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Field Biology
Professor MacPhail
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Lesson: The Water Cycle

Age Level: 3rd Grade

Standards: 3.3.5 Give examples of how change, such as weather patterns, is a continual process occurring on Earth

Objectives:

1. After participating in the condensation station, students will be able to explain cloud formation.
2. After participating in the precipitation station, students will be able to explain saturation and precipitation.
3. After participating in the evaporation station, students will be able to explain where the water that disappears from the Earth goes.
4. After the completion of the entire lesson, the students will be able to explain the different stages of the water cycle and how they relate to each other.

Materials:

Blank KWL chart, Markers, Hotpot, Warm Water, Measuring Cup, Sponges, Salt Shaker, 2 Glass Jars, 3 Metal Pie Pans, Bunsen burner, ring, ringstand, Ice, Matches, Ice, Plastic Bags to hold ice (1 per group), Sheet of Black Paper, Flashlight, CD with song Water Cycle Boogie

Step by Step Plan:

1. As a whole class have the students do the first two sections of the KWL chart.
2. Split the class into three groups having each group start at one of the following stations.

Evaporation:

1. Pour 2 cups of water into the hotpot and turn on.
2. Explain what evaporation/transpiration is.
3. Let the kids observe the steam coming from the hot pot.
4. Pour the water back into the measuring cup and show some of the water is gone.
5. Question what happened.
 - Why isn't there the same amount of water?
 - Where did the water go?
 - Does the water have to be boiled to evaporate?
6. Explain how it connects with the water cycle.

Condensation:

1. (Teacher) Explain the definition of process of condensation.
2. Tape a piece of black paper onto one side of the glass jar. (On the outside)
3. Add warm water to the jar and fill it about 1/3 full.

4. (Teacher) Light a match and hold it in the jar for a few seconds. Then drop the match in the jar.
5. Immediately cover the jar with a bag of ice.
6. Shine the flashlight on the side of the jar that does not have the black paper on it. Watch closely and observe a cloud forming in the jar.
7. (Teacher) Discuss with the students what caused the cloud to form in the jar:
 - What interactions do you see happening in the jar?
 - Where did the cloud come from?
 - Why did we use warm water in the jar and ice on top?
 - Why did we light a match and drop it in the jar?
8. (Teacher) Explain how the process of condensation connects with the water cycle.

Precipitation:

1. Set up 3 pie tins with water. Have sponges and salt shakers with each pan.
 2. Let students experiment with sponges and water for 2 minutes.
 3. Ask questions:
 - At what point do water droplets fall from the “cloud” (sponge)
 - Explain saturation
 4. Ask, “What is it called when water droplets fall to the earth as rain?”
 5. Explain precipitation.
 6. Do experiment
 - Fill pie tin with ice
 - Fill jar with hot water and stick in pie tin
 - What is happening now? Is it raining in the jar?
 - Light a match and drop into jar, returning lid immediately
 - Talk about why there is dirt in the water cycle
 7. What did you learn about precipitation?
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3. Bring the class back together and play the Water Cycle Boogie (show the motions as it is played).
 4. Have the student complete the last part of the KWL chart with the knowledge that they have learned.

Summary of the Development of the Lesson:

Our group began by agreeing on a topic from several ideas that were suggested. We decided on the Water Cycle because it has definite possibilities for stations. We met and split our group of five people into three groups, the condensation group, the precipitation group, and the evaporation group. From here each group met and picked out an experiment that could be performed in front of a group of students in approximately five minutes. Our entire group met again and Elizabeth suggested we use a KWL chart to test the kids prior knowledge as well as what they learned at the end to assess our presentation. Jessica suggested a song called the water cycle boogie be used to tie everything together at the end. We did a run through of what we would do and who would say what during our presentation. Finally, we wrote our objectives from the standard we had found for our age group and concluded we had everything prepared.

Timeline

- 3/22 Several emails were sent to the group with suggestions on websites and ideas for topics. We decided to do the Water Cycle as our topic and to use stations in our presentation.
- 4/5 Group Meeting in the Library. At this meeting we split up the stations, decided to include the song and the KWL chart, and set our last meeting time so we would have time to run through our presentation.
- 4/10 The precipitation group emailed about ideas for experiments, and decided on an experiment to perform.
- 4/19 The evaporation group found an idea for an experiment with spinach leaves and transpiration. After trying it out they decided it would take too long.
- 4/22 The condensation group used email to set up a meeting time for Sunday April 24.
- 4/24 The condensation group met and looked for an experiment that dealt with condensation.
- 4/28 The precipitation group met and went over the experiment and wrote out their procedure.
- 4/29 The evaporation group decided to use a boiling experiment for the station and have the students observe a difference in water levels after boiling water.
- 4/30 The condensation group used email to set up a meeting for Sunday May 1. A group email was sent out to gather procedures and material lists before the final meeting.
- 5/1 The condensation group met and wrote out the procedure and materials, then did a basic run-through.
- 5/2 The entire group met and did a run through of the presentation.