

# Making Soil - How Does Soil Form?

## Essential Question:

*How is soil made? Can we imitate the process of making soil?*

**At a Glance:** Learners use items such as hammers to crush rock and scissors to shred leaves as they investigate how weathering and time contribute to soil formation.

## Background Information:

It takes approximately 100 years to create an inch of topsoil. In Georgia, much of the topsoil has been lost as a result of the excess runoff of rainwater and floodwater. Until about the 1930's a major factor in the destruction of Georgia's soil was the cotton production, whose poor farming techniques encouraged excessive water runoff and soil depletion. Another important factor has been the hilly, sloping nature of much of the land. When left bare, the hilly slopes are soon gullied and stripped of their soil by heavy rains. Much of the eroded area has left a heavier reddish clay subsoil. The red color is due primarily to iron oxides. The red soils result from the affect of a warm, humid climate weathering acid crystalline rocks over a long period of time.

## Getting Ready:

In order to save time for this activity, collect the "ingredients" for the soil from the schoolyard or other location. Choose an appropriate learner from the group to be the rock crusher or if safety is a concern, the teacher should crush the rock.

## Procedure:

1. Have learners identify the components of soil.
2. To represent mechanical weathering, the learners can crush rocks and sand with the hammer as parent material for the mineral portion of the soil. Keep the rocks and particles inside the cloth bag to prevent injuries from flying pieces. Explain the ways in which weathering occurs in nature (the freezing and thawing of rock, wearing down of rock by wind and water).
3. To represent the products of chemical weathering, learners can file off rust from rusty metal (scrap iron bars). Explain that chemical weathering occurs when chemicals in the environment react and break down. Iron reacts with oxygen in the air and forms rust. This process also occurs with the minerals in rocks.
4. The learners can shred leaves and other fresh organic material that appropriate to be used. Dead bodies, animal wastes, living such as worms and insects are present in the organic soil but may not be appreciated or appropriate.
5. Have the learners combine these ingredients to prepare soil.

**Location:** Classroom, (with materials collected outside)

**Objectives:** *Learners will*

- 1) name the ingredients of soil and combine these items to prepare soil.

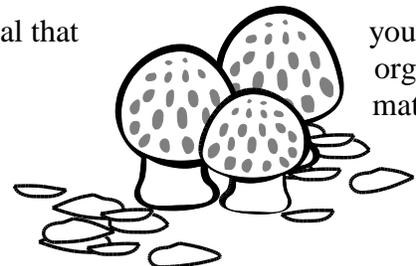
**Skills:** communication, inference

## Supplies:

- rocks, sand
- rusty metal (*no sharp edges*)
- leaves
- hammer
- scissors
- cloth bag
- file
- safety goggles

**Subjects:** Science, math

**Time:** 10 minutes



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**Discussion/Assessment:**

Have learners discuss how they formed soil and how nature produces soil.

How is their soil different than natural collected soil?

Is anything missing in their soil?

What would happen in nature to make soil?

What would happen if they left a sample of their soil outside to be observed over a period of time? How might it look in one week? One month? One year?