

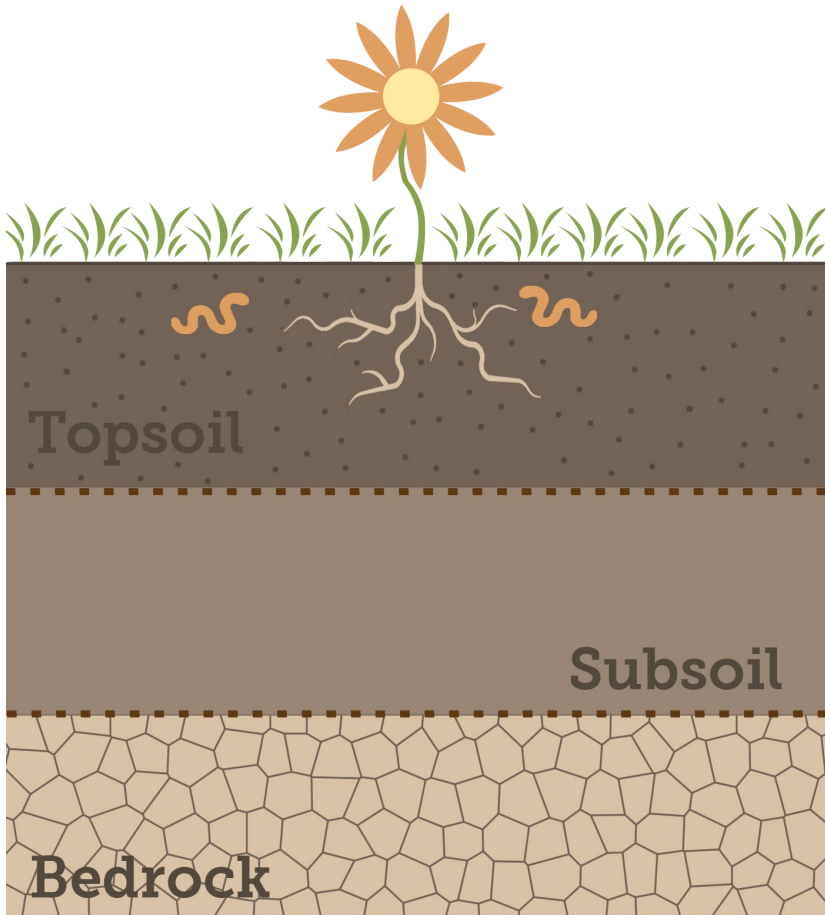
Edible Soil

Soil is a vital resource and very important to farmers. Today, we're going to learn about the different layers of soil and how each layer works. Join Val on Vimeo to do the activity along with her:

<https://vimeo.com/monsantostem/ediblesoil>

What does soil do?

- Provides support for the roots of the plant
- Provides nutrients for the plant
- Holds water for the plant



Soil can vary from location to location. In some places, the topsoil is made of larger particles such as sand and silt, so water drains from it quickly and makes it a great place to grow plants like cotton. Other topsoil is made of smaller particles like clay that holds water like a sponge, which makes it good for growing rice.

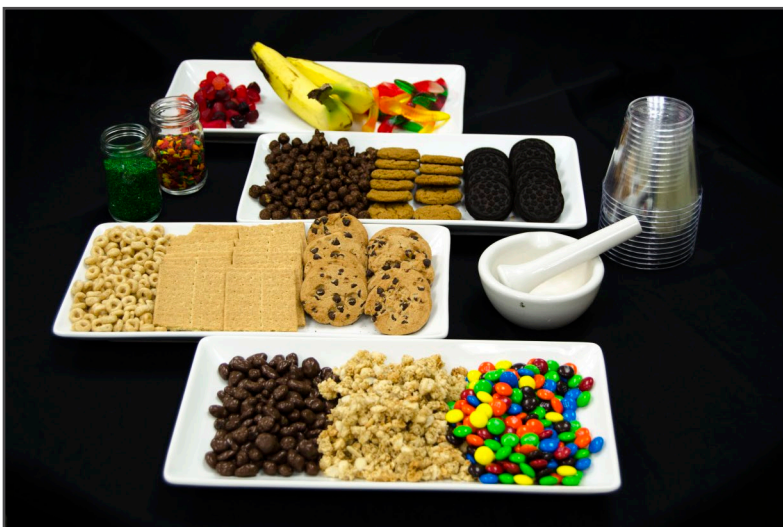
Today, we're going to make a soil profile model and a tasty snack all at the same time! Remember, you can make your soil profile using whatever snack ingredients you want, so feel free to tailor this to your own taste. We used the ingredients we like best to munch on, but you can be as creative as you want in deciding which snacks you want and think make the most sense to represent your different layers.

Safety:

Since we're working with food, make sure to wash your hands well and work in a clean area.

What you will need:

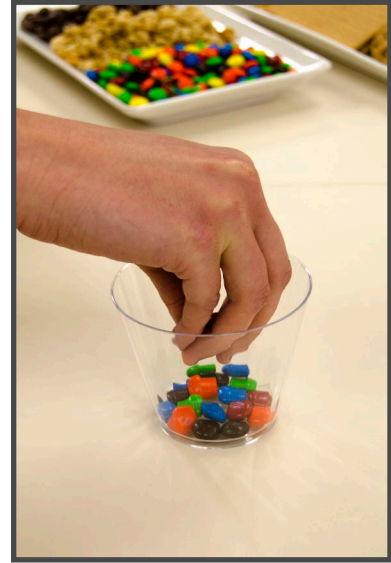
- **A clear plastic cup**
- **A zip top plastic bag**
- **A meat tenderizer/ rolling pin/ mortar and pestle**
- **Snack foods to represent each part of your soil profile:**
 - **organic matter and microbes** (we used 2 different colors of shapes and sprinkles)
 - **decomposers** (we used gummy worms)
 - **topsoil** (we used dark cookies)
 - **subsoil** (we used light cookies)
 - **bedrock** (we used hard chocolate candies)



We will be building our soil from the bottom up, so let's get started!

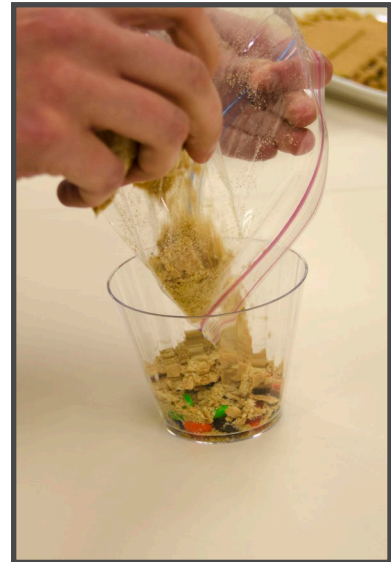
1. Bedrock is made from large chunks of rock, which you can sometimes see when you go to the mountains or after a natural disaster, like an earthquake. For our soil profile, we are using hard chocolate candies to represent the bedrock.

- **Place a handful or a scoop of your bedrock material into the bottom of your cup.**



2. Subsoil is the layer that sits on top of the bedrock, and it's made up of a mix of dirt and large chunks of rock. Subsoil is where deep rooted plants like soybeans and sunflowers send their roots to pull nutrients and water to the rest of the plant. We are using light colored cookies to represent the subsoil, and since we need to make them the right size, we'll need to break them into pieces.

- **Place your subsoil material into a plastic bag and use your hand to smash them into pieces. Pour the pieces into your cup right on top of the bedrock.**



3. Topsoil is the layer that sits on top of the subsoil and is the dirt you see in your backyard or in the park. It's the most important layer of soil because this is where farmers and gardeners plant their seeds, and it is full of nutrients, minerals, microorganisms, water, and organic matter- all things that plants need to grow. Most plants grow in the top few inches of topsoil, so without that layer, we would have a hard time growing food. For our soil profile, we are using dark cookies to represent the dark, nutrient rich topsoil, and we used our mortar and pestle to grind it into a fine soil.



- **Grind up your topsoil material into a powder using a mortar and pestle, meat tenderizer, rolling pin, or other tool. Pour it on top of your subsoil layer.**

Quick Fact

It takes 300 - 500 years to create just one inch of topsoil. That's a long time!

4. The topsoil layer is home to decomposers such as worms, microorganisms, and insects. These decomposers break down organic matter that falls onto the soil, and without them, we wouldn't have any topsoil! We used gummy worms to represent our decomposers.

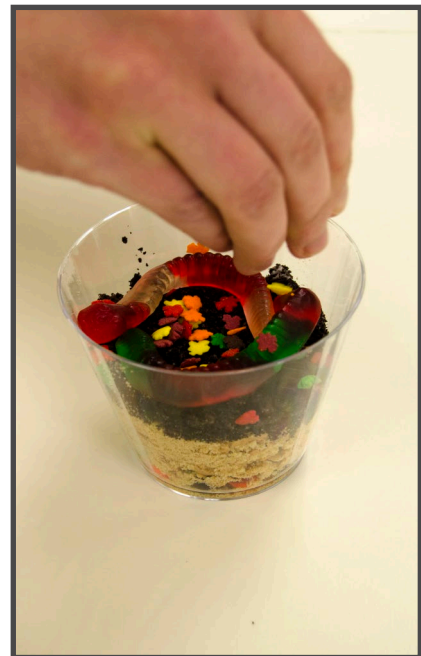
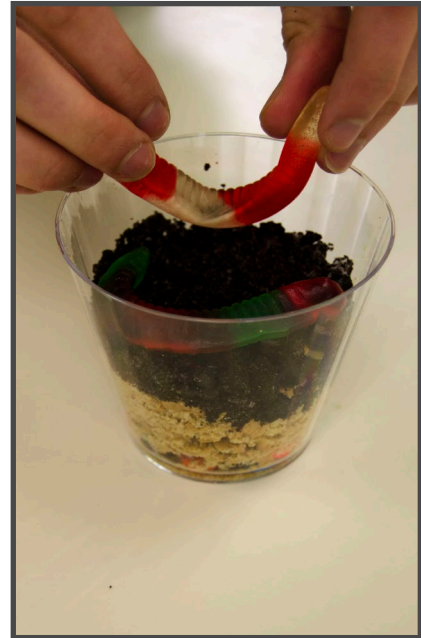
- **Place your decomposers into your topsoil so they can break down the organic matter and keep your soil healthy.**

5. Organic matter is made up of decomposing materials such as leaves and animals that dissolve into the soil. This is what gives the topsoil the rich nutrients for plants to absorb. We used leaf-shaped sprinkles to represent the organic matter in our soil profile.

- **Sprinkle your organic matter on top of your topsoil so that the decomposers can break it down into nutrients.**

6. Microbes are beneficial bacteria that are found in topsoil and they are vital to the health of plants. They help protect plants against insects and diseases. We are using small sprinkles to represent microbes.

- **Sprinkle your microbes on top of the organic matter so your plants will grow healthy and produce lots of food.**



You've finished your soil profile! Take a look at the different layers and think about what different plants need to survive. Does your soil look like it would drain well and be good for crops like cotton, or does it look like it would hold water like a sponge and be perfect for rice? Or does it look like something in between?

Take some time to look at the soil in your neighborhood and near where you live. Can you see differences in the soil in different places? What could you use to make an edible soil profile that would best represent the soil near you?

#CampSci

Draw a picture of your soil profile and label the parts. What kinds of plants do you think would grow best in it?

