



Science Lessons

And worksheets for

Food Forests and Edible Gardens

First Quarter Soil Sort Grades 1-5

Standards and Pacing Guide:

Science

Grade 1- 1st quarter, The Practice of Science SC1.N.1.1: Question, Investigate, Explain
SC.1.N.1.2: Use Five Senses to Observe, Describe and Compare Objects
2nd quarter, SC.1.E.6.1 Recognize Rocks and Soil
3rd quarter, SC.1.L.14.3 Living and Nonliving Things

Grade 2-1st quarter, SC.2.E.6.2: How Soil Forms
4th quarter, SC.2.L.17.1 Compare and contrast Basic Needs of Plants and Animals

Grade 3- 1st quarter, The Practice of Science SC3.1.1: Question, Investigate, Explain
SC.3.1.2 Compare Observations, Explain Differences

Grade 4- 1st quarter, The Practice of Science: SC.4.1.1 Question, Investigate, Explain
SC.4.1.2 Compare Observations, Explain Differences, Earth Structures SC.4.E.6.3 Natural
Resources

Grade 5 – 1st quarter, Earth in Space and Time SC.5.E.5.2: Planet Characteristics , Practice of
Science SC.5.N.1.2 Compare Use of Experiment and other types of Investigation.

Language Arts Informational Text:

L

LAFS.3.RI.1.1, Ask and answer questions to demonstrate understanding of key details in the
texts.

LAFS.4.RI.1.1 Refer to details and examples in a text.....

LAFS.5.RI.1.1 Quote accurately from the text when explaining what the text says...

Resource: Growing Food, Linking Food and the Environment, Pages 189-193

Soil Sort Grades 3-5

Grades 3-5 Overview: This lesson furthers students understanding of soil and plant/soil interactions. Through a hands-on investigation, students will gather data on the characteristics of healthy soil then record, explain and make inferences.

Vocabulary for Grades 3-5: organic, inorganic and decomposing

Materials for Grades 3-5:

- Master 2.1A and 2.1B- one per group, and Reading for Life Healthy Soil and Observation and Review worksheet, one per student.
- pencils for sorting and writing,
- A small plastic magnifying glass – one per group
- Soil sample A - a container of fertile soil from an area where plants grow and Soil sample B - a container of soil from an area where no plants grow.

Teacher Note: The Dirt on Soil. Background information for the teacher.

Procedures for Grades 3-5:

- Place students in working groups of 2-3 students and give each group a magnifying glass.
- Before beginning the soil observation, review the categories of sorting and review organic and inorganic material. (Material from living or once living organisms, like dead plant material, worms and **decomposing** bugs, can be called **organic**. Nonliving materials, such as rocks, clay and sand, are **inorganic** materials.
- Place several spoonfuls of the soil in the center of Master 2.1A
- Remind students that they will have to take turns sharing the magnifying glass and discuss their findings with each other.
- Use the questions listed below to guide the soil observation and discussion
- Repeat with soil sample B Master 2.1B
- Students will record observations on worksheet and answer the questions.

Questions for Observations:

Do the soils look the same?

What is the difference in color, texture and smell?

Which one has more rocks?

Which soil has more organic materials?

Are there any insects-alive or dead?

Which soil is better for plants?

Further study: Together class will read Reading for Life – Healthy Soil. Guide comprehension with the following questions:

- What do you see in the picture?
- What are the steps in the soil food web?
- How do insects and worms contribute to healthy soil?
- In the picture, you see a mole burrowing in the soil. Moles do not burrow in South Florida. Why? What makes the soil in South Florida different? (We live on oolite-dead coral rock.)
- Your school garden should have lots of mulch. How does mulch enrich the soil? (Hint- mulch is from trees-organic.)

The Dirt on Soil

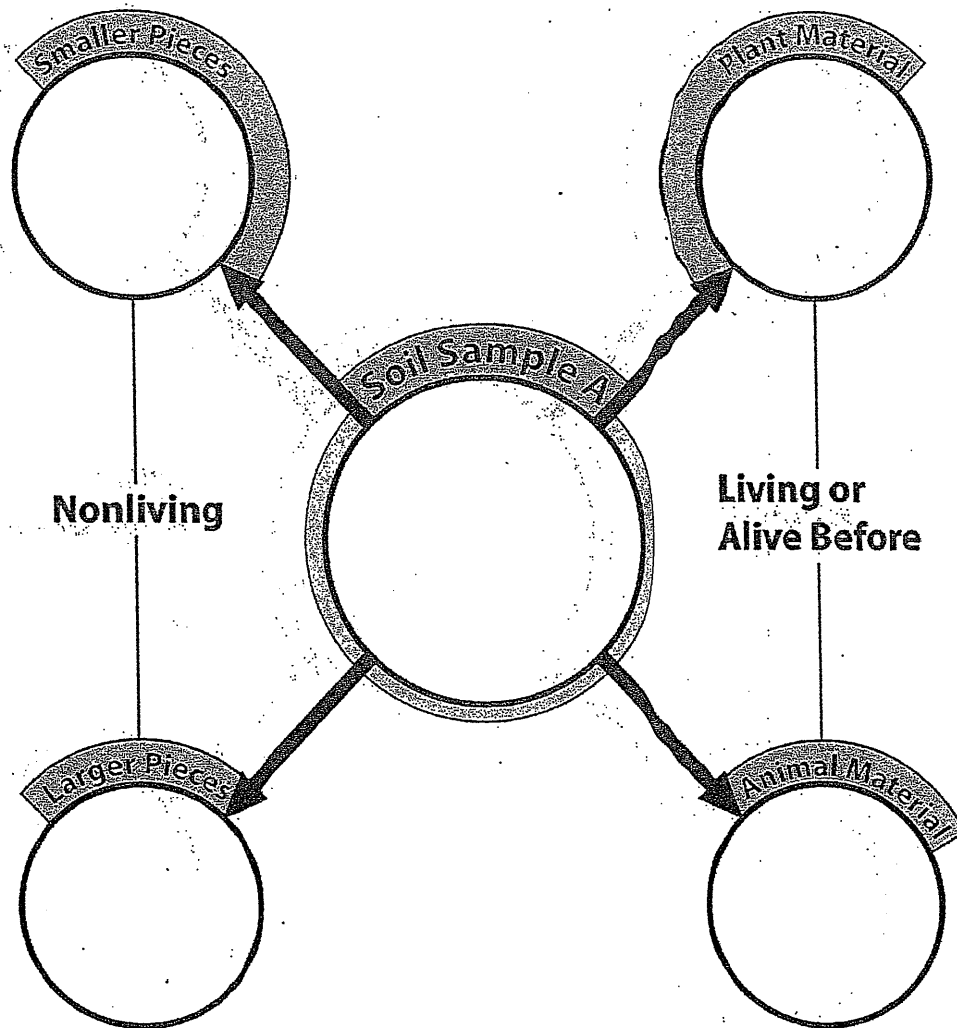
Soil is the layer of organic and mineral matter that covers much of the terrestrial land surface. Some scientists refer to it as “the skin of the earth.” Although it varies in composition from place to place, in general it’s made up of plant roots, plant and animal remains, air, water, rocks, and minerals. The process of making soil is a slow and continuous one. It includes the physical and chemical breakdown of rocks and the decaying of plant and animal remains. Soil is dynamic, constantly changing as the proportions of its components change.

Soils vary depending on the climate. Wind, water, and ice are constantly moving soil. The wind, for example, redistributes sandy soil by blowing it from one location to another. Water rushing down steep slopes often causes topsoil on the slopes to erode. Biological interactions cause soils to change as well. For example, burrowing animals, such as worms and moles, mix soils with their tunneling actions. Plant roots open channels in the soil, allowing water and air to enter. Fibrous plant roots near the soil surface, like grass roots, easily decompose and add organic matter to the soil.

In this lesson students are introduced to the basic components of soil. Based on their own observations, they begin to find out that there are different kinds of soil. In Lesson 15 students add to this knowledge by learning more about some of the characteristics of soil. They also add to their understanding of healthy soil. The term “healthy soil” has different meanings for different people. For farmers and gardeners, it refers to soil where plants can grow and thrive. Although soil is made up of mostly inorganic matter — sand, silt, and clay — it is the organic matter in the soil that is one of the key components of healthy soil. Organic matter, or humus, is a vital building block of soil. It helps soil retain water and nutrients. The amount of water soil holds depends on its components. For example, soil with a lot of sand in it does not hold water well. The water quickly passes through the coarse grains of sand. Soil with a lot of clay in it retains water and can become too wet for crops to thrive. Knowing how well soil holds water helps gardeners and farmers determine how often to water their plants.

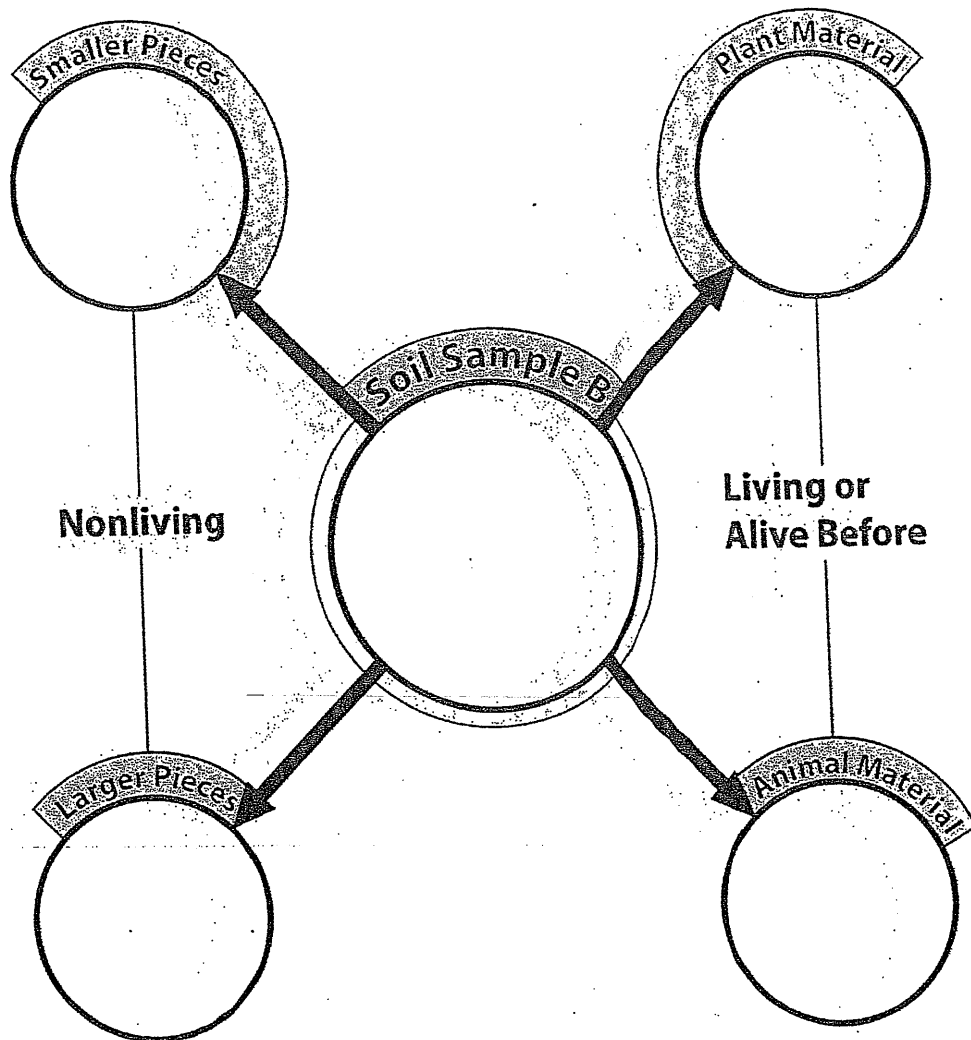
MASTER 2.1A, INVESTIGATION 1: LOOKING AT SOIL SAMPLES

1. Put one spoonful of soil A the middle circle.
2. Use a hand lens and a pencil to sort the parts of the soil into different piles.



MASTER 2.1B, INVESTIGATION 1: LOOKING AT SOIL SAMPLES

1. Put one spoonful of soil B the middle circle.
2. Use a hand lens and a pencil to sort the parts of the soil into different piles.



Soil Observations and Review

Name: _____

Observations			
Soil Sample	See	Smell	Touch
Sample A			
Sample B			

1. How is the texture of the soils alike and different?

2. Is there a difference in the odor-smell?

3. Describe the difference in color.

4. In which soil would a plant grow best? Explain your answer.

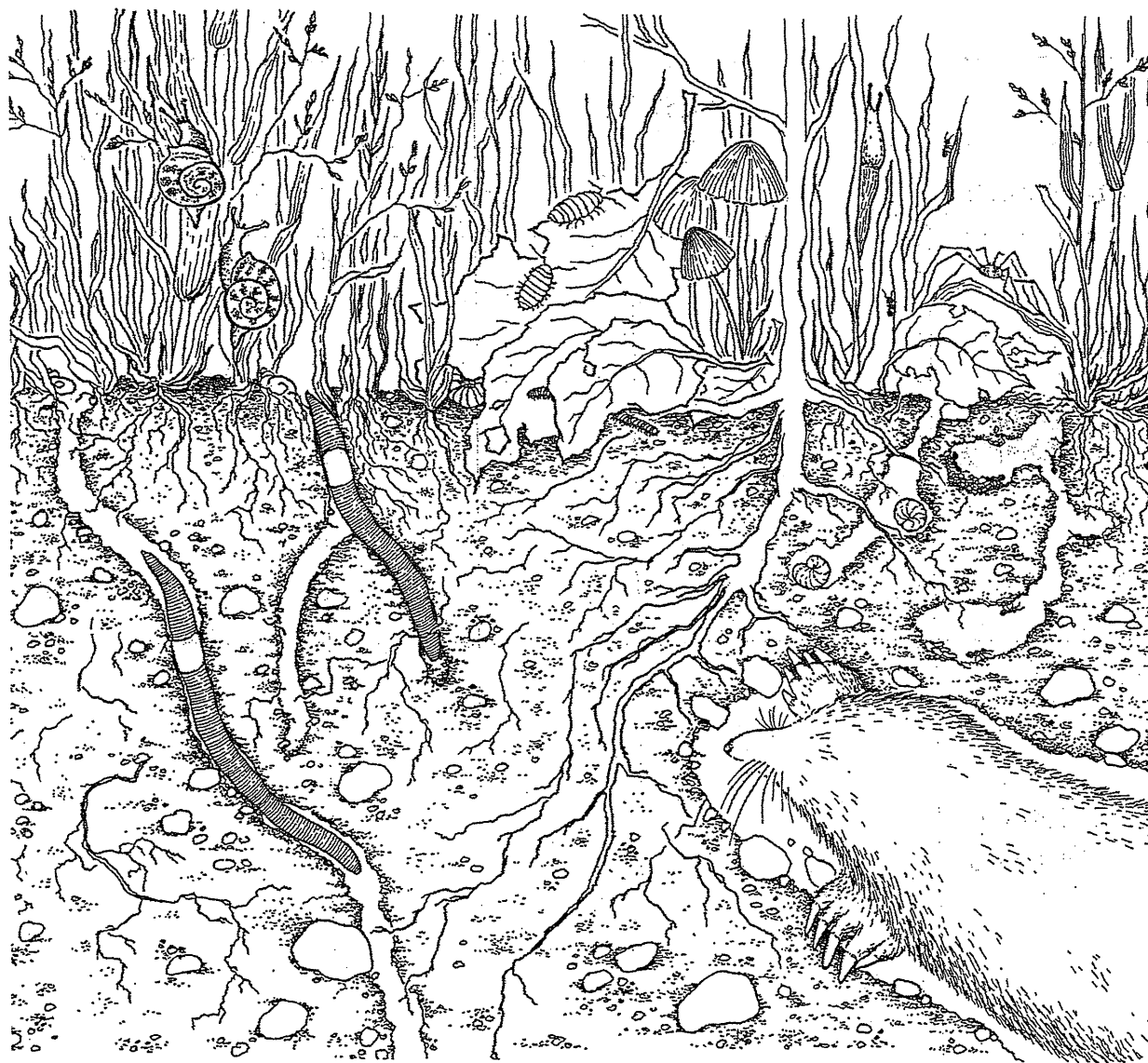
5. What did you learn that you did not know before you made these observation?



Name _____

Date _____

Healthy Soil



What is **healthy soil**? For a farmer, it means soil where crops grow well. How can you tell if soil is healthy? One sign is organic material. This indicates fertile soil where plants will thrive. Another sign of healthy soil is lots of plant and animal interactions. Look at the soil ecosystem on this page. Now find a soil food web. It begins with plants. Snails chomp on grass. Worms, sow bugs, ants, and bacteria feed on dead and decaying plants and animals, recycling nutrients into the soil. Moles burrow through the soil eating worms and insects. Their burrowing makes tunnels, which lets water and air into the soil. The organisms that live there need air and water to survive. All these interactions help make healthy soil and a place where more plants can grow.