

NFTI Text Set Cover Sheet

District:	Teaching & Learning Collaborative; Ohio Resource Center
Team Members:	Renee Snyder, Kelli Shrewsberry, Anita Gonzalez, Terry Shiverdecker, Tracy Cindric

Grade Level and Standard:	<p>Grade 3: Earth Science</p> <p>Earth’ s resources can be used for energy</p> <ul style="list-style-type: none"> • Many of Earth’ s resources can be used for the energy they contain. Renewable energy is an energy resource, such as wind, water, or solar energy that is replenished within a short amount of time by natural processes. Nonrenewable energy is an energy resource, such as coal or oil that is a finite energy source that cannot be replenished in a short amount of time.
Question:	How is Solar Energy affected by daily weather changes?

Overview: A brief description of text set.

In this text set, the students are engaged with texts as they are used as a springboard for inquiry based learning opportunities. Students will generate questions, investigate these ideas by building solar homes using different materials, and determine how weather effects solar energy. Students will conclude the unit with an argumentative piece and text evidence to showcase their thoughts and understandings about Solar Energy.

Resource Types (Check all the are used in this text set)

<p>X Nonfiction Text</p> <p>X Article</p> <ul style="list-style-type: none"> <input type="radio"/> Podcast <input type="radio"/> Photograph <input type="radio"/> Essay 	<ul style="list-style-type: none"> <input type="radio"/> Infographics <p>X Artifact</p> <p>X Narrative Expository</p> <p>X Video</p> <p>X Diagram/Map/Drawing</p>	<ul style="list-style-type: none"> <input type="radio"/> Poetry <input type="radio"/> Music <input type="radio"/> Graphic Text <input type="radio"/> Other
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

NFTI Text Set Learning Cycle

Phase: *please select the appropriate phase*

Engage	Explore	Explain	Expand
X			

Activity Overview:

Show students a solar bulb. This may be a glass bulb used in a garden or outside patio. When showing students the bulb, do not tell them what it is. Ask students to look at the bulb and think about what questions they may have. After a few minutes, allow students to share out ideas. Record these ideas, as they may lead to further investigations and/or uncover misconceptions students may have. Guiding Questions during activity may be:

- What connections do you know about_____?
- What else do you know about_____, that may help you think about_____?
- How can these be useful in our daily lives/environment?
- How often does this change? What causes the change? What may effect the change?

Resources and Annotations:

Artifact: Solar Bulbs

Assessment:

Formative Assessment: Observe and listen to student' s ideas and responses to questions asked. Record ideas or connections; consider student thinking and understanding regarding misconceptions aligned with content. You can use an anecdotal document to record student thinking for future instructional learning.

Phase: *please select the appropriate phase*

Engage	Explore	Explain	Expand
	X		

Activity Overview:

Begin the phase by reading “The Solar Home” page 20–29. As you read the book, ask students:

- How are these homes alike or different than yours?
- How does the sun affect these homes? How do the materials that these homes are made of affect the temperature inside the homes?

Students will investigate a solar environment home, to clarify what happens when the sunlight reaches certain types of materials. They may use a variety of materials, heat lamps or sunlight, and thermometers to document the temperature change.

Resources and Annotations:

Title **Author** **Publication**
↓ ↓ ↓

Book:

- *A True Book; Solar Power* by Christine Petersen (Danbury, Connecticut: Children’s Press, A Division of Scholastic, 2004), ISBN: 978051622807

Annotation →

The book is about different forms of solar energy. For the purpose of this phase, pages 20–29 discuss how homes are use solar panels, glass, specific colors, and other materials for different purposes. The book provides insight as to why homes are using these panels and the different purposes they have. In this portion of the book, the author describes how the seasons and sun’s position impacts a solar home.

Assessment:

Formative Assessment: After students complete their models, have them respond to the following prompt. “What materials did you choose? Why did you choose these materials to build you solar home? The student responses to these questions can be used to authentically guide instruction and provide insight into misconceptions students may have. This is not intended to evaluate, it is intended for the teacher to gain insight into student understanding.



Phase: *please select the appropriate phase*

Engage	Explore	Explain	Expand
		X	

Activity Overview:

Using the book *Energy Island*, read only the portion of the book that discusses renewable energy. After reading the book, students can generate ideas or wonderings about renewable resources in the environment and how they may be utilized. Students can then apply what they have learned about solar energy and explain why this is a renewable resource and not a nonrenewable resource. Students will then discuss their ideas with partners, whole group, or in journals.

Resources and Annotations:

Book:

- *Energy Island; How One Community Harnessed the Wind and Changed Their World* by Allan Drummond (Farrar Straus Giroux, New York: Frances Foster Books, 2011), ISBN: 9780374321840.

This narrative expository is about a community that embraced the wind and created energy on their island. The books discusses renewable and nonrenewable resources and discovered electricity from wind.

Assessment:

Formative Assessment: Students will apply what they have learned from building their solar homes and linking it to how this is a renewable resource, by explaining “Are the solar homes you created a renewable or nonrenewable resource? How do you know?” This information can be shared whole group, with partners, or in a journal.

Phase: *please select the appropriate phase*

Engage	Explore 2	Explain	Expand
	X		

Activity Overview:

The video clip connects heat from sunlight to the temperature in a city. The narrator of the video discusses weather changes and their affects on solar energy. Prior to watching the video, pose the following question to students and discuss. “*How is solar energy affected by daily weather changes?*” After watching the video, discuss the same question with students, to determine new learning and/or connections they gained from the video. Record additional questions they may have. The students can then create a simulation to test water temperatures with solar energy. They can place their simulation in direct sunlight (or use a heat lamp) and in the shade to represent cloudy days.

Resources and Annotations:

Video: *Depending on your student needs, these video clips maybe used to help facilitate their conversations and/or questions. You can choose between the videos to best support their learning and bridge connections.*

- http://youtu.be/z_g0P5Dvp1l
This video is about a company in Georgia that uses solar panels and collects data on climate and weather patterns to determine solar panel efficiency. The video also discusses the importance of a backup plan for power.
- <http://youtu.be/lC54Gje7s2U>
This video clip is a news broadcast that discusses the challenges with temperature and solar panels.

Assessment:

Formative Assessment: The discussion around the question posed prior to learning, can be used as a pre-assessment to see how students are connecting their understanding of weather to what they are learning about solar energy and renewable resources. Additionally the questions students have after watching the video, may provide insight into misconceptions or learning gaps students may have, which need additional learning and support.

Phase: *please select the appropriate phase*

Engage	Explore	Explain 2	Expand
		X	

Activity Overview:

Using the map on page 22 of the book, “*How do Solar Panels work?*” students will make observations from the map and generate questions regarding the type of renewable resources in different parts of America. The objective is for students to begin to think about how weather affects renewable energy (solar energy). Guiding questions should be used to support students to think about weather affects on renewable energy. After the discussion, students will watch a short digital video. Students will then compare the information from the text, digital video, and learning (resources and opportunities) to determine what information is being learned and how it is related. Students will compose a news article or broadcast to showcase the relationship between weather changes and renewable energy and the connections they have.

Resources and Annotations:

Book:

- *How Do Solar Panels Work?* by Richard Hantula (New York, New York: Chelsea Clubhouse, 2000) ISBN: 978-1-60413472-8

This book is all about solar panels. The book describes how they are built and used to create energy. The book provides future outlook on solar energy and environmental ideas to consider.

Video:

Solar Thermal Energy: Harnessing the Power of the Sun

- <http://www.neok12.com/video/Solar-Energy/zX4501794c04647766705041.htm>

The video clip describes the world’s largest solar energy plant. The video describes how a small town is provided hot water and heating needs through a solar heating plant. The video explains how the sun provides these resources for the community. Additionally, the video shares during the certain months the town received 100 percent of the energy. This information can be used to draw conclusions related to weather changes and its affects on solar energy.

Assessment:

Formative Assessment:

- During the discussion of the map the guiding questions will provide insight into student understanding and connections made.

- When creating the news article or broadcast, students may pose questions or wonderings for their audience to think about. These questions can provide insight into connections in which students have difficulty understanding.

Summative Assessment: Students will produce a news article or broadcast to show the relationship between weather changes and renewable energy.

Phase: *please select the appropriate phase*

Engage	Explore	Explain	Expand
			X

Activity Overview:

Use the video (found in expand resources) to connect students learning to a real world application in California. After watching the video, students will be given the article *Pros and Cons of Solar Energy*. After reading the article, and using what they know about solar energy, students will create an opinion text based within evidence from research and the learning opportunities regarding their thoughts and feelings about Solar Energy. The students can determine how they want to prepare their opinion piece (book, essay, speech, etc.) This information can be used a summative assessment of understanding and the scientifically accurate information that is used to defend their opinion. After students have completed their opinion piece, provide them with an article (found in expand resources) on the Presidents promotion of clean energy. Students will have to decide, is there information that they want to add or change to their opinion piece, why or why not? Students may also determine, what additional questions they still have about renewable resources and/or solar energy.

Resources and Annotations:

Video:

- <http://video.nationalgeographic.com/video/solar-power>

This video discusses how there is more sunlight that falls in the United States in a day, than what is used in a year. The video discusses costs of solar power in California through a variety of aspects. The video concludes with a brief connection to weather and agricultural affects of solar energy.

Articles:

- <http://www.clean-energy-ideas.com/solar/solar-energy/pros-and-cons-of-solar-energy>

This is an online resource explicitly states and lists pros and cons of solar energy. The lists of pros and cons expand across multiple aspects from cost to pollution to sunlight.

- <http://www.scholastic.com/browse/article.jsp?id=3756003>

This article reflects the Presidents thoughts and ideas about clean energy and solar panels. In the article, the president discusses the importance of increasing energy generated from clean energy resources.

Assessment:

Formative Assessment: In students opinion piece, continue to have awareness of any misconceptions they may have.

Summative Assessment: Student' s information used to defend their opinion can be used as an assessment tool. When using their opinion, do not assess whether you agree with their thoughts, but instead are their thoughts validated with scientific accurate information and resources.