TEXAS MEGA COMPOST

CONCEPT: Composting

OBJECTIVES: Students will be able to:

3) Construct a mini-compost pile;
4) Observe and discover nature's recycling process at work in a mini-compost pile.

METHOD: Students will build a mini-compost pile in the classroom.

MATERIALS: aquarium or large container (bucket or trash can); soil (sand, silt, clay or gravel, but not potting soil); organic waste (no meat scraps or dairy products); thermometer, trowel or large spoon; 1-2 dozen red earthworms (optional)

VOCABULARY: decomposition, organic waste, natural recycling, compost, composting, biodegradable

BACKGROUND:
When we mention the word "recycling" we often think of glass bottles, aluminum cans and newspapers. Over 20% of the waste stream is grass and leaves. Most of this can readily be recycled, utilizing composting. Food scraps, leaves, grass clippings and other biodegradable organic wastes can be recycled by composting. Simply stated, composting creates optimal conditions for decomposition to occur naturally. Decomposition is the biochemical process by which bacteria, fungi and other microscopic organisms break organic "wastes" into nutrients that can be used by plants and eventually animals.

Decomposition occurs in nature whenever a leaf falls to the ground or an animal dies. It is essential for the continuation of life on earth. For decomposition to occur in a compost pile, several components must be present: soil, organic waste, nitrogen, microorganisms, worms, water, air, time, heat and mass. Decomposition does not occur rapidly in a landfill because three necessary components – breathable air, water, nature's recyclers – are not there. The result of decomposition in a compost pile is a nutrient-rich humus that is excellent for improving soil quality and plant growth.

PROCEDURE:

1. Discuss concepts of decomposition and natural recycling. Ask students to define "compose" (example: musicians make songs by putting words together). Conclude that decompose means to take things apart. Therefore, nature's decomposers help nature's recycling process by breaking materials down so they can be recycled over and over again. Relate the concept of composting to recycling.

2. Collect organic wastes in the aquarium/container or build and outdoor pile 5'x5'x3' high for better results. Include leaves, grass clippings, sawdust, hair, kitchen scraps (no meat or dairy products). Break some of the organic waste into small pieces. Leave some pieces large to compare rates of decomposition.

3. Alternate the following layers of material:
    a. manure, green grass clippings, or leaves;
    b. some organic food waste;
    c. some soil;
    d. water, sprinkled just to dampen;
    e. repeat layers.

4. Cover with approximately one inch of soil. Water the compost enough to make it moist but not soggy.

5. Place compost where it will be at room temperature, not in direct sun. Gently mix the compost once a week to aerate the contents. Use a thermometer to test the temperature of the pile. Graph the temperature data, as a class.

EXTENSIONS:

1. Discuss how composting at home reduces amounts of waste thrown into landfills. Encourage home composting. Texas Commission on Environmental Quality has information on-line at http://www.tnrcc.state.tx.us/admin/topdoc/index.html

2. Observe benefits of compost pile by comparing plant growth with and without compost. If plants are not available in the classroom, use grass areas around the school campus.

3. Discuss how nature is composting in the natural environment. Discuss reasons for differences in decomposition rates and effects on the environment (i.e. algae blooms in a lake which has nutrient rich water from decaying sewage sludge and farm and homeowner fertilizer run-off).

4. Discuss city composting operations that work on a larger (mega) scale. What do they do with the compost they create? How much money do they save (in unused landfill space) by composting? Why is saving landfill space important?

EVALUATION:

1. Draw and label the primary layers of the compost pile. Tell why each layer is necessary.
2. Write an essay ("a story" – lower grades) about why nature's recycling, through decomposition in a composting pile, is good for the environment.