

# Soil Testing and Texturing

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**Objective of the Lesson:** This lesson is designed to introduce students to soil textures and why they are important in examining soil quality. Through the exercise, students will learn how to feel the difference between soil textures.

**Standards Addressed:**

Science

K-3	4-5	6-8
<b>Standard 1</b> <i>Nature of Science and Technology</i> A-1, A-2, A-3	<b>Standard 1</b> <i>Nature of Science and Technology</i> A-1, A-2, A-3	<b>Standard 1</b> <i>Nature of Science and Technology</i> A-1, A-2, A-3
<b>Standard 2</b> <i>Materials and Their Properties</i> A-1, A-3	<b>Standard 2</b> <i>Materials and Their Properties</i> A-2	<b>Standard 2</b> <i>Materials and Their Properties</i> B-2
<b>Standard 5</b> <i>Earth's Dynamic Systems</i> A-1	<b>Standard 5</b> <i>Earth's Dynamic Systems</i> A-1, A-2	<b>Standard 5</b> <i>Earth's Dynamic Systems</i> B-2
_____	<b>Standard 8</b> <i>Ecology</i> B-2	_____

Agriscience

6-8
<b>Standard 4</b> <i>Plant Science Careers</i> B-2, B-9
<b>Standard 7</b> <i>Natural Resource and Environmental Careers</i> B-6

**Materials Needed:**

- ✧ Sandy and Clayey soil samples (for texturing)
- ✧ Soil testing kits (available from Wards; 50 tests for \$22.00)
- ✧ Several different soil samples (for testing)

**Teaching Tips:**

- ✧ Students will work in groups of 2-4 students.
  - ✧ In your classroom, you may wish to have samples of textures for the students to which the students may compare their samples. One way is to have small grain size cards with 1 in. squares of sand, silt and clay.
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**Procedure:**

1. Dig several small holes from a surface soil in the area or provide several different types of soil for sampling and texturing.
  2. Have students examine and feel each sample to texture. Explain what each texture feels like (beach sand with which they may have built a castle, play dough, etc...). Show them where each of these textures is represented on a simple textural triangle (see handout).
  3. Have students write down what texture they think their soil is closest to on the handout.
  4. Using that soil sample, follow the directions in the Accu-grow Test Strip kits.
  5. Have students count together and follow all directions together so that everyone understands what steps are being done and why.
  6. Have students write down the different values that they have for nitrogen (N), phosphorus (P) and potassium (K) for their soil.
  7. Explain the soil nutrient levels that are optimum and what they could do if their soil is not optimum. Stress the importance of soil testing when fertilizing lawns and gardens.
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**Check for understanding:**Possible Questions

1. Describe which soil texture is best for gardens and growing healthy plants.
2. What factors may control the texture of a soil?
3. Why is it important to know the texture of a soil?

Suggested Answers

1. Soils that are best for gardens and growing plants are loams. These soils are found in areas with good summer rains and cold winters. This makes for a variety of grain sizes. There are a variety of loams (i.e. sandy, silty, clayey, etc.), however a loam has less clay than sand or silts. Loams also tend to have higher organic material percentages.
  2. Factors such as climate, topography, and microbial activity can control the texture of a soil.
  3. The texture of a soil affects the water infiltration rates and the movement of water through the soil. The soil texture can also affect the aeration of the soil and the ease with which a soil can be tilled. A soil's texture is a factor that can control if the soil may be used for agriculture or gardening.
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### **Summary of learned material:**

The texture of a soil (i.e. sandy, silty, loamy, etc.) is an important factor to analyze. If the texture of a soil is known, how that soil stores water and nutrients can be determined. The texture also helps in determining what types of organisms live in the soil as well as the types of plants that the soil may grow. Soil texture may also provide information regarding the parent material and how the climate may affect that substance.

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### **Additional Resources:**

*General sites:*

[http://interactive.usask.ca/ski/agriculture/soils/soilphys/soilphys\\_tex.html](http://interactive.usask.ca/ski/agriculture/soils/soilphys/soilphys_tex.html)

<http://ltpwww.gsfc.nasa.gov/globe/pvg/texture1.htm>

<http://ltpwww.gsfc.nasa.gov/globe/tbf/txtbyfel.htm> - Texture by feel.

*Determining Soil Texture:*

<http://ltpwww.gsfc.nasa.gov/globe/pvg/texture2.htm>

<http://www.osha.gov/doc/outreachtraining/htmlfiles/soiltex.html> - Nice table of field methods.

<http://www.waite.adelaide.edu.au/school/Soil/texture.html> - The ribbon method.

