Student Handout

Nature Kaleidoscope

Project Area: Environmental Science

Skill Level: Intermediate—Intermediate—Advanced

Learner Outcomes:

⇒ Be able to define new vocabulary words.

⇒ Differentiate between a healthy soil and unhealthy using simple field indicators.

⇒ Use an observational metric to evaluate biodiversity between different habitats.

Science Skills: Collect data, interpretation, comparing

Life Skills: Observing, Reflecting

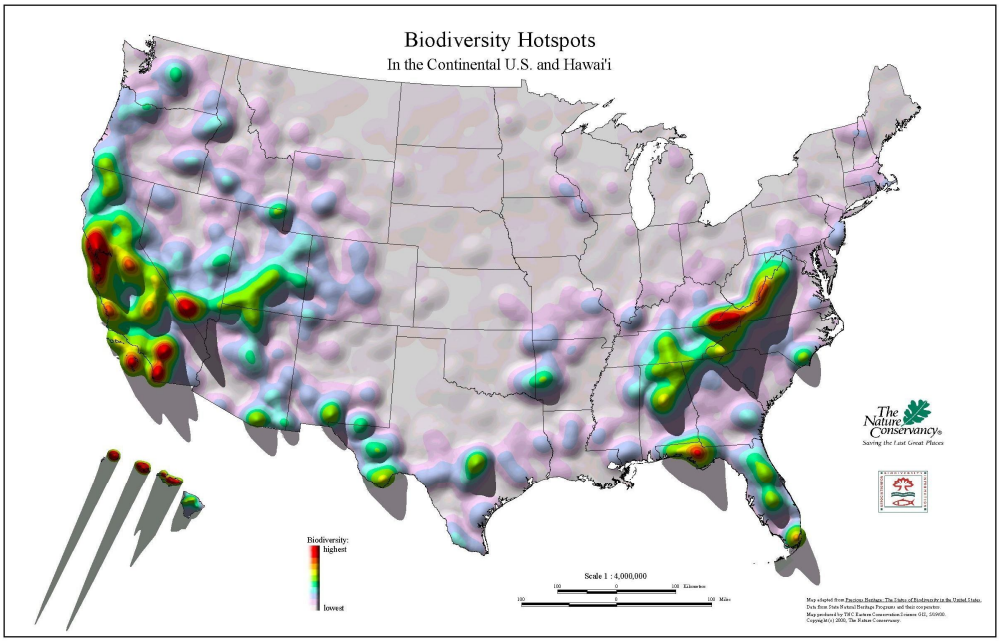
Tags: Biodiversity, soil health, metrics

⇒ Did you know that Tennessee has some of the highest levels of biodiversity in the entire country? Most of the state is noted as being a biodiversity "hotspot."

The shapes we see in nature show us a lot about biodiversity

The earth is covered in unique ecosystems that depend on soil health to sustain plants, animals, and humans. The biodiversity of an area can greatly depend on the health of the soil in it, and at the same time, the biota of an area greatly affects soil health. Soil health can be described through an observational metric that identifies qualities of the soil present due to the biota that inhabit it. Soils are an important part of a plant or animal's habitat.

Vocabulary Word	Definition
Biodiversity	The variety of different types of life found on earth.
Soil Health	The continued capacity of soil to function as a vital living ecosystem.
Organic Horizon	Soil layer that is dominated by organic material.
Metric	A standard of measurement.
Transect	A straight line or narrow section across the earth's surface, along which observations are made or measurements taken.
Habitat	An ecological area that is inhabited by a particular species of plant, animal, or other type of organism.



ACTIVITY: Using Indicators and Metrics

Work in small groups to complete the habitat assessments and collect data that will be expressed in your Nature Kaleidoscope.

Credits: Andrea Ludwig and Jennifer DeBruyn

Nature Kaleidoscope

Worksheet

Group Name: _____

1. What kind of habitat is the study plot or transect section? (check one)

_____ Grass Field _____ Woods _____ Riparian (Streambank) _____ Wetland/Lake

Other: _____

2. How is the soil health? Create a metric for soil quality by tallying how many indicators of healthy soil are in the soil sample.

Which of the following were found in the soil sample? (check all that apply once)

_____ Decomposing biomass _____ Leaf litter _____ Moss _____ Roots _____Wood

_____ Worms _____ Insects _____ Moisture

Tally Total: _____ (soil quality metric score)

3. In the box on the reverse side, draw the different shapes you see in the habitat. Include shapes of leaves, grasses, flowers, stems and trunks of trees, etc. The greater the amount of different shapes in the habitat, the greater the bio-diversity of life contained in it. From the list below, circle the words that describe the shapes and patterns you see in the habitat.

How many different unique shapes are in the habitat? _____

4. Make a prediction considering all the habitat plots studied in the activity.

Which habitat do you think will have the greatest soil health metric?

_____

Which habitat do you think will have the greatest amount of unique shapes?

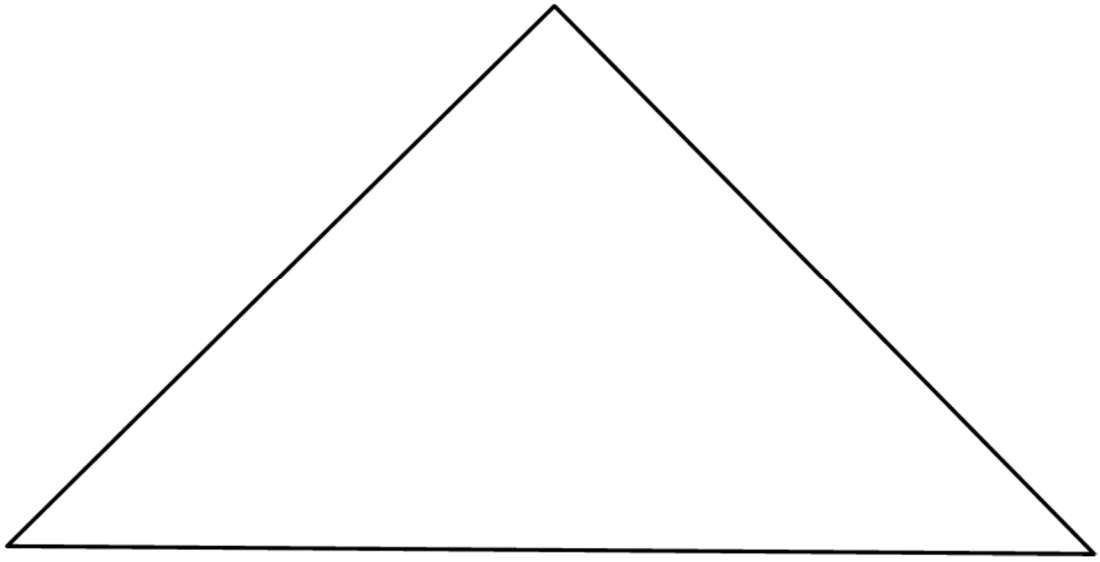
_____

Do the teams with higher soil quality metric scores have greater or fewer shapes in their drawings? How does soil quality and biodiversity relate?

Credits: Jennifer DeBruyn and Andrea Ludwig

Nature Kaleidoscope

5. Make a Biodiversity Kaleidoscope. Choose your favorite shapes from the box (limit to 4-6 shapes) and redraw them on a notecard. Adjust their sizes so that they will all fit into the triangle below. Cut out the shapes to make stencils. Arrange the shapes in a unique pattern in the triangle such that edges of the stencils touch the edge of the triangle. Outline the shapes using a thick sharpie. This will be the pattern that is repeated in the Kaleidoscope.

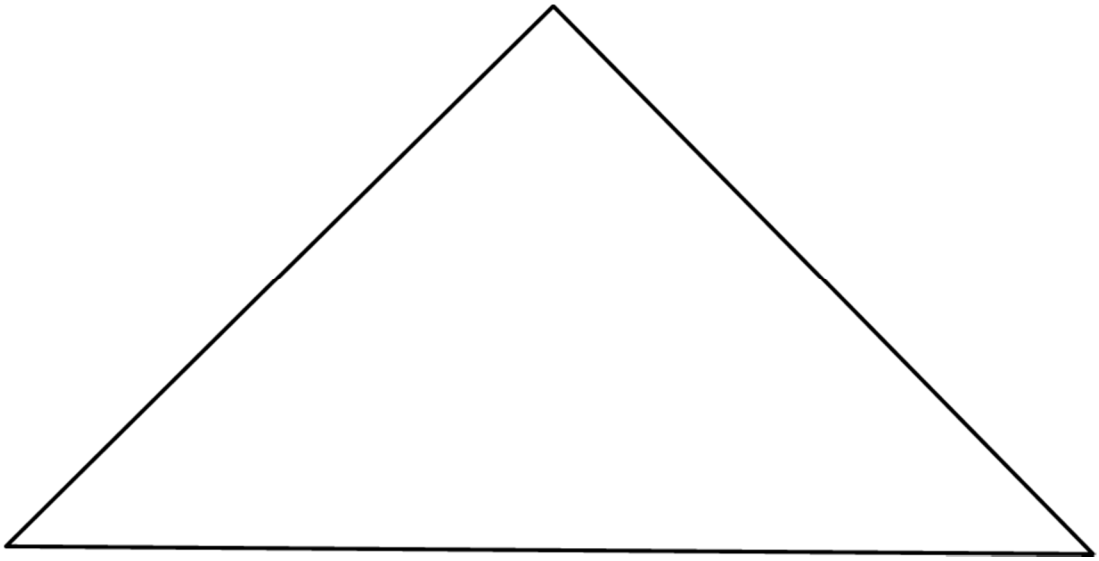


Credits: Jennifer DeBruyn and Andrea Ludwig

Nature Kaleidoscope

Place the pattern triangle behind one of the triangles in the box on the last sheet of this handout. This is your Nature Kaleidoscope. Trace the lines with a pencil. Flip the pattern triangle over and repeat the tracing for the adjacent triangle in the box, creating a mirror image. Repeat this for all four boxes until all triangles are complete. Trace the pencil lines in thick black sharpie. Color in the shapes in a repeated pattern in each triangle to complete the Kaleidoscope. Then give it a fitting name that reflects upon the habitat in which the shapes were observed.

Extra pattern if needed:

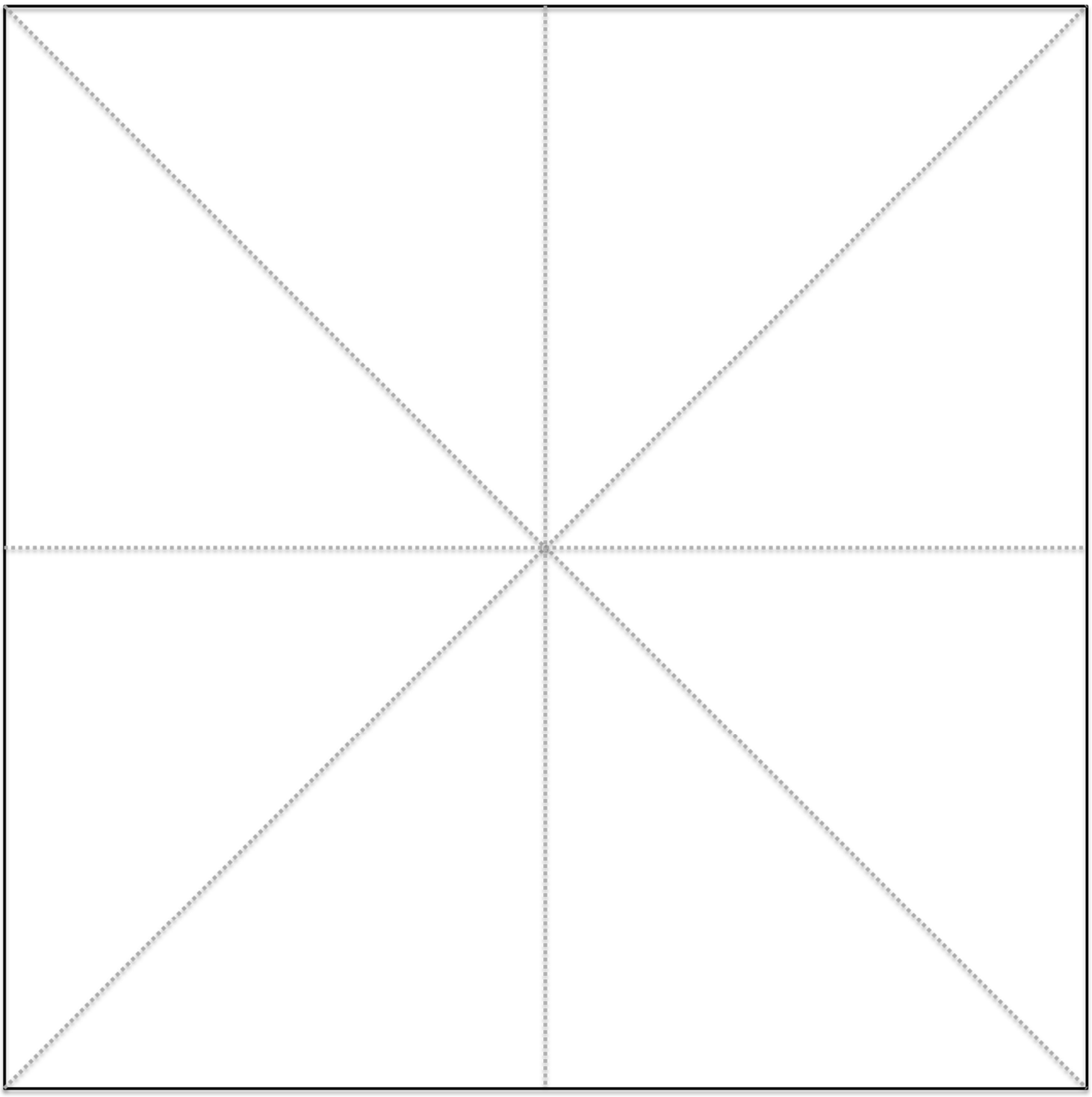


Reflect:

Write a Hiku or short story about the habitat your Nature Kaleidoscope reflects. Include information like the kinds of animals that inhabit the space, what the seasons look and feel like, how the plants change as the seasons change, and what kinds of natural happenings occur there.

Credits: Jennifer DeBruyn and Andrea Ludwig

Nature Kaleidoscope



Kaleidoscope Name: _____

Credits: Andrea Ludwig and Jennifer DeBruyn