Biodiversity - Insects

SUBJECTS

Biodiversity, Entomology, Ecology

OVERVIEW

Biodiversity is an important aspect of ecology. It determines the number of different species are within a specific area and is a tool for determining the quality of a space. This activity will use insects and arachnids as the means to determine biodiversity. We will collect samples of insects, identify the insects using iPads and guides, and discuss the roles that various insects play in the environment.

	V. SUPERVISOR GUIDE	STUDENT GUIDE
OBJECTIVES	To teach the role insects play in an ecosystem, how biodiversity helps determine health is a site, and scientific method through monitoring sites.	To discover the difference between orders of insects, understand biodiversity, and monitoring site conditions.
BACKGROUND INFORMATION	Biodiversity (biological diversity) is the number of different species and other classifications of animals in a given area or system. Included in this measure are plants, animals (insects, mammals, on land, in the water, even humans!), fungus, and microbes. In this activity, we will focus on insects and their connection to pollination and other 'ecosystem services'. High biodiversity means highly productive ecosystems and has major benefits to humans, too; think of fuel, food, shelter, medicinal sources, water and air purification, nutrient cycling, climate regulation, pollination, and more! Why does biodiversity matter? 1) The services listed above and 2) all organisms are interconnected. As one organism arrives, disappears, becomes less common or more common, it affects many, if not all, of the other organisms around it. For example, a flowering plant disappears. This would affect the butterfly that fed from its nectar, the mouse that ate its seeds, the beetle that laid its eggs there, the bird that built its nests from the stems, etc. Many organisms are specialized, too, meaning that they feed, find shelter in, or otherwise use ONE plant or animal and if that plant or animal is gone, it likely will be, too. All of these interactions come together to produce a finely balanced and healthy system that contributes to a healthy and sustainable planet.	
COMPREHEND	The description of biodiversity and why it is important. Basics of insect collection and identification (use of ID resources).	Basics of biodiversity, why it is important, why to measure biodiversity in insects. Understand basics of how to identify insects and how they relate to the local food chain/ecosystem.

EQUIPMENT	RESOURCES	TAKEAWAY
- bug boxes - sweep nets	- iPad with MN Insect app - insect body parts poster - insect order ID poster (posters are in development)	- What insects exist here - What roles they play in the ecosystem/ food chain

	V. SUPERVISOR GUIDE	STUDENT GUIDE
ACTIVITY	1. Discuss differences between insects, true bugs, and arachnids (spiders). 2. Show the Orders of Arthropods. 3. Discuss importance of diversity in these animals. 4. Lay out the tools and determine "home base" for everyone to come back to after collecting insects. 5. Define how far they're allowed to go away from home base/into the prairie 6. Demonstrate how to properly collect insects using the sheet, bug net, and bug box. 7. Compile the insects onto the net or in the bug box and identify them as a group. Determine how many of each order were found.	1. Discuss concepts of biodiversity and identifying organisms. 2. Find a partner or small group and work together to collect insects from designated prairie space. 3. Once you have a collection, come back to home base to identify what has been caught. 4. Invert the net close to the sheet and shake it gently to have the insects fall out. Make sure to double check that the net is empty. 5. Spend time identifying each insect to what order they belong in. Keep a record of what you find (including number of insects in each order). 6. Switch back and forth between who sweeps/collects, who identifies, who records, etc. in 2 minute intervals. Repeat the process as time allows.
QUESTIONS TO ASK AT THE END	What is biodiversity and did you find that this site has a high, medium, or low biodiversity? What different types of insects did you find? Why do we want different species on a site and not just one species? What functions do different species have in an ecosystem? How do you think pesticides could affect insect populations? Do you think they affect this prairie at all? Studies have shown that there is a sharp decline in insects worldwide. Why do you think this is? How does this relate to biodiversity? How would this affect humans?	