**Quantifying Biodiversity Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Block \_\_\_ # \_\_\_\_\_\_**

**Introduction:** There are many ways to quantify biodiversity. For the purpose of this activity, you will use Simpson’s Diversity Index.

 $Ds=1-\sum\_{}^{}(\frac{n}{N})^{2}$

*Ds* = Diversity Index

*n* = Number of individuals for each species

*N* = Total number of all individuals

This is the version of the equation found on the AP Biology formula sheet. There is another version of the equation that is used for smaller communities. The two versions are sometimes called finite (small samples) and infinite (for large samples). While this simulation produces a relatively small sample size, there is value in practicing with the specific formula that appears on the AP exam.

**Part I.** Simple Example

Simpson’s Diversity Index results in a number between 0 and 1. To get a feel for how this equation works, calculate the minimum diversity – a system in which all organisms are the same species.

*Scenario:* There are 20 people in a classroom (we’ll assume there are no spiders hanging out in the corner).

What is *n*?

What is *N*?

Calculate *Ds*.

**Part II.** Comparing Communities

Go to the Biodiversity Simulation on [www.biologysimulations.com](http://www.biologysimulations.com).

*Scenario:* You are monitoring biodiversity in a forest at two different time periods.

*Procedure:*

1. Click on the “Produce Community” button.
2. Record the species and populations sizes in the Sample 1 chart.
3. Click on the “Produce Community” button again.
4. Record the species and populations sizes in the Sample 2 chart.
5. Calculate Simpson’s Diversity Index for both Samples and record the results.

*OVER 🡪*

*Sample 1 Sample 2*

 



Sample 1 represents the starting diversity, and sample 2 represents the diversity after a number of years. On another sheet of paper, write a description (100-200 words) of a scenario to explain the changes in the biodiversity between your two samples. You can be creative in designing your scenario and can take into account factors from the surrounding area. Think about factors that can lead to increased/decreased/stable biodiversity. Be as detailed as you can be in your description. Attach the description to the back of this sheet.