

You Will Be Mist



The Science of Evaporation



9th-12th Grade

Common Core Objective(s)

Earth Science, Standard 4, Objective 1.d
Chemistry, Standard 3, Objective 3.c

15-20 Minutes

Key Skills

Observing
Measuring
Predicting
Experimenting
Interpreting data

Key Vocabulary

Evaporation
Water Vapor
Liquid
Gas

Activity Summary

Before precipitation can occur, water has to get up into the sky. The majority of H₂O molecules do this through the process of evaporation. In today's activity the power of the sun will be harnessed to turn water from a liquid to a gas.

Materials

- Warm sunny day
- Student worksheets
- Paper bowls
- Metric measuring cup
- Potting soil
- Grass clippings
- Plastic wrap
- Stop watch

Instructions

1. Divide class into teams of five-to-six students.
2. Give each team four paper bowls.
3. Bowl 1: Cover bottom of bowl with half-inch of potting soil.
4. Bowl 2: Put two handfuls of grass clippings in bowl.
5. Bowl 3: Cover top of bowl with plastic wrap.
6. Bowl 4: This bowl is the control.
7. With the scale, measure the weight of each bowl and record the data.
8. Put 100 ml of water in each bowl.
9. With the scale, re-measure the weight of each bowl and record the data a second time.
10. Carefully carry the water-filled bowls outside to a warm sunny area.
11. Place bowls in direct sunlight for 10-to-15 minutes.
12. Carefully carry the water-filled bowls back to the classroom.
13. With the scale, re-measure the weight of each bowl and record the data for a third and final time.
14. As a group discuss your findings.

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Discussion Questions

1. You are trying to protect an irrigation canal from losing too much water to evaporation. What types of infrastructure can you use to minimize evaporation?
2. When watering a lawn, what type of environmental factors (wind, temperature, sun, etc.) should you avoid to minimize the amount of evaporative loss?
3. In Utah there are many situations where we want to minimize the loss of water through evaporation, but there are places we want to actively encourage evaporation. As a group come up with five situations where evaporation can be an effective tool.



Dive Deeper

Now that you have studied how evaporation works on a small scale, why not explore how this force of nature acts on a landscape? Head over to the BBC 'The Evaporating Mediterranean Sea' video <https://www.youtube.com/watch?v=BemsLUldVAo> and learn about how the balance between evaporation and precipitation can affect geography.

Additional Resources

- ◆ USGU Water Science School- <https://water.usgs.gov/edu/watercycleevaporation.html>
- ◆ Evaporation Friend or Foe- <https://blog.epa.gov/blog/2014/07/evaporation-friend-or-foe/>
- ◆ NOAA Climate Prediction Center- <http://www.cpc.ncep.noaa.gov/soilmst/e.shtml>



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1. Let's start by taking some measurements.

	Weight (without water)	Weight (with water)	Weight (after experiment)
Bowl 1 Potting Soil			
Bowl 2 Grass Clipping			
Bowl 3 Plastic Wrap			
Bowl 4 Control			

2. Now calculate how much water was lost during the experiment.

	Weight (with water)	Minus	Weight (after experiment)	Equal	Total
Bowl 1 Potting Soil		—		=	
Bowl 2 Grass Clipping		—		=	
Bowl 3 Plastic Wrap		—		=	
Bowl 4 Control		—		=	

3. Which treatment had the most water evaporate?

