



LESSON PLAN

WATER CYCLE GRADES 3-5

SUMMARY

Students identify the different forms water takes in our world and explore how water changes from one form to another.



5-ESS2-1 Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.

Science & Engineering Practices	Connections to Classroom Activity
<p>Developing and Using Models (5-ESS2-1)</p>	<ul style="list-style-type: none"> • Create, observe, record and analyze findings and explanations in a water cycle modeling activity.
Disciplinary Core Ideas	Connections to Classroom Activity
<p>ESS2.A: Earth Materials and Systems</p> <p>Earth’s major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth’s surface materials and processes. The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate. Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather. (5-ESS2-1)</p>	<ul style="list-style-type: none"> • Represent the hydrologic system at work on Earth’s surface - evaporation from large bodies of water, condensation that forms clouds, and precipitation that returns water to the Earth’s surface.

Crosscutting Concepts

Connections to Classroom Activity

Systems and System Models (5-ESS2-1)

- Identify processes in the water cycle
- Create water cycle models

DURATION

One 50-minute lesson

PRE-ASSESSMENT QUESTIONS

Please see Discussion Questions. These can be discussed as a group or answered individually in student science notebooks.



ENGAGE

Set up the Solar Bowl evaporation/condensation demonstration as described at the end of the lesson plan.

Ask students for ideas of what they think will happen in the different bowls while they sit in the sun. Record their ideas on paper or the board, to refer to later.



EXPLORE



WATCH THE GENERATION GENIUS WATER CYCLE VIDEO.

After the video, discuss what is happening in each activity in the video. Create a list with descriptions of the water cycle processes seen in the Generation Genius Water Cycle video (condensation, evaporation, precipitation, and so forth). Return to the parts of the video that show each activity, if needed, and discuss what students see happening in each activity.

Ask:

- What is the water doing in each activity? Is it staying in the same form or changing forms? (changing forms) What form is it taking on? (vapor or gas, liquid, solid)
- What does it take to cause water to change forms? (energy) Where does the energy come from in the video? (various ways of producing heat)
- Do you think the water ever disappears entirely? (no) Why or why not? (because it just changes form, it doesn't go away)

MATERIALS

- Science notebooks
- Pencils

Solar Bowl Demonstration

- A large bowl and a smaller bowl
- Glass of water
- Small amount of grass and dirt
- Sheet of plastic wrap, enough to cover large bowl
- Big rubber band
- A few coins
- A sunny window

Student Water Cycle Models

- Large sheets of paper or poster boards
- Markers



EXPLAIN

Retrieve the Solar Bowl from the window. Have the class gather around to observe what has occurred in the different bowls. Write their observations on the same paper as the class predictions. Compare the predictions. Using the class list of water cycle processes generated from the information learned in the video, identify the water cycle processes that took place in the two bowls (evaporation, condensation, and precipitation).

Ask students to describe the differences between the water left behind in the big bowl compared to the water that collected in the small bowl. (The water in the big bowl still contains the grass and dirt. The water in the small bowl should be clear and possibly warm to touch.) Ask students whether they think that the solar bowl demonstrated the distillation process, and if so, what their evidence is.

Claim-Evidence-Reasoning Explanations

Using the **GENERATION GENIUS WATER CYCLE VIDEO** information, work with the class to write a Claim-Evidence-Reasoning (CER) statement to explain how the Solar Bowl works.

Tell the class that they made a claim that water evaporated out of the big bowl, and then condensed on the plastic covering the bowls and precipitated into the small bowl.

Ask: How did they tell—or what is the evidence—that showed that evaporation and condensation took place? These are the students' observations: that there is less water in the big bowl, and there is water in the small bowl when there wasn't any before. There may also be water droplets on the plastic covering, and the water in the small bowl may be warm.

Ask students to identify the scientific process they know about, which the solar bowl demonstrated, that supports their claim—their reasoning: the steps of the water cycle.

Generate a class CER statement using the sentence framework:

I think [include claim here]. I think this because [include evidence here]. This matches what I know about [including reasoning here].

Completed CER for reference:

I think the water evaporated out of the big bowl, condensed on the plastic covering, and precipitated into the smaller bowl. I think this because there is less water in the big bowl, and there is water in the small bowl when there wasn't any before. There are water droplets on the plastic covering, and the water in the small bowl is warm. This matches what I know about how the water cycle works and the distillation process.

Have students record the completed CER in their science notebooks.

Student Water Cycle Models

In teams of two, or individually, have students design and draw a depiction of the water cycle processes they have just witnessed and discussed. Their models must include the 3 major processes of the water cycle—evaporation, condensation, and precipitation—and show how those processes are related. Their models must show how water can change form as it moves through those processes and what is driving the process.



ELABORATE

Ask the class to discuss among themselves (with their table partners or shoulder buddies) where these processes are taking place on Earth right now.

Ask:

Share the group discussions aloud as a whole class and affirm with the class that the water in large bowl of the Solar

Bowl represents open bodies of water on Earth (oceans, lakes) and the plastic covering (in the Generation Genius Water Cycle video—steel drum activity—it's the bag of ice) represents the upper atmosphere (where temperatures are colder than at the Earth's surface), and the sun provides energy to heat (and evaporate) the water.



EVALUATE

The Student Water Cycle models are visual assessments that can show how well students understand the interrelationships between water cycle processes and the forms of water. The CER explanations provide a written assessment of the students' understanding of the water cycle processes. The class discussions help to assess student understanding of how the various video and class activities represent natural processes on Earth.



EXTENSIONS

Students can extend their learning and understanding by researching where on Earth various forms of water are found. They can research the types of clouds that have been recognized and categorized (cirrus, cumulus, and so forth), and the formation processes for various types of clouds. Students can research extreme weather events and identify the water cycle processes that took place to create those events.

The class can create an enclosed growing structure to grow green plants to explore the effects of plant transpiration on water vapor in the atmosphere.

The class can take a walking field trip after a rain or snow event to explore changing water forms in the natural world.

