

The Day Joshua Jumped Too Much Educator Guide

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Think Scientifically

Concept Enhancement Lesson Plan

The Day Joshua Jumped Too Much

Objectives

1. Students will be able to explain that Earth's energy comes from the Sun.
2. Students will be able to explain that the Sun sustains life on Earth.
3. Students will be able to describe several ways that humans use the energy that comes from the Sun.

Reading Comprehension Objectives

1. Students will be able to answer questions about the story by referring to key details in the text.
2. Students will be able to summarize the story.

Vocabulary

Energy: The ability to do work.

Solar: Things relating to the Sun.

Radiation: Energy that travels as a wave.

Source: The place where something begins.

Estimated Shared Reading Time: 15 minutes.

National Science Education Standards

Content Standard C: As a result of their activities in grades K-4, all students should develop an understanding of organisms and their environment, 1: All animals depend on plants. Some animals eat plants for food. Other animals eat animals that eat the plants.

Content Standard D: As a result of their activities in grades K-4, all students should develop an understanding of objects in the sky: The Sun provides light and heat necessary to maintain the temperature of Earth.

Background Information

Energy is defined as the ability to do work on an object. Energy exists in many different forms on Earth including electrical energy, thermal energy (heat), light energy, and solar energy. All work done on Earth requires energy and the primary source of our energy is the Sun. Energy travels from the Sun to Earth by electromagnetic radiation, which is energy in the form of waves and particles. We

see the waves of visible light, but other waves are invisible to the human eye. Solar radiation passes through the atmosphere and heats the surface of Earth. Visible light interacts with plants that use it to photosynthesize water and carbon into sugar, producing chemical energy they can use to grow. Humans then use energy from plants in the form of food and fossil fuels like gas and coal.

The chain of energy transfer on Earth starts at the Sun. In the food chain, for example, producers (plants) utilize energy from sunlight to make their own food through the process of photosynthesis. Plants are then eaten by consumers (animals and people) and converted into various forms of energy that they need to survive. Energy can also be collected directly from the Sun using solar cells, which convert sunlight into electricity. Solar cells are commonly used to power items such as calculators, buildings, and even satellites! For more information on energy and its many forms, see the Resources section on page 39.

Materials: One per group.

- Shoe box
- Bean sprouts (store bought beans can be sprouted in damp paper towels)
- Small disposable cup
- Soil (enough to fill 2 inches in the bottom of each cup)
- Scissors
- Tagboard or card board for barriers
- Water
- Paper towels

Hands-On Activity: Searching for the Sun

In this activity, students will create a plant box and observe that a plant will grow toward the Sun, its primary source of energy. By periodically collecting data on the growth of the plant, students can come to their own conclusions about why the plant grew toward the sunlight. This activity can be done individually or in groups to reduce the quantity of materials needed.

Content:

Ask students what plants need in order to grow. Have them list this on a piece of paper or write it on the board for the class to see. Remind students that sunlight is essential for plant growth.

The Plant Box:

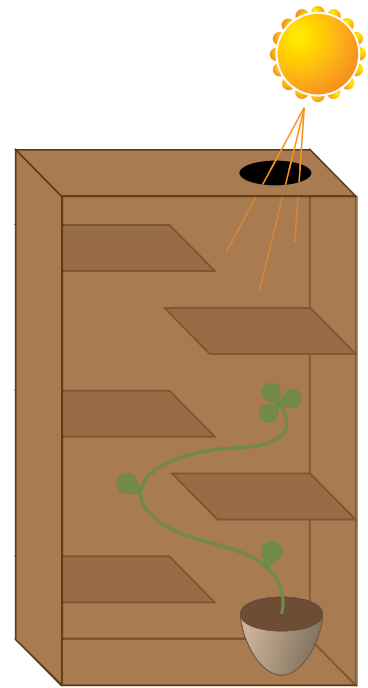
1. First, sprout a bean seed in a cup with a paper towel and water, then plant it in a small cup filled approximately 2 inches (5 cm) high with potting soil.
2. Stand a shoebox on its side so that it is as tall as it can be. Using cardboard, create a maze with tape and tagboard (or cardboard) in the shoebox, leaving space at the bottom for the cup with the sprout. To see an example maze, refer to the figure on page 39 or visit the Delaware State University Plants for Kids website (see Resources section on page 39 for link).
3. Cut a hole with a diameter of approximately 2 inches (5 cm) in the top of the shoebox.

4. Place the cup with the seedling that has already sprouted in the bottom of the shoebox. Place the lid back on the box.
5. Remove the lid to water the sprout as needed.
6. Place in a spot where the box will get sunlight, but not overheat.

Over time the sprout will begin to grow along the maze created in the box, toward the sunlight coming through the hole at the top.

Lab Activities:

1. Students can use the worksheet provided to regularly collect data on the plant growth in their box. This is a good opportunity to learn about observational data and quantitative data – recording what you can see versus what you can measure.
2. The size of the plant can be measured more accurately by following its curved growth around the maze with a string, and then measuring the length of the string.
3. Plant growth can be tracked on a bar graph. Seeing the trend of growth over time can lead to conclusions about the rate of plant growth to the amount of sunlight it gets.
4. Have students decorate the shoebox with images of the Sun and the things on Earth that depend on it, illustrations from the story, or vocabulary words.



Extension:

To extend this activity, students can try growing their sprouts under various conditions:

- One sprout can be kept in the dark while another is exposed to full sunlight.
- One sprout can be rotated daily in a planter while another is left in the same position each day.

Resources:

- California Energy Commission—The Energy Story: <http://energyquest.ca.gov/story/index.html>
- Delaware State University's Plants for Kids website—Shoe Box Maze Experiment: <http://herbarium.desu.edu/pfk/page11/page12/page13/page13.html>
- NASA Kids Science News Network—Why Do Plants Grow Upwards? (video): http://www.nasa.gov/mov/178685main_033_ksnn_3-5_plants_cap.mov
- Woodchurch High School Science Blog—Photosynthesis Animation: <http://woodchurchscience.edublogs.org/files/2008/03/photosynthesis-flash.swf>

Assessment

Science Comprehension Questions:

Knowledge

- What is Earth's primary source of energy?
- What would happen if there was no Sun?

Application

- Create a poster that shows how energy is transferred from the Sun to humans.
- Draw a picture that illustrates how the Sun's energy benefits Earth.

Evaluation

- How would you feel if the Sun disappeared? Why?
- What do you think is the most important way we use energy from the Sun? Why?

Reading Comprehension Questions:

Knowledge

- What is the setting of the story?
- Why did Mr. Smith tell Joshua to bundle up?

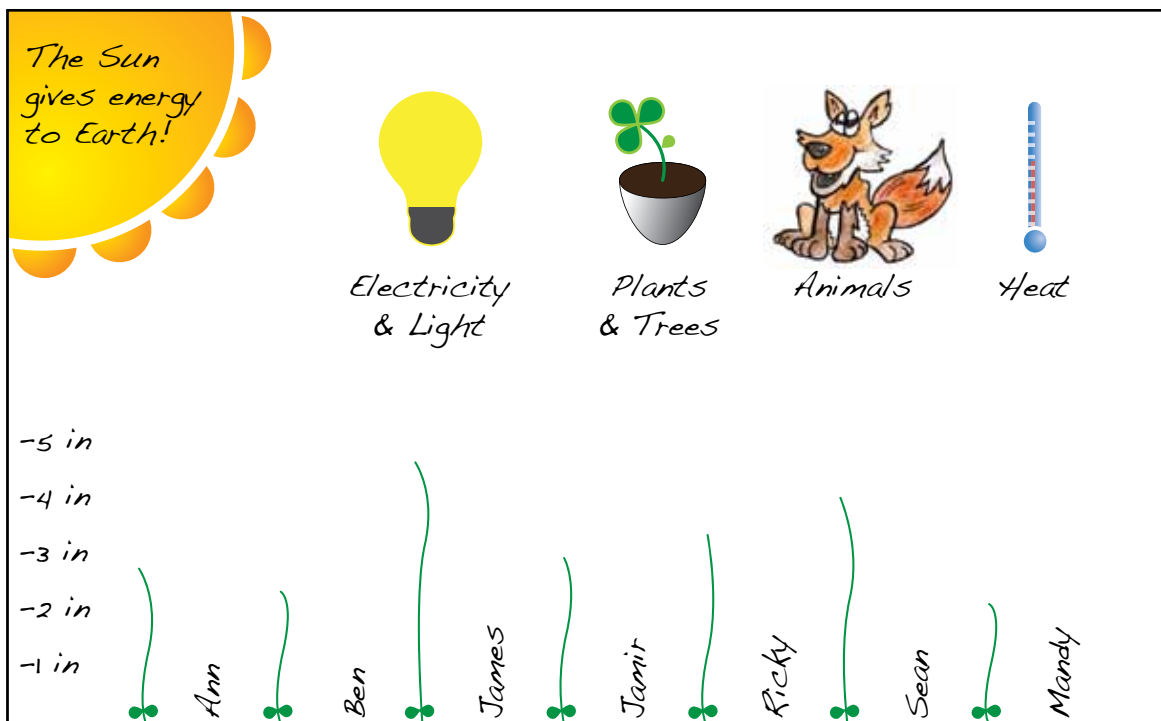
Application

- Pretend you are a reporter and present an oral broadcast of what happened in the story.
- Write a summary of the story.

Evaluation

- What would you have said to Joshua to get him to stop jumping?
- What questions would you have asked if you were Joshua?

Bulletin Board Idea



Searching for the Sun! Data Sheet

Name: _____

Date: _____

Observations and Measurements:

Day 1 Date:	What I see...	Plant Size:
Day 2 Date:	What I see...	Plant Size:
Day 3 Date:	What I see...	Plant Size:
Day 4 Date:	What I see...	Plant Size:
Day 5 Date:	What I see...	Plant Size:

Conclusion: Explain what is happening to your plant.

Searching for the Sun: Math Connection!

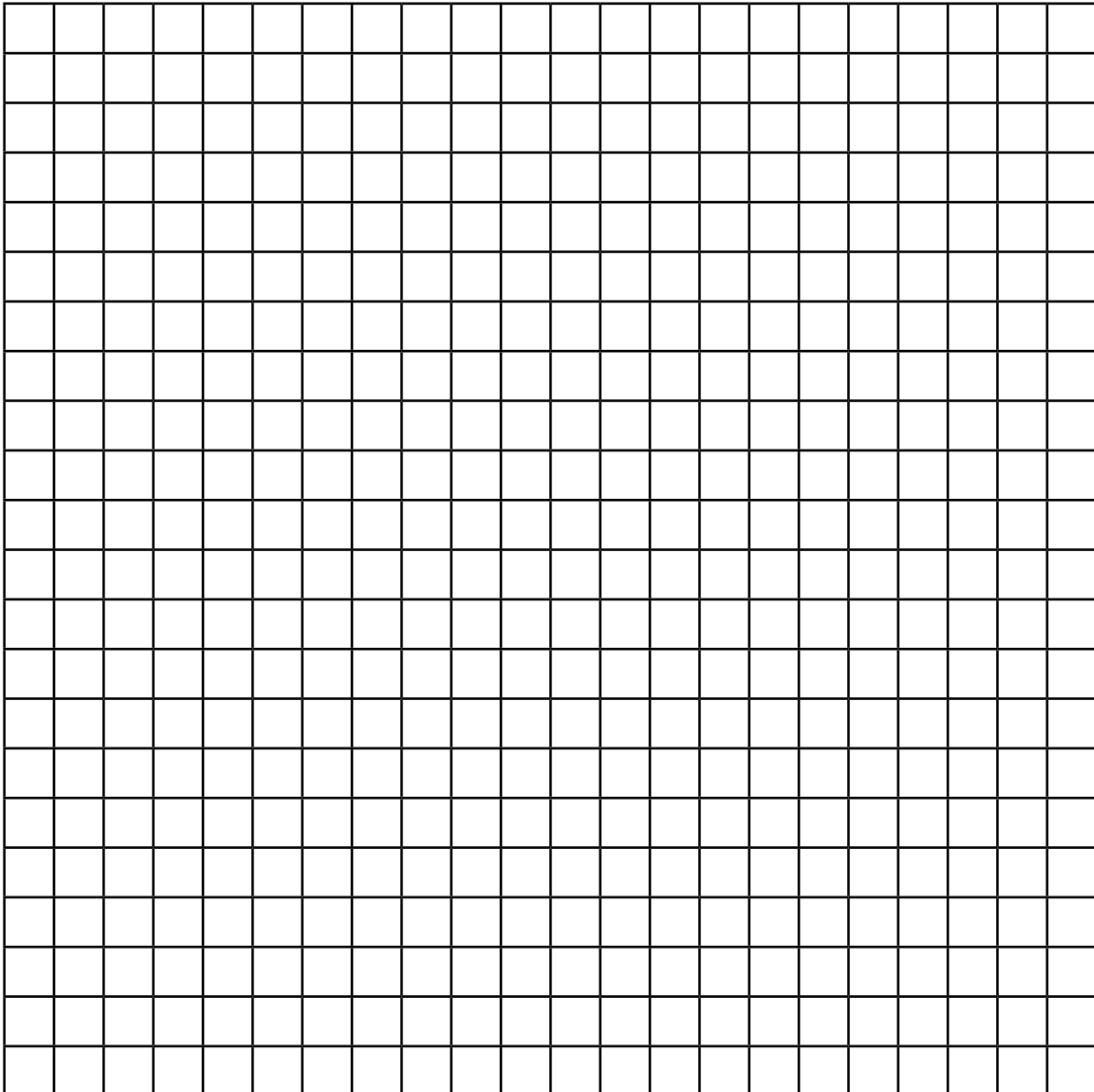
Name: _____

Date: _____

Create a bar graph showing the growth of your plant over time: Don't forget to label your graph!

On the X Axis is: _____

On the Y Axis is: _____



Questions:

1. How big was your plant on Day 1? _____
2. How big was your plant on Day 5? _____
3. How much did your plant grow between Day 1 and Day 5? _____

The Day Joshua Jumped Too Much: Language Arts Connection!

Name: _____

Date: _____

Find the following literary devices in the story. Write the sentence and the page number where you found it.

Alliteration:

Assonance:

Hyperbole:

Simile:

The Day Joshua Jumped Too Much: Language Arts Connection! – Answer Key

Name: _____

Date: _____

Find the following literary devices in the story. Write the sentence and the page number where you found it.

Alliteration:

Pg. 12: The only light was the soft twinkle of stars in the sky.

Assonance:

Pg. 1: Mr. Smith awoke early due to the bright light shining in his room from the hallway and all of the crashing and banging.

Pg. 4: He jumps and dives around his room from early morning till night playing imaginary space invader games.

Hyperbole:

Pg. 5: Also, all the lights and gadgets plugged in here are using enough energy to light an entire city.

Pg. 6: "If you continue this behavior, young man, you are going to use up all the energy on Earth!"

Pg. 11: Joshua must have walked out the same front door a million times, but what he saw now was not familiar.

Simile:

Pg. 20: It's like a pyramid of energy with the Sun on the bottom and us on the top.

The ABC's of Inquiry: Activity Before Concept

Engage students in the concept to be learned without priming them first. Don't tell them what you are going to teach them, let them figure it out for themselves. Through discussion following the activity the concept can be teased out. What was in their subconscious will emerge and become a solid concept that is not only connected to their prior knowledge, but is now a rewarding "Aha!" moment.

Concept from Think Scientifically book 1:	Activity you will use to demonstrate concept...
<p>"Humans use the energy that comes from the Sun in a variety of ways." P. 14, 15, 23</p>	
<p>"The Sun is the primary source of heat and light energy on Earth." P. 13</p>	
<p>"The Sun sustains life on Earth." P. 19, 20, 24</p>	
<p>"Plants use energy from the Sun to make food and grow." P. 17</p>	

Book Walk Cue Chart- The Day Joshua Jumped Too Much

Page #'s	Description	Sample Answers	Sample Cues
Before Reading	Review vocabulary. Have students say each word and review the definitions. Ask the students what they already know about these words?	Students will supply their background knowledge of vocabulary.	VOCABULARY * <u>Energy</u> - the ability to do work * <u>Solar</u> - things relating to the sun * <u>Radiation</u> - energy that travels as a wave * <u>Source</u> - the place where something begins.
Cover - 7	Picture Walk- Browse pictures from the cover to page 7 and have students say what they notice. Prompt them, if needed, to notice the excessive energy use.	"I notice there are a mom and a dad. It looks like there is a lot of noise and shaking. I also notice a boy who is playing and has a lot of things plugged in and turned on. It looks like the dad is mad about it."	PICTURE WALK Cover- page 7 * Notice excessive energy use.
Before Reading	Have students make a prediction. Prompt them to use vocabulary, the story title, and picture clues to make their predictions.	"I predict Joshua gets in trouble for being too loud and jumpy. I think he will learn how stop being so loud and learn to stop wasting energy." Grass, trees, flowers, insects, animals	PREDICTION * Predict what the story will be about based on the vocabulary, title, and picture clues.
Before Reading	Write 5 things you think we would not have without the sun.	Grass, trees, flowers, insects, animals	PREDICTION * Write 5 things you think we would not have without the sun.
4	After reading page 4, stop and ask students to identify the characters in the story. Also, have them identify the relationships of the characters.	"The characters in the story are Mr. Smith, Mrs. Smith, and Joshua. Mr. and Mrs. Smith are Joshua's dad and mom."	CHARACTERS * Who are the characters? * How are they related?
8	After reading page 8, stop to make a prediction. Ask students to predict why they think Joshua must bundle up.	"I think Joshua must bundle up because something must have changed for it to be cold out."	PREDICTION * Why do you think Joshua must bundle up?
13	After reading page 13 return to the prediction question from page 8. Ask the students why Joshua did have to bundle up? Have them compare and contrast what really happened to their predictions.	"Joshua had to bundle up because if he used all the energy on earth, the sun would no longer shine. The sun is what warms the earth, so without the sun it would be very cold."	PREDICTION CHECK * Why did Joshua have to bundle up? * Compare/contrast the story to your prediction

Book Walk Cue Chart- The Day Joshua Jumped Too Much (Cont.)

Page #'s	Description	Sample Answers	Sample Cues
14	<p>Before reading page 14, tell students you are going to read the next 10 pages (five page turns) and you want them to make a list of 12 things we would not have without the sun that are mentioned in the story or are part of the pictures in the story. Challenge them to write at least one thing from each page and to find even more than 12 items.</p>	<p>NO: light, television, heat, computers, video games, lamps, energy, wind farms, wind, flowers, power plants, wood/trees, birds, insects, animals, fruits, vegetables, cars, oil, animals from food pyramid, and water.</p>	<p>CHALLENGE * In the next 10 pages, listen and look for 12 things we would not have without the sun.</p>
21	<p>After reading page 20, direct the students' attention to the picture on page 21. Tell the students the picture is showing them something called a food pyramid, which shows how the sun's energy is transferred through living things. Tell the students a food pyramid is many food chains put together. A food chain is just one example of a way the sun's energy is transferred through living things. Draw an example for the students. (The sun → oak tree → squirrel → fox → bear) Challenge the students to come up with a different food chain that involves humans. Before reading on, remind students to continue writing 12 things we would not have without the sun.</p>	<p>* The sun → apple tree → human * The sun → grass → cow → human</p>	<p>VOCABULARY * <u>Food web</u>- Shows how energy is transferred from the sun through living things. * <u>Food Chain</u>- a single example of how the sun's energy is transferred through living things. FOOD CHAIN * The sun → oak tree → squirrel → fox → bear * Remake with humans involved * Continue writing 12 things!</p>
24	<p>After reading page 24, stop and have each student name one thing they saw or heard in the story that we would not have without the sun. Challenge them to not repeat any answers. Ask the students if any of the things surprised them and why? Take a poll to see how many students in your class think Joshua will change his ways at the end of the story.</p>	<p>(Look to sample answers for page 14 for a list of things mentioned in the story.) Students will likely be surprised by not having things such as plants, animals, TV, and water.</p>	<p>CLASS ACTIVITY * Have each student name 1 thing we would not have without the sun. * Did any items surprise you? Why? PREDICTION * Poll students: Do you think Joshua will change in the end? Why/ why not?</p>

Book Walk Cue Chart- The Day Joshua Jumped Too Much- Conclusions

Page #'s	Description	Sample Answers	Sample Cues
32	Return to prediction from page 24. Did Joshua change at the end of the story? If so, how?	Yes, Joshua changed at the end of the story. We see this because there are no more bright lights in the pictures, no more bashing and crashing, and Mr. and Mrs. Smith slept in. Students may ask questions about items on their list. They may not know if, or how, an item is affected by the sun.	PREDICTION CHECK * Did Joshua change? If so, how?
32	Ask students to return to their list of five things they predicted we would not have without the sun. Were any of your answers mentioned in the book? Are any of your answers incorrect? If so, replace your answer with something you learned we would not have without the sun from the book.	Students may ask questions about items on their list. They may not know if, or how, an item is affected by the sun.	CONCLUDING ACTIVITY * Review and correct 5 things written at beginning of story.
32	Ask students to brainstorm ways to save energy. Have them discuss their ideas with a partner or in small groups. Then, discuss as a class. What do you think Joshua will do to save energy?	"I can save energy by turning off a light when I am not using it, turning the water off while I am brushing my teeth, and unplugging items I do not use all the time. I think Joshua will stop using for much electricity while playing in his room."	CONCLUDING BRAINSTORM * What can you do to save energy? * What do you think Joshua will do to save energy?

The Day Joshua Jumped Too Much – Book Walk

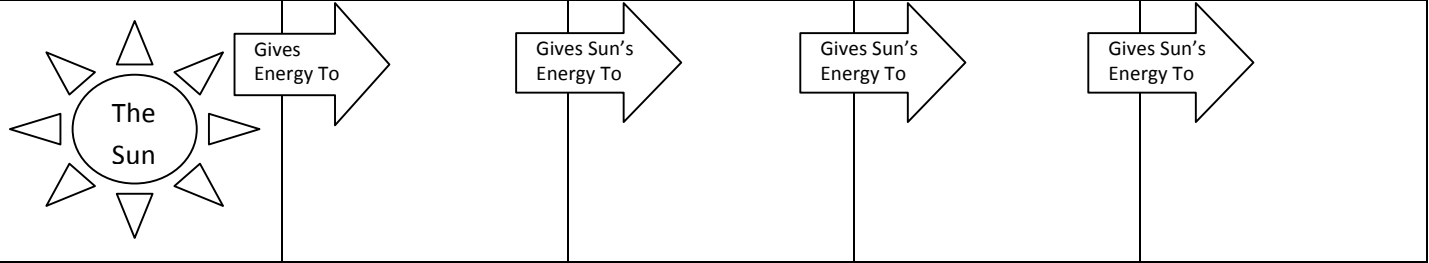
VOCABULARY			
_____ is the ability to do work.	_____ means things relating to the sun.	_____ is energy that travels as a wave.	A _____ is the place where something begins.

PREDICTION CHART			
Prediction Number	Question	My Prediction	Answer/ What Happened?
1	After reviewing the vocabulary and skimming the pictures and title, what do you think this book will be about? What do you think will happen in this story?		
2	Why do you think Joshua must bundle up? (Pg. 8)		<u>Are your answers correct?</u>
3	What are 5 things you think the Earth would not have without the sun? (Pg. 11)		
4	Do you think Joshua will change in the end of the story? Why or why not? (pg. 28)		

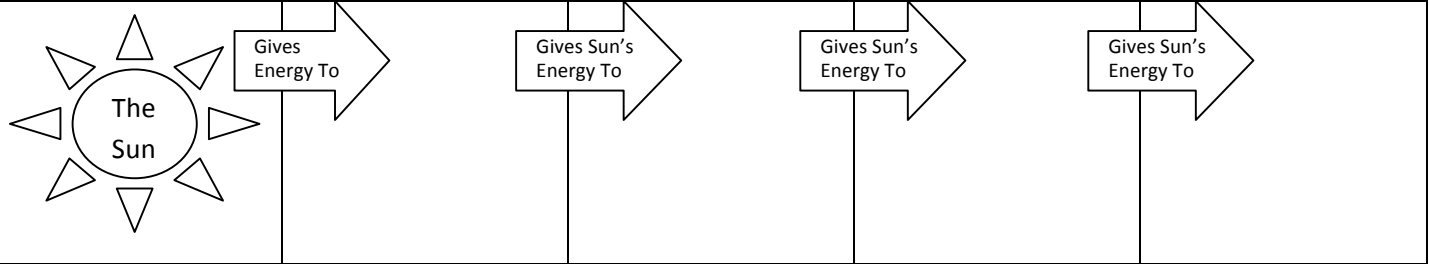
THINGS WE WOULD NOT HAVE WITHOUT THE SUN			
(From the story and story pictures.)			
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

FOOD CHAIN ACTIVITY- HOW DOES THE SUN'S ENERGY TRANSFER?

DIRECTIONS: Copy your teacher's food chain example in the boxes below.



DIRECTIONS: Use the example food chain above to help you create your own food chain. Include humans in your food chain. Challenge yourself to fill all boxes!



BRAINSTORM- HOW CAN I SAVE THE SUN'S ENERGY?

DIRECTIONS: Complete the following sentences.

I will save energy by _____

_____.

I will save energy by _____

_____.

The Day Joshua Jumped Too Much – Book Walk Answer Key

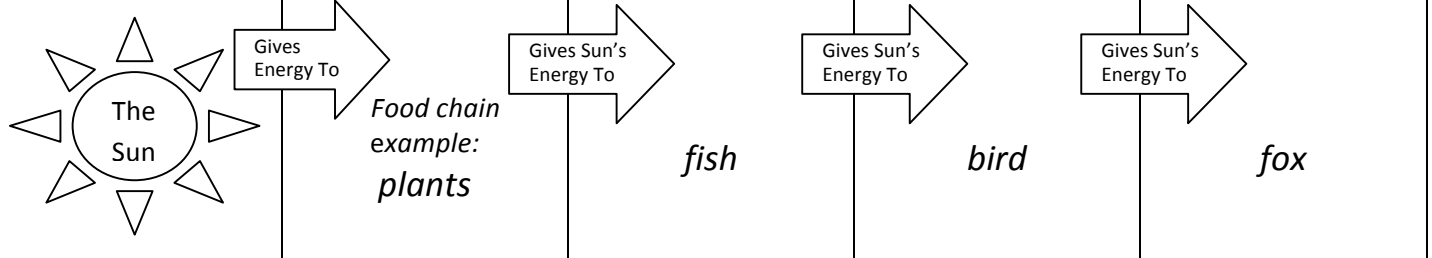
VOCABULARY			
<u>Energy</u> is the ability to do work.	<u>Solar</u> means things relating to the sun.	<u>Radiation</u> is energy that travels as a wave.	A <u>source</u> is the place where something begins.

PREDICTION CHART			
Prediction Number	Question	My Prediction	Answer/ What Happened?
1	After reviewing the vocabulary and skimming the pictures and title, what do you think this book will be about? What do you think will happen in this story?		<i>Example: It was about an energetic boy who learned about the many ways the Sun supplies the Earth with energy.</i>
2	Why do you think Joshua must bundle up? (Pg. 8)		<u>Are your answers correct?</u> <i>Example: It was cold outside without the Sun and his dad wanted him to dress warmly.</i>
3	What are 5 things you think the Earth would not have without the sun? (Pg. 11)		<i>See box at the bottom of this page for sample answers. *</i>
4	Do you think Joshua will change in the end of the story? Why or why not? (Pg. 28)		<i>Example: Joshua changed at the end of the story. He was no longer jumping around and his parents could finally sleep.</i>

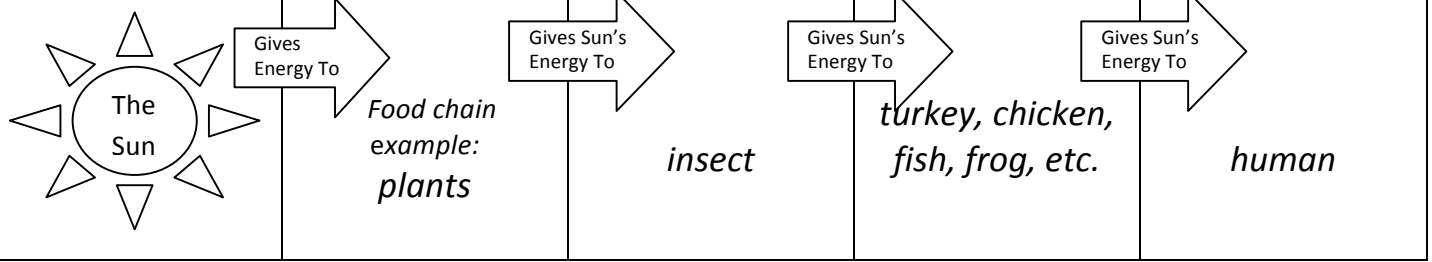
THINGS WE WOULD NOT HAVE WITHOUT THE SUN
(From the story and story pictures.)
<i>*Sample answers: plants, wildlife, sunlight, heat, wind energy, coal and oil to produce electricity, oil for cars</i>

FOOD CHAIN ACTIVITY- HOW DOES THE SUN'S ENERGY TRANSFER?

DIRECTIONS: Copy your teacher's food chain example in the boxes below.



DIRECTIONS: Use the example food chain above to help you create your own food chain. Include humans in your food chain. Challenge yourself to fill all boxes!



BRAINSTORM- HOW CAN I SAVE THE SUN'S ENERGY?

DIRECTIONS: Complete the following sentences.

Sample answers:

I will save energy by turning off my computer and television when I am not using it.

I will save energy by going outside to play more instead of playing video games.