

# Climate Change Activity: Evaporation

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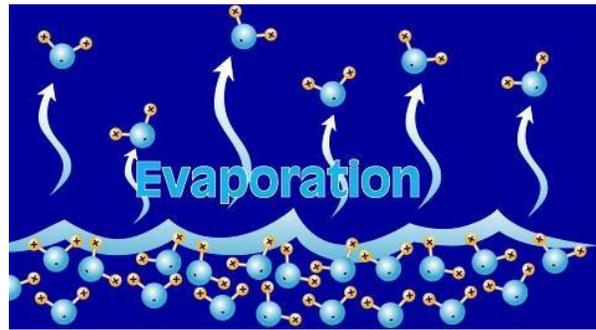
**Subjects:** Science; Climate Change; Water Cycle

**Location:** Inside, classroom

**Duration:** several class periods (24 hrs. in between)

**Sunshine State Curriculum Standards:**

MA.4.A; MA.5.S.7; MA. 5.G.5; MA.5.A.4; MA.5.A.5;  
MA.6.S.6; SC.4.P.8; SC.4.P.9; SC.4.N.1; SC.5.E.7;  
SC.5.N.1; SC.5.P.9; SC.6.E.7; SC.6.N.1.4; SS.4.G.1.3;  
SS.4.C.2; SS.5.G.3; SS.5.G.4.1; SS.6.G.2.1; SS.6.G.5



**Objectives:** For this activity, students will compare and contrast evaporation rates in different climates. They will be able to explain how temperature can affect evaporation, and list ways that evaporation can affect the water cycle.

**Materials** (all materials listed are per student/group):

- Beaker or Graduated Cylinder (100-200 ml) x2 (same size and surface area)
- Thermometers x2
- Heat Lamp/Source x1

**Background:** Evaporation is the process by which water turns from a liquid into a gas. The rate of evaporation is influenced by many factors, including wind speed, humidity and air temperature. One projected effect of climate change is a rise of global air temperatures. We will perform an experiment that measures the rate of evaporation in a control setting (normal room temperature) compared to the rate of evaporation in a setting with higher temperatures. We will then learn and discuss what effects the evaporation rate can have on the water cycle and related earth systems. This experiment will be most effective if measurements are taken over the course of several days.

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## Procedures:

- The day before the experiment, set out enough water for all participants in the room you will be conducting your experiment. This ensures that all the water is at the same room temperature.
  - For each student/group, measure out 100 ml of water into two separate beakers .
  - Take a temperature recording of the water and the air (1-2 inches above the water) for each beaker, and record those temperatures with the time.
  - Set one beaker in an area of the room away from hot/cold sources such as windows and vents.
  - Set the other up with a heat lamp near it, to raise the air temperature surrounding the beaker.
  - Establish a time interval to take your measurements (e.g. every hour, every day), and record the temperatures of the water and surrounding air for both beakers, along with the amount of water within each beaker (be sure to record the time for your measurements).
  - The experiment can last for as long as you like; it will be most effective over several days. Once the experiment is over, you can have the students create graphs to plot their data.
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### Evaluation:

- Students can visually see the rate of evaporation if they graph their data, but they can also calculate the rate by dividing the difference of two measurements by the time passed between those two measurements. This new data set can be graphed as well.
- Instruct the students to compare their data sets (individually and as a class); you can also have them create data sets/graphs for the class averages.
- Which beaker had the most evaporation?
- Did the water temperature increase as air temperature increased?
- Does water temperature have an influence on evaporation rate? What about water quantity measurements? (think about what happens when substances heat up)
- Which beaker had the highest rate of evaporation? Did the rate change for either beaker?
- In our natural water cycle, what effects would an increase in evaporation have?
- How could a change in temperature affect precipitation?

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### Extension:

- Try the experiment with two beakers in each area, one covered and one uncovered.
- Discuss (or lead other activities) ways that climate change can cause temperature increases.
- Discuss ways that rising temperatures can affect plants, farming, and human water usage.

### Related Activities and Resources:

- Is It Getting Hot In Here?
- A Balancing Act: Climate Change & the Energy Cycle Storyboard
- <http://www.epa.gov/climatechange/students/basics/index.html>

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### Sample Data Collection Table:

	Beaker					
	Control			Heat Source		
Day/Time	Water Level	Water Temp	Air Temp	Water Level	Water Temp	Air Temp
Day 1	100 ml	74°	74°	100 ml	74°	74°
Day 2	98 ml	74°	74°	94 ml	76°	82°
Day 3	96 ml	74°	74°	84 ml	80°	90°