

# Biocube How-To

## 1. Prep

### Connect with iNaturalist

- Sign up with [iNaturalist](#)
- Join the [Biocubes Project](#)

### Request a Biocube ID to identify your project

- Contact [Jen](#) through iNaturalist to get a Biocube ID
- Provide information about your group and location

### Begin “About my Biocube”

- Print and enter your Biocube ID into the [About my Biocube form](#)
- Review what data you will need to collect

### Formulate approach and define goals

- How much time do you have?
- What concepts, questions, or comparisons do you want to investigate?
- [Ideas for investigations](#)

## 2. Build

### Gather supplies and permissions

- Collect [supplies](#) to build, extract, sort and identify
- Obtain needed permits and permissions

### Build your biocube

- See [instructions](#) to assemble your biocube

## 3. Deploy

### Select a biocube site

- Survey potential sites
- If you cannot return to your study site to return specimens after you collect and sort your cube, think about impact and how to minimize it.
- Explore and document the area. Ask your group how does the area affect the community? How might overhanging structures, shading, water level, changes that might occur in other seasons, manmade alterations, etc., impact your cube? Complete a [Site Observation Sheet](#)
- Select a site and place your biocube

## 4. Explore

### Observe your biocube

- Observe quietly from a short distance away. Do any birds, small mammals, or large insects visit your cube?
- Observe close up. Gently look under plants or other cover.
- Take a photo of your undisturbed cube.
- Complete a [Cube in Context Datasheet](#)

### Sample things that move through your biocube

- Prepare containers to hold motile specimens.
- If your cube contains air and plants, sweep an insect net to collect mobile insect visitors.
- If your cube contains water, use a dip net to catch swimming visitors.

### Extract your biocube

- If part of your cube is in water, collect a representative bucket of about the right volume.
- If it contains sediment, use a shovel to dig it out and transfer into another container.
- Speed matters and it doesn't have to be perfect. You are attempting to take a 'snapshot' of a biological community. The more you dillydally, the more individuals will escape!
- Do your best to not disrupt your sample yet. Your biocube will probably be in a few pieces. Treat each piece delicately and keep out of direct sun.

## 5. Identify

### Sort your biocube

- When you set up to sort, keep the temperature and other conditions as stable as possible. A black bucket or plastic bag in direct sunlight will warm up quickly, so keep dark containers in the shade. Small samples of mud or wet sediment will dry if left exposed; keep these in covered containers.
- A large, white surface is great for sorting — as is a tray or shallow dish if you're working with water. Use a colander or sieve to separate organisms from substrate. Have some clean water from the same habitat on-hand.
- Sort a little of your biocube at a time; be patient. You can imagine that many of the residents are hiding. Give them time to start moving. Look in the corners of your container.
- As you find your organisms, put those that look the same together.

### Count, photograph, and identify the residents of your biocube

- For each species you find, count or estimate how many specimens or individuals are present (long dark grass, 4 separate tufts; earthworms, 3; large black ants, 2; small brown ants, approx. 40...). Fill in [Specimen Datasheet](#) (Word document)

- For each species, take one or several photographs of one individual. If your specimen is small, try photographing it through a magnifying glass. Try to catch all the distinctive-looking details. Close-up shots are helpful. So are shots from different angles (e.g., one from above, one from the side). Placing a ruler in the background allows your photo to document body size. Shining a small bright light on the specimen can help improve photos, as can using a matte white or black background, such as construction paper or cloth. Check out these additional [photo tips](#).
- For each species, try to identify it. If it is a “bug” of some kind, is it an insect, or an arachnid, or a millipede, or a pill bug (isopod)? If it is an insect, is it an ant, a bee, a fly (careful, those two can be tricky!) a dragonfly, or something else? Is it in the family Dytiscidae or Hydrophilidae? Local field guides are very helpful and available at your local library. Use free [online resources](#) and keys to insects, plants, mushrooms, crustaceans, etc., of your region. Identifying specimens can be challenging, but take it as far as you can with confidence. Even your most basic identifications are helpful.

## 6. Clean Up

### Minimize impact on the landscape

- Return soil, rocks, dead wood, or other substrate from where you took it. Do you have living organisms still in your possession? If you do not intend to preserve them or study them further, take them back to the same place. Similar appearing habitats are not necessarily the same. Introducing organisms in the wrong place or even in sites that look similar is damaging.

## 7. Share

### Report your findings

- Finish filling in your [Specimen Datasheet](#) (Word document)
- Fill in the online [“About my Biocube” form](#).
- Log onto iNaturalist and upload biocube data as observations within the Biocube Project. (Adult supervision is recommended, as iNaturalist activity is pinpointed on a publicly visible map.)
- Get detailed [instructions](#) for iNaturalist.
- You can compare your biocube with others around the world. Download your dataset using your Biocube ID if you’d like to graph or analyze your data further.

**Biocube Website:** <https://naturalhistory.si.edu/education/teaching-resources/life-science/biocubes-exploring-biodiversity>