Backyard Scientist: Quadrat

STEM • GET OUTSIDE!

A different type of measuring device that scientists use to analyze an environment is called a *quadrat*. Ecologists use a quadrat, shaped like a picture frame, to count the number of plant and animal species in a particular area. Rather than counting all of the crabs on the rocky coast, just a few samples taken with a quadrat can help scientists estimate the number of crabs on an entire beach. Quadrats are also a good tool to use in order to zoom in on a particular area in order to observe nature, and make comparisons between different locations.

Materials

- Household items to create your own quadrat
- A natural setting, OR materials to symbolize natural organisms
- Quadrat Species Count Data Sheet
- Pen or Pencil
- Clipboard (optional)
- Measuring tape or ruler (optional)

Directions

1. Create your own quadrat. Find or create something that has a large hole in the middle and maintains its shape. Examples of “found” quadrats may include coat hangers, hula hoops, old picture frames, etc. Examples of “created” quadrats may include tying sticks together with string, or pencils together with rubber bands. Use what you can find, and be creative!

2. (Optional) Measure the length and width of your quadrat, and then calculate the area.

3. Head outside, or create a simulated natural environment on the floor using household items. For instance, if you want to pretend that you are in the tide pools, scatter crayons on the floor to represent sea stars, shells to represent snails, and blocks to represent sea weed. For a field environment, game pieces could represent ants, and different colored string can represent different types of grass or plant.

4. Do some initial tests with your quadrat by tossing it in a random place in your natural environment or simulated natural environment. Look closely and see what you notice. Now, test a new area. Do you notice any differences?

5. Come up with a question based on your observations. For instance, are the species of plants and animals found in different parts of your backyard the same, or different?

6. Using the Quadrat Species Count Data Sheet, record up to 4 different species for two different locations. What does your data tell you? What else do you wonder about the species found in this environment?

7. (Optional) Repeat this activity using different questions, and taking more data points. What can you discover?

Tip: Choose random locations for your quadrat by tossing it gently rather than placing it in a chosen spot. This helps to ensure your data is a random sample.

Quadrat Species Count Data Sheet

Species Count

Date:_____ Time:_____ Temperature:_____

Location:_____

Quadrat Length (inches):_____ Quadrat Width (inches):_____

Quadrat Area (sq. inches)_____

Quadrat Location (i.e. in front of tree, next to swing, shady area, rocky area, etc)	Type of Species (i.e. ant, clover, dandelion, etc.)	Number of Individuals inside Quadrat
Location 1:		
Location 1:		
Location 1:		
Location 1:		
Location 2:		
Location 2:		
Location 2:		
Location 2:		

Which location had the highest number of organisms?_____ Which location had the highest number of species? _____ Can you think of any reasons why one area would have different organisms than another area?_____