Hoffman- APES Name: _____

Shannon-Weiner vs. Simpson's Diversity Indices

Shannon-Weiner

$$H = \frac{[n \log n - \sum (f_i \log f_i)]}{n}$$

Simpson

$$D = 1 - \frac{\sum n(n-1)}{N(N-1)}$$

Shannon-Weiner Diversity Index:

- Measures both the richness and evenness of species in a sample.
- A value of zero (0) represents a community of only one species – the higher the number, the greater the biodiversity of a community
- Usually most valuable in comparing two or more communities of species.

Simpson Diversity Index:

- Measure both richness and evenness of species in a sample.
- A value of zero represents a community with no biodiversity, while a value of one represents infinite biodiversity

DATA COLLECTION

Mrs. Hoffman samples species from three different communities. Below is the data she collected:

Gaithersburg High School		Rockville High School		Watkins Mill High School	
Species A	23	Species A	20	Species A	22
Species B	30	Species B	30	Species B	23
Species C	29	Species C	42	Species C	32
Species D	16	Species D	25	Species D	13
Species E	7	Species E	0	Species E	0
Species F	3	Species F	1	Species F	3
Species G	4	Species G	12	Species G	10
Species H	18	Species H	15	Species H	18
Species I	8	Species I	2	Species I	3
Species J	12	Species J	19	Species J	2

DIRECTIONS

1. Using the data collected, calculate both the S-W and Simpson's diversity indices for all three locations.
2. Record your results in the data table provided.

	Gaithersburg HS	Rockville HS	Watkins Mill HS
Shannon-Weiner			
Simpson			

CALCULATION CHARTS

Use these charts to help you calculate the different diversity indices.

GAITHERSBURG HS – SHANNON-WEINER		
Species **(i)**	Total number of each species **(f_i)**	Frequency of Individuals **($f_i \log f_i$)**
A	23	
B	30	
C	29	
D	16	
E	7	
F	3	
G	4	
H	18	
I	8	
J	12	
Total (sum) ∑ =		

S-W Diversity Index Value (H) = _____

ROCKVILLE HS – SHANNON-WEINER		
Species **(i)**	Total number of each species **(f_i)**	Frequency of Individuals **($f_i \log f_i$)**
A	20	
B	30	
C	42	
D	25	
E	0	
F	1	
G	12	
H	15	
I	2	
J	19	
Total (sum) ∑ =		

S-W Diversity Index Value (H) = _____

WATKINS MILL HS – SHANNON-WEINER		
Species **(i)**	Total number of each species **(f_i)**	Frequency of Individuals **($f_i \log f_i$)**
A	22	
B	23	
C	32	
D	13	
E	0	
F	3	
G	10	
H	18	
I	3	
J	2	
Total (sum) ∑ =		

S-W Diversity Index Value (H) = _____

GAITHERSBURG HS – SIMPSON'S		
Species	Total number of each species **(n)**	**n(n-1)**
A	23	
B	30	
C	29	
D	16	
E	7	
F	3	
G	4	
H	18	
I	8	
J	12	
Total (N) =		**Sum [∑ n(n-1)] =**

Simpson's Diversity Index Value (H) = _____

ROCKVILLE HS – SIMPSON's		
Species	Total number of each species **(n)**	**n(n-1)**
A	20	
B	30	
C	42	
D	25	
E	0	
F	1	
G	12	
H	15	
I	2	
J	19	
Total (N) =		**Sum [∑ n(n-1)] =**

Simpson's Diversity Index Value (H) = _____

WATKINS MILL HS – SIMPSON's		
Species	Total number of each species **(n)**	**n(n-1)**
A	22	
B	23	
C	32	
D	13	
E	0	
F	3	
G	10	
H	18	
I	3	
J	2	
Total (N) =		**Sum [∑ n(n-1)] =**

Simpson's Diversity Index Value (H) = _____