



This lesson is presented as a hands-on approach to learning the components of soil. Students will get their hands dirty exploring soil and discovering firsthand why each component of soil is important for keeping the soil and our plants healthy. Students will look closely at a scoop of soil to discover the living, non-living, and once living parts. They will then practice stewardship and discuss the things we can do to keep our soils healthy.

K-ESS2-2. Construct an argument supported by evidence for how plants and animals (including humans) can change the environment.

K-ESS3-



Finally, soils that form from rocks with clay minerals will have a high clay content. The size and type of the rock and mineral content of a soil will impact the soil's structure, how compacted or aerated the soil becomes, the soil drainage, porosity, and permeability. The soil's ability to hold air and water is vital to keeping micro-organisms alive and thriving.

When rocks undergo weathering and erosion, the individual minerals that are within a rock are released and make up the sediments that are formed. While there are over 4,000 different types of minerals, just 9 minerals make up the majority of all rocks on Earth. These minerals are referred to as rock forming minerals. These are the minerals you are likely to find in your backyard soil.

The organic material in soil is arguable the most important ingredient. Without organic material, plants would not have the necessary minerals they need to survive. Organic material includes both living and non-living organisms. Humus, which makes up about 80% of the organic material, is all the organic material that is decaying. It is mostly made from decomposition of plants (and animals) - leaves, roots, etc. Decomposition takes place through the living organisms that are present within the soil. Fungus, bacteria, and insects work to eat and decompose this material. They then poop out healthy mineral rich soil! (Most children get a kick out of this fact!) Without these living organisms we would not



Begin by reviewing what living and non-living means with students.

Ask the students what do all living things need to live? (Food, water, shelter, space)

Ask the students how plants get their food and water. They might say rain, hose (humans), sunlight).

Discuss with the student that plants do get their water from rain (or us) and use the sunlight to make their own food. However, plants cannot do those things without soil. For example, they need soil for their roots to grow and hold them steady. Otherwise, they could not stand up.

Discuss how the soil holds onto the water for the plants to drink.

Discuss how soil holds important nutrients for the plants. While plants primarily make their own food, they also need these nutrients from the soil.

Next read one of the books provided.

Discuss that without healthy soil, plants could not grow and without plants we would not have fruits, vegetables, trees, or the animals that eat plants and animals that eat those animals!

Hand out the soil journal to students and have them cut and staple the pages together.

Have the students fill out their name and the first page by drawing a picture and writing a sentence about why soil is important.

-
1. Break the students into groups of 2 or 3 and give each group a soil sieve, shovels, magnifying glasses, and two aluminum pie pans.
 2. Go outside and pick a location that has good soil (not mulch beds or playground gravel).
 3. Have one student take a shovel of soil and dump it on top of the sieve, while another student holds the sieve over the pan. Gently shake the sieve until the smaller pieces fall through the holes.
 4. Have the student holding the sieve dump the contents left on top of the sieve into the second pie pan.
 5. Have the students first look through the larger sized particles (the stuff left behind on the sieve) and describe what they see in their soil journal.
 6. Next have students use magnifying glasses to look through the smaller sizes particles to observe what they see, using their journal to document. Allow 10-20 minutes for them to explore and look through the soil. They can search multiple locations if space and time allow.
 7. After students have looked through the soil outside, they can come back into the classroom to discuss their findings.
 8. Have each group take turns describing the things they saw in their soil.
 9. Next, list soil's main 'ingredients' using the ingredients box of items. You can spend as much or as little time as you would like to discuss each ingredient in detail. Have the students fill out their final page in their soil journal as y(e)9(m[])JTIT@MC 08. 04 Tf1 0 0)9(so)-7(90 Gar/F1 11.GI.2 0 612 792 reV



11. You should discuss how each ingredient is important to keeping soil healthy, which keeps all our plants and animals healthy.
12. You can ask students ways in which we can protect our soils. Some ideas to discuss might be not using pesticides/fertilizers, growing native plants (great for local wildlife too!), using safe soaps when washing our cars, etc.