STEMTaught

Summer Camp
Exploring Africa Day 2

4TH-8TH GRADE

WELCOME

(5 min)

Instructions: Welcome your students to camp. Be friendly, ask a question. Say, "Today we are going to construct our very own solar ovens, similar to what many of the indigenous people of Africa use to cook their food!"

GAME TIME

(25 min)

Materials:

- Open area or grassy playing field

PLAY "WHAT TIME IS IT, CHEETAH?"

Objective: This game is a variation of tag in which students will run away from Cheetah, to avoid being tagged.

Instructions: Have all the players line up at one end of the play area, such as on one end of a basketball court. Choose one person to be Cheetah. Have this player go to the opposite end of the play area with their back facing the other players. The players will begin by yelling out, “What time is it, Cheetah?” Cheetah will then shout out a time, such as, “It’s 2 O’clock!” Then everyone will then take that many steps forward. They will continue to play in this pattern. When the players are close to reaching Cheetah, they will say, “What time is it, Cheetah?” and Cheetah will say, “It’s lunch-time!” Then everyone will turn around and race back to the start as they try to make it back without getting tagged. The player who gets tagged becomes Cheetah.

STEM TIME

(120 min)

Materials:

- 1 piece of plastic wrap
- Tape
- Black duct tape
- Cardboard boxes of various sizes
- Aluminum foil
- Scissors
- Black construction paper

S'mores Materials:

- Graham crackers
- Chocolate
- Marshmallows

SOLAR OVENS AND COOKING S'MORES

Instructions: Say: "We have made it to Africa! Today we will be constructing solar ovens! Solar ovens capture the energy generated by the sun to cook food. Let's watch how the villagers in rural Africa use these." Watch the movie on the African Solar oven project. This movie shows how solar cookers have helped people in Africa cook their food without needing firewood. Solar cookers help to reduce deforestation and improve the lives of many people. Today we will put together our own solar ovens, and tomorrow (or today weather and time permitting) we will put our designs to the test to see if we can make s'mores using the ovens we have created!"
Keep the ovens at school as each week the students will get to improve their solar ovens, or use them as they are to bake.

1. Follow the videos found on the Summer Camp portal.
2. Remind students that they can be creative and try new things. It will be neat to compare the different designs in the group.
3. When the students have completed their solar ovens, have them follow the Art Time instructions and draw their solar oven design.
4. Make s'mores! Place the s'mores into the solar oven, close the lid, wait for them to melt, and enjoy!
5. While you are waiting for your s'mores to cook draw your solar oven as in the prompt below.

ART TIME

(30 min)

Materials:

- Camp journals
- Coloring utensils

DRAW YOUR SOLAR OVEN

Objective: Each student will draw and label the features of their solar ovens in their camp journals.

Instructions: Say, "Drawing and labeling the features of a design is an important part of the engineering design process. Today you will get to draw your solar oven, label the different parts, and write down the measurements of your final creation."

1. Draw a picture of your solar oven in your camp journal.
2. Take measurements of your solar oven, and label them on your drawing.
3. Label the features of your solar oven.

STEM TIME

(60 min)

Materials:

- Solar panels
- Fans
- Alligator clips

SOLAR POWER CHALLENGE

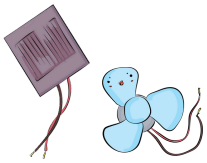
Objective: In the Arctic there is no power source. Scientists need power to charge phones, instruments, and our snow mobiles also need power. Let's get to work and set up some solar power!

Watch the class prep movie

1

Pass out solar panel challenge cards ans some solar panels

2



Put out supplies (motor fans, solar panels, alligator clips

3

Instructions:

1. Go outside to a shady/sunny place to work. (solar panels still work in the shade but will have a higher energy output in the sun)
2. Each student should get at least 6 alligator clips and some fans and some solar panels. Some students will choose to form groups so they can have more supplies and some students will want to work on their own.
3. Each student takes a solar panel challenge card and gets ready to be creative!

Explain:

Today we get to solve some fun challenges together. I am excited to see what you figure out. Here are some things to remember:

1. Alligator clips: When you push on both sides of the clamp it opens. Metal is a conductor, but plastic insulates so circuits won't work if touching plastic.
2. Solar panels: Make sure you have the pattern of red to black wires. Red is positive and black is negative. Electricity flows from + to -
3. A circuit needs to form a closed loop, or no electricity can flow.
4. Remember to help each other!

Ask: "How many solar panels have you connected? What are you discovering as you experiment?"