

# Evaporation Condensation Challenge

## Summary

Students will review the processes of evaporation and condensation.

## Time Frame

1 class periods of 45 minutes each

## Group Size

Small Groups

## Life Skills

Thinking & Reasoning, Communication, Social & Civic Responsibility, Systems Thinking

## Materials

Ice Cubes

Jars

Lids for jars or aluminum foil

Thermometers

Hair Dryer

Food Coloring

Small Plastic Cups

Measuring cups

Clear glass brownie pan or a plate

Masking tape

Markers

Rulers

Electric Kettle

Towels for clean up

Several cold full soda or juice can

## Background for Teachers

Evaporation is the process by which water is converted from its liquid form to its vapor form and thus transferred from land and water masses to the atmosphere. Evaporation from the oceans accounts for 80% of the water delivered as precipitation, with the balance occurring on land, inland waters and plant surfaces.

Condensation is the change of water from its gaseous form (water vapor) into liquid water.

Condensation generally occurs in the atmosphere when warm air rises, cools and loses its capacity to hold water vapor.

It is important to remember that condensation and evaporation are both types of a process in the water cycle.

## Student Prior Knowledge

Students should have a review or introduction to the water cycle.

A short brainstorm session of where our water comes from would be a great place to start the activity.

## Intended Learning Outcomes

## 1 Use Science Process and Thinking Skills

- a. Observe simple objects and patterns and report their observations.
- c. Make simple predictions and inferences based upon observations.
- e. Use instruments to measure length, temperature, volume, and weight using appropriate units.
- f. Conduct a simple investigation when given directions.
- h. Use observations to construct a reasonable explanation.

## 3 Know science information specified for their grade level.

- a. Know science information specified for 4th grade.

## 4 Communicate Effectively Using Science Language and Reasoning

- b. Record data accurately

### Instructional Procedures

Note: The day before this lesson, place a jar of water and measure its level in front of the students and leave it in the front of the room. Demonstrate how you measured the water level on day one (by placing masking tape and drawing a level) and how you will measure it today.

#### PART 1

Engage the students by having a large bowl of soapy water in the front of the room and washing your face in front of them and towel off or wash your hands.

Invite students to talk about what use they had for water today. Students can write these down in the front of the room, each student can come up with one use. Also allow students to ask questions such as "did my orange juice have water" at this time when thinking about uses for water today.

Ask students in small groups to discuss ideas from where all the water comes from, give them 4 minutes to brainstorm in a journal.

Discuss their ideas into a diagram of the water cycle (some of their answers will say the water came from the sky for example).

#### PART 2

Provide three easy demonstrations for vocabulary reviews, evaporation with a tea kettle or electric kettle and condensation with that same kettle and a hand mirror or a plate or clear glass pyrex brownie tray. Also pull out an icy cold soda can from your cooler and talk about any locations of water droplets on it.

Explain to students which equipment is in the classroom today on the equipment table. Each group will need 1 of each thing listed in the materials except the sharing of the hair dryer (since you probably have only one).

#### PART 3

After the students have seen your demonstration, challenge them to create their own condensation given what is on the table. Give them about 10 minutes.

Explain to the students for the 2nd part of their experiment they are free to use different types of water (temperature) and the cups.

Challenge the students to start an evaporation experiment. Students should create a hypothesis of what could evaporate water the MOST. They are to put this in their journals. Have them choose 4 locations for water around the room. (Inside cabinets are ok!). Students will be reminded that in order to make measurements in two days, they will need to make initial measurements. This can be demonstrated with the teacher jar at the beginning of class.

#### PART 4

After students have cleaned up, save one of the jars with ice. Use the hair dryer to evaporate the water droplets on the jar and have a discussion about evaporation again.

#### PART 5

Students the next day or two days later or 1 week later should collect their cups and record their data. Students should have a conclusion written down.

### Extensions

Thermometers can be used to take final temperatures of the cups of water in the classroom and a graph can be created

Students can have a "show and tell" of their cups in the front of the room.

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