



## WOW at Home Lesson Plan Rain Clouds

**Program Duration:**

10-15 min

**Recommended Grade Levels:**

K-5

**Materials Needed:**

- White shaving cream
- Blue food coloring
- Water
- Clear plastic cups or glasses
- Plastic droppers
- Sponge

**Learning Objectives**

Students will learn about clouds and how they produce rainfall, as well as the water cycle.

**Preparation**

- Ask your child what they think clouds are made of
- Discuss with them where water in oceans and lakes comes from
- Ask them to describe differences between rain and snow

**Background**

When it rains outside, we see the rain fall from clouds. But where does that water come from? On Earth, the amount of water always stays the same and is cycled through different environments. The water cycle describes this event: water in oceans and lakes evaporates into the atmosphere, this water condenses back into tiny water droplets to form clouds, then the water returns to Earth by rainfall. See the water cycle diagram at the end of this document.

Rain clouds are made up of the tiny water droplets grouped together in the air, as well as gas in the form of water vapor. When enough of these droplets combine, they become heavy and are more likely to fall from the clouds in the form of rain. Rain is also the result of warm air cooling, which condenses the water vapor part of clouds into water and raindrops. This activity includes two simulations of rain clouds for students to learn about how rain is produced.

**Activity A: Cloud in a Cup**

1. Fill a clear cup or glass halfway with water
2. Dispense a layer of shaving cream on the surface of the water – this is our cloud!
3. Mix blue food coloring with water in a separate cup – this is our rain!
4. Use the dropper to add the blue rainwater drips to the shaving cream cloud
5. Observe the rainwater traveling from the top to the bottom of the cloud and finally exiting as rain below the cloud into the clear water

**Activity B: Sponge Cloud**

1. Lay a sponge over the top of an empty cup, glass, or plastic container – this is our cloud!
2. Take a dropper and fill up with water. Start dripping drops of water to the sponge.
3. Continue adding water until the sponge starts to drip rainwater

4. Observe that the cloud sponge first had to be fully saturated with rainwater before it started to drip
5. You can try this experiment over and over again by wringing out the sponge of water and trying again. If you rather have this activity go by quickly, you can also slowly pour water onto the sponge instead of adding it by drops.

### Questions

1. Where does water go in the water cycle after it rains?
2. Why can we see clouds even when it doesn't rain?
3. How are these two activities similar?
4. What does the shaving cream represent in the first activity? What does the sponge represent in the second activity?

### Summary

These experiments were two examples of cloud simulations. In the first experiment, our shaving cream cloud showed how rain travels through a cloud and eventually comes out the bottom as rain. In the second experiment, our sponge cloud showed how clouds need to accumulate a certain amount of rainwater before finally being able to rain. Another characteristic of rain clouds is their dark color. This dark color comes from the groups of water droplets and water vapor scattering sunlight, limiting the amount of light that is able to pass through it. Clouds have varying shades of darkness based on the amount and size of water droplet groupings. Next time it rains, be sure to pay attention to the clouds and think about what they are made of!

### Sources

Shaving Cream Rain Cloud Science Experiment – 2017, Midget Momma, [www.midgetmomma.com](http://www.midgetmomma.com) and 2015, Megan, CoffeeCupandCrayons <https://www.coffeecupsandcrayons.com/make-rain-cloud-jar/>

Raining Sponge – 2015, The Pinterested Parent, [www.thepinterestedparent.com](http://www.thepinterestedparent.com)

Cloud Science Experiments from Home Science Tools: water cycle experiment plus rain cloud in a jar <https://learning-center.homesciencetools.com/article/clouds-and-rain/>

