

## How to find Water Bears!

They're cute, tough and microscopic. They have eight legs, they can survive just about anything and they live almost everywhere. Let's take a look how to find them using your microscope!

Get an envelope or small plastic bag, a knife, and microscope. If you don't have a compound microscope, then use a handheld magnifier. (It's best if you have two so you can increase your magnification like we discussed in class.)



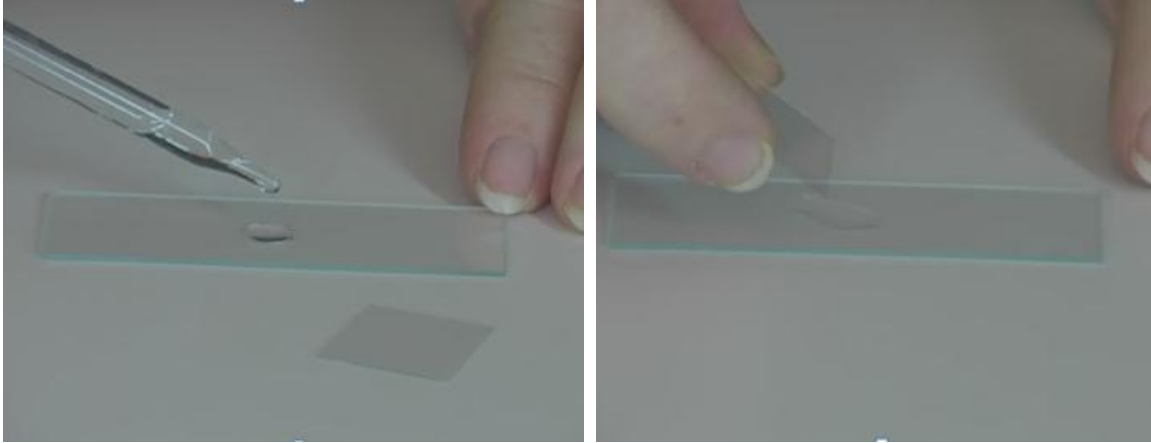
Now go on a hunt for moss, lichen, or algae. Water bears like moss, but not all moss samples will have water bears, so collect a variety. Look at green stuff growing between cracks in sidewalks, at playgrounds, and even moss growing on trees and along fences. Get in those cracks and crevices and get good samples. Moist samples are more likely to have water bears!



When water bears sense their environment is dry, they go into a state called *cryptobiosis*, which makes them look shriveled up like a raisin. It's the way they survive without oxygen, water and food. They are hard to spot when they are in this state, so before you look at your samples, rehydrate everything by adding distilled or spring water (not tap water, which can kill microscopic organisms). Leave your sample for a couple of hours to rehydrate.

When you're ready, take the moss in your hands and squeeze out the water into a cup. If you have water bears in your sample, they'll fall into your cup. Use a medicine dropper to take a sample (if you let it sit for a couple of minutes, take a sample from the bottom or the sides of the cup).

Place a drop or two on your slide and add a cover slip.



Now place it in your microscope and start to hunt for those water bears! You may find all kinds of interesting things in your hunt, so keep at it!



If you look and look, and you *still* don't see any water bears in your sample, go back out tomorrow and take new samples. Don't get discouraged! Try taking samples from different parts of the tree, rocks, and dirt. Sooner or later, you will find one!

You can take a dark field image by sliding a black piece of paper under your microscope slide and use a flashlight to illuminate it from above. You'll need to play with the focus and lighting to get a good view. Take an image with your cell phone!

If you want to keep water bears as pets, place your moss in a plastic container and keep about a half-inch to inch of water in it to keep them happy. Label each container from where you found your sample originally.

Water bears eat nematodes (tiny worm-shaped critters also called roundworms) and rotifers (tiny plankton that look like animals with wheels).

You'll find water bears in both salt and fresh water environments, so don't mix fresh and salt water samples when you do your observations to keep each water bear sample happy.

About once each month, replace the moss, algae or lichen (whichever you used) as it begins to decompose or turn moldy in order to keep your water bears healthy. Replace the water only when it is just about dried out. Your water bears can survive without water, but it's nicer to keep them moist.

After you get the hang of finding water bears, see if you can find them shedding their outer layer, laying eggs or even hatching (hint: it's going to be really small!). Have fun!

