

# Lesson 3: Soil

## Notes for Parents

### Notes on Soil

- Various plants require various soil types, if you are looking at succulents you will need a specific mix. If you want to plant flowers there are soils and fertilizers geared for that. Spend time planning around the seeds you and your family have chosen.
- Based off your garden location you will need to purchase soil.
  - Seed starter mix is necessary for starting off seedlings for your garden
  - Garden soil will be used if you are planting an outdoor garden
  - Potting mix will be used if you are planting in pots or other containers
- Soil health centers around a few main components:
  - Nutrients such as Nitrogen and Phosphorus often obtained from fertilizers, and organic ones if possible, provide essential functions for plant growth and development.
  - Organic matter from dead and decaying plants contributing to more functional components such as sulfur.
  - Soil air/Atmosphere containing pores consisting of gases such as Oxygen and Carbon Dioxide along with water vapor.
  - Microorganisms containing bacteria, fungi and more conduct an array of various tasks that contribute to both healthy plants and a successful soil environment.

### Notes for Lesson 3

- Wearing gloves while gathering and working with garden soil is recommended.
- Ensure children thoroughly wash hands after manipulating soil.
- For the **“Soil Art”** activity you will need to gather soil. Having many colors is good, but be sure to make sure it is a safe place to gather. You do not want animal feces or to be near an old building or industrial location that could contain lead.
- Whatever soil you are using have your children see if they can find the various pieces discussed. Use a magnifying glass if necessary to see each part and go over its function.
- Use this opportunity to talk about flora and fauna across the worlds environments: deserts, tundra, rainforest etc. What might their soils and plants look like?

# Lesson 3: Soil

A natural resource that is formed from broken down rocks, rotting plants, bones, and parts of creatures and microbes.  
*What is another name that you know for soil? DIRT!*

Soil can look very different because each place is different. *Think about the soil you see on the mountains versus on the beach?* It's different because different materials are broken down and different **organisms** [*or-gan-izms*] are present. Organism, means a single plant or animal.

Soil can even come in many colors! *Have you seen red soil? How about black soil?*

Once the seed sheds off the cotyledon it will need a new source of food, and that is where soil comes in! Compost is one of the ways gardeners feed their plants.

## What is compost?

Compost is a type of fertilizer, or plant food, made from waste that is broken down by microorganisms.

**Microorganisms** [*mik-row-org-an-izms*] are VERY tiny bacteria or fungi in the dirt.

To make compost you need to have nitrogen-rich ingredients and carbon-rich ingredients.

**Nitrogen** [*nigh-tro-jin*] is a gas that is needed for animals and plants to live and is a big part of earth's air.

All living things on earth contain **carbon** [*kar-ben*] so adding these to your compost provides energy for microorganisms that break the waste down.



### Green—Nitrogen

Garden waste, kitchen green waste, grass clippings, coffee grounds and even hair!



### Brown —Carbon

Paper, dried leaves, wood pieces, straw, sawdust



## Soil is the foundation for Healthy Plants!

If you have an outside garden, you can use gardening soil, and if you grow in pots or containers you need potting mix. **BUT WHY?**



### Garden Soil

-Garden soil is soil that has compost and other added nutrients.

-Garden soil does not drain well because it is more **compact** [*kam-pak*]. Compact is when something is closely or tightly packed together.

### Potting Mix

-Potting mix is made without soil but contains compost.

-Potting soil includes: Peat moss and vermiculite which hold water. Perlite is also added which improves soil **aeration** [*air-a-shun*] and drainage.



# Hands on: Soil

## Looking at Dirt

### What you will need:

- Dirt
- Glass jar
- Stick or something similar to stir

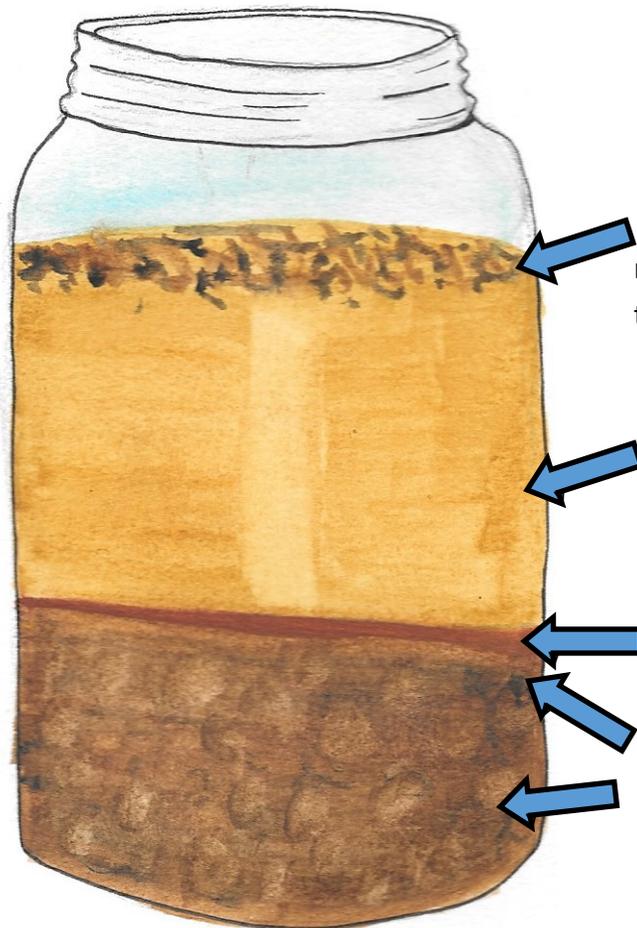


### Directions:

1. Fill jar 1/3 with the dirt you collected
2. Then add water until the jar is almost full
3. Stir the contents in the jar really good making sure to get the bottom and break up thick parts
4. Leave jar to settle for at least 1 hour

## What are you seeing?

You should see different layers inside your jar.



**Humus:** The rotting plants, leaves, wood and animal matter that float at the top. The humus helps bind the soil together.

**Clay:** A very small and fine powder that mixes with the water.

**Silt:** Like sand but much smaller, since it's smaller it holds more water.

**Rocks and Sand:** Rocks are very heavy so they settle on the bottom and the sand sits on top of it. The grains of sand do not compact so water moves through them very easily. *Just like the beach!*

# Hands on: Soil

## Soil Art

### What you will need:

- Soil (diverse colors is best)
- Tools to crush soil
- Glue
- Oven to dry out soil in
- Cups/plates
- water
- Sieve, panty hose or similar material
- Water color paper
- paintbrushes

### Directions:

1. Collect dirt samples from your yard or other safe areas and clean out large materials
2. Dry out soil on old baking sheets, once dry crush the soil to make it as fine as possible
3. Sift the sand through a sieve or material similar to panty hose to make it the smallest particles possible. Ideally you want it to be powdery.
4. Adding a little at a time, mix soil with glue and water aiming for a paint consistency
5. Begin to paint!

### Parent Note::

This activity gives room to use substitute materials and for your child to partake in making choices on the process.

### Examples of questions to ask to lead your child:

*Where can we collect dirt?*

*How can we smash the dry soil?*

*Do we need tools?*

*What should we use to paint? (paintbrushes is fine but you can also use plants, material etc)*

