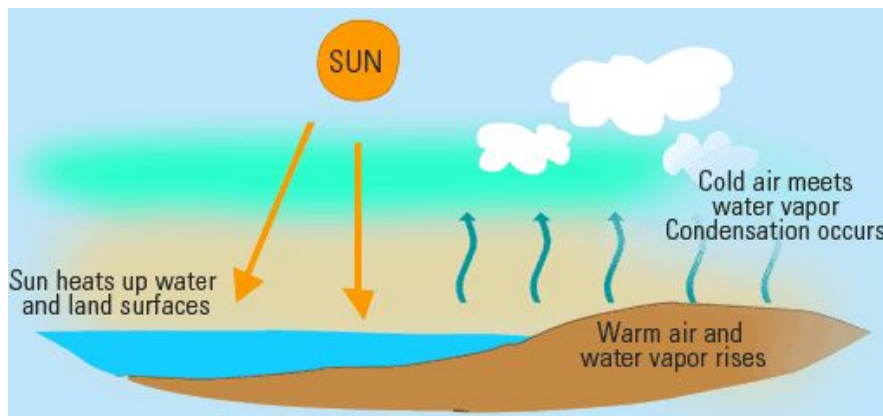


# Cloud in a Cup Lab

**Condensation** is the part of the water cycle responsible for the formation of **clouds**. Clouds form when air containing water vapor near the Earth's surface is warmed by the sun. The warm air becomes **less dense**, causing it to **evaporate** and **rise**. As the air rises, it cools to the point that the water vapor molecules slow down enough that they condense, forming **liquid water** and **clouds**. The clouds may eventually collect too much water to hold and release it as **precipitation** back to Earth's surface. This process will also often result in various contaminants being removed from the water as the water evaporates into the atmosphere.



In this lab we will model the physical processes of condensation and cloud formation. We will investigate the following question.

**What will happen as water vapor rises and cools inside a cup?**

## Prelab

1. Identify and describe the process that adds water vapor to Earth's atmosphere.
2. Identify and describe the process that turns water vapor into liquid water and clouds.
3. Complete the hypothesis for the question in this lab.

**If** water vapor rises and cools, **then** the gas will \_\_\_\_\_ to form a \_\_\_\_\_ **because** the water molecules will \_\_\_\_\_ energy and the molecules will get closer together.

## **Procedure 1**

1. Measure **150mL** of HOT water. **CAUTION, IT'S HOT ENOUGH TO BURN YOUR SKIN.**
2. Pour the hot water into the white Styrofoam cup.
3. Place the clear plastic cup on top of the Styrofoam cup as shown.
4. Observe what happens for **3 minutes**.
5. After your observations, use a paper towel to dry the inside of the clear cup.



## **Procedure 2 (contaminated water)**

1. Measure **150mL** of HOT water. **CAUTION, IT'S HOT ENOUGH TO BURN YOUR SKIN.**
2. Pour the hot water into the white Styrofoam cup.
3. Add a Skittle or two drops of food coloring to the water in the Styrofoam cup.
4. Place the clear plastic cup on top of the Styrofoam cup as shown.
5. Observe what happens for **3 minutes**.
6. After your observations, use a paper towel to dry the inside of the clear cup.=

## **Post Lab**

1. Remove the top cup and feel inside, especially at the very top. Describe what you feel on the inside the cup.
2. In procedure 2 with the contaminated water, what color was the liquid water that formed on the inside of the cup?
3. What does this mean for water that evaporates from Earth's oceans?
4. Draw a diagram to show what occurred with the water molecules in this lab. Label where on your diagram **evaporation** and where **condensation** is taking place.

5. Using your data as evidence, write a conclusion for this lab in **RACE format**.

**Restate and Answer in red, Cite evidence in blue, Explain in green, Summary in purple**

**What will happen as water vapor rises and cools inside a cup?**