

## APES- Parking Lot Species Diversity Lab

*The diversity of species present in an ecosystem can be used as one gauge of the health of an ecosystem. Species richness is a measure of the number of different species present in an ecosystem, while species evenness measures the relative abundance of the various populations present in an ecosystem. In an ecological survey designed to measure species diversity, a wildlife biologist might determine the number of individuals of each species present in an area, then calculate a "diversity index" for the area. Comparison of the diversity index with that of other areas provides insights into the species diversity and the health of the ecosystem.*

*In this activity your "ecosystem" will be the school parking lot, and the "species" will be the different car models and colors. As a class, we will be comparing the species diversity of the student and staff parking lots. The diversity index we will use is the Shannon Diversity Index. After determining the number of each species (car), in each parking lot, the Shannon Diversity Index will be calculated separately for the student lot and the staff lot. A rich ecosystem with high species diversity has a large value for the Shannon Diversity Index ( $H'$ ), while an ecosystem with little diversity has a low  $H'$ .*

$$p_i = \frac{n_i}{N}$$

(equation 1)

$$H' = -\sum_{i=1}^S p_i \ln p_i$$

(equation 2)

$n_i$  = number of individuals of species "i"

$N$  = total number of individuals of all species

$p_i$  = relative abundance of species "i" (see equation 1)

$S$  = total number of species

$H'$  = The Shannon Diversity Index (see equation 2)

### Materials

- 2 parking lots full of cars

### Procedure

1. Prepare a data table. There must be enough space for 20 "species".
2. Visit the school's parking lot and collect data as directed in class.



3. Determine the maximum and minimum values for the Shannon Diversity Index in the parking lot you surveyed.
4. If you conducted this lab in a shopping mall parking lot, predict whether the Shannon Diversity Index would be high or low, and how it would compare to the school parking lots.
5. If you conducted this lab at a new car dealership, predict whether the Shannon Diversity Index would be high or low, and how it would compare to the school parking lots.

## Species Diversity Lab Grade Sheet

Name \_\_\_\_\_

\_\_\_\_\_/100 Table of contents updated

\_\_\_\_\_/400 Data tabulated/calculated

\_\_\_\_\_/100 Ink Only

\_\_\_\_\_/100 Data initialed

\_\_\_\_\_/600 Prelab Questions

\_\_\_\_\_/100 Diversity Index tabulated

\_\_\_\_\_/100 No Obliterated Data

\_\_\_\_\_/500 Postlab Questions

\_\_\_\_\_/2000 Total

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