Round and Round

Summary

Students create their own water cycle story and storyboard and teach what they've learned to a younger audience.

Group Size

Small Groups

Materials

- Frisbee®
- Black marker
- *Singing in Our Garden*
- Chart paper
- Watercolors
- Crayons
- Paper

Additional Resources

Books

Water Dance, by Thomas Locker; ISBN 0-15-216396-4

Where the River Begins, by Thomas Locker; ISBN 0-14-054595-6

The Earth Science Book -- Activities for Kids, by Dinah Zike; ISBN 0-471-57166-0

Daily Warm-ups -- Earth Science, by Walch Publishing; ISBN 0-8251-4454-X

Picture-Perfect Science Lessons, by Karen Rohrich Ansberry and Emily Morgan; ISBN 0- 87355-243-1

More Picture-Perfect Science Lessons, by Karen Ansberry and Emily Morgan; ISBN 978-1- 93353-112-0

Media

Singing in our Garden, CD, Banana Slug Band; ISBN 680598 00272 5

What's the Weather, Puppets - 6 hand puppets that facilitate this activity. Oriental Trading, Hands on Fun Catalog, Summer 2008 MV-58/1017, pg. 86.

Background for Teachers

Water is such a basic life sustenance that it is easy to take for granted. Water is a substance that can naturally occur in three different forms, solid, liquid, and gas. The solid form of water can be found in the glaciers and ice caps on the opposite poles of Earth. We are most familiar with water in its liquid form. We see it in our lakes, rivers, streams, and oceans. Water vapor rises into the atmosphere and condenses back into a liquid through clouds, fog, and mist. The water then falls to Earth in the form of rain, hail, sleet, and snow to nourish our planet and sustain life.

Much of Earth's water is in constant motion, and the water cycle describes the continuous movement of water on, above, and below the surface of Earth. The water cycle is truly a "cycle," with no beginning or end. The vocabulary words, evaporation, condensation, and precipitation describe the continuous movement of water into the air and ground, onto and over land and back.

This activity will take 2-4 class periods, depending on how involved the students are in creating the final product.

Intended Learning Outcomes

1. Use science process and thinking skills

3. Understand important science concepts and principles.
4. Communicate effectively using science language and reasoning.

Instructional Procedures

Invitation to Learn

With a permanent marker write Evaporation, Condensation, and Precipitation around the perimeter of a Frisbee®. Write WATER CYCLE in the center of the disc. Have students stand in a circle. Toss the Frisbee® to a student. Have the student recite the steps of the water cycle from where their hand caught the disc. For example, if the disc is caught on the word "Evaporation," the student will tell what happens when water evaporates and relate the next steps in the cycle after evaporation, which are condensation and precipitation. This can be repeated as often as desired. For the second round, play the song "Water Cycle Boogie" and toss the disc around the circle. When a student catches the disc on a water cycle "step" they will act out the word. For example, if the disc is caught on "precipitation," the student will indicate a downward motion. If it is caught on "evaporation," the student will indicate an "up" motion. To add to their movement have the students go "round and round" in the circle as they toss the Frisbee® back and forth to each other.

Instructional Procedures

Divide the class into 4-5 groups. Provide each group with review resources about the water cycle. (See the booklist from the Dino Drool activity) There is a student reference guide at http://www.schools.utah.gov/curr/science/core/4th/TRB4/default.htm that can be downloaded and distributed to students.

On an easel sized Post-it®, have students write down the information they think is important to know for someone who is just learning about the water cycle. Tell them they are becoming authors of their own water cycle book. Play the "Water Cycle Boogie" as they work. Instruct the groups to use the song's organization to help them create their story.

Once the students have determined how they want their facts to be represented, give each group another easel sheet and have them create a rough draft "storyboard", complete with text and illustrations.

The final draft can be on any type of paper. Markers, colored pencils, crayons, and watercolors can be used to create color and interest in the illustrations. The students can choose to make a book, a final storyboard, a DVD, or a mural.

Have students share their final product and teach the water cycle to a younger audience. If there is an opportunity for a school wide science fair or other school wide audience, have students share their product.

Extensions

Curriculum Extensions/Adaptations/ Integration

Science - Cover a medium sized box with question marks. Put a container of water inside the box. Invite students to ask questions so they can determine what is inside. Instruct students to ask three types of questions:

Does it _____? / Can it _____? (verbs)
Is it_____/ (adjectives)
Does it have_____? (nouns)

They may want to ask specific questions like, "Is it a leaf?" or "Is it a spider?" right off the bat. The purpose of asking the above questions is to help the students gather information so they can make an educated inference about what is in the mystery box, not a lucky guess.

A student/teacher exchange might go like this:

Student: "Can it move?"

Teacher: "Yes, it can move."

Student: "Does it have six or more legs?"
Teacher: "No, it does not have six or more legs."
Student: "Does it have four legs?"
Teacher: "No, it doesn't have four legs."
Student: "Does it have legs?"
Teacher: "No, it does not have legs."
Student; "Is it a snake?"
Teacher: "No, it is not a snake."
This exchange may give you an idea of how to answer and guide the inquiry. You can introduce the properties of water through this type of question/answer activity. Just because it moves, does not mean it is an animal! Water also conducts electricity, but it is not metal!
As the teacher and student exchange information, write down the responses on three pieces of chart paper with the headings, verbs, adjectives, and nouns. Stop the questioning when you feel he students can make an educated inference about the mystery box's content. Ask them to write or draw what they think the mystery object is using this lead, "I think/infer that the mystery object is _____. You can also ask, "Are you 100% certain?" Point out that the questioning process is vital to science understanding and discovery.
At the end of the questioning, the container of water is revealed. Make the list of nouns, verbs, and adjectives available to help the class continue their inquiry into water and to journal their science experience.

Divide students into four groups to participate in four stations. Students will record their observations, draw pictures, and make inferences about each step in the water cycle in their journals.
Evaporation Station
Condensation Station
Precipitation Station
Water Cycle Station
Read the book *Water Dance* by Thomas Locker. Identify the nouns, verbs, and adjectives that describe each part of the water cycle from the book, under the word strips, evaporation, condensation, precipitation, and water cycle.
Invite students to highlight and identify the words on the posters that best describe the water cycle according to what they have come to understand through their experiments and experience and highlight them on the posters.
Ask students, "What have you learned?" Direct them to write a reflection about their learning over the past few days. Have them look at their predictions, their observations and their inferences about the water cycle in their journals. Instruct them that they will need to use the water cycle vocabulary in a meaningful way, using the parts of speech displayed and discussed in class to help the reader understand the water cycle and its importance to our planet.
Language Arts/Visual Arts -- Have students create their own "Water Dance " book using their reflection vocabulary and watercolors.
Science /Social Studies -- Have students do Internet research on different world biomes, rain forest. desert, wetland, etc and graph the different amounts of annual rainfall in these areas. Do the same for Utah counties and compare and contrast Utah's rainfall with other world biomes.

Family Connections

Have students share their water cycle reflection with their family. Discuss other parts of speech that describe the water cycle to help create understanding of the water cycle process.
Students can perform a "Water Cycle Boogie" for their family.
Students can use their final product to teach their family about the water cycle.

Assessment Plan

Photograph interview -- see Dino Drool activity.

- Card sorts
  -- This type of assessment measures student attitude and knowledge toward science and what type of science student they are.

Print individual cards with the water cycle vocabulary and attitude descriptions. Allow students to group the cards according to the water cycle and have them match science attitude cards to their science knowledge. Attitude cards such as, "Thinks up good questions" or "Thinks up own ideas to study" are paired with knowledge cards such as " Precipitation is_____". (Student fills in the blank.) You can use this assessment at the beginning, middle and end of an activity to measure understanding.

Bibliography

Research Basis

Harlen, W. (2001). *Primary Science...taking the plunge; How to teach primary science more effectively for ages 5 to 12*. Portsmouth, NH: Heinemann.

An increase in student learning occurs when students have opportunities to discuss what they have observed and inferred in small groups and as a class. Elementary students' science learning needs to be scaffolded around a metacognative approach, where students are asked to think about what they know (what they can directly observe) and what they do not directly know (what they need to infer).

Kluger, B. B., (1999). *Inquiry thoughts, views, and strategies for the K-5 classroom*. National Science Foundation, Arlington, VA.

In inquiry-based classrooms, teachers support students as active learners as they explore, carefully observe, plan and carry out investigations, communicate through varied methods, propose explanations and solutions, propose thoughtful questions, and critique their science practices. Good science inquiry provides many entry points--ways in which students can approach a new topic--and a wide variety of activities during student work.

Authors

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