

Student Exploration: Forest Ecosystem

Directions: Follow the instructions to go through the simulation. Respond to the questions and prompts in the orange boxes.

Vocabulary: consumer, decomposer, inorganic, organic, organism, population, producer

Prior Knowledge Questions (Do these BEFORE using the Gizmo.)

1. When a rancher puts cattle in a pasture, what happens to the amount of grass in it?

There will be less grass.

2. If someone adds thousands of small fish to a lake, how would the number of big fish change?

It would change drastically because the fish will grow and have another baby fish.

Gizmo Warm-up

The *Forest Ecosystem* Gizmo shows you the effects of adding **organisms** to, or taking them from, a forest. An organism is any living thing. To start, do the following:

- Click **Advance year** a couple times to see two years of growth.
- Remove all **Deer** from the forest by clicking the minus (-) button until none remain.
- Click **Advance year** a couple more times.



1. Select the **DATA** tab. Select **Pictograph** and click the **Tree** to show the size of the tree **population** for the past several years.

- A. How did removing deer affect the tree population?

When the deer was removed the tree population grew.

- B. Why do you think this happened?

The deer ate the tree leaves.


2. Under **Choose organism**, select the **Mushroom**.

- A. How did losing deer affect the mushrooms?

When deer were removed, the mushroom population grew.

- B. Explain why this may have happened.

The deer ate mushrooms.

Activity A: Trees	<u>Get the Gizmo ready:</u> <ul style="list-style-type: none">• Click Reset.• Select the FOREST tab.	
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Question: What role do trees play in the forest?

1. Form hypothesis: Where do you think trees get the nutrients they need to grow?

I think they get the nutrients from the water on the soil.

2. Predict: Based on your hypothesis, how will the tree population change if ALL other organisms (deer, bears, and mushrooms) are removed from the forest?

In the first years, the tree population will be huge but then it will be so big, there will be no more water resulting in the trees dying.

3. Analyze: Remove ALL organisms except trees. Click **Advance year** a few times and select the DATA tab. Was your prediction correct? Explain what you found.

The tree population grew but it didn't get so big there would be no more water.

4. Draw conclusions: Substances that contain carbon and are produced by living things are called **organic**. Examples of organic materials are sugar, blood, protein, and fat. Other materials, like water, carbon dioxide, oxygen, and ammonia, are called **inorganic**. Some living things, called **producers**, can produce the organic materials they need (like food) from inorganic matter. All other organisms are **consumers**; they consume organic matter since they cannot make it themselves.

Do your results show you that trees are producers or consumers? Explain.

My results show me that trees are producers, green plants make their food by taking sunlight and using the energy to make sugar.

5. Analyze: Click the FOREST tab. Click the plus (+) button for **mushrooms** several times. Click **Advance year** a few times. Select the DATA tab. How did adding mushrooms affect trees?

It didn't. They co-existed.

6. Extend: The mushrooms thrived without hurting trees. How could this happen? Try for *two* possible explanations. Write your ideas in the space below.

- They need different sources of nutrients.
- They need a small amount of nutrients, so there is enough for both of them.