

The Hydrosphere

Laboratory Activity – Student Edition

Our Edible Earth



Background Information:

Earth is the third of eight planets in our solar system, the third planet from the sun, and the only place in the universe known to support life. Our planet earth is a complex, dynamic system comprised of a merger of interacting, interdependent parts forming a connective whole. At a lower level, it is helpful to think of the earth system in terms of four components known as subsystems—the hydrosphere, lithosphere, atmosphere, and biosphere. These systems interact by cycles and processes that transform and transfer matter and energy in ways driven by the laws of conservation of matter and energy. These processes are driven from energy from the sun and/or energy sources inside the earth.

Some of these processes include erosion, evaporation, transpiration, convection currents, transpiration, weathering, or photosynthesis. When observed from space, one of earth's most prominent features is its abundant water, the primary component of the hydrosphere. Not only do the earth systems overlap, what affects one may also affect another. These interactions may be complex or subtle. For example, volcanic eruptions are dramatic results whereas some undetectable changes also work to alter earth's surface.

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In this laboratory activity, you will make an edible pizza model of the earth which highlights its four subsystems using delicious toppings of your choice! Your teacher will provide you with a pre-baked thick and thin cheese pizza. The pizza crust has already been divided into 4 equal parts. Each part has been labeled one of earth’s subsystems: biosphere, hydrosphere, atmosphere, and geosphere. Making a model of the earth will help you to visualize the interdependence of our planet.

Learning Objectives:

At the end of this laboratory activity, students are expected to:

- Describe the characteristics of earths’ four subsystems.
- Create an edible model that shows the interdependence of earths’ subsystems.


Pre-lab Question:

List the four subsystems that comprise our planet earth.


- _____
- _____
- _____
- _____

Laboratory Proper:

Materials (per group of 5 students)

<p>Supplies</p>	 <p>Paper towels, gloves, flatware, & plastic plates</p>
<p>Crust</p>	<p>Thin crust cheese pizza Thick crust cheese pizza</p>

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<p>Pizza Toppings</p>	<p>Options include: Marinara sauce, mozzarella cheese, cheddar cheese, parmesan cheese</p> <p>Onions, mushrooms, green peppers, olives, sausage, ham, turkey, bacon, pepperoni, and/or meatballs</p> <p>(Your pizza toppings represent items you would “expect” to see on each of Earth’s spheres.)</p>
<p>Pizza Toppings</p>	

Procedure:

Your teacher has prepared a fully baked cheese pizza and cooked any meat and/or vegetables for your edible Earth! However, your team will need to decide which toppings to use for your pizza model. As a reminder, the toppings represent items you would “expect” to see on earth of Earth’s four spheres. As you add to your pizza, imagine that you are completing Earth as know it.

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Step 1:

Choose your lithosphere. Will you have thick or thin crust? (*Note: The geosphere represents all the land on Earth.*)

Options:

Thick crust cheese pizza

Thin crust cheese pizza

Step 2:

Choose your hydrosphere. (*Note: The hydrosphere is composed of all of Earth's water.*)

Options:

Marinara sauce, mozzarella cheese, cheddar cheese, parmesan cheese

Step 3:

Choose your atmosphere. (*Note: This gaseous envelope protects us from harmful UV rays.*)

Options:

Tomatoes, mushrooms, green peppers, olives

Step 4:

Choose your biosphere. (*Note: Earth's biosphere is comprised of all living things.*)

Options:

Pepperoni, Sausage, Ham, Bacon, Meatballs

Step 5:

Discuss these points with your team.

- How does Earth operate as a system?

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- What are similarities and differences in our Edible Earth vs. our actual Earth?

Step 6:

Eat your edible Earth!

Post-lab Questions:

1. How does the model you created reflect our planet earth?

2. Think about how Earth operates as a system. In the table below, write down what feature(s) you would expect to see in each sphere. *Hint: Ask yourself, "If my pizza was actually Earth, what would the toppings represent?"*

Geosphere	Hydrosphere	Atmosphere	Biosphere

Name: _____ Period: _____ Date: _____

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3. What are some possible outcomes that might occur if one of Earth's subsystems did not exist?
