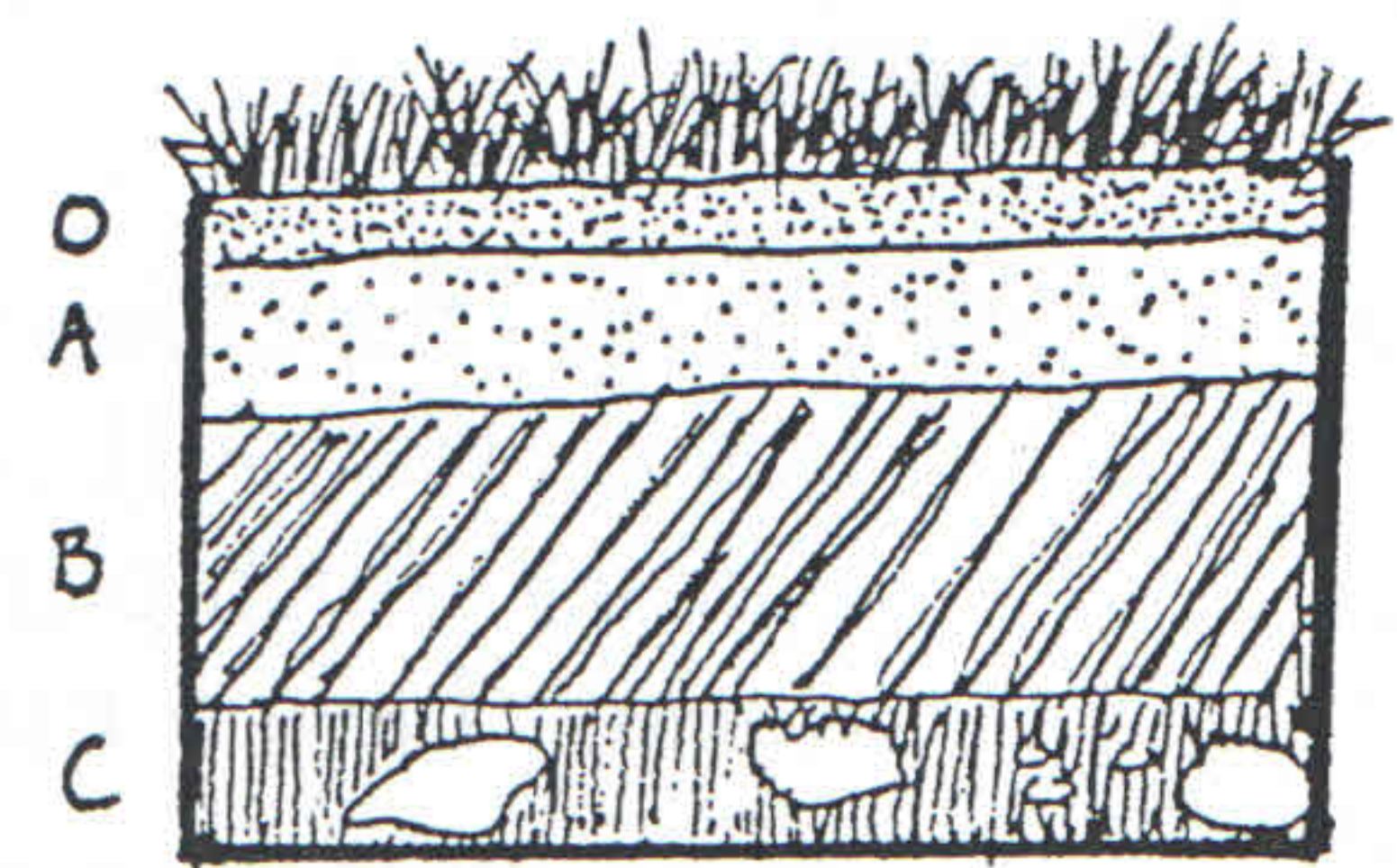


Name _____

Date _____

24. CLASSIFYING SOIL SAMPLES



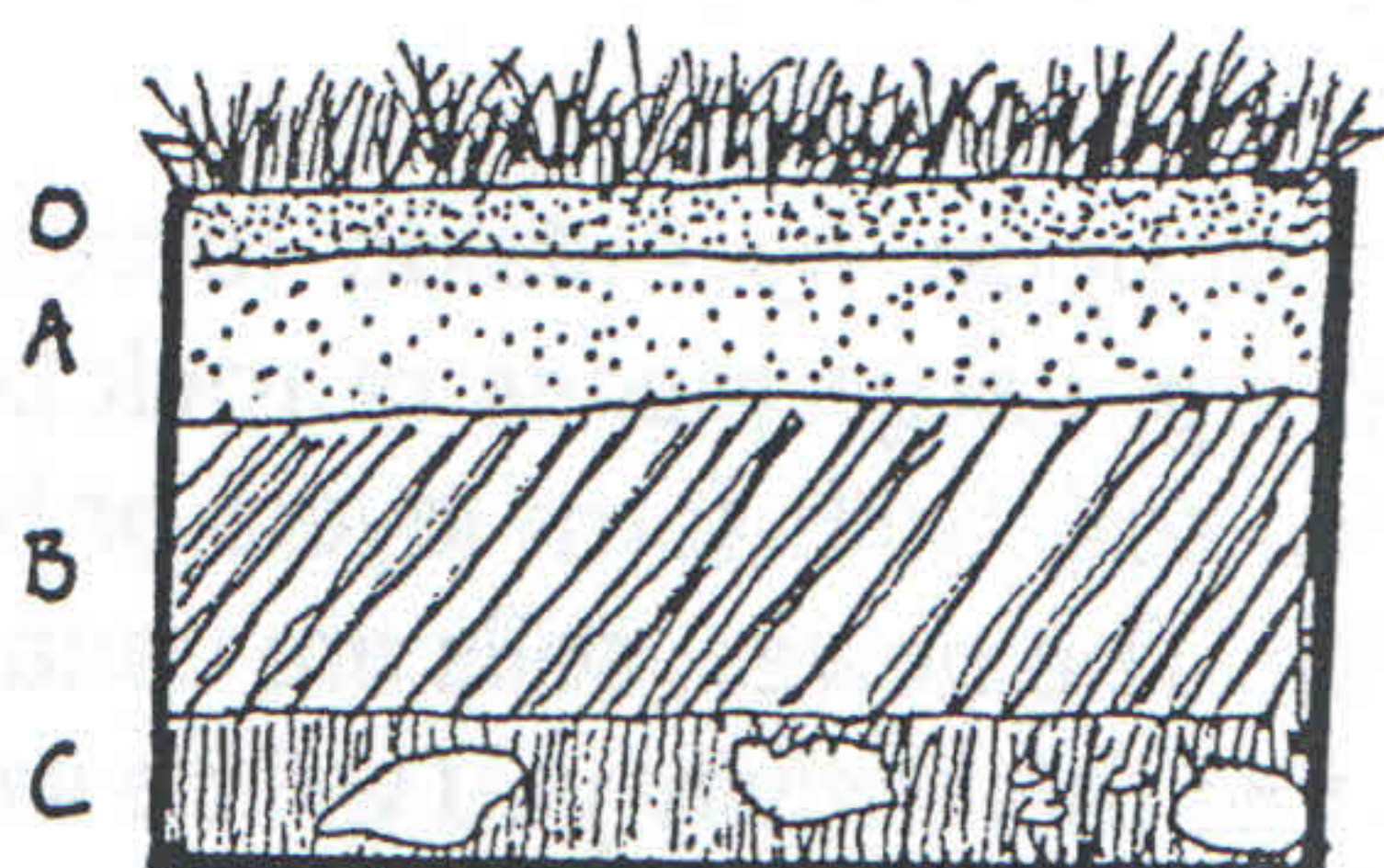
Soil is formed when large rocks are acted upon by outside forces like wind, precipitation, and temperature changes like freezing and melting. Large pieces of rock become smaller and smaller. It takes thousands of years to change rock into soil. Soils form layers or horizons. By collecting the soils from each horizon, you can form a soil profile. The newest soils are usually at the top layer of a site. The deeper you dig, the older the soil becomes. For this activity you will be working at your line transect site.

Instructions

1. Identify three different digging spots along your line.
2. At the first spot, dig to a depth of 5 cm., collect a soil sample, put it in a plastic bag, and label the bag.
3. Continue to dig to a depth of 10 cm., collect a soil sample, put it in a plastic bag, and label the bag.
4. Dig to a depth of 20 cm., collect a soil sample, put it in a plastic bag, and label the bag.
5. Dig to a depth of 30 cm., place a soil sample in a plastic bag, and label it.
6. Repeat steps #2–5 at the other two digging spots on your line transect.
7. Classify your soil samples by performing the “snake-roll” test on each sample. Compare your results with classification chart 24A below.

CHART 24A SOIL CLASSIFICATION	
Soil type	Snake-roll test
gravel	will not roll
sand (tiny particles)	will not roll
loam	rolls, but breaks
clay	rolls and keeps shape well

6. Discuss the differences between soil types and their effect on plant growth. What makes loam? (Decayed plants and animals.) What plants will grow in sand? (Cacti.) Which plants won't? Why? (Any plant that requires a lot of moisture and doesn't have a method for storing water or preventing water loss.)
7. As a continuation of this activity, you may wish to discuss and demonstrate a soil profile for the class. The following illustration is a typical soil profile. For further soil information see the reference section in the back of this book.



8. If your students did not complete Activity 21, they can participate in this activity if you provide soil samples.

24. CLASSIFYING SOIL SAMPLES

Introduction

In carrying out this activity students will need to collect soil samples. If you are using the line transect community survey method, Activity 21, this is an ideal assignment. If not, students can gather soil samples by any method you desire, i.e. dig in the school yard, at home, a vacant lot, building sites. If there is no way students can provide their own samples, you could bring in samples for them to classify.

The easiest method for student classification is the "snake roll" method. Even the youngest children have rolled clay snakes. The soils are classified by how closely the sample comes to forming the snake shape.

Objective

Students will classify soil samples based on texture and the "snake roll" test and will record the results.

Materials

- Many plastic bags (zip lock are best) labeled 5 cm., 10 cm., 20 cm., and 30 cm. (three sets for each group)
- Implements for digging (trowel, camp shovel, spoons)
- Folder or clipboard to write on
- Pencil
- Student Worksheet 24

Teacher Instructions

1. If students are responsible for providing the digging tools, you will need to remind them a day or two before the activity.
2. A brief introduction to soil formation will be helpful in beginning this activity. Soils are formed when weathering (wind, water, freezing, and melting) act on a matrix (large rocks). This causes the matrix to break into smaller pieces. It takes thousands of years to change rock into soil. When you make a cut into the earth, the newest soils are usually on the top; the deeper you dig, the older the soils become. If you collect samples from each level you can create a soil profile.
3. Students are outside for this activity. They will collect samples at their line transect sites, Activity 21.
4. Follow student activity instructions #1-8.
5. When you return to the classroom (or the next day), discuss the soil types and ask students to compare locations and soil classification.

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4. Soils are divided into four large groups according to the quantity of different sized particles found in an individual sample. Use Chart 23B to help you decide into which group the soil samples you are working with are classified and named.
5. Carefully observe each soil sample (A, B, C, and D).
6. Compare your observation to the information on Chart 23B. Decide which type of soil you have.
7. Write the soil name on Data Table 23A beside its texture description.

CHART 23B SOIL TYPE AND TEXTURE	
Soil type	Soil texture
gravel	coarse, many pebbles
sand	coarse, fine grains, no pebbles
loam	dark color, velvety, particles soft
clay	smooth, slimy, sticky when wet

You will notice that identifying soils is not as easy as it seems. The particles may be combinations of two or more different textured soils. To solve the problem, soil scientists combine names to more correctly identify the sample. Examples include: sandy-loam, clay-loam, sandy silt-loam. You may find several different types of soils in the same region. You may also find similar soil textures that are different colors. Clay may be gray in one area and brown or red just a few miles away. The color of a soil depends on the chemicals in the rock that produced the soil.