

# Learning Layers

**OBJECTIVE:** To explain the carbon to nitrogen ratio of backyard composting.

**MATERIALS:** bristol board, crayons, glue, magazines, scissors and other craft materials, **HANDOUTS:** **Brown Or Green?** (E43), **Composter** (E27)

**VOCABULARY:** carbon, compost, cross section, energy, green, brown, micro-organism, nitrogen, ratio, reproduce

## BACKGROUND:

Successful backyard composting depends upon many factors. The easiest to understand is the carbon to nitrogen ratio. Micro-organisms use carbon for energy. This energy allows them to turn waste into finished compost. Nitrogen helps the organisms to reproduce. The ideal compost pile has a carbon to nitrogen ratio of 30:1. By adding waste in green and brown layers this ratio can be achieved. A green layer is high in nitrogen, a brown layer high in carbon. A good compost pile will have nearly 50% green and 50% brown layers as well as a layer of dirt every few layers. These layers should alternate (green, brown, green, brown, soil and so on).

## PROCEDURE:

1. Explain the information found in BACKGROUND section of this activity to the class.
2. Distribute copies of the HANDOUT: **Brown Or Green?** (E43) to the class. Explain that the items under "Green" are high in nitrogen. The items under "Brown" are high in carbon. Both materials are needed to make proper compost.
3. The students are to draw a cross section of a composter on a piece of bristol board. The composter outline on the HANDOUT: **Composter** (E27) could be enlarged and used.
4. The children now start putting waste "into" their composter. Each acceptable item on the HANDOUT (E43) should be drawn, cut out of a magazine, photocopied, etc. and attached to the cross section. Items can be used more than once, for example several pictures of bread could be put in the composter, the only stipulation is the drawings must be attached in layers. This means several green items are attached to the bristol board. Several brown items are placed above the green then more brown items and so on.
5. Have each student title their finished cross section and write a small report explaining what the cross section illustrates. Reports should mention carbon to nitrogen ratio, micro-organisms, green and brown items and layers.

# Learning Layers (cont.)

## **EXTENSION:**

1. Provide the children with photocopies of pages E5-E7 of the COMPOST BACKGROUND INFORMATION. Explain these are the micro-organisms and insects that turn the green and brown layers into finished compost. Have the children attach the pictures of the organisms and bugs to their cross sections.
2. Make a three dimensional model of a composter showing finished compost at the bottom with green and brown layers on top.
3. Have the children display their finished compost posters in the lunch room and have them answer questions for other pupils in the school.

## **EVALUATION:**

1. Ask the children to explain what carbon and nitrogen do for a compost pile.
2. Would any of the students consider composting as a science fair project?
3. Ask the children to name, from memory, some green and some brown items.