

Adventure Description:

In this adventure you will think like a solar engineer and design an oven that uses solar energy instead of fossil fuels.



Activity

Step 1: Background Information on Solar Engineers (5+ minutes)

- Explain to students that solar engineers are scientists that work to develop new technology that uses the sun's energy instead of energy from non-renewable sources.
- Ask students what things they know that can be powered by solar power. (Answers will vary, but may include: solar powered homes, cars, traffic lights)
- Remind students that solar energy can be used to power tablets, ovens, microwaves, and even turn on light switches!

Step 2: Building a Solar Shoebox Oven (15-20 minutes)

- Explain to students that they will build a prototype of their own solar oven.
- Explain to students that a prototype is the first version of a new product. It usually helps a developer figure out what works and what doesn't, so that the next version will work better.
- Provide students with [Handout: Creating a Solar Oven](#) and go over the instructions for Part 1.
- Provide students with the following materials:
 - Shoebox
 - Large piece of card stock
 - Large piece of aluminum foil
 - Black construction paper
 - Scissors
 - Glue
- Instruct students to complete steps 1-5 on their handout.
- While students are working ask the following questions:
 - What purpose do you think the aluminum foil will serve? (Helps reflect the heat energy into one spot to be able to cook in the oven.)
 - What is the benefit of using a solar oven over a traditional oven? (Uses renewable energy instead of nonrenewable energy.)

Please contact Allison Bischoff, Director of Teacher Support, at allison@rozzylearningcompany.com or 314-272-2560 with questions.

Step 3: Testing the Solar Shoebox Ovens (10 minutes)

- Tell students that as the engineers, they need to test their prototype and record some data before it is sold in stores!
- Students should now complete steps 6 and 7 on Handout: Creating a Solar Oven.
- Give pairs of students the following materials:
 - Timer
 - Skewer
 - 2 large marshmallows
- Read over the instructions on the handout with them and emphasize that they will do two tests for quality assurance.
- Explain to them that solar engineers need to do quality assurance tests on their products to make sure they work well.
- Remind students to fill out their data table while they are completing their quality assurance tests.
- After students have finished their tests, give them [Handout: Quality Assurance Form](#). Ask students to use their data to fill in the form.

Materials List

Provided online:

- Handout: Creating a Solar Oven
- Handout: Quality Assurance Form

Not provided (each student or group needs):

- Shoebox
- Large piece of card stock
- Large piece of aluminum foil
- Black construction paper
- Scissors
- Glue
- Timer
- Skewer
- 2 large marshmallows

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