



## Unit: Cooking with the Sun and Solar Ovens

### Lesson #4: Saving Lives with Solar Ovens

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**DESCRIPTION:** Students will be introduced to Solar Cookers International. Students will learn about different solar cooker designs and how they function. Students will learn the pros and cons on the use of solar ovens in developing countries. Students will gain an understanding of the kind of lives people lead in a refugee camp in Africa. They will gain an appreciation for the hardships people in other parts of the world face for survival. They will gain an understanding of the various reasons people leave their homes to move to a refugee camp. They will learn the customs, jobs, food and clothing of people in different countries of Africa. Students may develop empathy and compassion for people in the world who are less fortunate than they are and gain a greater appreciation for the opportunities they have in their own lives.

**GRADE LEVEL(S):** 3-12

**SUBJECT AREA(S):** Life in a refugee camp in Africa, solar ovens and solar water purification.

**ACTIVITY LENGTH:** 45 minutes or the video could be shown in two parts.

**LEARNING GOAL(S):** Students will learn about different solar cooker designs and how they function. Students will learn the customs, jobs, food and clothing of people in different countries of Africa.

#### **STANDARDS MET:**

##### **Common Core:**

- RI.3.1. Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers
- RI.3.3. Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect
- W.3.2. Write informative and explanatory texts to examine a topic or convey an idea and information clearly.
- W.3.7 Conduct short research projects that build knowledge about a topic
- SL.3.4 Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.

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- RI.4.1 Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.
- RI.4.3. Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.
- W.4.2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
- W.4.7. Conduct short research projects that build knowledge through investigation of different aspects of a topic.
- W.4.8. Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.
- SL.4.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on other's ideas and expressing their own clearly.
- RI.5.1. Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.
- W.5.7. Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic.
- W.5.8. Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources.
- SL.5.5. Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes

#### **Next Generation Science Standards:**

- 3-ESS2-2. Obtain and combine information to describe climates in different regions of the world.
- 3-ESS2-1. Make a claim about the merit of a design solution that reduces the impact of a weather-related hazard.
- 4-PS3-2. Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.
- 4-PS3-4. Apply scientific ideas to design, test, and refine a device that converts energy from one form to another
- 4-ESS3-1. Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.
- 3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time or cost.
- 3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
- 3-5-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved

#### **Vocabulary:**

- Refugee camp

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- Africa
- Solar ovens
- Water purification

### Other Materials List:

- <http://youtu.be/D619r8FiRDs> "A More Durable Solution for Desert Refugee Camps"
  - Book: *Living in a Refugee Camp/ Carbino's Story* – By David Dalton
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### Lesson Details:

#### Procedures:

1. Play the video to give the students a background introduction to solar ovens and solar cooking. This video also portrays people living in refugee camps in Africa.

Have a class discussion on the video. Possible discussion points:

- Imagine what it would be like to have to leave your home and start walking to another country tomorrow.
  - In what ways would your life change if you did not go to school?
  - (*Prepare a container with 2 liters of water in advance.*) If you were in a desert and had this much water for your family each day, what would you use it for?
  - Have you ever gathered up wood? Imagine what it would be like to walk 10 miles into dangerous areas for wood and carry it home. How would you accomplish it?
2. Spend a week or so reading, discussing and researching the book [Living in a Refugee Camp: Carbino's Story](#). This book gives the life story of Carbino who grew up in Sudan and became one of the Lost Boys of Sudan who walked 1000 miles to Ethiopia in 1987. Ask students to bring in information from books, news articles and the internet that relate to the Lost Boys of Sudan as well as more current information about refugee camps around the world today.

#### Ideas for Closure Activities

- Students write a reflection, a poem or draw or paint a picture in response to what they have learned about people living in refugee camps around the world.
- Students research the history of one particular refugee camp and how it came to be.
- Locate current refugee camps on a world map.
- Students design an idea for a new plastic cover as explained in the video and submit their design to Solar Cookers International.
- Students plan a way to raise funds to send a donation to Solar Cookers International or another nonprofit volunteer group working in developing countries.
- Students research people who volunteer for Solar Cookers International or other volunteers they admire and write thank you letters to them.

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