



SPECIES DIVERSITY IN YOUR GARDEN

Katherine MacKenzie

Matt Decovsky

Turi Schäffer



Overview:

In this activity students use a quadrat to measure species diversity in an area such as garden, field, lawn, roadside. Students can compare and contrast regions based on factors such as light intensity in the areas, soil depth, grass type, etc.

Data is collected, processed, analyzed, reported upon and evaluated.

Curriculum links:

- IB MYP4-5 Integrated science or Biology
- Dutch havo/vwo ANW domains A and D
- Grade 9-10 Science, biology

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SPECIES DIVERSITY IN A GRASSY AREA

When sampling a population, the numbers of organisms are counted within a sample site, and then the results multiplied to estimate the total number in the entire habitat. Large animals and plants can often simply be counted. Sometimes smaller animals like insects and smaller mammals need to be trapped first so they can be counted and then released afterwards. We will conduct this on a smaller scale using quadrat squares and counting the number of species we find in each sample area.

AIM

To measure the species richness in a grassy area, comparing two contrasting regions

for example:

- Shade vs. light,
- Dense grass vs. patchy grass,
- Next to a tree vs. far from a tree
- Well maintained grass vs. wilder uncut grass

MATERIALS:

1. Quadrat square (can be made or bought, simply made with conduit piping/wood/wire frame and string/wire forming squares of equal size)
2. Notebooks and calculators

METHOD

In pairs or threes, take a quadrat square and make a table as follows:

		Round										
Area	Organisms	1	2	3	4	5	6	7	8	9	10	Total
1	Plants											
	Animals											
2	Plants											
	Animals											

- 1) Choose a starting point on the grassy area with your choice of Area 1
- 2) Randomly place/throw your quadrat square to find a sample area
- 3) Count the number of different plant species (& animal species if found) within this quadrat (the species richness)

- 4) Repeat steps two and three a further 9 times using different random areas
- 5) Repeat steps one to four for a part of the grassy area fitting your choice of Area 2
- 6) Compare your results by calculating a mean of plants and animals for each location

INTERPRETING YOUR DATA

Choose an appropriate way to display your results as a graph from your table.

Describe and **interpret** your data

Draw conclusions from your results, what does your measurement imply?

Evaluate the methodology, to what extent can you extrapolate your data to the wider ecosystem? **Discuss** reliability, validity, accuracy and improvements.

ALTERNATIVES:

Students may formulate their own research questions phrased as how does changing the *[independent variable]* affect the *[dependent variable]*? For example:

"How does the *distance* from a canal affect the presence of *[species X]*" In this way continuous data can be found, and if students all work along the same canal, class data sets can then be compiled and analyzed.