

Project 5

What's inside a Little Sun lamp?



Suggested age: 10 to 12

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Summary

This project explores solar energy creation through hands-on contact with a portable solar energy device; Little Sun.

Outcomes

- Through personal and group led investigations, students gain new knowledge about how solar technology works.
- Students will engage observational, questioning and problem solving skills to explore this topic.

Suggested age range: 10 to 12 years

Subjects Covered: Science, Technology, Environment

Materials: Little Sun lamps, 'What's Inside a Little Sun' poster print, Tx9 screwdriver

Time required: Preparation: 5 minutes

Teaching: 40 minutes

Preparation:

- Read through the program once
- Prepare materials

Introduction:

Solar energy is a renewable and clean energy that is now possible due to the invention of photovoltaic cells and relevant methods for storing and distributing that energy. This project explores personal solar energy systems through hands on investigation of what's inside a Little Sun lamp.

FEEL

Hand out the Little Suns to the students. Allow them time to look and investigate the object and to play with it for a moment.

Ask:

What is it that you are holding?

How do you think it works?

Students can either work alone, in small groups or watch as you take apart a Little Sun lamp.

ACT

Take apart your Little Sun and see what's inside by removing the 4 screws at the back and gently pulling apart the device.

Using the What's Inside a Little Sun print as a talking point, discuss and ask:

- *How can we use energy from the sun to generate electricity which in turn creates light?*
- *A: Sunlight is captured by the photovoltaic cells which convert the sun's energy into electricity.*
- *Batteries are used to store the energy until it is needed. If it is cloudy or foggy there is less energy produced.*

A good metaphor when explaining the action of light through the various parts is to talk about it as a sunlight highway that moves through the various parts of the Little Sun.

KNOW

Humans have created different technologies which harness naturally occurring forces from the sun, the wind, water and the earth to create renewable energy.

Solar energy is a renewable energy source. Renewable energy sources will not run out, non-renewable energy sources, however, will run out and they contribute to global warming.

Solar Panel

The solar panel is made from a printed circuit board with solar cells mounted on top that is connected to a circuit. These elements are then glued together with a metal layer and baked in an oven.

Batteries

Contact springs connect the solar panel and the electronic components. They bring energy produced by the solar panel into the batteries. The batteries are connected to the PCB with other contact springs.

The batteries are used for storing the energy produced by the solar panel for later use.

When the batteries are full, the charging stops.

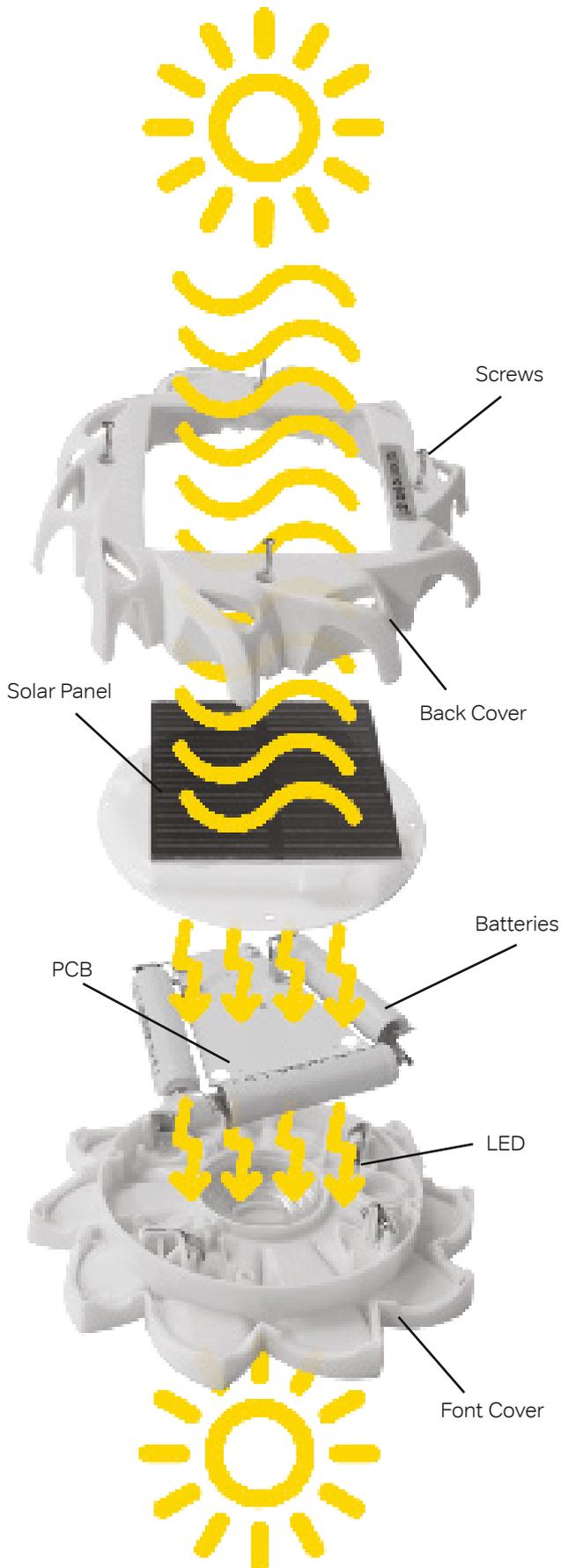
Case

Protects batteries / electronics from water, dust and other environmental damage.

PCB

Integrated circuits carry all the electronics that make the lamp work. They act as the middle men between the solar panel, LED and the batteries.

The PCB includes a tiny computer that makes the two light levels possible.



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