

Solar Water Heater



Science Film Festival Film

▶ **“Warm Bath” – A Solar Heater Developed by Xochitl**

Introduction

The sun is some 150 million kilometers from Earth. But because its surface is so hot, we on Earth benefit from the light it radiates - without it humans could not survive. The light radiated by our sun carries energy, part of which gets absorbed and transformed into heat when it reaches a surface. That is why places in the sun feel warmer than those in the shade. This activity is an excellent way for kids to learn about the power of the sun. By adding water through the tubes, they absorb energy from the sun and heat up the water. Add water and the sun = hot water!

Key Objectives

- To understand that a solar water heater is a device that captures sunlight to heat water.
- To understand that it can be an economical way to generate hot water for your household.
- To understand that a solar heater enables substantial energy savings as solar power is free in contrast to natural gas or oil.

Materials

- Zip Ties
- Glue or Tape
- 1-meter Black Gardening Tube (1/4-inch diameter)
- Sharp Pencil
- Water Dropper or Pipet
- Water
- Water Collector
- Thick Cardboard
- Thermometer

Optional Template

➔ <https://cdn.instructables.com/ORIG/FQF/93IK/IJRHS50I/FQF93IKIJRHS50I.pdf>

Safety Instructions

Careful: The water will be hot coming out at the end! Use caution when handling.

Guiding Questions

1

How does direct sunlight affect temperature?

2

Why does the sun heat up water?

Intermediate

Resource Type

Project

Topics

Energy

Sustainable Living

Thermodynamics

Subjects

Physics

Engineering

Keywords

Heat Transfer

Solar Energy

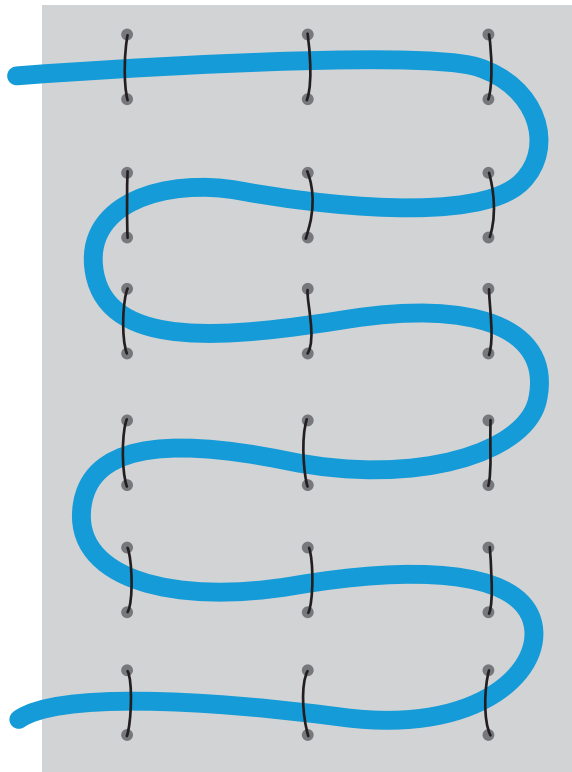
Time For Activity

30 – 45 minutes

Tasks/Steps

- 1 Add glue to back of template and stick on to cardboard.
- 2 Poke holes to get the zip ties through easily.
- 3 Add zip ties through the holes and tighten down the tube. Do not over tighten. Over tightening rips the cardboard. Zip ties need to be connected on the top or the heater will not sit flat on the ground.
- 4 Using the pipet, slowly add water to tube.
- 5 Place in direct sun light. Angle cardboard so that there are no shadows.

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6 Allow time for the water to sit in the tube. After 5 min in direct sun the water will be hot (be careful). Lift the heater up and allow gravity to force the water up and force water out the bottom or force water out using the pipet. Collect water but be careful, hot water can burn.

7 Use a thermometer to measure the before and after temperature of the water.

Authors/Source

→ <https://www.instructables.com/id/Kids-Solar-Water-Heater/>