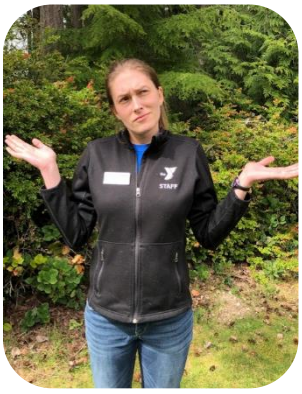
DAY 5: GET DOWN, LOOK AROUND!



Hi there! Me again! Have you ever wondered why, if living things have been living and dying on planet earth for millions of years, we aren't walking and climbing over their dead matter right now? What happens to plants and animals after they die?

Our challenge today is to try to answer those questions, by **getting down and looking around** at the ground below our feet, where all that dead matter *should* be, right?!

There are two helpful tools for this lesson (but you don't NEED them to participate!):

1) A **hand lens** or **magnifying glass**. If you don't have one at home, no worries! There are instructions to make your own on the last page of the lesson. Skip ahead if you want to make one!
2) A light-colored sheet, blanket, tablecloth, piece of fabric (please check with the adult you live with before using anything!) You could also use a white piece of scratch paper!
3) If it's wet outside, bring a plastic grocery bag or raincoat with you. You'll need it later!

Sweet, once we've gathered these items, let's **head outside**! And remember, if you take pictures and have a parent/guardian's permission, **tag YMCA Camp Seymour on social media**! It's so great to see you all outside and having fun!

The first thing we're going to do today is to look around for **four leaves. Arrange them in order from "youngest" to "oldest".** Make a claim supported with evidence you observed about why you think they are in the right order.

Claim: I think…

I put my leaves in this order. Make a prediction about what you think your leaves (or my leaves) would look like if we continued this model.

Prediction: I predict…

Scientists often try to understand scientific processes by **building models and making predictions** about what could come next to understand the natural world. Your leaf age chart did just that exact thing! Nice job!

Did you predict that your lead would eventually "disappear", decompose, or break down? That is exactly what is happening to our leaves in all of the steps as they get "older;" they are **decomposing** slowly into smaller and smaller pieces and eventually, simpler pieces too. Over time our leaves, and all living things, decompose, which explains why we aren't walking over them all the time today…or are we?

Living things on land decompose into parts that make up the **soil** underneath our feet! But that's not all! As they decompose, they also break down into water and carbon dioxide gasses, which make up parts of our atmosphere. Pretty cool!

But who/what is doing all this decomposing? To find out, we're going to **get down, and look around** at the ground below our feet. To show why, try this experiment:

Take a look down at your feet. Make sure to stay standing! What do you notice about the ground around them? Write down **three observations**.

Now get down closer on your elbows and knees (if it's wet, no worries! You can kneel on the plastic grocery bag or raincoat you brought. Just remember to bring it home with you!), and look at the same spot. What do you notice now that you're up close? Write down **three new observations.** This is a great time to use your magnifying glass or hand lens if you have one.

See? You can see so much more when you are up close! This is important for solving our decomposing mystery!

Organisms that decompose dead material are called **decomposers** (makes sense, right?!) Decomposers fall into three big categories: **Fungi, Bacteria, and Invertebrates**, which we like to call the **F.B.I.** The F.B.I usually are small, so getting down where we can see is important!

Even though the F.B.I. are hard to spot, evidence of them is everywhere! Check out some examples below.

Photo credit: Diana Edelblute

https://www.forbes.com/sites/linhanhcat/2019/08/25/decomposer-fungi-under-climate-change/#2df4d9651a10

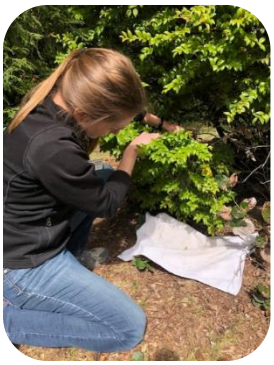
Photo credit: Diana Edelblute

https://homeguides.sfgate.com/worms-change-rotten-leaves-fertilizer-81616.html

Photo credit: Diana Edelblute

Evidence you might see:
Fungus-In examples 1 & 2, there are two different kinds of mushrooms performing their role as a decomposer. Mushrooms are commonly found on trees (living or laying on the ground) or amongst the leaves. These super decomposers send special enzymes into wood and other material to break things down from the inside.
Bacteria-Bacteria are microscopic, so we can't see them, but they often leave evidence behind, like interesting spots on leaves in example 3.
Invertebrates-Example 4 shows earthworms! As earthworms, slugs, and snails eat, they digest leaf matter and their poop enriches the soil. If you see one of these creatures, they are almost certainly decomposing! Example 5 shows holes left behind by invertebrates eating leaves to break them down.

Let's see if we can find evidence of the F.B.I. in our outdoor spaces! Good places to look include under logs, sticks, rocks, and leaves (be sure to replace them when you're done looking) and inside holes in stumps (don't put your fingers anywhere you can't see inside). Spend around five minutes searching, using your observation, question, and connection skills as you go. Write down **three claims** about what you find. Why do you think this is evidence of the F.B.I.?



Nice work! You really have to look for that evidence of the F.B.I.!

It can be hard to actually see fungi and bacteria sometimes, but it can be relatively easy to see **invertebrates** (organisms with no backbone). Common invertebrates we see are insects, slugs, and worms. Do you see any of these? If you have a bush nearby try observing there. Invertebrates love to hang out in the leaves. Still can't see any? Try this:

Set a light-colored piece of fabric or paper on the ground under the bush. Shake the bush gently, then observe what landed on your fabric or paper. Use your magnifying glass or hand lens if you have one. What do you notice?! Feel free to sketch something you see in the space below.

Decomposers are such an important part of our ecosystem. Take a look around you. If there were no decomposers, what do you think this area would look like?

Nice! I hope you learned something new today and throughout these last few days! Thanks for exploring the outdoors with us! We've had such a good time investigating with you! In the upcoming weeks, keep playing outside and using your skills to explore your natural spaces! Stay safe, and we hope to see you at YMCA Camp Seymour soon!

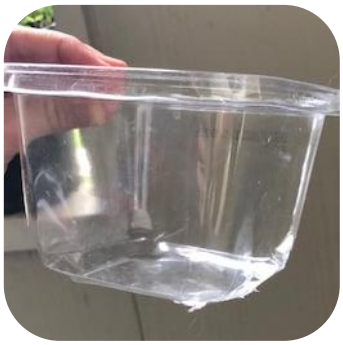
Homemade Magnifying Glass/Hand Lens

Making your own low-strength magnifying glass or hand lens at home is fun and easy! I've included basic instructions, as well as a few links to other ideas on the internet.

Step one:

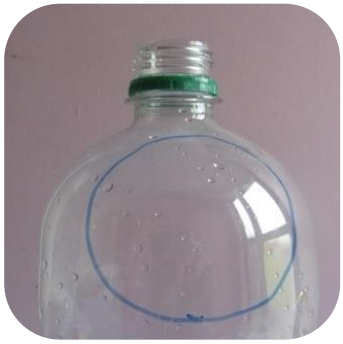
Find a **concave** piece of see-through plastic (Concave means it is shaped liked a slight bowl: you want to be able to put a small amount of water in the bottom) There are so many options for this! I used a leftover food container and made it concave by pressing the bottom down to form the bowl shape. It really doesn't have to be a deep bowl to work!

Concave shape



Another option is to use an empty soda or water bottle and cut a small concave circle from the top of the bottle. See this website for more detailed instructions:

https://www.science-sparks.com/make-your-own-magnifying-glass/



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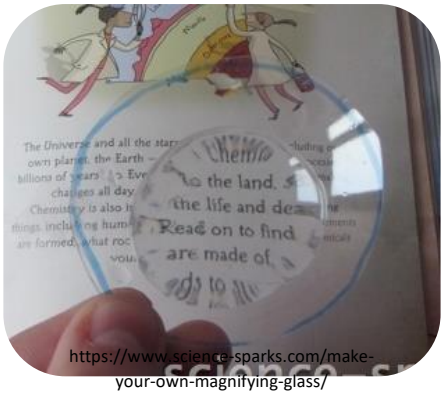
Step two:

Once you have your concave plastic, put a small amount of water in the "bowl" of the container. The water refracts light as it passes through the shape (meaning bends it inward), making things on the other side appear larger, like a lens.

Step three:

Move your hand lens over the text of object you are trying to make bigger. You should see the object magnify!



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Other ideas:

Magnifying using a zip-lock bag: https://www.youtube.com/watch?v=5z7c_6p3RFE

Magnifying using plastic wrap: https://www.youtube.com/watch?v=YbqaoAxkd4s

Video instructions for using a plastic bottle: https://www.youtube.com/watch?v=lxGkF8ORD80