Lesson Title	The Water Cycle
Length of Lesson	50 minutes
Created By	Claire Babineaux
Subject	General Science
Grade Level	8th
State Standards	3.e, 4.c
DOK Level	2
DOK Application	Infer, Summarize, Relate
National Standards	D
Graduate Research Element	The water cycle is an important aspect of geology and coastal geomorphology.

Student Learning Goal:
The learning goal for the students in this lesson is to understand what a cycle is, what the water cycle is, the processes involved in the water cycle, and the different paths a water molecule may take along the water cycle. The main focus of this lesson will be the defining terms and processes of the water cycle.

State Standards:
3. Compare and contrast the structure and functions of the cell, levels of organization of living things, basis of heredity, and adaptations that explain variations in populations.

e. Explain energy flow in a specified ecosystem. (DOK 2)

- Populations, communities, and habitats
- Niches, ecosystems and biomes
- Producers, consumers and decomposers in an ecosystem

4. Describe the Earth's System in terms of its position to objects in the universe, structure and composition, climate, and renewable and nonrenewable resources.

c. Examine weather forecasting and describe how meteorologists use atmospheric features and technology to predict the weather. (DOK 2)

- Temperature, precipitation, wind (speed/direction), dew point, relative humidity, and barometric pressure
- How the thermal energy transferred to the air results in vertical and horizontal movement of air masses, Coriolis effect
- Global wind patterns (e.g., trade winds, westerlies, jet streams)
- Satellites and computer modeling

National Standards:
D: Structure of the Earth System: Water, which covers the majority of the earth's surface, circulates through the curst, oceans, and atmosphere in what is known as the 'water cycle'. Water evaporates from the earth's surface, rises and cools as it moves to higher elevations, condenses as rain or snow, and falls to the surface where it collects in lakes, oceans, soil, and in rocks underground.

Materials Needed (supplies, hand-outs, resources):
Game, instructions (see teacher notes), activity worksheet, PowerPoint for lesson or white/chalk board

Lesson Performance Task/Assessment:
The task/assessment for the students will be a PowerPoint lesson about the water cycle, a guided discussion on the processes that are associated with the water cycles (the paths a water molecule may follow), and how the water cycle is not a perfect circle.

Lesson Relevance to Performance Task and Students:
Being in the Southeastern United States in Central Mississippi, the students have experienced many storms and it is important that while learning about the atmosphere, that they learn about water cycle and how it is involved with the weather they experience.

Anticipatory Set/Capture Interest:
In order to capture the interest of the students, the teacher can show a video of the water cycle. The one included in the PowerPoint for this lesson is The Water Cycle Rap. The song covers the processes and steps in the water cycle and is presented in a way that the students can relate to and/or find interesting.

Guided Practice:
Prior to the lesson on the water cycle, the teacher can implement a game on the water cycle. See instructions in Teacher's Notes. The game will help the students to develop an understanding that the water cycle is not a perfect circle and has many components.

Following the lesson on the water cycle, the teacher can then proceed to lead the students in a discussion of the water cycle. The following are some questions to consider:

1. In your own words, describe a cycle.
2. Describe the movement of water in the water cycle?
3. What are the processes associated with the water cycle?
4. Can you see the movement of water?
5. If all living things use water, why isn't all the water used up?

Independent Practice:
For independent practice, the students will complete the worksheet provided. The students should use the notes they took during the PowerPoint lesson and their book to answer the questions on the worksheet.

Remediation and/or Enrichment:

Remediation: Individual IEP will be followed. Additionally, the teacher may have the students work together in pairs.

Enrichment: The teacher may implement an extra credit assignment for the students to present what they have learned about the water cycle.

Check(s) for Understanding:
In order to check for a thorough understanding of the concepts presented in this lesson, the following questions can be considered:

1. What is a cycle?
2. List the processes in the water cycle.
3. Why is it important to understand the water cycle?
4. Describe a path a water molecule may follow.
5. How do clouds form?

Closure:
The closure for this lesson can be a teacher led discussion on how the water cycle applies to the graduate student's research and how the water cycle is being studied further at Mississippi State University in different applications.

Possible Alternate Subject Integrations:
Math: the rate at which water moves through different parts of the water cycle can be measured and calculated.
History: the history of the water cycle and how it has been studied in the past.
Biology: all life needs water to survive, an in depth study of how different organisms utilize water can be studied.
Physics: The knowledge and equations applicable to currents also applies water currents.

Teacher Notes:
Reference for game Instructions:
The game/Activity is called Water Wonders and can be found in the Project Learning Tree book for grades Pre K-8 for Environmental Education Activity Guide from 2006.

- *Environmental Education Activity Guide: Pre K-8.* Project Learning Tree. Washington, DC: American Forest Foundation, 2006. Print.