



UNDERSTAND

Simpson's species diversity index (DM6)

- Simpson's Species Diversity Index is a numerical representation of diversity within a habitat.
- It considers the 'richness' and 'evenness' of species within a habitat.
- The species diversity of a habitat is generally dependant upon, and can provide clues about the environmental conditions within it.
- It is a comparative measure that can be used to represent differences between sites (e.g. secondary vs ancient woodland); changes in diversity after a pollution incident (e.g. sewage discharge into a river); or changes in diversity over time (e.g. seasonal changes of river invertebrate communities).
- Species richness – the number of different species found in a sample area.
- Species evenness – how evenly distributed the number of individual are between the numbers of species present.
- If the index is to be used as an effective comparison the same sampling method should be used each time.

Equation:

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

Where:

D	=	Simpson's Index of Diversity
N	=	Total no. of individuals in the sample
n	=	Number of individuals per species
Σ	=	Sum of.....

Method:

1. Copy your data into the table over the page listing species found and the number of individuals per species. Label the site the data is from and the date collected.

For Each Site:

2. Calculate the total the number of individuals
3. Calculate n-1 for each species
4. Calculate n(n-1) for each species
5. Sum n(n-1)
6. Calculate a value for D for each site

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



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High values indicate stable sites, whereas low values may suggest harsh conditions; for example a polluted area. These are only suggestions - a low value is just an indication that there are influential factors at work. Where these factors are not obvious, a further investigation may be worthwhile.

Site:

Date:

Species	Number of individuals per species (n)	n-1	n(n-1)
	Total (N)		$\sum n(n-1)$
		D =	

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



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Compare your area to Epping Forest Field Centre. Which has the highest diversity?

Site: Epping Forest Field Centre

Date: January 2013

Species	Number of individuals per species (n)	n-1	n(n-1)
Alder	3	2	6
Ash	3	2	6
Cherry	4	3	12
Hawthorn	2	1	2
Hazel	1	0	0
Holly	4	3	12
Hornbeam	8	7	56
Lime	20	19	380
Maple	1	0	0
Oak	5	4	20
Pine	6	5	30
Rowan	1	0	0
Silver Birch	9	8	72
Sycamore	8	7	56
Wild Service	1	0	0
Willow	1	0	0
Yew	1	0	0
	Total (N) 78		∑ n(n-1) 652
		D = 9.21	

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

$$D = \frac{78 \times 77}{652}$$