



## **Backyard Nature Survey**

Objective: Observe and record different organisms in a small area.

Time: About 30 minutes

Location: Some of this can be done inside, but some will need to be outdoors in a safe space. A backyard, nearby open park, or anywhere plants are growing can be used.

Materials needed:     Paper and writing utensil  
                                 Survey boundary device (see below)  
                                 Internet device (optional, for linked videos)

### **What lives near me?**

Write down your hypothesis (educated guess) about what is living outside near you. Think small and big; animals and plants.

### **How nature surveys can be done**

Here are two short videos about several ways to count animals in the wild:

[Basic Sampling Techniques \(3:32\) by Stone Age Man](#)

[What Is Environmental Sampling? \(4:44\) by FuseSchool](#)

Ecologists and other scientists use different sampling techniques depending on what they are looking for. Similar to what you will do for this activity, when it comes to plants and other organisms that don't move (like a barnacle at the beach) they can use a *quadrat*, or an open square, to count the organisms in that square. They then repeat the process several times in an area to get a better estimate of the total species.

This is easier to do than trying to count every single organism in the entire area - that's hard enough to do in a courtyard or a backyard, but it would be so much harder in a big park, or an entire beach, or even a whole country.

### **Making a quadrat for a boundary**

The word *quadrat* came from the same root word that gave us *quadrant*, which is a shape with four sides. While you can buy quadrats and kits for quadrats, you can also make one at home! Here's some of our favorite ways.

- Using a large piece of cardboard from a box, trace out a 12" square, and then a 1" border around that. Carefully cut it out so that you have a one-foot 'picture frame' to use.
- Take a wire coat hanger and twist it into a square. It may not be 12" on each side, and that's okay. As long as you use the same shape each time your measurements will be consistent.
- Tie both ends of a string or shoelace together and form it into a square when you place it on the ground.



- Use an actual picture frame, making sure you remove the photo and glass. You can also use any other item that has a large open space, like a hula hoop.
- We suggest not using a box or even a clear storage container, because anything with tall sides or a top/bottom when you put it on the ground will make it harder to use.

### Using your quadrat

Okay, got your quadrat? Get some paper and a writing utensil and let's go outside! Pick a safe space to make your survey and place your quadrat on the ground. Now start looking for organisms.

- Start by looking in one corner and go across the area, and then “move down a line” and repeat. You'll cover the whole area as if you are reading one line at a time.
- Each “line” is as thick as you would like it, but we suggest 1”-3” which is between the height of a paperclip and the width of a smartphone. That's small enough that you probably won't miss anything and big enough that it won't take you too long to complete.
- As you go across each line, write down any organisms you see: grass, clover, ants, etc. You don't have to count each blade of grass but you can write “lots” or “some” or “almost none” if you want to be more specific than “grass.”
- Look for *evidence* of other organisms, specifically animals. You may not see a spider but you might find a spiderweb. You may not find a dog but you might find a paw print.
- If you don't recognize something, describe it and try to find out what it is later.
- You can also take notes on *abiotic* items you find - descriptions of rocks, dirt, sand, or more. Abiotic parts of the ecosystem aren't alive, and were never alive (as opposed to a stick or a snake skin, which used to be alive), but still affect what and how organisms live in the area.

Once you have everything written down then you can move your quadrat. You can repeat this in one of three ways:

1. Random: If you're in a big area you pick some places randomly to survey. Maybe if it's a big area you can close your eyes and spin in a circle, and then toss your quadrat on the ground right after (or right before) you open your eyes.
2. Transect: Instead of trying to be random and maybe not being completely random, you can be methodical. A transect is a line through an area that can then be surveyed. Take your quadrat and flip it on one side so that it is now lying down right next to where it was. Each time you flip it in the same direction so that you have a series of surveys that all touch in a line.
3. Chosen locations: just like how it sounds, you choose the location. Maybe you want to find areas that have the most number of organisms, or two areas that have the biggest difference in organisms. Just remember that when you choose the areas you survey, you will not get representative samples.



### **Extrapolation of data**

We can *extrapolate* the data we collect into a hypothesis on what is in the larger area. You can measure the area you were in and then find out what percent of the area you surveyed, and then do some math to come to a conclusion. Measuring the area can be done with a large tape measure, or maybe looking up online how large the park or the courtyard is. You can even go online and use a tool like Google Maps to estimate an area from a satellite photo.

### **Interpretation of data**

Answer these questions:

1. Write down the organisms you found or what organisms for which you found evidence.
2. Were there any that you didn't know, and were you able to identify them later?
3. Are there any that surprised you - organisms you didn't expect to find?
4. Are there any organisms (or organisms with abiotic elements) that you found together more often than you found them separately?