

Bay Area Scientists in Schools Presentation Plan

Lesson Name The Water Cycle

Presenter(s) UC Berkeley PhD students

Grade Level 1

Standards Connection(s) Earth Sciences, physics sciences

CA Science Content Standards: 1st grade

Earth Sciences: Weather can be observed, measured, and described.

Physical Sciences: Materials come in different forms (states), including solids, liquids, and gases.

Next Generation Science Standards:

Connections by topic:

Kindergarten: Weather and climate

2nd grade: Earth's systems: Processes that shape the earth

Scientific and Engineering Practices:

1. Asking questions and defining problems
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
6. Constructing explanations
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

Crosscutting Concepts:

1. Patterns
2. Cause and effect: Mechanism and explanation
3. Scale, proportion, and quantity
4. Systems and system models
5. Energy and matter: Flows, cycles, and conservation
7. Stability and change



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Teaser:

Your opportunity to tell teachers and kids what's going to be fun and interesting about your visit!

From making our own clouds, "rain", and "snow" in cups to learning about water in the environment, we'll be exploring the water cycle with hands-on crafts and activities. Students will make and decorate a miniature solar-powered water cycle of their own to take home with them.

Objective: *As a result of your lesson, what will students learn? What will they be able to do?*

Water moves through the air and earth in the water cycle.

Clouds, rain, and snow are made of water.

Warm water rises into the air, then turns into clouds.

Vocabulary/Definitions:

3 – 6 important (new) words

Water cycle

Experiment

Hypothesis

Water vapor

Condense

Materials:

What will you bring with you?

Paper towels

Clear plastic cups

Snow: baking soda, hair conditioner, large plastic container

Rain cloud: aerosol shaving cream, blue food coloring (diluted), transfer pipettes

Condensed clouds: Electric kettle, salt, blue food coloring, transfer pipettes

Take-home water cycle: small Ziplock bags, permanent markers

What should students have ready (pencils, paper, scissors)? Nothing necessary

Classroom Set-up:

Student grouping, Power/Water, A/V, Light/Dark, set-up/clean-up time needed

Water – request that classrooms have a sink

Desks arranged into 3 stations

Central area for gathering everyone (e.g., on a rug)

Classroom Visit**1. Personal Introduction:**

2 Minutes

Who are you? What do you want to share with students and why? How will you connect this with students' interests and experiences?

Hello! We are scientists and engineers at UC Berkeley. We study all different things, but what we have in common is that we like to ask questions to learn how things work. (Each teacher gives name and simplified area of study.)



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Topic Introduction:**10 Minutes**

What questions will you ask to learn from students? Big Idea(s), vocabulary, assessing prior knowledge...

What are clouds made of? (water)

Where does the water we drink come from? (rain, snow)

Read out loud the story "The Little Raindrop."

Where does Little Raindrop go? Use the story of the Little Raindrop to guide you as you draw the water cycle on the board, starting from a cloud, then rain, then a stream, an ocean, and back into the cloud with the help of the sun. This is the water cycle!

After this, take a minute or two to connect the book to the upcoming activities: "Now we're going to learn more about the water cycle, by being scientists! We're going to split you up into 3 groups, and you'll all have the chance to do four great science experiments."

Explain how you will signal for attention. "When I clap like this, all eyes on me," etc.

Then a few moments for them to go to their first stations, settle down, etc.

2. Learning Experience(s):**30 Minutes**

What will you do, what will kids do? Demonstrations, hands-on activities, images, games, discussion, writing, measuring... Describe in order, including instructions to kids.

Split students into 3 groups (8-10 students each). Each group will go to a different station. Groups will rotate between stations so that everyone tries each activity. At any point, if you end up with one of the activities running short, engage the kids with Q&A – either about the demo itself, or if that doesn't work for some reason, ask them about the water cycle more broadly; or, what they know about science, whether they have questions about what it's like to be a scientist, etc.

a. Rain and snow:

"How did the Little Raindrop start out? He fell out of a cloud! Why do raindrops come from clouds? Have you ever been in a cloud (fog)? Tiny baby raindrops float around inside clouds until they join together to make raindrops heavy enough to fall as rain. You can make rain in a cup that does the same thing."

- Give each student a plastic cup. Half-fill with water and top with a shaving cream cloud.
- Supply blue food coloring in a shared stock with transfer pipettes.
- Show students how to squeeze several drops of food coloring on top of the cloud.
- Wait for the food coloring "rain" to fall out of the bottom.

"Can you name something else that falls from a cloud? Hint: it's really cold. Snow! When it's so cold it makes ice, water in clouds falls as snow. Why don't we have snow in California? Have you ever seen snow? Where I grew up, we played in the snow every winter. You could make snowmen and snowforts with it."

- In the plastic container, mix the baking soda and hair conditioner with a large spoon, or your hands.
- Let students play in the "snow box" – make snowmen! No snowballs allowed.
- Wipe hands with paper towels before moving to the next station.

b. Warm water rises and turns into clouds:

Fill up an electric kettle and turn it on. "Do you remember what happened when Little Raindrop washed up on the beach at the end of the book?" (He warmed up in the sun and

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joined another cloud.) “This kettle is heating up the water. What do you think is going to happen?” (Steam will come out.) “A lot of clouds come from the salty water in the ocean. Can the salt go up into the clouds too? To find out, we are going to do an experiment.”

- Give each student a cup half full of water with salt and food coloring in it. If a kid is allergic to food coloring, make a cup without.
- Add a transfer pipette’s worth of hot water to the cups and stir to distribute the heat.
- Ask students to cover their cups with a second cup upside down on top.
- Observe the condensation that forms inside the cups. “What color is it? Is it salty? Do you think ocean clouds taste as salty as the ocean? Why did you change your mind?”

c. Water cycle in a bag:

- Pass out snack-size ziplock bags and permanent markers.
- Draw a water cycle! Include the sun, a cloud, rain, and a body of water.
- When you are done, help students add a splash of water to their bags and seal the top. Write each student’s name at the top with a permanent marker.
- Collect the bags somewhere out of the way.
 - Teacher can tape the bags to a window with sunlight. Follow-up activity: observe what happens.
 - Students can take them home at the end of the day. Ask an adult to tape the ziplock bag to a window with sunlight. Warm water will condense in the bag, making “clouds” and “raindrops”.

3. **Wrap-up: Sharing Experiences** 10 Minutes

Putting the pieces together – how will students share learning, interpret experience, build vocabulary?

Gather everyone together at the center of the room. Ask, “What did you do at ___’s station? What did you learn?” Ask questions to test comprehension, such as “What happens to water when it dries up? Where does it go?” Direct attention back to the vocabulary and water cycle written on the board.

4. **Connections & Close:** 5 Minutes

What else might kids relate this to from their real-life experience? How can they learn more? Thanks and good-bye! Clean-up.

California is in a drought! What does that mean? Where did our water go? How can we use our water responsibly?

Can you think of any questions for us? (Topics include: the water cycle, science, what it’s like to be a scientist)

Total 50 – 60 Minutes

Follow-up – After Presentation

Suggest students write a letter explaining “How we learned about _____”
List or attach examples of activities, websites, connections for additional learning.

- Plants can “drink” water! It just takes time. To see it, put a celery stalk in a glass of water with food coloring. The color will travel up the stalk. Stems have structures like tiny straws that help plants suck up water.
- When water dries up, it leaves behind any salt that was dissolved in it. Try leaving very salty or sugary water out with a string dangling in it to make rock salt or rock candy.

Attach worksheets, hand-outs, visuals used in classroom presentation.