think soil is made of, what it feels like, what colors it might be, and how soils might differ. Show them how to use a hand lens or magnifier.

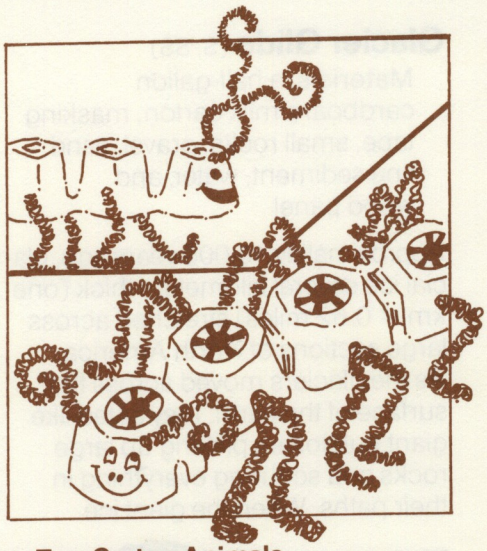
For your soil walk, visit several places where different kinds of soil can be found. Try such areas as a pitcher's mound, the bottom of a slide, under a tree, the edge of a field, or under a rotten log. At each spot, have the children look closely at the soil with the magnifying glass. They might find bits of plants and animals, clay, rocks, and sand. Look for leaves, sticks, roots, and remains of animals such as insects and worms. Students can pick up, feel, and smell each kind of soil and look for different colored soils. Make sure that your students return the soil to the place where they found it to prevent erosion.

Down-to-Earth Art (A)

★ **Soil Collage**

Materials: soil, glue, markers, and heavy paper or cardboard

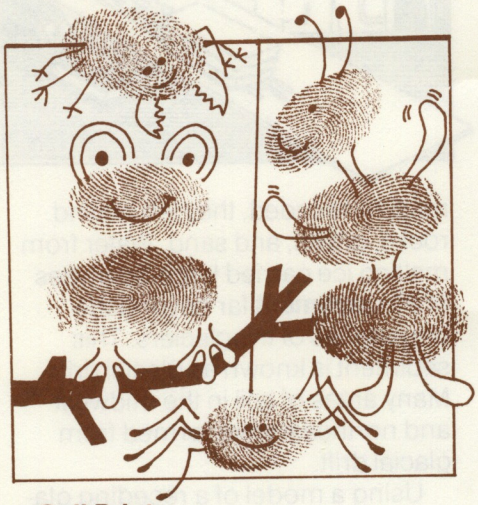
Let your children use real soil to make their own pictures. Begin by talking about soil's importance to plants. Name some plants you see every day (trees in the school yard, house plants, wildflowers, grass, and plants that give us food). How is soil important to these plants? Let each child sketch a plant showing the roots beneath the ground's surface. Trace over the roots with a brightly colored marker. Spread glue over the soil area (omitting the roots) and sprinkle soil over the glue. Wait for the glue to dry and shake off the excess.



★ **Egg Carton Animals**

Materials: egg cartons (broken apart in lengths of two to six cups), pipe cleaners, markers, seeds, glue, and scrap paper

After your children have studied the animals on the 16-picture poster and the soil ecosystem transparency, let them make their own soil creatures using the materials suggested above. Earthworms, millipedes, and ants are easy to make with egg cartons.



★ **Soil Prints**

Materials: clay, scrap paper, felt tipped pens, paper, and thumbs

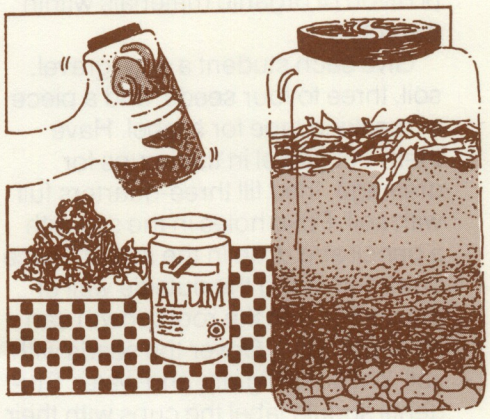
Your children can make soil prints by pressing the tips, sides, and pads of their thumbs in moist clay soil, then onto paper. Add a few straight lines, curves, dots, and triangles of scrap paper to turn their thumbprints into amazing soil animals.

OBJECTIVE: To help students understand how soils are formed and the characteristics of different types of soil.

Shake-a-Jar (S)

Materials: quart jars, newspapers, soil, water, and alum (purchase in drugstore)

Soil is composed of a variety of materials. To compare the relative amount of these materials in different soil types, have your students take soil samples from a garden, field, empty lot, woods, and other places. Keeping samples separate, spread the soil on a newspaper, crush any lumps, and remove large rocks, sticks, or trash.



For each soil type, fill a quart jar one-quarter full with soil, label, and add water until the jar is three-quarters full. Add one tablespoon of alum, close the lid, and shake hard. Let the jar stand for several minutes.

Students will see that the mixture separates into layers. The larger particles—coarse sand or rocks—settle to bottom of the jar. The finer particles of silt and clay will form the next layer. The material left floating on top of the water is called organic matter. Organic matter is made up of dead leaves, twigs, stems, and parts of animals and plants. The more organic matter in soil, the richer it is.

Ask your students such questions as: How long did it take for all the particles to settle? Did some soil samples take longer to separate than others? If so, what do you think caused

this to happen? Compare the different soil samples. Which has the most organic matter? In which soil do you think plants would grow best? What could be done to improve soil with little organic matter?

Watching Roots Grow (S)

Materials: soil, gravel, seeds (bean, pea, squash, corn, or radish), clear plastic cups, and masking tape

As plants grow, their roots spread into the soil. Roots break up rocks by pushing into cracks and crevices and splitting them apart. This helps add minerals to the soil. Roots also loosen the soil, allowing air to seep under the ground. Air stimulates plant growth and speeds up decomposition of organic materials within the soil.

Give each student a cup, gravel, soil, three to four seeds, and a piece of masking tape for a label. Have them put gravel in their cups for drainage, then fill three-quarters full with soil. Poke holes in the soil with a pencil and drop in the seeds. Place one seed along the outside wall of the cup so that the root growth can be easily seen. Cover the seeds with soil, pat down lightly, and water. Students should label the cups with their name, the kind of seed, and the date.

Depending on the seed, you should see growth within a few days. Ask the students such questions as: What do the seeds need to grow? (soil, sunlight, water) What happens as the seed begins to grow? What part of the plant grows first? (roots) How long before shoots or leaves come up? Do big seeds sprout first? Do different kinds of seeds have differently shaped roots? Are the roots long or short? Which grows faster—the roots or the leaves? How do the roots affect the soil?

Water the plants every other day with just enough water to darken the soil. To record the seed growth, students can make drawings of their plants every few days. The plants can be transferred to milk cartons to take home.

Glacier Glide (S, SS)

Materials: a half-gallon cardboard milk carton, masking tape, small rocks, gravel, sand, fine sediment, water, and wood panel

Approximately 15,000 years ago, glacial ice several kilometers thick (one km = 0.62 miles) stretched across large sections of North America. As the glaciers moved across the surface of the earth, they acted like giant bulldozers picking up large rocks and scouring everything in their paths. When the giant ice

masses receded, they left behind rocks, gravel, and sand. Water from melting ice carried large quantities of this **sediment** far beyond the boundaries of the glaciers. This sediment is known as glacial drift. Many areas of soil in the midwest and northeast were formed from glacial drift.

Using a model of a receding glacier, demonstrate to your students how glaciers left large deposits of rock and soil on the earth. At least two days in advance make the model glacier as follows: Wash out a half-gallon wax-coated milk or juice container, and place it on its side. Cut out the top side panel and tape the spout opening closed so that water cannot escape. Put a layer of small rocks, gravel, sand, and fine sediment in the bottom of the carton. Fill the container one-third full with water and place it in a freezer. After the water has frozen, repeat the layering process two more times or until the ice reaches the top.

On a warm day (above 55° F) take your model glacier out on the school grounds and remove the carton. Place the block on a twelve foot panel that is set at a 20° angle. As the ice melts, the glacier model will slowly slide down the board and leave deposits.

After you try this activity, you may want to have your students do research to find out if glaciers affected the landscape and soil in your area.

Volcanic Panic (S, SS)

Materials: clay or papier-mâché, small juice can, vinegar or lemon juice, baking soda, water, and red food coloring

A volcano is an opening in the earth's surface from which molten rock (magma), rock fragments, hot ashes, and gases escape—often forming a cone-shaped mountain. The heat and pressure deep inside the earth are extreme and sometimes cause tremendous explosions when the volcano erupts. Since the formation of the earth, volcanos have brought molten rock and ash from the center of earth to its surface, and this material has contributed significantly to the making of soil.

Students can make a model of a volcanic cone from clay or papier-mâché with a shallow crater (about six inches deep). In the crater of the volcano, place an empty orange juice can. To simulate lava (flowing magma), fill three-fourths of the container with water and add several drops of food coloring plus a tablespoon of lemon juice or vinegar. Then add two tablespoons of baking soda. The combination of water, baking soda, and an acidic substance such as vinegar and or lemon juice releases carbon dioxide gas causing the water to foam and flow down the sides of the model.

After demonstrating the explosive force of a volcano, your students may want to research the effects of the 1980 eruption of Mount St. Helens on the northwest area of the United States. You may also want to do research on how volcanos may have affected the area in which you live, or other parts of the country.

Worm Watch (S)

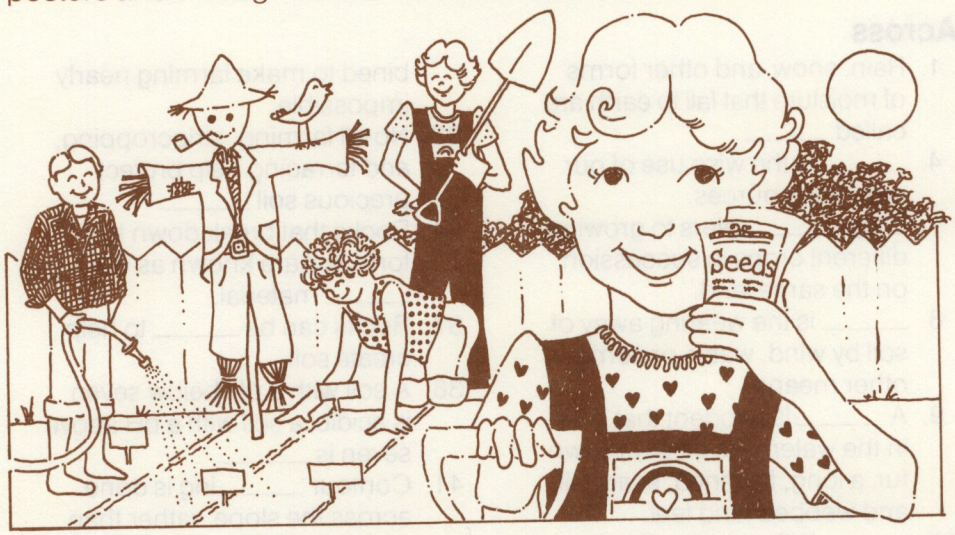
Materials: earthworms, hand lens, and paper towels

Earthworms are familiar to almost all children and make great classroom animals. You can buy earthworms at a bait shop or dig them up yourself. Just after a rain is a good time to find worms. Look for them in moist soil. Put the worms in a box filled with moist soil or lined with damp paper towels, and keep covered.

Give each child a moist paper towel and place a worm on it. See if the children can identify these parts of an earthworm: the rings, the head (the pointed end), the tail (the slightly flattened end), the light-colored band around the worm (two worms join here during mating), the top side, and the belly (a little lighter in color than the top and lined with tiny bristles). With a hand lens, children may also be able to see beneath the skin's surface to the long intestinal tube and the five ring-shaped hearts near the earthworm's head. Some questions you can ask the children are: What does the skin feel like? How does the worm move? What are its bristles for? Can you see eyes, ears, or a mouth? What happens when you turn the earthworm over? What happens when you gently touch the worm? What do worms eat? (Bits of decaying plants and animals in the soil.) Why are worms good for plants? (As earthworms tunnel underground, they loosen the soil, allowing air and water to reach plant roots. Their tunneling also helps mix organic matter, rich in nutrients, into the soil. Earthworms help break down organic matter making these nutrients available for plants to use.)

Digging For Words

Forty-one soil-related words are hidden in this puzzle. The shortest word contains three letters; the longest contains thirteen. The words may be read forward, backward, up, or down. All words for solving this puzzle can be found on the back of the Wildlife Week posters and throughout the Educator's Guide.



W	E	A	T	H	E	R	I	N	G	C	R	O	P	S	C
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N	O	C	O	R	N	Z	C	Y	A	M	I	R	E	L	N
D	S	C	I	H	Z	V	O	L	C	A	N	O	C	T	S
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E	S	T	R	I	P	C	R	O	P	P	I	N	G	M	L
T	W	I	N	D	B	R	E	A	K	S	L	T	R	M	E

Answers: Ant, clay, compost, conservation, contour, corn, crops, dirt, environment, erosion, glacier, ground, habitat, humus, land, landscape, mineral, mole, mulch, organic, owl, precipitation, pulverized, rain, resource, rill, sand, sheet, silt, skunk, soil, subsoil, stripcropping, tillage, trees, topsoil, volcano, weathering, wind, windbreaks, and worms.