

READ ALoud STEM

Iqbal and His
Ingenious Idea

Carly and Adam



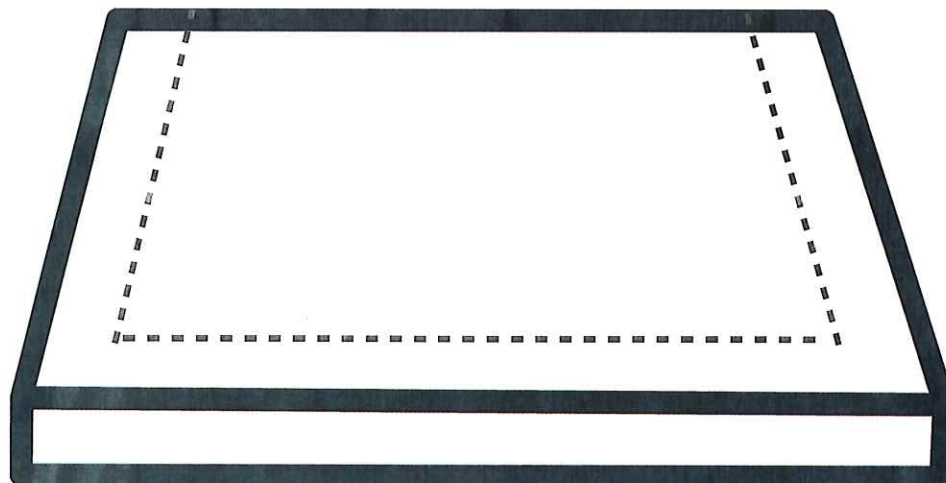
Name: _____

Dear Students,

You are an engineer working to build safer cooking solutions. Part of your job involves designing and testing solar ovens. Follow the instructions to get started then finish your design with your group.

Begin with the pizza box closed. Using your ruler, trace a 1-inch border around three sides of the pizza box. Cut along the lines, but do not cut along the flap! You may need your teacher to help you cut.

Lift up the flap that you just cut out. The flap will be used to reflect the sun. You will need to prop it up so that it stays open.



VIDEO LINKS

Resources:

Solar Cooking: National Geographic
(3:10 min)

<https://www.youtube.com/watch?v=Ofn7jqPDTeY>

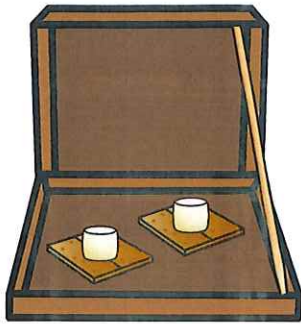
SOLAR OVEN STEM

Teacher Instructions: **EXAMPLE**



Vocabulary

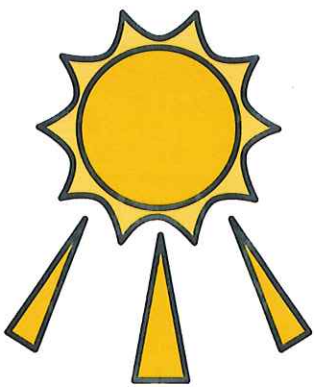
Directions: Use the vocabulary cards to pre-teach the vocabulary words before completing the activities.



Solar Oven: a device that cooks food using energy from the sun.



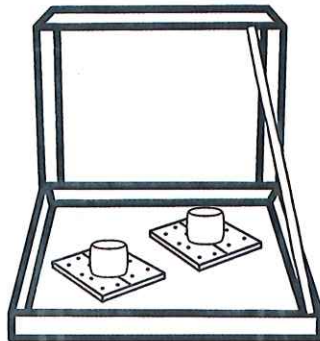
Sustainability: a system that meets the needs of the current generation without compromising the needs of future generations.



Solar Energy: light, heat, and other forms of energy given off by the sun. It can be collected and used to heat buildings and make electricity.

Name: _____

How Do Solar Ovens Work?



Solar ovens work by converting sunlight into heat energy. A solar oven needs to be placed outside in an area that gets a large amount of sunlight and is protected from the wind. Since the ovens are powered by **solar energy**, they do not work at night or on cloudy days.

Shiny surfaces in and around the outside of the oven reflect sunlight, which increases the heat potential. A clear plastic covering on the outside of the oven lets sunlight in, but traps the heat inside the oven. This explains why cars that are left in the sunlight, especially those with dark interiors, will heat up on the inside.

Think About It:

Which of your materials could be used to trap heat inside the oven? _____

Which of your materials could be used to reflect sunlight?

Name: _____

The inside of the pizza box is where you will cook your food. Remember that this part of the oven will need to be sealed to trap the heat and cook the food. The inside of the oven will also need to be dark and reflect the sun.

Using what you know about how solar ovens work you will complete your design with your group. You may use the following materials to complete your design.

You will have 10 minutes to plan your design individually and 10 minutes to plan as a team. Your team will have 30 minutes to construct your solar oven. At the end of the time limit you will test your design. Good luck!

Materials:

1 pizza box

plastic wrap

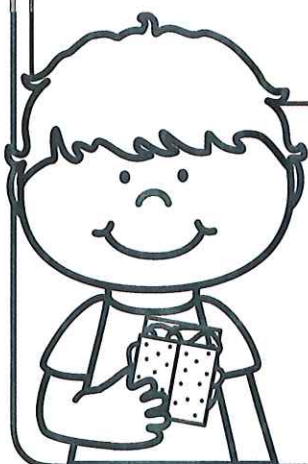
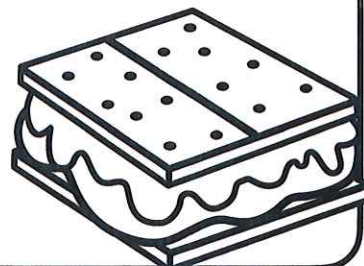
tape

1 sheet of black construction paper

aluminum foil

2 popsicle sticks

scissors



Name: _____

ASK



What is the problem you are trying to solve?

IMAGINE



Imagine the best way to solve the problem on your own.

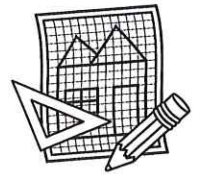
Sketch out your design and brainstorm a list of ideas.

Think about:

- *How will you use your materials?*
- *What will you use to trap the heat inside the oven?*
- *What material will you use to reflect the sun? Where will you use this material on your oven?*

Name: _____

PLAN



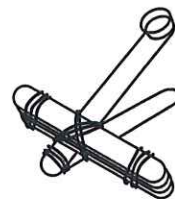
With your group, sketch out your plan to solve the problem.

A large, empty rectangular box with rounded corners, intended for students to sketch out their plan to solve the problem.

Name: _____

CREATE

Build your solar oven.



EXPERIMENT

Does your solar oven work?



IMPROVE

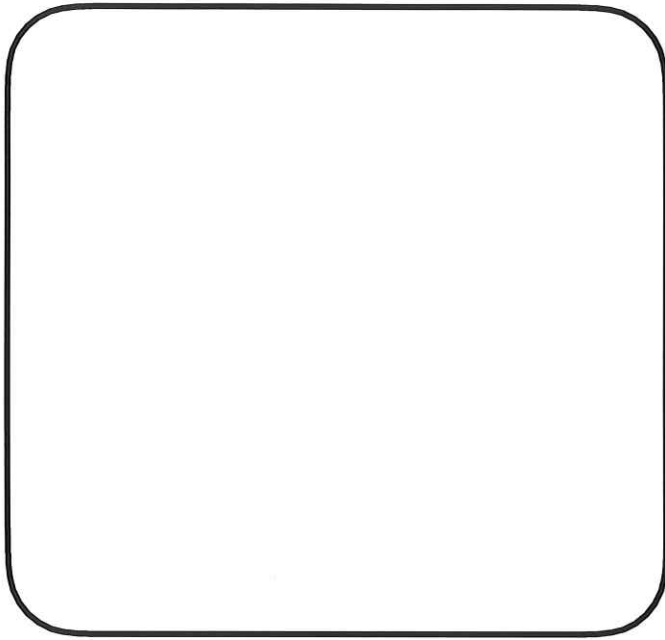
What could you do to improve your design?



Commercial Planning Page

Name: _____

Directions: Draw a picture of your solar oven and write a description of how it works.



Solar Oven Name: _____

Cost: _____

What materials is it made of:

How does it work? What problem does it solve? Why should people buy it?
