FAMILY SCIENCE

MAKE A SOLAR STILL

THE SCIENCE PENGUIN

TERMS OF USE

You may share the "Family Science: Make a Solar Still resource with families and students online or in print.

Source: Free Elementary Science Activities for Educators and Families from The Science Penguin

SOLAR STILL INVESTIGATION

Topics: Separating Mixtures
Activity: Separate the water from solutions using evaporation.
Location: Outside

Materials

- Large bowl or container
- Cup shorter than the bowl (a glass is ideal)
- Water
- Salt or sugar
- Food coloring
- Juice, soda, or another water-based liquid
- Plastic wrap
- Small rock

Preparation

- Make sure you have access to a safe outdoor area on a sunny day.
- Gather materials.
- Print optional recording page or have a sheet of paper available.

Overview

Day	Activity Overview	Time Needed
1	Separate a Solution	10 minutes in the morning and 20 minutes in the afternoon
2	Follow-up Investigation	10 minutes in the morning and 10 minutes in the afternoon
3	Choice Activity	20 minutes

DAY 1: SEPARATE A SOLUTION

Let's answer the following question: How can we separate water from a solution using evaporation?

1. In your bowl or tub, mix warm water, food coloring, and either salt or sugar until dissolved and evenly spread out to form a solution.

2. Place the glass or cup in the center of the bowl.

3. Cover the top of the bowl with plastic wrap. Make sure there is space between the rim of the cup and the plastic wrap.

4. Place a small rock on top of the plastic wrap over the cup so that the plastic wrap sinks down slightly at an angle. Place the bowl in a sunny spot outside.

NOTE: You may want to introduce these vocabulary terms.
Mixture: a combination of two or more substances
Solution: a special kind of mixture in which the substances are evenly spread out
Dissolve: break down into smaller pieces until it is evenly mixed throughout the mixture.

You made a mixture that is also a solution. The salt or sugar you mixed in dissolved in the water.

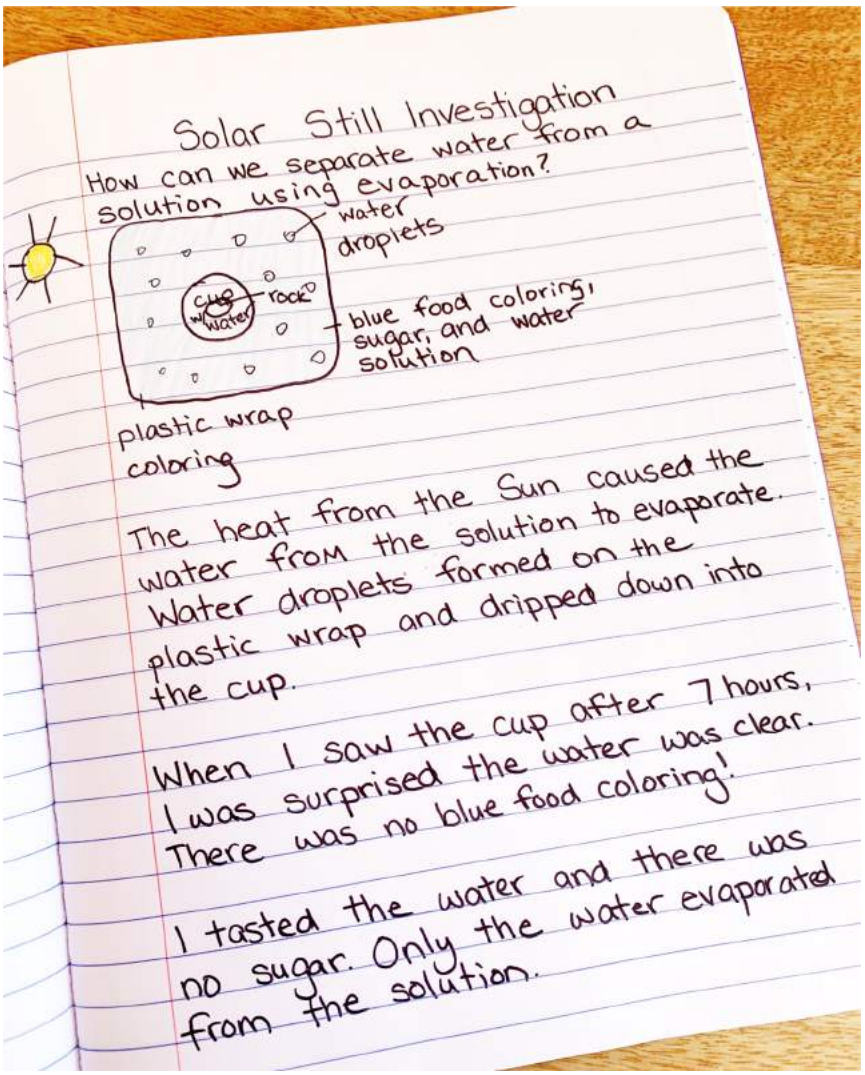
5. After 6-8 hours, remove the plastic wrap and take out the cup. Is there any food coloring in the cup? If safe, taste the water in the cup. Can you taste any flavors?

6. Discuss the questions below.

   - What results surprised you?
   - Did the food coloring evaporate?
   - Did the salt/sugar evaporate?

7. On your paper, explain your results and draw a diagram of your investigation set-up.

8. Empty the bowl and cup, but keep your materials for the next day's activity!



DAY 2: FOLLOW-UP INVESTIGATION

1. Complete a follow-up investigation to yesterday's activity. Choose another liquid: juice, soda, dish soap (mixed with water), broth, or another liquid that primarily contains water.

2. Set up your investigation the same as you did Day 1. Just substitute your chosen liquid for the water/ food coloring/ salt or sugar mixture. I used room temperature Coke.

3. If possible, look at the ingredients list on your chosen liquid. Which ingredients do you think will evaporate and end up in the cup?

4. Set up your bowl in a sunny spot outside.

5. After 6-8 hours, check your results. It may be unsafe to drink the solution so just look.

6. Discuss the questions below.
   - What results surprised you?
   - Which ingredients evaporated?
   - Which ingredients did not evaporate?
   - Compare this investigation to the previous day's investigation.

7. Clean up your investigation materials.

DAY 3: CHOICE ACTIVITY

Choose one of the following activities:

1. Watch the video about natural filtration and write about what you learned. https://bit.ly/wastershedvideo

2. Watch the video about desalination and write about what you learned. https://bit.ly/desalinationvideo

3. Watch the video about desalination plants and write about what you learned. (Be for grades 6+) https://bit.ly/desalinatingvideo

4. Draw a detailed, labeled diagram of both the investigation you completed. Compare and contrast the investigations. What other investigations could you conduct using a solar still?

SOLAR STILL INVESTIGATION

How can we separate water from a solution using evaporation?