



Try This at Home Science: Shaving Cream Clouds

Activity Overview:

Observe how the precipitation portion of the water cycle works!

Materials:

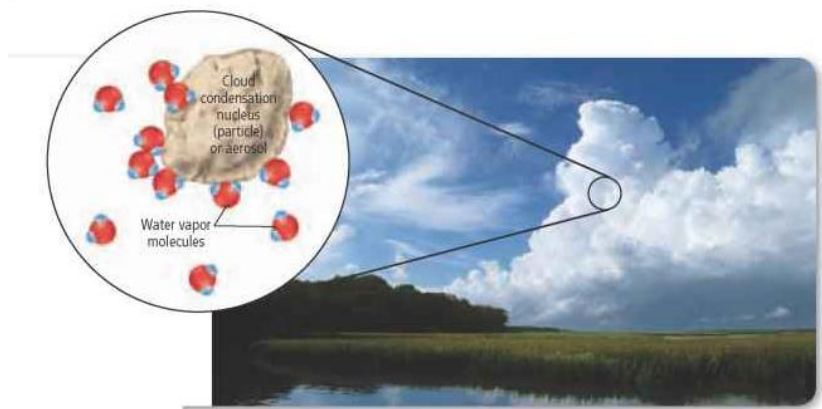
- 1 Clear glass
- At least 1 additional glass or bowl
- Water
- Liquid Food Coloring
- Shaving Cream
- Pipette or 5mL syringe
- Towels

Try this!

1. Fill your clear glass thirds full with water.
2. Fill the remaining space with a shaving cream “cloud”.
3. Place 3-5 drops of food coloring into your additional glass or bowl and fill with water until the water has reached your desired shade (darker colors will work better).
4. Fill your pipette or 5mL syringe with colored water and slowly drip the colored water on top of the shaving cream, one drop at a time. Try to count the drops until you complete step 5 below.
5. Continue to add colored water until you see the colors “precipitating” out of the bottom of your cloud, into the clear water underneath.
6. Clean up by washing materials down the sink, and wipe up any spills with towels.

What’s happening?

When the sun warms collections of water on Earth like ponds, lakes, puddles, and oceans; the water increases in temperature causing the molecules to become excited and evaporate into water vapor. Since heat rises, the water molecules will rise into the atmosphere until they reach cooler temperatures high above the Earth’s surface.



At this point, if there are dust particles, ice crystals, or pollution in the air (called condensation nuclei) the water vapor will attach to the nuclei to form clouds.

Once the nuclei have had enough water vapor condense on them, the weight becomes too great to continue to be held up by the cloud, and the process of precipitation begins. Precipitation can come in many forms, including: rain, sleet, snow, freezing rain, and hail. What we observe on the surface of Earth is determined by the air temperatures between the clouds and the ground.



The water in the clear glass is representing the atmosphere between the Earth and the clouds. The shaving cream represents the condensation of the cloud, and the colored water represents the water droplets condensing within the cloud in the upper atmosphere. Finally, the colored water coming out from the bottom of the “cloud” represents precipitation falling to Earth.

In order for the colored water to make its way through the shaving cream cloud and into the clear water, a collection needs to form in a single place on the cloud. Once that collection has grown heavy enough, the colored water will force its way through the shaving cream and out the bottom, creating a cascade of color.

Now try...

- Use warm water for the “atmosphere”, and cold water for the colored “rain”. What did you notice? Did the experiment run faster or slower than before? Was it easier or harder to see the “precipitation”?
- Use cold water for the “atmosphere”, and warm water for the colored “rain”. What did you notice? Did the experiment run faster or slower than before? Was it easier or harder to see the “precipitation”?
- Add small beads into the cloud as larger “condensation nuclei” and repeat the experiment. What did you notice? Was the rate of “precipitation” faster or slower than before?

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