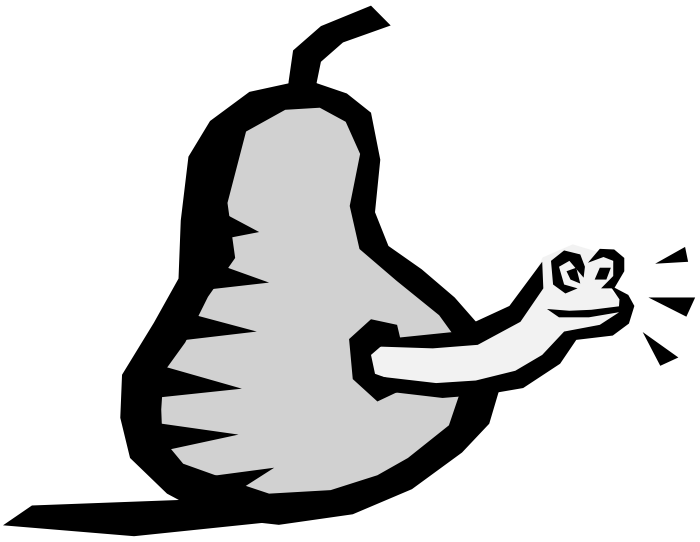
Lesson 3
A Decomposer's Dilemma



Garbage comes into Michigan, but none goes out

More trash from other states, Canada comes to Michigan. Article published Feb 2, 2007

Article from the South Bend Tribune

Associated Press Writer: TIM MARTIN

LANSING -- The amount of trash coming into Michigan from other states and Canada increased by about 3 percent last fiscal year, according to a report from the state released Wednesday. But the overall amount of trash buried in Michigan landfills declined for the first time since at least 1996, mostly because state residents and businesses are dumping less.

The annual increases of imported trash are smaller than they were earlier this decade. But the increases are still a concern to those who say Michigan remains a magnet for out-of-state trash, particularly from Canada, because it is relatively inexpensive to dump in state landfills.

"It's coming here because Michigan is the cheapest dumping ground in the Great Lakes region," said state Rep. Kate Ebli, a Democrat from Monroe who has introduced a bill to restrict the expansion of Michigan landfills in an effort to discourage imported trash.

Michigan's fees for dumping in landfills are about 21 cents per ton. House Democrats want to raise the fee to $7.50, which would be highest in the nation, to discourage the importation of out-of-state trash. Some of that money would go to boost recycling programs. But critics of raising the fees say it would hurt Michigan residents the most because they're the ones who dump most of the trash in state landfills.

"If the prices go up, who pays that? What you are really doing is increasing costs on your hometown team," Mike Johnston of the Michigan Manufacturers Association told the House Great Lakes and Environment Committee.

Matt Resch, a spokesman for House Republican Leader Craig DeRoche of Novi, likened raising the fees to slow the importation of trash to "punishing muggers by putting their victims in jail." Resch said it would amount to a tax increase on Michigan homeowners and businesses. The overall amount of trash buried in Michigan landfills in the 12-month period that ended last September, nearly 62 million cubic yards, decreased almost 3 percent from fiscal 2005 levels. Michigan residents sent about 6 percent less garbage to landfills.

The amount coming from out-of-state is becoming more stable, after much larger increases in previous years including double-digit percentage increases in 2002, 2003 and 2004.The largest source of imported trash for the 2006 fiscal year continued to be Canada, which increased dumping in Michigan landfills by about 2 percent during the period. Garbage also came to Michigan from 15 states, some as far away as Florida, Louisiana and Rhode Island. The biggest exporters to Michigan were Indiana, Illinois, Ohio and New Jersey. Overall, imported trash made up about 31 percent of all the garbage dumped into Michigan landfills. That percentage has climbed steadily in recent years. Based on the trends in the fiscal year 2006 report, the DEQ estimates Michigan has enough room in its landfills to last another 18 years.

How to Make a Classroom Worm Bin[1]

Materials

- One 2-gallon size plastic container with lid (worms don't like sunlight — pick a dark colored container if possible)
- Drill and medium-size drill bit
- Plastic screen material cut to fit at the bottom of the plastic container
- Shredded newspaper to fill the container (equivalent to one daily paper)
- Spray bottle filled with water
- 1 cup Red Worms (ordering information is in "Worms Eat My Garbage")
- Kitchen scraps – about 4 cups of vegetables and fruit peels and coffee and tea grounds. (No meat or fat please, because this rots and smells!)
- Tray that fits under the bin

Procedure

1. Remove the lid.
2. About 2 centimeters below the top of the container, drill holes about 3 centimeters apart and around the sides of the plastic container (this provides air holes).
3. Drill holes in the bottom of the container about 3 centimeters apart (this allows for excess fluid to drain out).
4. Place a tray under the container.
5. Line the bottom of the container with plastic screen material.
6. Shred newspapers into 1 centimeter wide strips and place inside the container — "fluff" up the newspaper and spray with water until paper is moist, but not soggy.
7. Add worms.
8. Add kitchen scraps.
9. Whenever more kitchen scraps are added gently mix the contents of the bin and wash hands afterward.
10. If too much liquid collects in the tray pour off the liquid outside in a grassy area and add dry shredded paper to help absorb some of the extra liquid.
11. Later, the compost can be used to fertilize plants.

[1] Applehof, Mary (1997) Worms Eat My Garbage. Flower Press, Kalamazoo, MI.

Decomposition Worm Bin Observation Sheet

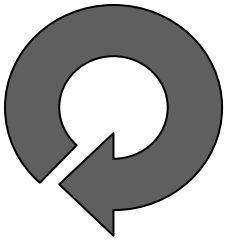
Name _____ Date: _____

Date and Time	Styrofoam Packing Peanut Observations:	Cornstarch Packing Peanut Observations:

What is Biodegradation?

- ***Nature cycles*** materials back into basic simple elements; the building blocks of life.

This is an example of
a circular or "Designed by Nature" life cycle.



- This is the process of ***biodegradation; decomposition*** is another word for biodegradation (bio means 'life' and degrade means 'deteriorate').
- ***Biodegradation*** is a ***natural*** process performed by organisms called ***decomposers***.
- ***Fungi, bacteria***, and invertebrates like ***worms*** are examples of ***decomposers***.
- ***Biodegradation*** changes a product's ***physical*** and ***chemical*** characteristics. For example, in a compost pile, an ***apple core*** loses its form and turns into soil-like ***compost***. This happens as decomposers break apart the material using its digestive enzymes.
- Only materials composed of ***living things (coming from plant or animal products)*** can ***biodegrade*** and ***decompose***.

What is Non-Biodegradable?

This is an example of a linear life. The product's life finishes in a dead end – at the LANDFILL!

- Human-made products not made from plant or animal materials may not decompose easily (products made from metals or glass) or may never decompose (products made from plastic).

- These products are called ***non-biodegradable*** because the materials are not broken down into simple elements.

- The ***digestive enzymes*** of decomposers cannot break down these materials.

- These products sit in landfills for years and years. They may physically break down into smaller and smaller pieces, or rust (if it is metal), but they don't decompose into elements that nature can reuse again.

Categorization of Clothing Elaboration Activity

Name _____ Date: _____

Consider everything on your person and fill in the information below for **TWO** items only. For instance, if you were wearing a polyester sports jersey, the polyester and nylon components are made from processed petroleum that is not biodegradable. For a pair of wool socks, the materials are probably wool and cotton and nylon, where the wool and cotton are biodegradable, but the nylon is not. Probable disposal for old socks would be "landfill" (however, if they are not too far gone, you might give them away for "reuse").

ITEM #1: _____

RAW MATERIALS:

WHICH OF THESE RAW MATERIALS ARE BIODEGRADABLE?

HOW WILL YOU LIKELY DISPOSE OF THIS ITEM?

ITEM #2: _____

RAW MATERIALS:

WHICH OF THESE RAW MATERIALS ARE BIODEGRADABLE?

HOW WILL YOU LIKELY DISPOSE OF THIS ITEM?