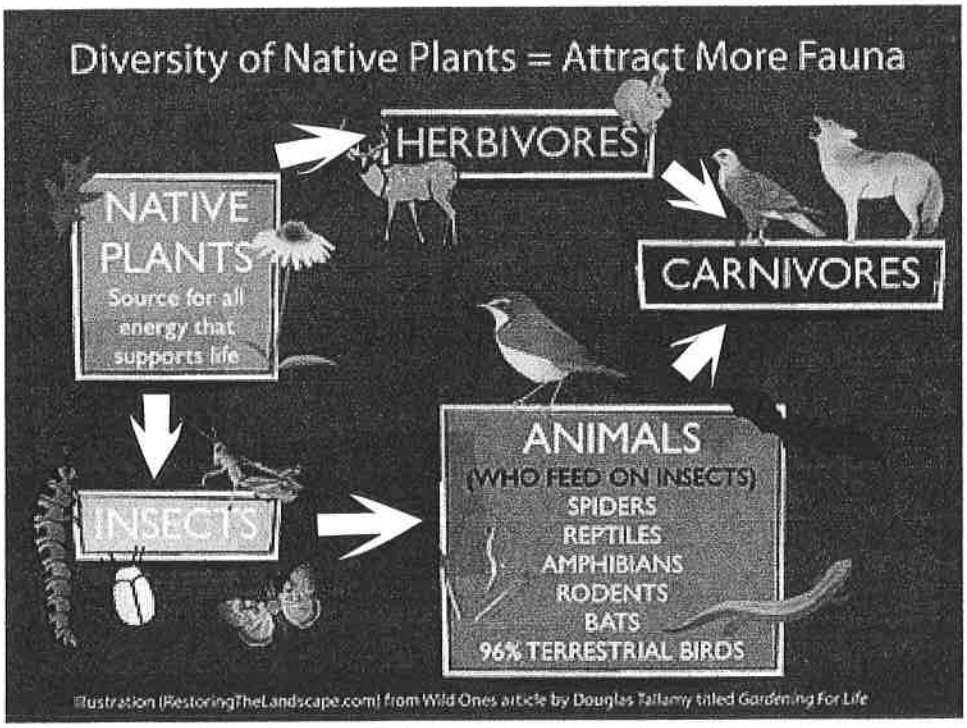
Name _____ Period _____
Due date _____

BIODIVERSITY IN A HULA HOOP

In order to have a truly organic yard or garden, you should encourage biodiversity. An ecosystem works best when you've got a variety of plants and animals interacting, from the tiniest insect on up to flowers, trees, birds, and squirrels.

Instead of planting just one kind of tree in your yard, plant several types of varying heights and shapes, and include some shrubs too. And don't be too worried about your lawn; a mix of different species of grass, and even a few blades of crabgrass or dandelion, will probably result in a healthier lawn.



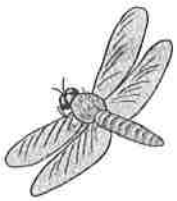
In this laboratory activity, you will examine a patch of lawn on the high school campus, observing the biodiversity of plants & animals. You will select and identify 3 different lawn species using the picture pages as a reference. You will also read about the basics of common lawn plants.

MATERIALS: Hula hoop Trowel Picture pages

PROCEDURE:

1) With your group, randomly toss your hula hoop onto a patch of open lawn. Gather around the hula hoop and observe the biodiversity within its perimeter.

(2) ANIMALS



A. Look inside your hula hoop at your patch of lawn and see if you can find any insects. Describe what you found. (Just use your own words if you are not sure what the name of the insect is.)

_____

_____

B. Now using the trowel, dig a hole in the soil and look for animals. What do you see? (Worms, potato bugs, grubs, ants….)

_____

_____

(***Please fill the hole and put the piece of lawn back when done***)

C. Now just look up and around for any animals you see on campus. What do you see?

_____

(3) PLANTS

A. Look all throughout the hula hoop and count how many DIFFERENT TYPES OF PLANTS you can see.

How many different plants did you count? _____

B. Now select any 3 of these plants and complete the data table on the next page. Use the "LAWN WEED IDENTIFICATION PICTURE PAGES" to help you ID these plants.

PLANT #	DRAW A LEAF	DESCRIBE THE LEAVES, FLOWERS, AND STEM	NAME OF PLANT (using ID guide)
1			
2			
3			

(4) READING

DIRECTIONS – Read each passage then answer the corresponding questions

A Call For Backyard Biodiversity

Acclaimed author and ecologist Douglas Tallamy explains the reasons behind the decline of native flora and fauna, and how we can work to reverse it from our own backyards.

Photos and story by Douglas Tallamy

You have probably never thought of your property as a wildlife preserve representing the last chance we have to sustain plants and animals that were once common throughout the US. But that is exactly the role our suburban and urban landscapes are now playing – and will play even more in the near future.

Common suburban landscapes consist of manicured lawns and nonnative ornamental plants, which provide little nourishment to local fauna.

The US contains 4 million miles of paved roads, turning nature into long, barren stretches of land.

The population of the US, now over 304 million people, has doubled since most of us were kids, and continues to grow by roughly 8,640 people per day. All of those additional souls – coupled with cheap gas, our love affair with the car, and our quest to own ever larger homes – have fueled unprecedented development that continues to sprawl over 2 million additional acres per year (the size of Yellowstone National Park). We have connected all of our developments with four million miles of roads; their paved surface is five times the size of New Jersey.

_____ 1. How is the growing population in the U.S. a threat to biodiversity?

A. Manicured lawns & non-native ornamental plants
B. 2 million acres per year of new development
C. 4 million miles of paved roads
D. All of the above

But does this matter? Are there consequences to turning so much land into the park-like settings humans enjoy? Absolutely, both for biodiversity and for us. Our fellow creatures need food and shelter to survive and reproduce, and in too many places we have eliminated both. State Natural Heritage Centers have estimated that as many as 33,000 species of plants and animals in the US are now imperiled – too rare to perform their role in their ecosystem. These species can be considered functionally extinct. The songbirds that brighten spring mornings have been in decline since the 1960s, having lost 40 percent of their numbers so far. One hundred twenty-seven species of neotropical migrants are in steep decline. In fact, a survey of our nation's bird populations, commissioned by former President Bush, has found that one-third of our nation's birds are endangered.

_____ 2. What % of our nation's birds are endangered?

A. $1/4^{th}$ B. $1/3^{rd}$ C. ½

Why We Need Biodiversity

Nonnative ornamentals like the Asian azalea in this yard cannot support the nutritional and lifecycle needs of our native insect species.

For most of us, hearing such numbers triggers only a passing sadness; few people feel personally threatened by the loss of biodiversity. Here's why you should. Biodiversity losses are a clear sign that our own life-support

systems are failing. The ecosystems that support us – that determine the carrying capacity of the earth and our local spaces – are run by biodiversity. It is biodiversity that generates oxygen and cleans water, creates topsoil out of rock, buffers extreme weather events like droughts and floods, pollinates our crops, and recycles the mountains of garbage we create every day.

And now, with human-induced climate change threatening the planet, it is biodiversity that, if given half a chance, will suck that carbon out of the air and sequester it in living plants. Humans cannot live as if they are the only species on this planet. Why? Because it is other species that create the ecosystem services that are so essential to us. Every time we force a species to extinction, we are encouraging our own demise. Despite the disdain with which we have treated it in the past, biodiversity is not optional.

3. Give any 3 benefits of biodiversity to humans:

_____ _____ _____

Redesigning Suburbia

What will it take to give our local animals what they need to survive and reproduce on our properties? Native plants, and lots of them. This is a scientific fact deduced from thousands of studies about how energy moves through food webs.

Here is the general reasoning: All animals get their energy directly from plants, or by eating something that has already eaten a plant. Insects are the group of animals most responsible for passing energy from plants to the animals that can't eat plants. This fact is what makes insects such vital components of healthy ecosystems. So many animals depend on insects for food (e.g., spiders, reptiles, amphibians, rodents, and 96 percent of all terrestrial birds) that removing insects from an ecosystem spells its doom.

Diverse native gardens like this one provide support for many native species that cannot survive on nonnative plants.

____ 4. Why are insects so important to biodiversity?

A. They are the food source for so many animals
B. They are the food source for so many plants
C. They help to decompose dead & decaying materials

Plants Matter

In the past we have ignored the vital role plants play in our landscapes. Plants, of course, are the only organisms that capture energy from the sun and turn it into the simple sugars and carbohydrates: the food that supports nearly all the food webs on earth. Every time we bulldoze a native plant community, we are reducing the amount of food available for our fellow creatures. In fact, the amount of life that can exist in an area is directly proportional to the amount of vegetation in that area. Because plants have physical structure, they also provide housing for animals.

The Paper Birch is a member of a family of trees capable of supporting an impressive 413 species of butterfly and moth caterpillars.

We can no longer landscape with aesthetics as our only goal. We must also consider the function of our landscapes if we hope to avoid a mass extinction that we ourselves are not likely to survive. As quickly as possible, we need to triple the number of native trees in our lawns and underplant them with the understory and shrub layers absent from most managed landscapes. Homeowners can do this by planting the borders of their properties with native trees such as white oaks *(Quercus alba)*, black willows *(Salix nigra)*, red maples (*Acer rubrum*), green ashes *(Fraxinus pennsylvanica)*, black walnuts *(Juglans nigra)*, river birches (*Betula nigra*), and shagbark hickories (*Carya ovata*).

_____ 5. What are 2 major roles plants play in biodiversity?

A. Food source & habitat B. Solar energy & decomposition C. Consumers & Prey

6. List any 3 native trees that you should plant in your yard:

_____ _____ _____