TEACHER MATERIALS - The Soil

CONCEPTS:

Math, Science, and Technology
-Standard 4.6, 4.7- Living Environment
ELA
-Standard 1.1- Listening and Reading
Career Development
-Standard 3a.1- Basic Skills

OBJECTIVE:

The students will:

1. describe what is in soil.
2. explain why soil is important.
3. explain the difference between dirt and soil.

BACKGROUND:

While not well represented in New York's Science Syllabus, soil is crucial for all life on the planet. Most of us consider "dirt" an annoyance. Dirt is what is cleaned up off of the floor, soil is the host of life. The reality is that soil provides nutrients for plant growth, holds water for plant growth, supports plants, and highways and homes. If misused, soil becomes the number one water pollutant, erodes, clogs drainage pipes, and leads to flooding and landslides.

This lesson could be used in segments—one per day (introduction, dirt cake, collect items, sort, make puppets) for a week or a day long project.

ACTIVITIES:

1. To introduce this lesson, make **"Dirt Cake"** following the directions on pages K-116 through K-120. If you have any children in class who are allergic to chocolate use the "sand cake" recipe instead.

2. Make the **Dirty Dirt and Super Soil Puppets** following the directions on pages K-123 through K-130. If this is confusing, use Tommy Trash instead of Dirty Dirt.

3. Read the **"Dirty Dirt and Super Soil"** story to the students and have them use the puppets to tell their own story.

Teacher Resource: Wilcox, Charlotte. Trash. Minneapolis: Carolrhoda Books, Inc., 1988.

4. Complete the **"Compost It"** activity on pages K-131 through K-132.

5. Make **Soil Magic** following the directions on pages K-133 through K-137.

DIRT CAKE

INGREDIENTS:
1 20 oz. package Oreo cookies
1 8 oz. package Cream Cheese (low fat)
1/2 stick margarine (low fat)
1 cup powder sugar
2 (6 serving sizes) packages vanilla instant pudding
3 1/2 cups milk
1 (12 oz.) frozen whipped topping (Cool Whip lite)

MATERIALS:

Necessary
large bowl
measuring cups
large mixing spoons

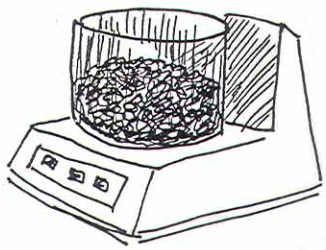
Option I
food processor
sand pail and shovel

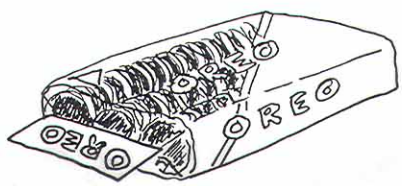
or

Option II
small ziplock bags - 1 per student
single cups - 1 per student

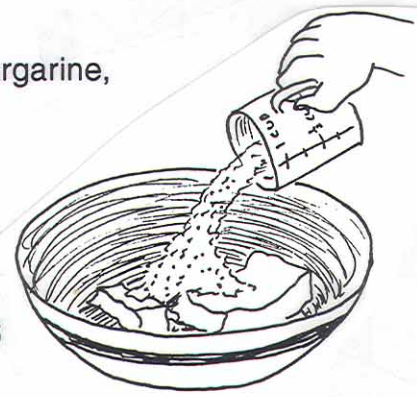
PROCEDURE: **Option I**

1. Crush the cookies in a food processor. Compare the appearance to potting soil.



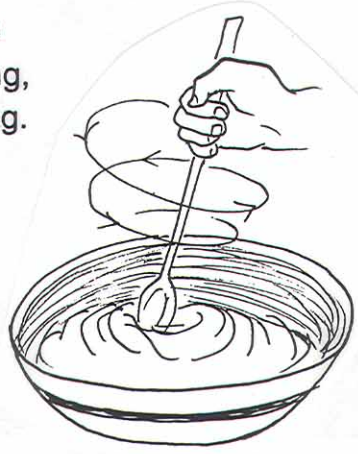


2. Cream the cheese, margarine, and sugar together.



3. Mix the pudding using the 3 1/2 cups of milk.

4. Fold together cream cheese mix, pudding, and whipped topping.

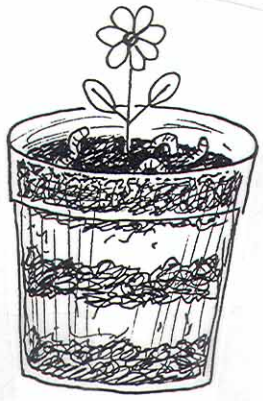


5. Layer into plastic flower pot**: cookies (crushed), then pudding mix, then cookies, then mix, etc., until you end with cookies on top.

* The contributor used a child's sand pail (used to build sand castles) and did the following: "dirt", pudding mix, "dirt", pudding mix, "dirt."

****Use plastic only. Ceramic pots sometimes contain lead.**

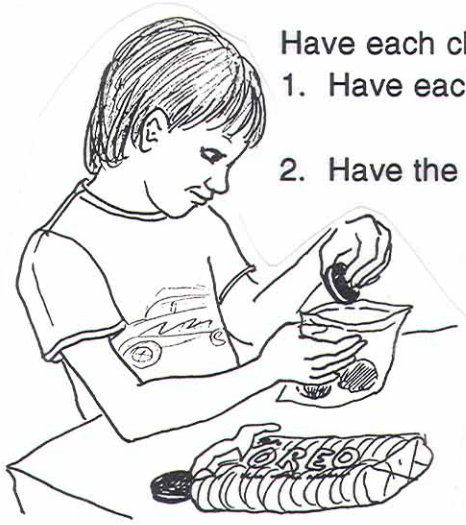
6. Lay several gummy worms across the dirt or if you use a plastic flower pot insert several silk or plastic flowers for decoration.



7. Serve with a plastic sand pail shovel.

Contributed by Beverly Bruns of Texas to New York Agriculture in the Classroom.

Option II

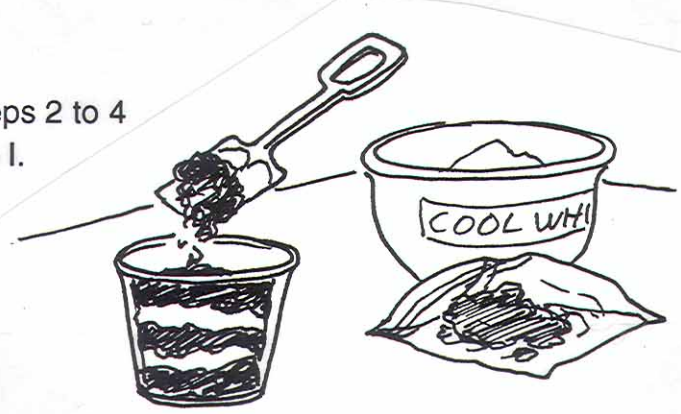


Have each child prepare their own single serving dirt cake.

1. Have each child place 2-3 Oreos in a small ziplock bag.

2. Have the children crush their cookies.

3. Complete steps 2 to 4 under Option I.



4. Layer ingredients into single serving cups (clear cups would show the layering)—cookies, pudding mix, cookies, pudding mix, etc. to top.

5. Insert gummy worm, one per cup.

6. Enjoy.

Option III Sand Cake

Replace Oreos with either vanilla wafers or vanilla sandwich cookies.

Decorate with gummy sea shells and candy stars instead of gummy worms.

Less Expensive Options

Several pilot teachers indicated that cost is a factor in making snacks. One suggested using graham crackers and chocolate pudding.

Marion Baldwin offered this option

Ingredients:
2 cups cold milk
1 package chocolate instant pudding
1 tub whipped topping, thawed
1 package sandwich cookies, chocolate
8 to 10 (7 ounce) cups
Decorations: gummy worms, frogs, candy flowers, chopped peanuts

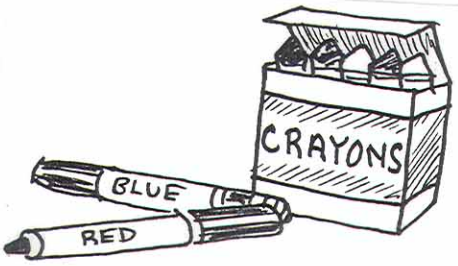
Pour milk into large bowl, add pudding mix. Beat until well blended (1 to 2 minutes). Let stand 5 minutes. Stir in whipped topping and 1/2 of the crushed cookies.

Place 1 tablespoon crushed cookies into cup. Fill cup 3/4 full of pudding mix. Top with crushed cookies. Refrigerate 1 hour. Decorate.

DIRTY DIRT AND SUPER SOIL PUPPETS

MATERIALS:

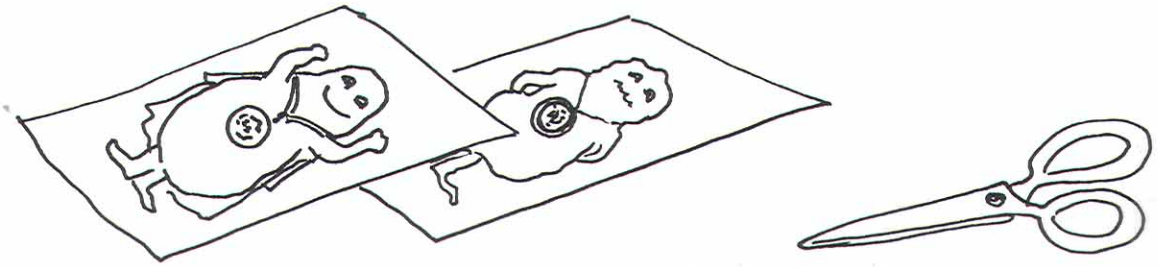
copies of two puppets
trash to decorate Dirty Dirt
crayons or markers
glue
paper bags
scissors



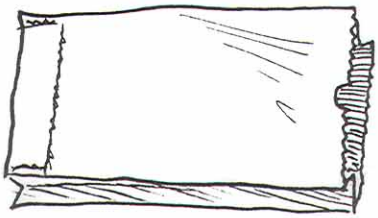
ACTIVITY:

1. Make Dirty Dirt and Super Soil Puppets or large bulletin board characters from the pattern.

   A. Make copies of the two puppets.



   B. Have the students cut out Dirty Dirt and Super Soil characters and paste each onto an open paper bag.



   C. Take a walk around the school grounds and pick up items of trash, leaves, weeds, etc. Or, have the students bring in similar items from home.

   D. Read **"Dirty Dirt and Super Soil"** to the students. Then

have them sort their items into those that will bio-degrade into soil and those which need to be disposed or recycled in other ways.

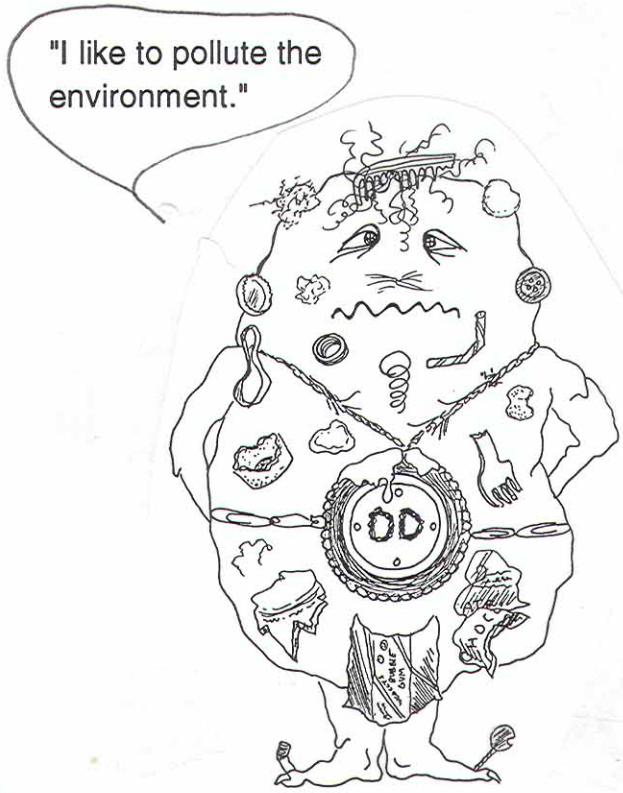
E. Color Super Soil and decorate it with leaves for clothes, grass for hair, worms for a belt, etc. - use biodegradables or sand, clay, etc. (see pages K-124 through K-128 for an example). Decorate Dirty Dirt with the materials which cannot be composted and should be disposed of in other ways.

2. If cutting out these characters is too difficult, just use the paper bag. Make eyes and a mouth and decorate it as per directions above.

3. Make bulletin boards of the two characters decorated as described. Make speech bubbles for each character and brainstorm what they might say.
   Examples:

Billy Douglas (Pre-1st) Ausable Forks Primary

Mathew Ano (Pre-1st) Ausable Forks Primary



DIRTY DIRT AND SUPER SOIL

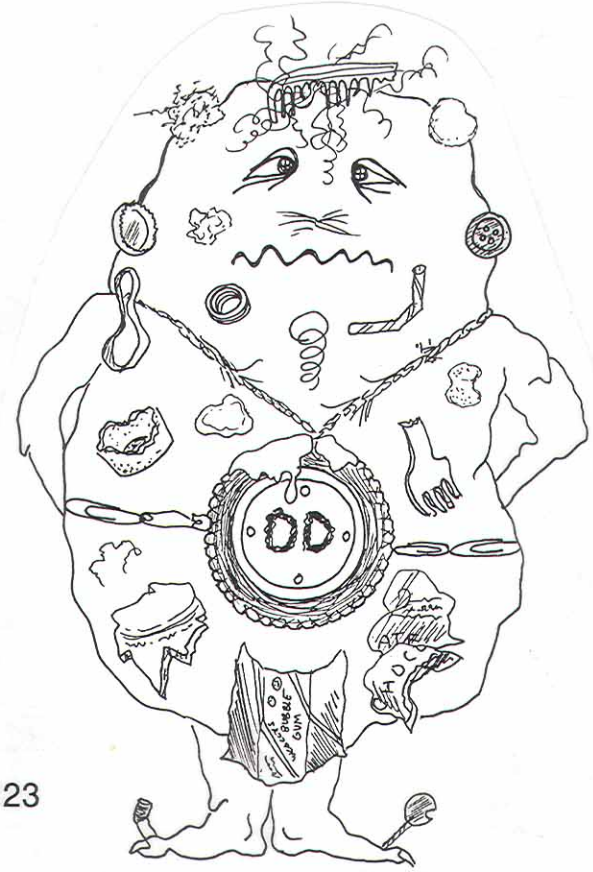
"Dirty Dirt" and "Super Soil" both lived in the same neighborhood. Some days when the children went out to play, they played in "Dirty Dirt" and some days they played in "Super Soil." Many children couldn't tell "Dirty Dirt" apart from "Super Soil." Let's see if you can tell the difference. Which is which?

One is found on the streets. It is tracked into the house and makes a mess on the kitchen floor. This one is vacuumed up when the house is cleaned. This one is washed out of clothes and forces you to take a bath.

The other can be found in a garden or under a lawn. Trees and plants grow in it. Farmers need it to grow crops. Houses and apartments are built on it. Roads travel over it. Can you guess?

Well, Super Soil can sometimes become Dirty Dirt when it travels places it shouldn't go. If you play in the soil or garden and track mud into your home, parents will call it dirty dirt.

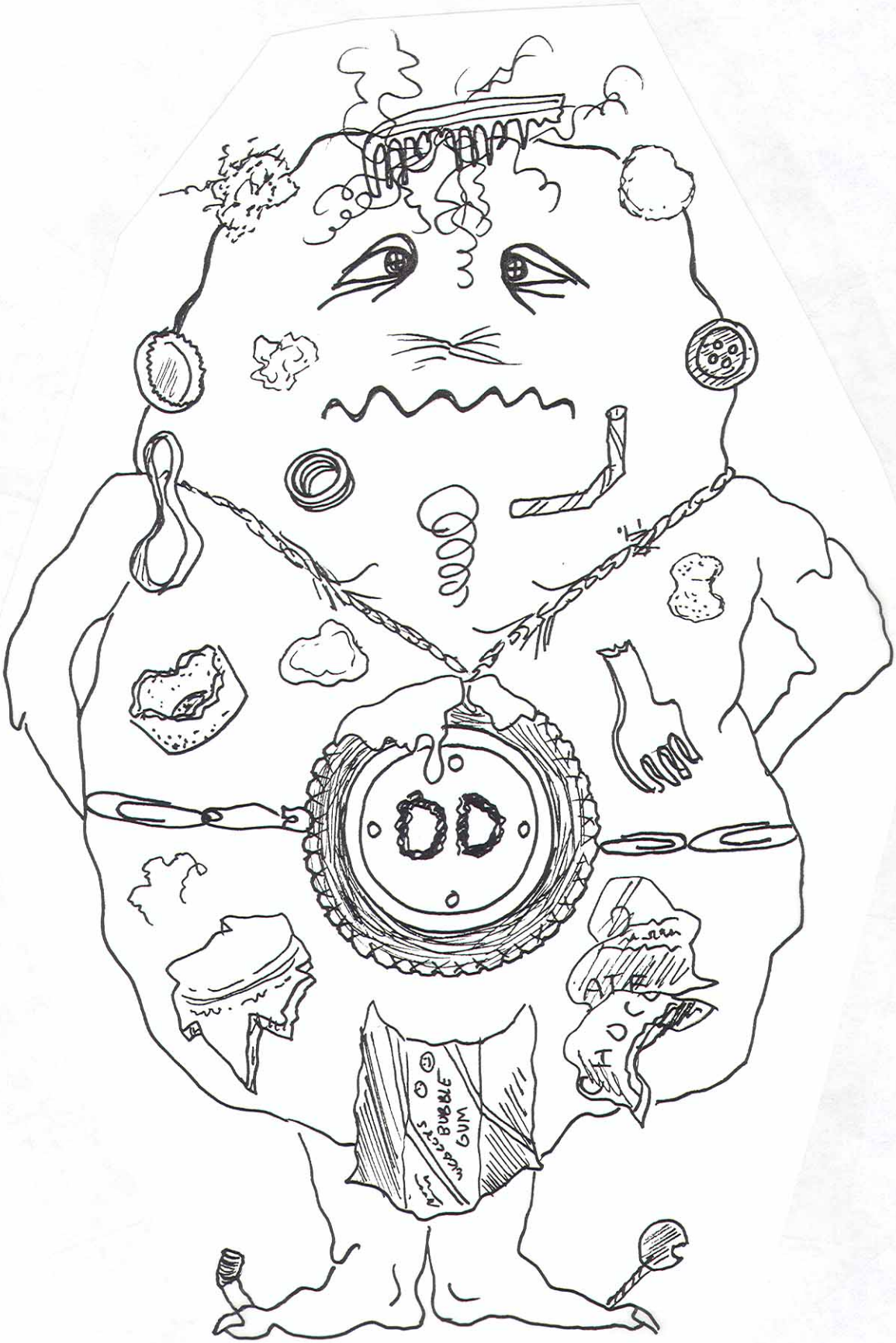
Take good care of Super Soil and keep it where it belongs. We need Super Soil to live! Dirty Dirt just gets cleaned up and washed away!

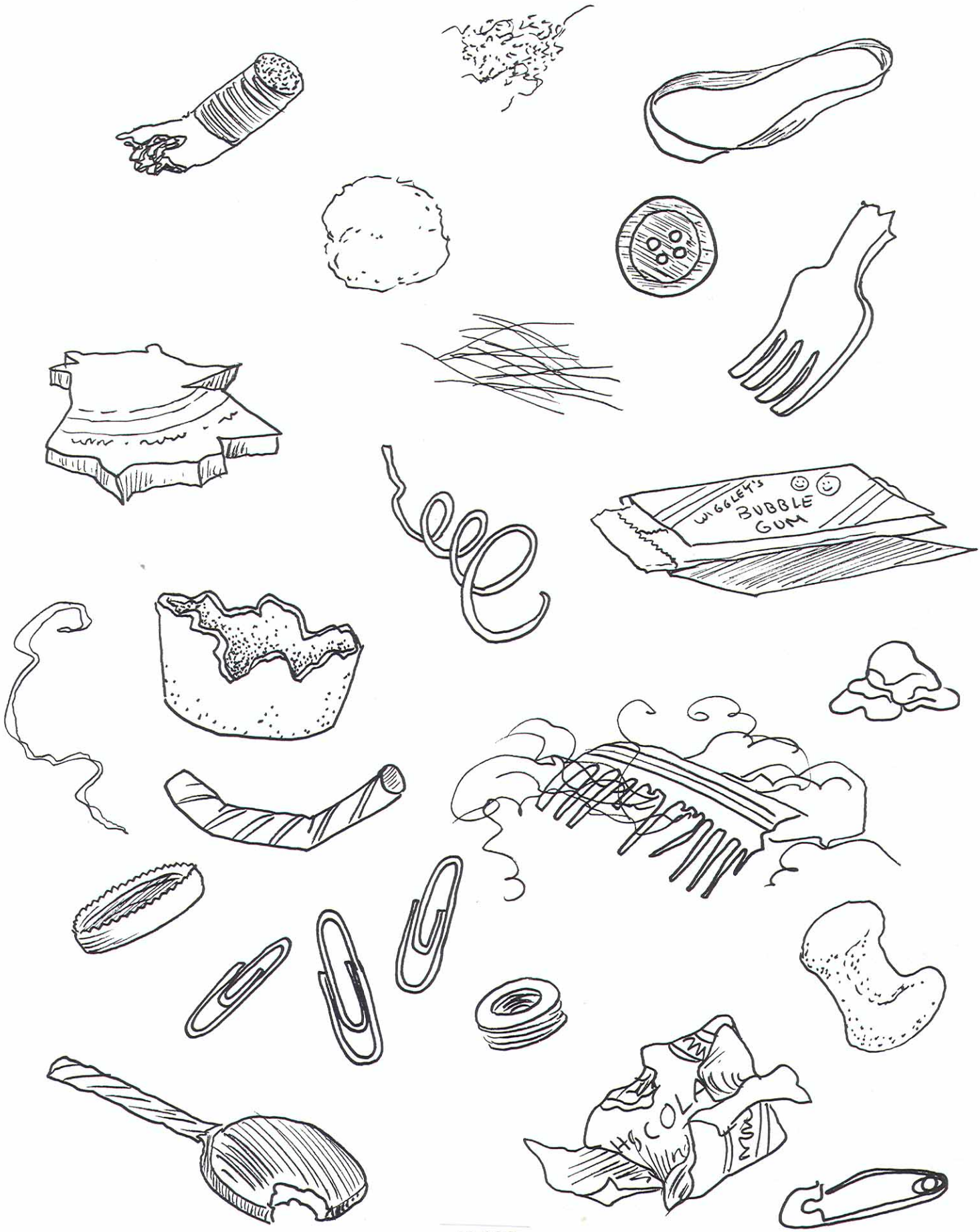


SUPER SOIL

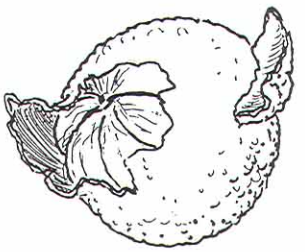
SUPER SOIL DRESSED UP

PUPPET - Dirty Dirt


BUBBLE
GUM


WIGGLET'S
BUBBLE
GUM
COLA

Compost It!



A very important part of the nutrient and life cycle are the decomposers (plants and animals) which live in the soil. These decomposers break down dead plant and animal tissues and return the nutrients to the soil. If dead plants and animals were not decomposed, they would pile up and eventually there would be no room for the living.

Many of these decomposers are large. The earthworm is a great decomposer. Most are so small that one would need a microscope to see them. A spoonful of soil could host more of these tiny plants and animals than the total human population on Earth.

Decayed plant and animal matter is called humus or compost. Humus is rich in minerals and organic matter. It is returned to the soil and important to a plants' roots.

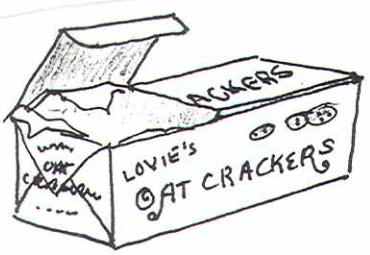
MATERIALS:

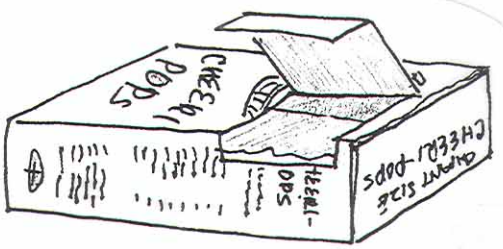
food scraps
leaves
dead insects
} **Super Soil's compostible decorations.**
a waterproof container - an old milk carton will work
soil
water

ACTIVITY:

1. Have the students save their food scraps from lunch—banana peels, orange peels, lettuce leaves—no dairy products or meat, please. Use left over "Super Soil" items which have been collected—leaves, weeds, twigs, etc.

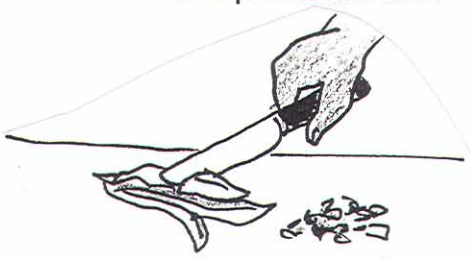
2. Lay a waterproof container on its side and cut a flap into it. Make sure you can reach in with a spoon.

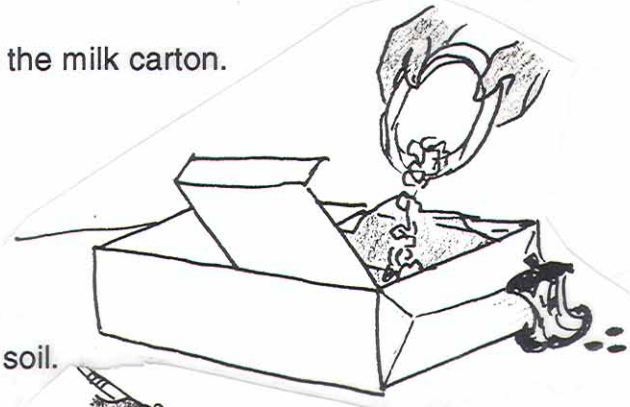




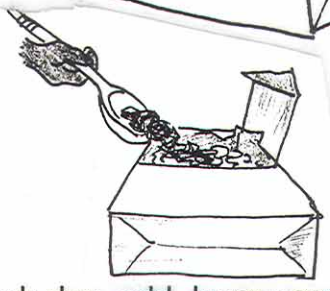
3. Cut food scraps into small pieces—the smaller, the better.

4. Spread the food mix in the milk carton.





5. Cover it with a layer of soil.



6. Stir mixture inside carton each day, add layer upon layer. If the mixture is too dry add a little water. Fill to one inch of top. Sit back and let the bacteria and molds do their work.

7. After the container is full, it should take 3 to 4 weeks until you have brown soil to add to the garden.

SOIL MAGIC

MATERIALS:

magic wand
large bowl
rocks - pebbles
sand
worms
leaves
bugs
grass
twigs
bark
water
clock
magic cloth to cover bowl
stirrer (spatula or wooden spoon)

} use either the real thing or copies from pages which follow

ACTIVITY:

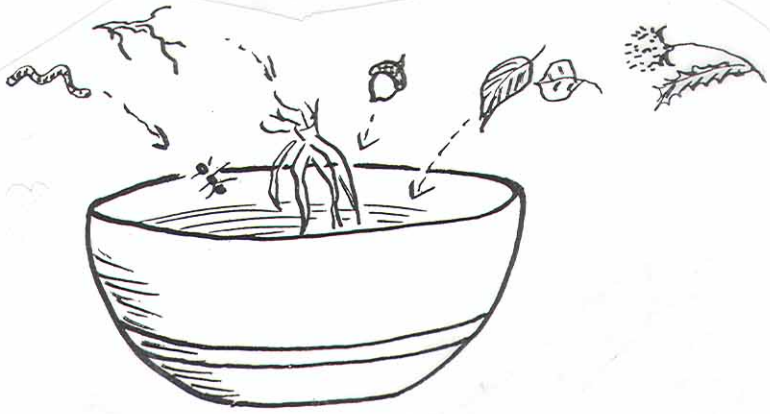
Step 1. Make copies of the items which go into the soil recipe (see pages K-136 through K-137 or use K-129 through K-130) or plan to gather them from the school yard.

Step 2. Make a magic wand with a copy of the recycling symbol provided and a dowel or straw.

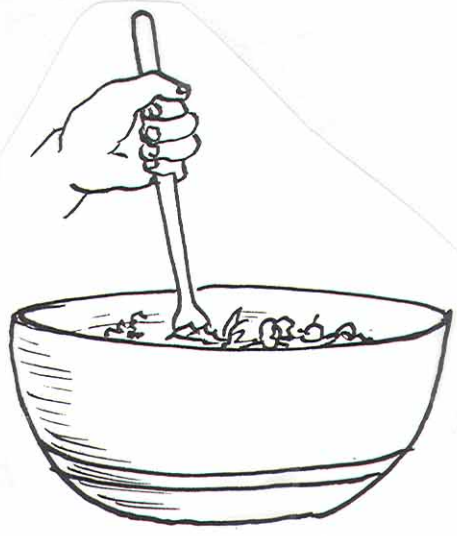
Step 3. Tell the students that you are going to perform magic and make soil.

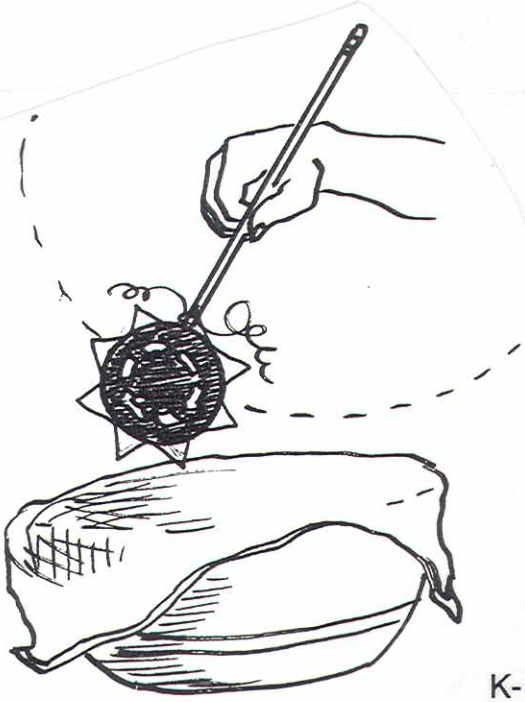
Step 4. Ask the students what is soil made of? What is in their soil recipe? Have them brainstorm their ideas.

Step 5. As they name an item, place it in the large bowl as if you are making a cake.



Step 6. When they can no longer think of what goes into soil, have one of them stir the batter.





Step 7. Place the cloth over the bowl, wave the wand, and say the magic words: "Super Soil."

Step 8 Has it turned to soil? No? What did we forget? The students usually forget "time." Hold up the clock and say that time is very important. It takes one thousand years to make an inch of topsoil the natural way.
So your magic will work, but only after a long, long time.