Biodiversity Counts!

Our planet is filled with life. Do you know how to count it?

Words to Explore

Biodiversity

Richness

Evenness

Community

Species

Keystone species

Did You Know?
Tennessee is the most biodiverse inland state in the United States!

Did You Know?
Each year, about 15,000 NEW species are discovered!

Biodiversity, or biological diversity, is the variety of life on our planet. It includes everything from a tiny microbe to a giant blue whale, and everything in between!

In many parts of the world, human actions result in a loss of biodiversity—species can die off because of habitat degradation, loss of a food source, new diseases or introduction of an exotic species.

Why should we protect biodiversity? We as humans are part of the planet's food webs. We are dependent on life around us!

- **Many drugs and helpful products have come from nature, if we lose species we would lose these products**

- **Keystone species perform special functions. For example, a plant might depend on a certain species of insect for pollination.**

- **More biodiverse communities are more stable, so when disasters or an invading species comes along, it can resist the change.**

How do we measure biodiversity?

Diversity is a measure of the different kinds of organisms in a region or other defined area. It includes the number of species and the distribution of individuals among the species.

Richness is the number the number of species in a region or specified area

Evenness is how equally the species are distributed. Maximum evenness is when all types of species have the same number of individuals.

Activity 1: Calculating Diversity

Your leader will give you a community of different species. Take a look at your community, compare it to the other communities in the class and make a prediction.

Predict:

Which community do you think is the **most** biodiverse? _____

Which community do you think is the **least** biodiverse? _____

Investigate: Find out how diverse your community is.

1. Determine the RICHNESS of your community. Richness is the number of species present. List the names of the species in the first column and write the richness in the bottom row.
2. Count the number of each species and enter your numbers into the table.
3. Determine the EVENNESS. How evenly are the species distributed? Remember that the highest evenness is when all species have close to the same number. Score each community as high, medium or low evenness.

Species	Community				
	1	**2**	**3**	**4**	**5**
RICHNESS (number)					
EVENNESS (high medium or low)					
DIVERSITY (high, medium, or low)					
DIVERSITY (calculated)					

1. Which community was the most biodiverse? _____

2. Which community was the least biodiverse? _____

Activity 2: DISASTER STRIKES!!!

Biodiversity is very important in helping a community withstand change. This change could be habitat descruction, disease, or invasion by another species. That's because different species perform different "jobs", and the more species, means you're more likely to have a species there to perform that job!

Your leader will present you with a disastrous scenario where some biodiversity is LOST.

Predict: What do you think will happen...

   ...to the most biodiverse community? _____

   ...to the least biodiverse community? _____

Investigate: After the disaster, look at your new communities and recalculate richness and diversity. Compare it to the numbers from Activity 1. Compare your data with the rest of the class.

	Community				
	1	**2**	**3**	**4**	**5**
RICHNESS					
EVENNESS					
DIVERSITY					

1. What happened to the biodiversity in the more diverse communities?

_____

2. What will be the effect of the disaster on the more diverse communities?

_____

3. What happened to the biodiversity in the least diverse communities?

_____

4. What will be the effect of the disaster on the least diverse communities?

_____

5. What else might have happened as a result of this loss of biodiversity?

_____

6. What are some ways humans cause losses in biodiversity?

_____   _____

_____   _____

Activity 3: Small Samples

There are often so many species in an area that a scientist can't sample them all! They must rely on small samples and try to estimate richness. Could you estimate the diversity from a small sample?

Predict:

If you were to only sample 5 individuals, would you see the same richness as for the whole community?

_____

Investigate:

Step 1. Put your community back into the bag. Now, randomly draw <u>5</u> individuals. What is the richness of your subsample? Record your data below.

Step 2. Return your community to the bag. Mix them well, then randomly draw <u>10</u> individuals. Record you data below.

Step 3. Compare your community with the others in the class.

	Community				
	1	**2**	**3**	**4**	**5**
Actual RICHNESS (from Activity 1)					
RICHNESS (for 5 individuals)					
RICHNESS (for 10 individuals)					

1. Was 5 individuals a big enough sample to accurately measure richness?

_____

2. Was 10 individuals a big enough sample to accurately measure richness?

_____

3. Was small sample more accurate for more diverse or less diverse communities?

_____

4. How do you know if you have a big enough sample to estimate biodiversity?

_____