

Conservation and the Environment

OBJECTIVE

- Understand and explain the difference between weather and climate
- Analyze information and data to describe how and why the climate is changing
- Describe how using energy impacts the environment

MATERIALS

- Internet access, encyclopedias or other research materials (*suggested links provided below*)
- Pens, pencils, colored pencils, crayons or markers
- Conservation and the Environment Worksheet (*included*)

CLASS TIME

60 minutes

Procedure

1. Before getting started, ask students, **“What do you know about Earth as a planet?”** Some answers might be: Earth is the third planet from the Sun, Earth’s surface is about 70% water, Earth has one moon, Earth rotates as it orbits the Sun.
2. Then, ask students, **“What do you know about life on Earth?”** Some answers might be: Earth is the only planet that we know of with life in the solar system, Earth has millions of species of plants and animals.
3. Next, ask students, **“What do you know about different processes that occur on Earth?”** Some answers might be: Weather changes every day, the rock cycle, the water cycle, earthquakes, climate change.
4. As the final pre-lesson question, ask students, **“What do you know about energy and electricity use on Earth?”** Some answers might be: Turning on lights, cooking with a natural gas stove, driving a car.
5. To begin, explain that Earth can be divided into four major Earth systems: the atmosphere, biosphere, geosphere and hydrosphere.

6. Next, break the students into pairs or small groups and assign each pair or group one of the Earth systems. Have the groups use resources such as the Center for Science Education¹, National Geographic² or Encyclopedia Britannica³ to research what their assigned system encompasses, the processes that occur in that system and how each person's energy use affects that system. Allow students to organize their notes in a way that helps them make sense of the information to answer the Critical Thinking Questions (*seen below*).
7. Then, assign four sections of the classroom to each of the Earth systems and have each pair or small group join others who researched the same system. Supply each group with a piece of poster paper or a section of the whiteboard. Students will collaborate to write key words, ideas and drawings about their system on the poster paper or whiteboard.
8. Bring the class together and give each group a few minutes to present the main ideas of each Earth system. Then, using the Critical Thinking Questions as a guide, discuss each system and cross off the questions that students can now answer.
9. After the class discussion, have the students use their research materials to complete the **Conservation and the Environment Worksheet**. Students may work individually, with a partner or in a small group. If time permits, students can use what they have learned to make a presentation to their class about climate change, how it affects their ecosystem and ways that we can all reduce our impact on our planetary systems.

Links

1 <https://scied.ucar.edu/learning-zone/earth-system/sum-parts-earth-system>

2 <https://education.nationalgeographic.org/resource/earths-systems/>

3 <https://www.britannica.com/place/Earth>



CRITICAL THINKING QUESTIONS

1. What is your Earth system and what does it include?

Answers:

- The **atmosphere** contains all the gasses surrounding Earth, including the oxygen we need to breathe.
- The **biosphere** contains all types of life, including plants, animals and humans.
- The **geosphere** contains all the rock that makes up Earth, including the tallest mountains and deep underground – even liquid rock, which we call magma or lava.
- The **hydrosphere** contains all the water on Earth, including water frozen in glaciers, liquid water, and the water vapor trapped in the atmosphere.

2. Why is your Earth system important to Earth?

Answers:

- Weather occurs in the **atmosphere**.
- All life is found in the **biosphere**.
- Rocks, minerals and soil are essential for life and are all part of the **geosphere**.
- Life can't exist without water, which is found in the **hydrosphere**.

3. How is energy use related to your Earth system?

Answers:

- Some forms of energy release greenhouse gases into the **atmosphere**, which can contribute to warming temperatures and climate change.
- Humans use energy every day, and the way we produce and use energy can affect all life in the **biosphere**.
- Some energy sources, like natural gas, oil, and coal, are stored deep within the **geosphere**. It takes the Earth a long time to make these resources.
- Hydroelectricity is a source of energy that uses water, which is contained in the **hydrosphere**. Some other sources of energy, like fossil fuels, release gasses into the air that can pollute our rain.

Conservation and the Environment

Name _____

Use a reliable source such as The Weather Channel (www.weather.com) or the National Weather Service (www.weather.gov) to find the following information for where you live. You may use all words or a combination of words and pictures.

I live in _____

The weather yesterday was...	
The weather today is...	
The weather tomorrow will be...	
The weather one week from now might be...	

Next, use a reliable source to find out more about the climate where you live.
The typical climate where I live is: _____

Now, use your materials and research to complete the following sentences:

Weather is _____.

Climate is _____.

How do weather and climate affect each of Earth's systems?

Atmosphere	
Biosphere	
Geosphere	
Hydrosphere	

Now, use reliable sources to research what sources of energy are used where you live. Circle all that apply. Write a brief description of where this energy is used below.

Coal	Wind Power	Natural Gas
Geothermal	Hydroelectricity	Biomass
Oil	Nuclear Power	Solar Power

How do the energy sources you marked affect Earth's systems?

Have you heard of climate change? Before you research it, write down five words that you think of when you hear the words **climate change**.

Now, use reliable sources to research the definition of climate change. Complete the following sentence:
Climate change is _____.

Use a reliable source that predicts how the climate will change where you live. Use all words or use a combination of words and pictures to describe how your climate might change.

Next, research what is causing climate change. Make sure to use reliable sources from scientists that are studying climate change. Write down three reasons for climate change and include evidence that supports that reason.

Reason for climate change:	Evidence:

There are many scientists and groups of people working to find solutions to climate change. Choose one idea that you find in your research and explain how the idea might help slow or stop climate change.