways to share your ideas.

- Sketch a model of your idea on paper and write a short description.
- Sketch a model of your idea on paper and then work with an adult to build a mockup of it. A mockup is a full-scale, 3D model.

Once completed, with an adult's permission, email a photo of your work to inventstem@iastate.edu. We would love to see your idea!

CAREER CONNECTIONS

"The solar power industry employs a wide range of occupations in several major industry segments: research and development, manufacturing of solar power materials, construction and operation of solar power plants, and solar power installation and maintenance. Sales occupations are also integral to the solar power products industry."

To learn more about specific careers, go to https://www.bls.gov/green/solar_power/

LEARNING EXTENSIONS

Want to learn more about solar energy? Check out the following links:

- <https://www.sciencefriday.com/educational-resources/hack-a-solar-circuit/>
- <https://www.alliantenergy.com/OurEnergyVision/AdvancingCleanEnergy/SolarGeneration/SolarEnergyVideoSeries>
- <https://multiverse.ssl.berkeley.edu/Solar-Week>



We welcome your feedback! Please use this QR code or link to contact us. <https://form.jotform.com/isu4h/ResourceFeedback>

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Modeled after electrical engineering labs by EE 185 development and instructional teams, TAs and mentors, and students in the last decade. <https://www.ece.iastate.edu/>. This program is presented in partnership with Alliant Energy.

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