**Weather & Climate**

**Lesson #1:** **Introduction to the Water Cycle**

**Safety Warning:** This lesson includes the use of hot plates and heat lamps, which should not be handled by the students.

**Reminders:** Ice is not provided for this lesson. Be sure to coordinate with classroom teacher to set up a screen or projector to watch YouTube video.

**Essential Question:** How does weather and climate affect our lives?

**Standards:**

Earth and Space Science: 3-5  Standard  10-  The Water Cycle

1)      Describe how water on earth cycles in different forms and in different locations, including underground and in the atmosphere.

**Student will be able to:**

1.     Record observations and develop conclusions about the water cycle.

2.     Explain how water moves through the water cycle.

**WiDA Language Objectives**

**Reading**

Level 1: Match icons   or diagrams with words/**c**onceptsEntering students may benefit from matching the steps of the water cycle to a visual representation of the steps.

Level 3 : Sequence events in  stories or content-based processes Developing students could be presented with pictures  from  each step of the water cycle. Students could then sequence the pictures.

**Vocabulary:**

Evaporation: water changes from a liquid to a gas; occurs more rapidly at warmer temperatures

Atmosphere**:** the gases the surround the earth

Condensation: water changes from a gas to a liquid; occurs when water vapor gets cold

Precipitation: water falling to the earth in the form of rain, hail, mist, sleet, or snow

Collection**:** water that falls as precipitation comes together in bodies of water such as oceans, rivers, lakes, and streams, or underground

**Resources and Materials:**

|  |  |
| --- | --- |
| **Item** | **Amount** |
| Science notebooks |  |
| Water (not provided) | (in classroom) |
| Hot plate | 1 (in bin) |
| Metal pan | 1 (in bin) |
| Ice cubes (not provided) |  |
| Glass beaker | 1 (in bin) |
| Water cycle diagram student copies | 30 (in bin) |
| Water cycle overhead | 1 (in binder) |
| Water cycle fill-in-the-blank and vocabulary worksheet | make copies |
| Bill Nye Water Cycle Video (1:50 - 3:35)<https://www.youtube.com/watch?v=L6OeAY804MA> |  |

**Activator:**Ask the students to answer the following prompt in their science notebooks or in a class discussion:  Name things in nature that are made only of water.  Ask students to volunteer answers in order to compile a class list.  The list may include oceans, rivers, streams, ponds, lakes, clouds, rain, snow, ice, underground water, and water used and disposed of by humans.

**Introduction:**

Tell students that water moves from location to location all around the Earth.  Have students think about the following questions: Where do Clouds come from?  Where does the rain come from?  These movements are part of something called the water cycle.

**Activity:**

1.      Tell students that the process by which water moves and is changed is called the **water** **cycle**.  Write the words water cycle on the vocabulary wall.  To present a model of the water cycle, boil some water in a glass beaker on a hot plate.  Ask the students to **observe** with their eyes and ears what happens to the water.  Have students record their observations in their science journals or discuss as a class.  What makes the water evaporate or boil?

2.      *Teacher Explanation: When the water boils, it* ***transforms*** *into steam.  Steam is the gaseous form of water, which has more heat energy than liquid water.  Gas is less heavy than liquid, so it rises.  The process by which water changes into steam is called* ***evaporation****.*

3.      Hold a metal pan with ice cubes above the boiling water and ask students what they think will happen, then to watch what happens to the bottom of the pan.  Why do water droplets collect on the bottom of the pan?  Why does the steam turn back into a liquid on the metal plate?

4.      *Teacher Explanation: Ice is the solid form of water, and it cools down the pan.  When steam hits the pan, it cools down and loses heat, and it becomes a liquid in the form of water droplets.  The process by which steam cools to become water is called* ***condensation****.*

5.      When the water starts to fall off the pan and back down into the beaker, explain that this is called **precipitation**.  Precipitation happens when water droplets become heavy and fall due to gravity.  Draw a diagram of this model on the board and label the key parts and processes. Find copy of Bill Nye Water Cycle, one URL is: (<https://www.youtube.com/watch?v=L6OeAY804MA>) and watch segment from 1:50 - 3:35 to explain the water cycle. Explain that when water pools together such as in ponds and lakes, this is called **collection.**

6.      Ask the students where else they have observed precipitation. Guide them to think of examples like rain or snow outside.  Explain to students that rain is a form of precipitation.  Ask students where rain comes from.  Using the model of the water cycle, ask students to think about where the water from the sky is coming from.  Review evaporation.  Water evaporates into the air and condenses to form clouds.  Ask students to brainstorm sources of water for evaporation, such as rivers, lakes, and oceans.

7.      Use the color copies or overhead of the water cycle to discuss the water cycle in detail.  Ask students to describe the steps of the water cycle in their own words.  Then have students fill out the diagram on the “Can You Identify the Steps of the Water Cycle?” worksheet.

**Closure:** Discuss the following questions as a class:  Does water in the ground end up in the atmosphere again?  How?  How does water change states in the water cycle? *(Reminder: Classroom teacher should have students complete vocabulary four square for water cycle terms prior to next science lesson).*

**Assessment:** Science notebook responses, participation in class discussions, water cycle worksheet. Students should be able to explain the steps in the water cycle.

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Can You Identify the Steps of the Water Cycle? (Weather and Climate Lesson 1)**

Using the word bank at the bottom of the page, label each step in the water cycle.

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| --- |
| **Evaporation:** water changes from a liquid to a gas; occurs more rapidly at warmer temperatures**Condensation:** water changes from a gas to a liquid; occurs when water vapor gets cold**Precipitation:** water falling to the earth in the form of rain, hail, mist, sleet, or snow**Collection:** water that falls as precipitation comes together in bodies of water such as oceans, rivers, lakes, and streams, or underground |

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