

Hydrosphere and the Atmosphere; What do they have in common?

The hydrosphere, atmosphere, biosphere, and geosphere work together as part of earth's dynamic ecosystem. Each of the spheres are unique in their makeup as well as in the way they contribute to the ecosystem. This lesson will focus on both the hydrosphere and the atmosphere; their makeup and the way in which they interact with one another. The students will use pedal power as a way in which to simulate this process.

Grade: 5th Grade

Lesson Length: 45 minutes

Standards

5-ESS2-1 Develop a model using an example to describe ways the geosphere, biosphere, and/or atmosphere interact.
Mp.2 Reason abstractly and quantitatively.
SL.5.5 Include multimedia components and visual displays in presentations when appropriate to enhance the development of main ideas or themes.

Objectives

- Students will be able to identify and define both the atmosphere and hydrosphere with 80% accuracy.
- Students will be able to describe the way in which both the hydrosphere and atmosphere interact with one another, verbally and in written form with 80% accuracy.

Materials/Technology/Equipment

- ✓ One Green Microcycle
- ✓ Water bottle
- ✓ Two jars (One empty/another filled with water)
- ✓ Computer to project video
- ✓ Science notes/journal

Activity Structure

Opening Discussion/Introduction
minutes

5

Students begin the lesson by observing the two jars.

- As the students observe the jars the instructor engages the students in a discussion about what the jars consist of.
- What do the jars contain?

- What parts of the Earth do these jars represent?

***The terms water and dirt should be mentioned as well as Earth's crust and Earth's air/sky can all be mentioned when discussing information.**

**Lesson
minutes**

30

Keeping in mind the previous discussion, a student will be asked to simulate an example:

- a) The volunteer will be asked how they feel? Are they cool, is their heart pumping incredibly fast? Are they thirsty?
- b) Once the student has described their current state they will be asked to continue pedaling. They will be asked to increase their rate, slowly. (The rate safely matches student's ability and health conditions)
- c) The student will be pedaling for one minute and at each 15 second interval they will increase rate.
- d) As the volunteer is pedaling the instructor will be asking the other students to observe his state. What is his temperature like? Is his heart pumping faster? If he/she continues to pedal this fast what will happen? (looking for a student to mention sweat and perspiration)

After a minute the student will be asked to stop and then asked to explain his/her state and how he/she feels. How does your heart feel? Are you warm? Are you thirsty?

- a) As the student describes his/her state the instructor will begin to identify that as the student pedaled faster, he/she became warmer, which made his/her heart pump, and he/she started sweating. Then the students will be asked how the water came into their system to begin with?
- b) The instructor will then ask the students to draw a cycle of how the water came into the student's body and is being transferred out of them.
- c) Once the students have completed their drawings the instructor will have students take turns and go to the board and draw one step of the cycle.
- d) Once the steps are complete the instructor will highlight the relationship. (The heart is pumping faster as the student pedals harder. Their temperature increases making them warm and in order to cool themselves down their body releases water in the form of sweat. The water itself was brought into their body by food and drinks.)

The teacher will then illustrate that this happens on earth as well. As earth heats up, water is released into the atmosphere in different forms.

- a) The teacher will then ask the students what heats up the earth?
- b) What comes out of the earth? (Rain/water vapor)

- c) As the students are engaging in discussion vocabulary will then be discussed. As the vocabulary is discussed the students will be asked to write down the definitions within their Science notes.
1. Sphere: rounded form, a place or environment within which a person or thing exists.
 2. Hydrosphere: Total amount of water on earth; Hydro=water
 3. Atmosphere: All the gases and air that surround the air; atmo=air

The students will end the lesson by watching the following video:

https://youtu.be/UXh_7wbnS3A

- a. Students will be asked what make up the hydrosphere?
- b. What different water sources are included in the hydrosphere?
- c. What is something that helps the atmosphere get rid of water?

The students will be encouraged to use the vocabulary in explaining their thoughts on both spheres and what they are.

**Wrap-up
minutes**

10

Exit Ticket: The students have been introduced to both the atmosphere and the hydrosphere. They were defined and related to a real-world example. As a way to assess their comprehension and begin thinking about their homework, they will be asked to answer two journal questions for their science journal/notes:

1. What makes up the hydrosphere and the atmosphere?
2. Given one other example of a process in our daily lives, that resembles this process?

After the Lesson	
Homework	<p>Students will be asked to illustrate the relationship between the atmosphere and the hydrosphere:</p> <ol style="list-style-type: none"> 1. The drawing will need to include the vocabulary taught. 2. Both of the spheres labeled. 3. For each step of the cycle/process identified the students will have to write two sentences describing the step and what is occurring.
Extension Activities	<ul style="list-style-type: none"> ▪ The next lesson can build off this lesson, using jars for the next spheres and interlocking processes.

THE GREEN MICRO CYCLE

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| | <ul style="list-style-type: none">▪ Have the students move on to the next spheres by defining the vocabulary beforehand.▪ Completing a K.W.L. about the rest of the spheres.▪ Extend the relationship between the two spheres by learning about the water cycle.▪ Students can create sphere chains that identify the different spheres, illustrations can be included, and they can connect them with examples of the way they interact with one another. |
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