

# Design a Shoebox Solar Home

Explore solar energy and insulation with a hands-on experiment!

The Sun gives off energy in the form of light and heat, which can be collected and used to heat buildings.

Materials Needed:

Two small cardboard boxes, thermometer, markers, plastic wrap, black construction paper, scissors, tape, sunny day. **Optional:** Aluminum foil, fabric, paper in various colors.

## Instructions

Step 1: Gather two cardboard boxes about the same size. Cut two holes in the side of one box. These will be your windows.

Step 2: Use markers to decorate both boxes. Make them look like houses, or be creative!

Step 3: Place both boxes in the sun for thirty minutes to one hour. Use a thermometer to measure the temperature inside both boxes. Which box is warmer?

Step 4: Tape plastic wrap over the windows on one box. Repeat Step 3. Did the plastic wrap keep the box warmer than before?

Step 5: Cover the inside of the box with black construction paper. Repeat Step 3. Did the box get warmer or cooler?



Extension: Cover the inside of the boxes with different materials, such as aluminum foil, fabric, or paper in different colors. Which materials keep the box warmest?

# What is Solar Energy?

**Solar energy** is the energy given off by the Sun. At the center of the Sun, hydrogen atoms are under intense pressure from gravity. They undergo a process called **nuclear fusion** and get converted into helium atoms. This process generates a tremendous amount of energy, which is emitted in the form of light, heat, and charged particles.

Image: NASA/SDO.

Learn more about the Sun & energy: [spaceplace.nasa.gov/sun-heat/en](https://spaceplace.nasa.gov/sun-heat/en)

On Earth, people have used solar energy for thousands of years to keep warm, cook food, and for other daily activities. People harness the Sun's energy in different ways.

**Passive solar heating** is the design of buildings to take advantage of the sun's energy.