# A World in One Cubic Foot:

# Discover the Nature that Surrounds You

## Explorer Directions

What type of nature is living just outside your home? Step outside and find out!

Your quest is to discover what types of plants and small animals are living near you using a Biocube. A Biocube is a cubic foot square frame that you can place anywhere you want to investigate - in a tree, on top of grass, halfway in water, you name it. You will collect, identify, and return the life that you find, getting a chance to investigate the question “What kind of life can you find in one cubic foot of space?”.

**You can watch an introductory video about Biocubes and a video for each step at:** [**https://s.si.edu/biocube-videos**](https://s.si.edu/biocube-videos)

**You can use the** [**Recording Sheet**](https://naturalhistory.si.edu/sites/default/files/media/file/biocube-recording-sheet-v2.docx) **or your own piece of paper to record your work.**

### Step 1: Build a Biocube

1. Normally, Biocubes are built out of 12-inch aluminum tubes, but if you don’t have aluminum tubes, no problem. You can build a Biocube out of other materials, such as rulers, plastic knives, chop sticks, stiff wire, PVC, and more. Tape, wire, string, or other adhesive can help you secure the corners. Each side just needs to be about 12 inches.
2. Be creative in engineering a solution. If you don’t have supplies to build a Biocube, don’t let that stop you! You can just estimate a cubic foot using the edge of a piece of paper or ruler.

**Record:** Describe what you used to build your Biocube. Make a sketch or take a picture of the Biocube if you can.

### Step 2: Select Your Space and Place Your Biocube

1. Explore an outdoor space where you live. This can be a bush along your sidewalk, a woodpile in your yard, your garden, lawn, some gravel and dirt near your parking lot, or other types of space.
2. This place should be one that you are curious about or where you think there is a lot of life.

**Record:** Write a description of your selected space. Record information like time of day, temperature, weather, or any other information that helps describe the setting. What plants and animals do you see? Draw a picture if you can.

### Step 3: Observe your Biocube

1. Spend about 5 minutes quietly observing your Biocube from a short distance away. Look for insects, birds, small mammals, or other animals that go near or in your Biocube.
2. Spend another 5 minutes or so observing your Biocube up close. Gently look under plants or other cover to see what is living there.
3. If you have a camera or smartphone, take a photo of your undisturbed Biocube.

**Record:** Write down the types of plants and animals that you find. Describe what they were doing (hiding, crawling, sleeping, etc.).

### Step 4: Gather Your Collecting & Sorting Supplies

1.You are going to collect all of the life in your Biocube and sort it into different types of plants and animals. To do this, you need to find useful household items.

* Look for tools and containers such as a shovel, scoop, bucket, and/or net that can help you remove the Biocube.
* Look for smaller containers such as cups, jars, plates, ice cube trays, spoons, tweezers, and other items that help you remove and sort what you find. You may also need covers to keep animals in.

2. Be sure to seek permission to use the household items you collect. Have an adult help you with sharp tools.

### Step 5: Explore your Biocube

1. **Collect your Biocube**
2. Now it’s time to see what is living inside your Biocube.
3. Use the supplies you gathered to remove the Biocube from its location. This may mean getting a bit dirty!
4. It is important that you do not hurt any of the life you collect. You will return it to where you found it when you are done.
5. **Sort your Biocube**
6. Look carefully through your Biocube to find as much life as possible. Look closely. Many of these animals are really small! If you have a magnifying glass, use it.
7. Separate what you find into containers so that similar organisms are together . You can use general categories (for examples, “beetles,” “ants”) or be more specific (for example, sort different types of beetles into different containers). Don’t forget about the plants! Look carefully to sort these as well.
8. **Document what you find**
9. Count and identify the life in your Biocube. You can use online resources, you can take a picture and send it to iNaturalist (<https://www.inaturalist.org>) or Seek (<https://www.inaturalist.org/pages/seek_app>), or look for books that you may have at home. You can identify things generally like *worm, beetle, grass,* or try and find the genus and species name.
10. If you have a phone or camera, take a picture of the different life you found.
11. *Optional: measure organisms, record their appearance/attributes, weigh biomass*
12. Write down what you find.
13. When you are done, return all of the plants and animals, soil, rocks, dead wood, or other things back to where you found them.
14. Be sure to clean and return all of the supplies you used.

**Record:** Create a data table or lists to write down what you found, including how many of each type.

### Step 6: Share

**Record:** Summarize what you discovered. Select a couple of the prompts below and write a response:

* What lives in your chosen spot?
* What surprised you about what you discovered? Why do you think you found certain types of plants and animals and not others?
* How do you think the life that you found compares to what you would find in a different location or at a different time of year?
* What types of life do you think was in your Biocube that you did not find?
* Where would you want to look next?
* What do you want to know about some of the plants and animals that you found? Learn about the biodiversity nearby? Write down a couple of questions you are interested in and explain how you go about investigating them.

### Additional ideas:

* Photo-document the life you find like the professionals. [Watch the Video: Photographing and Illustrating the Biocube Specimens](https://naturalhistory.si.edu/education/teaching-resources/life-science/biocubes-exploring-biodiversity/photographing)
* Build your own species list. [Watch the Video: Building a Biocube Species List](https://naturalhistory.si.edu/education/teaching-resources/life-science/biocubes-exploring-biodiversity/building-biocube-species)
* Select a different location and do another Biocube to compare the biodiversity.
* Do another Biocube in the same area during a different time of day or different time of year.