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Initials

## Environmental Literacy Biodiversity Assessment: --- Elementary / Middle School Level ---

### Forest and Farm

Science is easier to understand if you can make connections between what you know now and the new ideas that you are studying. This is a test that will help us to understand what you know now. Please answer these questions as carefully and completely as you can. If you are not sure of the answer, please write about any thoughts that you have. If you can help us to understand how you think about these questions, then we can do a better job of explaining science in ways that make sense to you.

Please put your initials (not your full name) in the boxes

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First Middle Last

Date \_\_\_\_\_

Class \_\_\_\_\_ Teacher \_\_\_\_\_



Picture A (to the left) - The land area in this picture used to be only sand dunes. It did not have any beech or maple trees. Below, Pictures B , C, and D are close-ups of different parts of this land.

Picture B (below) – This is a close-up picture of the sand dunes.



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Picture C – This is a close-up picture of some grasses in the sand dunes close to the water.



Picture D – This is a close-up picture of the beech maple forest.

1. Pictures B, C, and D are close-ups of different parts of Picture A. Both grasses from the beach and trees from the forested area produce seeds that are carried by the wind and animals.

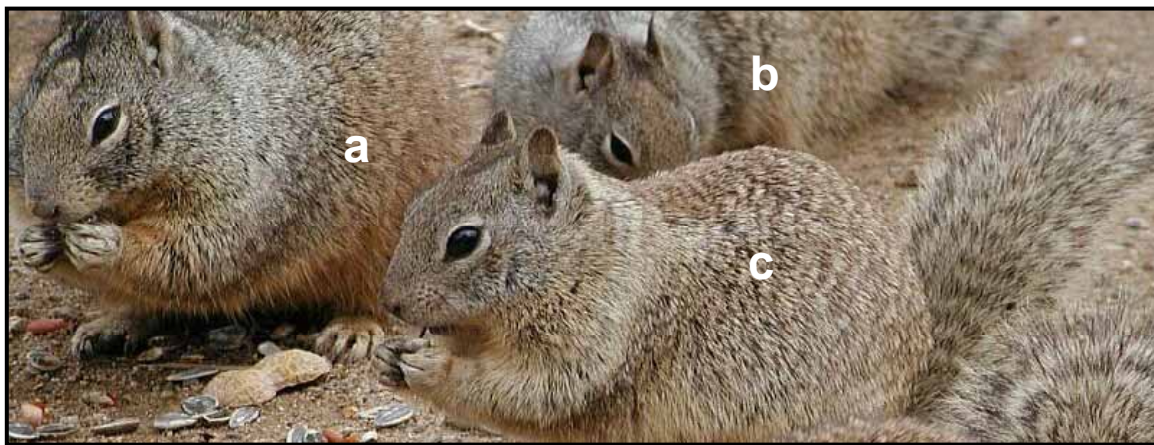
a. Some tree seeds land in the sand on the beach. But there are no trees growing close to the water (on the beach). Why do you think there are not trees growing on the beach?

b. Picture C shows some grass growing in the sand dunes. You find lots of grass growing in the sand dunes. But you do not find much grass growing in the forest, even though some grass seeds sprout under the trees (Picture D). Why do you think there is not much grass in the forest?

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1c. Picture D shows a beech maple forest. Why are there so many species of plants and trees in a beech maple forest? Why doesn't one or two species take over the entire area?



Picture E – Squirrels that live in the beech maple forest

2. As the land in Picture A gradually changed from sand dunes to a forest, squirrels began to inhabit the forest.

a. Why do squirrels live in the forest and not in the sand dunes? What does the forest have that helps the squirrels survive? What do the sand dunes not have that the squirrels need to survive?

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b. Before it was a forest, chipmunks lived in the area. Now, there are fewer chipmunks and more squirrels. Why are there fewer chipmunks now? Why are there more squirrels?

3. In the picture E, there are three squirrels a, b, and c that live in the forest and resemble one another. Suppose you are a scientist who is asked to determine how closely the squirrels are related to one another. Name two tests or observations that you could make to decide how closely the squirrels are related and what evidence you would look for in each one.

a. Suppose you could observe the squirrels, but not handle them. How could you test to see how close they are related? What would you observe?

b. Suppose you had blood samples from the squirrels. How could you test the blood samples to find out how closely they are related? What could you test?


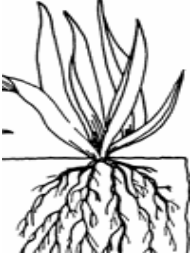

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4. Squirrels have claws that they use to help them climb the bark of trees and jump from branch to branch. They had ancestors that did not have good claws, so they were not as good at climbing and jumping. Explain how modern day squirrels have claws that are good for climbing and jumping even though their ancestors did not.

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5. The pictures below show characteristics of some different plants and animals. Describe how the characteristics might help the plants or animals to survive and reproduce.

	<b>Apples: Why are they round and sweet?</b>
	<b>Grass: Why does grass have long roots that grow deep into the ground?</b>
	<b>Cow Tongue: Why is it long and tough?</b>

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6. Explain the relationship between the bee and the plant

7. Farmers often spray their crops to help prevent bugs from eating their crops. Over time, the bugs slowly become resistant to these sprays, and so the farmers have to use different sprays to protect their crops. Tell a story about how the bugs become resistant to the sprays.



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8. Farmers till the soil (stir it up with machines) to get rid of weeds. Why are weeds bad for crops?

9. To the right is a photo of flock of sheep. Which of the statements below best describes the group of sheep? Circle your answer below:

- a) The sheep are all identical to each other.
- b) The sheep are all identical on the inside, but have many differences in appearance.
- c) The sheep are all identical in appearance, but are all different on the inside.
- d) The sheep share many characteristics, but also vary in many features.
- e) The sheep are all completely unique and share no features with other sheep.



Explain your answer. How are the sheep alike and how are they different?

Alike:

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Different:



**Photo A**  
**Corn Field**



**Photo B**  
**20 years later**



**Photo C**  
**80 years later**

10a. A farmer stopped planting his corn field. The photos above show what the corn field looks like 20 and 80 years after he stopped planting. During the 20 years after the farmer stopped planting, the number of plant species increases. Why do you think this happens?

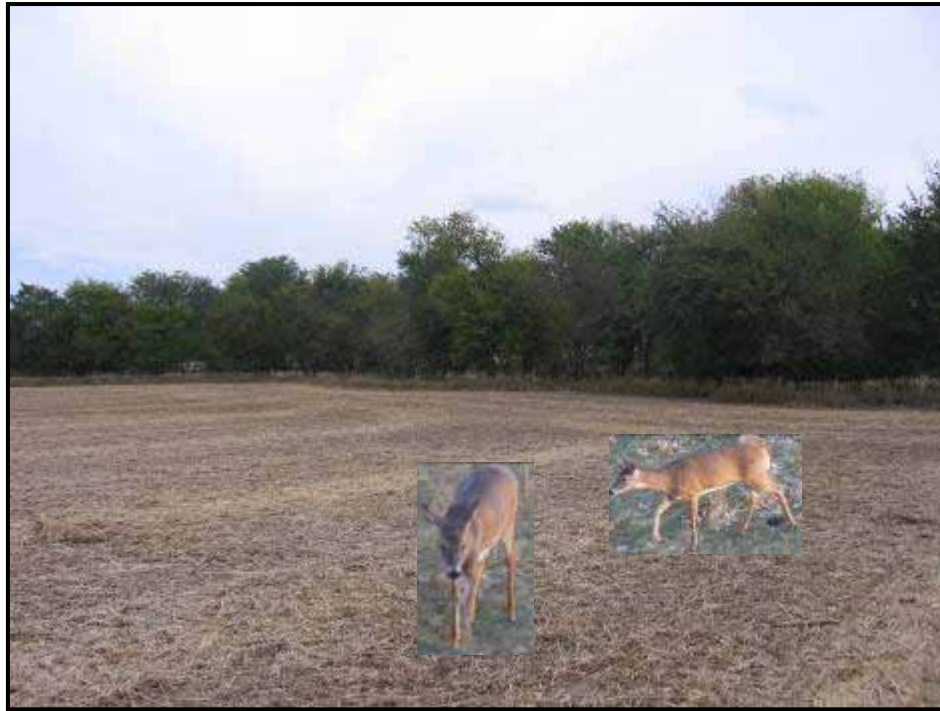
10b. After 80 years, most of the smaller plants have been replaced by trees. Why do you think this happens?



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11. Below is a picture of a Michigan forest next to a soybean field. A herd of deer live in the area. Why are the deer sometimes found in the forest and sometimes found in the field?



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