**LESSON 1**

SOLAR TECHNOLOGY AND ITS GLOBAL APPLICATION

GOALS

1. Educate students about where solar energy comes from and how it works
2. Provide a global perspective on solar technology application
3. Inspire students through stories to take action

MATERIALS

a. Printed stories and worksheet for each student and group

b. Projector for slide show/videos

c. Poster papers and markers

BENEFITS

a. Student engage in a discussion about solar energy, its source and its application in both developed and developing communities

b. Students learn about renewable energy and how it is being used to address the need of light especially in the marginalized communities

c. Provide students with changes they can implement at home to help save energy

ADVANCE PREPARATION

Review the presentation and lesson materials ahead of time.

HANDOUT REFERENCE LIST

1. Solar Stories
2. Presentation: Solar Energy Explained

PROCEDURE

Duration: 60 minutes

Targeted Students: 9-12 Grade

 **Lesson Agenda:**

1. Introduction (5 minutes)
2. Presentation: Solar Energy Explained (10 minutes)
3. Activity: Solar technology around the world stories (20 minutes)
4. Class discussion and Presentations: Solar lighting in developing regions (15 minutes)
5. Review Questions (5 minutes)
6. Student Questions (5 minutes)

**1. Introduction:**

 If you are a guest speaker please introduce yourself, `One Million Lights’ and

 `One Million Students’ Program.

**2. Presentation: Use the presentation `Solar Energy Explained’**

1. Begin a discussion about where solar energy comes from, how it is created and its impact on the planet.
2. Ask student’s questions to access their knowledge about solar energy and technology and as you move along share additional details to help supplement their knowledge.
3. Once you get to solar panels, discuss the applications around them, for example
	* Solar calculators
	* Solar powered emergency call-boxes on the freeway
	* Solar panels on a home
	* Anything else?

d. Why should we use Solar?

 Answers:

* + The sun will not run out, it is renewable and will last a long time
	+ Sun is eco-friendly and does not harm the earth
	+ There are no carbon emissions that are leading to global warming
	+ Sun is easily available and accessible
	+ Sun is clean and healthy, it does not harm human beings with toxic fumes

**3. Activity: Solar Technology around the World Stories**

(option: in lab groups, give each group one or two stories)

The purpose of the activity is to transition students from how solar technology works to its global application. Divide the classroom into 4 stations. Dim the classroom lights and keep a solar lantern at each station. Each station will have a story about solar technology and how it is being applied around the world. Each group will have 5 minutes to read the story and have a discussion about the story at the station. Once done they need to move on to the other station and repeat the activity.

**4. Regroup: Presentation**

Have each group share with the class what they learned from their solar stories. There are 10 stories and each one has a different use. This will link to the next activity.

**5. Solar lighting in the developing regions**

You can select a student volunteer to come up and write on the board the list of impacts solar lighting is having on the developing communities. Lead a class discussion:

Instructions for the students:

* 1. Think about living in a rural community that is completely un-electrified. No computers, no switches, no outlets, no televisions, no lights, no microwaves. The only light you have after the sun goes down is a kerosene lantern.
	2. Class Question: What benefits do you think a solar light would have in that community?
	3. Example: Provide the example of how students are dependent on kerosene lanterns to study in the evening. There are a number of problems associated with kerosene like strain on the eye, smoke inhalation and the danger of fire if it is knocked over. A solar light provides clean and better illumination for additional hours of study.
	4. Additional benefits include:

 - Education: additional study hours for students

 - Health:

 - Decrease smoke inhalation, respiratory illness

 - Allows for improved service at primary health clinics

 - Midwives use solar lights to deliver babies

 - Safety: transportation at night

 - Bio-Conservation: deter wild animals from approaching

 crops/fields

 - Livelihood: communities that produce handicrafts are able to produce more goods and generate a higher income

 - Savings

**6. Review Questions**:

* 1. Where does solar energy come from?

 Answer: Sun, Electrons

* 1. How is solar technology being used around the world?

 Answers: Space, farms, to light and to power homes

 3. What are the benefits of solar lighting?

 Answers:

 a. Education: additional study hours for students

 b. Health:

 - Decrease smoke inhalation, respiratory illness

 - Allows for improved service at primary health clinics

 - Midwives use solar lights to deliver babies

 c. Safety: transportation at night

 d. Bio-Conservation: deter wild animals from approaching

 crops/fields

 e. Livelihood: communities that produce handicrafts are able to produce more goods and generate a higher income

 f. Savings

**6. Student Questions:**

Time allocated for students to ask questions regarding the lesson.