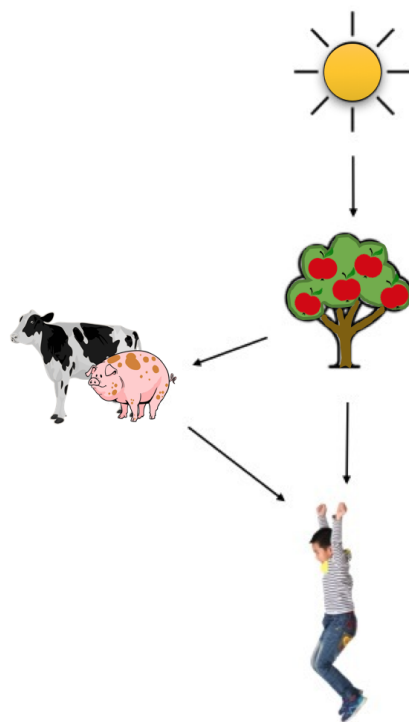


Energy: Where Does it Come From?		Grade 1 - Energy in Our Lives	
Lesson Plan		Safety Notes	Adult supervision and oven mitts are recommended when using the Solar Oven.
Description			
In this lesson, students will investigate how the sun is a primary source of energy for plants and animals. Students will explore the concept of using these sources of energy to make things grow and heat things up!			
Materials			
Sprouting Seeds		Solar Oven	
<ul style="list-style-type: none">- A used egg carton- Soil- Seeds, variety of garden seeds, grass seeds or chia seeds (Alternatives: kitchen scraps, apple seeds, tomato seeds, bell pepper seeds)- Water- Clear plastic bag- Box		<ul style="list-style-type: none">- Pizza Box (ideal but any smaller box will do)- Black Construction Paper- Aluminum Foil- Stick/Dowel Rod- Tape- Clear Plastic (like plastic wrap or clear plastic bags)- Glue (Glue gun is best)- Ingredients (S'mores, nachos, etc.)- Scissors- Magic Marker- Ruler- Optional: Thermometer- Oven mitts	
Science Background			
Energy is defined as the ability to do work or to move an object. Energy is all around us. It's needed to power every machine, plant and animal - including us humans! Every day, we experience and use different forms of energy, such as light, heat, electricity, sound and movement.			
Almost all the energy on the planet comes from the sun. There are two main types of energy that the sun gives us. The first is light energy. When light is present, people can see objects. The light we can see with our eyes is called visible light. The second main type of energy provided by the sun is heat. Temperature and heat are not the same thing! Temperature is a measurement of how hot or cold something is and we can measure that with a thermometer. Heat is the amount of energy contained in something, and this energy can be passed or			

transferred to a cooler object, which can raise its temperature. For example, the heat from your hands goes into an ice cube, causing it to melt into liquid water.

Everything needs energy, or fuel, to move. The fuel a car uses is gasoline or electricity, while animals use fuel from the food they eat. Plants make their own fuel by taking energy from the sun and carbon dioxide from the air and using it to make sugars and starch. This special process is called photosynthesis.

The way energy moves from the sun to all living things is called an energy chain. For example: the sun gives energy the earth → a plant of corn uses this energy for photosynthesis → Animals can use the energy from the corn by eating it → We can use the energy by eating animal products like milk and meat. Or, instead of eating it, we can use the energy by burning dried cobs to warm us up. Or, we can even make the corn into a fuel called ethanol which can be used to run some machines.



Energy comes from the sun, but can change forms and is found all around us. Solar energy can even be absorbed into solar panels and be transformed into electricity! Also, the sun heating the air creates wind, which can also be transformed into electricity with wind turbines. Even oil in the ground that is used to make gasoline came from ancient organisms that got their energy from the sun.

Activity Procedure

Sprouting Seeds

Egg Carton Planters

1. Cut the bottom of an egg carton into individual sections.
2. Add soil to the egg cartons
3. Place your seed of choice to the soil.
4. Add water to moisten the soil. (A spray bottle works best but is not necessary)
5. Place near a window for optimal sunlight.
6. Continue to water your seedlings everyday, only enough to moisten the soil.
7. Optional: Take pictures everyday as your plant starts to sprout to create a timelapse. Or, measure your sprout everyday and see how the number changes.

Kitchen Scraps

Lettuce

1. Cut the leaves off the core of the lettuce.
2. Place the core in a container with water enough to submerge a portion of the core.
3. Place by a windowsill.
4. Everyday make sure there is still water in your container and watch the lettuce regrow!



Green Onion

1. Cut the green portion from a green onion from the roots (white).
2. Place onion roots in a container with some water, ensuring to submerge a small portion of the roots.
3. Place by a windowsill.
4. Everyday make sure there is still water in your container and watch the green onion regrow!

Tomato seeds

1. Remove seeds from a tomato you will be eating.
2. Dampen a paper towel.
3. Place tomato seeds onto the damp paper towel.
4. Place the combination of seeds and paper towel into a clear plastic bag. Do not seal the bag.
5. Keep in a warm place.
6. Ensure daily the paper towel remains damp.
7. When the seeds start to sprout, transfer them to the soil and watch them grow!
8. You can try with grass seeds too!



Challenge: Try putting one of your plants under a box where it will get no sunlight. What do you think will happen?

Solar Oven

Note: The solar oven can get hot enough to melt food like cheese and chocolate - the use of oven mitts when handling the oven and adult supervision is highly recommended.

1. With the pizza box closed, measure and draw a one-inch border around the top of the pizza box.
2. Cut along three of the borderlines and leave one side intact to form a flap.
3. Fold the flap back along the uncut borderline.
4. Open the box, and line the inside of the flap and the inside of the box with foil.
5. Glue clear plastic over the hole in the lid of the box where the flap is. Make sure that the flap hole is sealed.
6. Place a piece of black construction paper in the bottom of the box, on top of the foil.
7. Prepare some smores or crackers and cheese and place them in the box.
8. Check the temperature inside of the box and then close the box (if you can do so), open the flap, and use a stick to hold the flap open.
9. Face the opening towards the sun for 30 min, verifying every so often.
10. Carefully open the box and use the thermometer (if you have one) to check the temperature inside; compare this to your first reading.
11. Place your snacks of choice inside the oven and let them cook for desired time.
12. Enjoy the snack!



Debrief

Sprouting Seeds

Humans and animals get their energy from food. Some of that food is plant based. While sprouting seeds, students will see that plants receive their energy from many sources like the sun and the earth. Through a special process called photosynthesis, plants are able to convert the sun's energy and carbon dioxide from the air into sugars for energy. They will also absorb nutrients from the soil through their roots with the help of water. If a plant is placed in an area with no sunlight (under a box), photosynthesis can't happen and the plant will eventually die.

Solar Oven

The sun's energy is transformed into heat when it hits the earth. The foil on the inside of the flap helps to reflect sunlight into the box. The foil on the inside of the box helps to insulate it, as well as continually reflecting the light and heat that is already inside of the box. The clear plastic allows sunlight in and keeps heat from escaping. To further this experiment, encourage students to try several boxes in different locations throughout different times of the year (the summer is best) to see which works best.

1. Draw a line to the correct answer.

Where does the earth get its energy from?

Food



Where do we (humans) get our energy from?

Batteries



Where do cars and trucks get their energy from?

Oil and Gas



Where do flashlights and remotes get their energy from?

The Sun



2. In your home find, draw and name 3 different foods that give you energy.

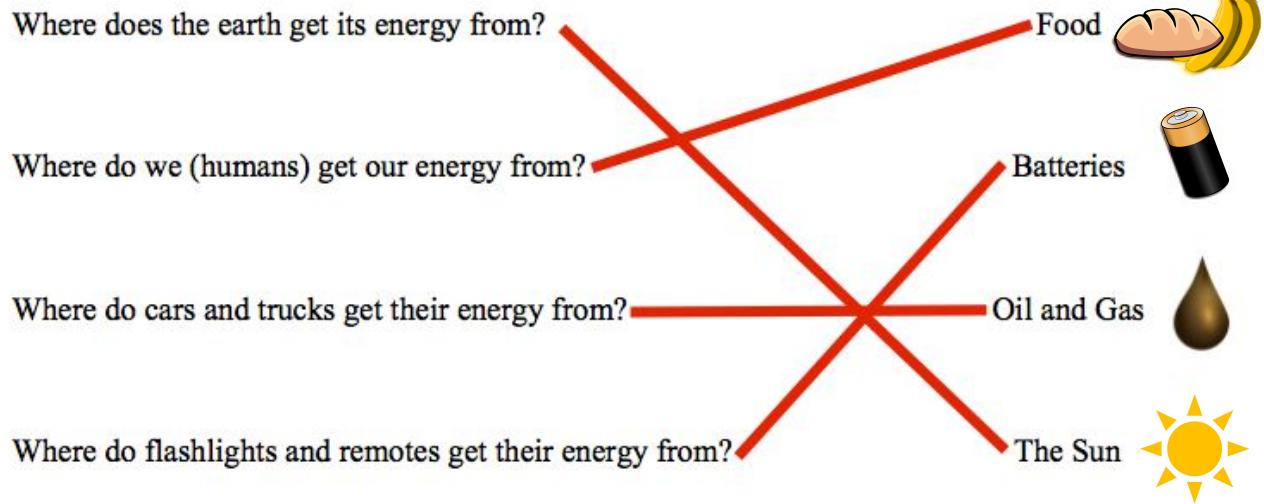
3. Draw four pictures that show how a seed turns into a plant. *Hint: Think about the seed experiment and what seeds need to grow.

1.	2.
3.	4.

Energy... Where does it come from?

Grade 1: Matter and Energy - Energy in our Lives

1. Draw a line to the correct answer.



2. In your home find, draw and name 3 different foods that give you energy.

Drawing	Drawing	Drawing
Name	Name	Name

3. Draw four pictures that show how a seed turns into a plant. *Hint: Think about the seed experiment and what seeds need to grow.

<p>1.</p> <p>*As long as pictures follow basic order and include the necessity of water and sun ✓</p> <p>Plant seed in soil</p>	<p>2.</p> <p>Seed is watered and put in sun</p>
<p>3.</p> <p>Seed sprouts, add more water and sun</p>	<p>4.</p> <p>Plant is grown!</p>