



# Soil Exploration

## Goals

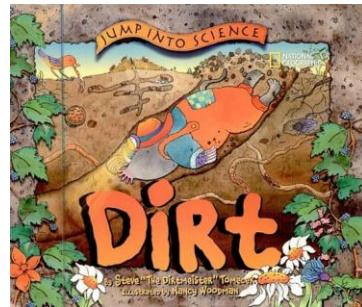
Through garden exploration, students will learn about the properties of soil and why soil is important to plants. They will closely observe soil and practice tallying and reporting results of soil experiments.

## Curriculum Alignment

Find a list of which Common Core State Standards and NC Essential Standards this lesson plan aligns with on the lesson plan page at [www.growing-minds.org](http://www.growing-minds.org).

## Materials

- Soil Sorting worksheet
- Newspaper
- Jars with lids (at least three)
- Water
- Trowels



**Book to Read**  
Dirt  
by Steve Tomecek

## Activities

### In Class (or In Garden) Discussion

Ask students, "What is soil?" Write some defining words on the board. What do students know about soil? What is it made of? Why is it important? What do students want to know about soil? Optional: Make a KWL chart recording their responses.

Read Dirt by Steve Tomecek. Every page of this book contains valuable information about soil. You can choose to read the entire book to students all at once or break it down into two or three days. Pages 4-15 are especially relevant to the activities in this lesson plan.

Discuss why soil is important for plants (holds water, air, nutrients). What is in soil? Have students think of things that make up soil and then talk about how soils are a combination of sand, silt, clay and organic matter. Soil type, and its capacity to grow plants, is dependent on the mixture of the four components. Review the information in Dirt:

*Sand, silt and clay are all different size particles, sand being the biggest (basketball), than silt (baseball), and clay (penny). Have some of each type for students to touch. The way a soil "feels" is called the soil texture. Soil texture depends on the amount of each size of particle in the soil. Sand, silt, and clay are names that describe the size of individual particles in the soil. Sand has the largest particles and they feel "gritty." Silt are medium-sized, and they feel soft, silky or "floury." Clay are the smallest sized particles, and they feel "sticky" and they are hard to squeeze.*



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*Soil contains much more than just the types of sediment (sand, silt, and clay). It also contains organic matter—like twigs and dead leaves. Organic matter comes from living things such as plants and animals. When organic matter rots or decays, it puts nutrients into the soil that plants need to grow. Farmers and gardeners add organic matter to their soil in the form of compost, manure, leaves, cover crops, and mulch.*

## Do the Soil Water Dance

Tell students that water moves through each of the different types of soil (sand, silt, clay) differently. Ask the students to stand up. Designate half of the class as “soil” and half as “water.” First, tell soil group that they are sand particles (the biggest type of sediment) and ask them stand very far apart, just like sand particles. Ask the students representing water to move around the “sand.” Was it easy or difficult for them to move around the sand particles? Tell the students that next, they’ll represent clay particles (much smaller). Ask students to stand very close together. The students representing water then try to move through the “clay” particles. How is this different? Review that water moves quickly through sand and that it moves very slowly through clay. At a farm or in the garden water often puddles on top of clay-based soil for many days.

## Garden Activity: Soil Shake

Want to find out what types of sediment are in the garden? Guide students in collecting several samples of soil from different locations in the garden, keeping the samples separate. Put each sample in its own glass jar, filling the jar about half way with soil. Add water until the jar is almost full. Put on lid tightly and shake the soil until any clumps are broken down. Leave the jar to settle for several hours. When students return to the jars, they will see distinct layers. Guide students in observing that the different soil particle types – silt, sand and clay –have settled out into their own layers. What types of soil are each soil type composed of? Does one have more sand or more clay? See chart below:





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## Garden Activity: Soil Exploration

Go out to the garden and place students in different areas of the space. Give each student a trowel and a piece of newspaper. Have them dig a small soil sample and put it on their newspaper. Have them examine it and sort it into different groups of things – things that were alive (grass, twig, root), bigger rocks, small rocks, leaves etc. Have students circle and tally the things they found in their soil on the soil sort worksheet. Encourage students to use their sense of touch, sight, and smell to explore the soil. Come back together as a class and select several students to report on their soil sample findings!

## Extension

Ask students to sort the soil base on color, hardness, shape, or size. Ask students to bring soil from home and compare them (with one another and with the school garden soil).