What Decomposes? What Doesn't?

Grade level: Upper elementary

NATIONAL STANDARDS
NS.K-4.3
NS.K-4.4
NL-ENG.K-12.8

Student Learning Objectives

By the end of this lesson, students will be able to:

1. Define decomposition.
2. Define organic.
3. Demonstrate composting.
4. Define recycling.

Time: 50 minutes

Tools, Equipment, and Supplies: 10 different organic items–leaves, grass, etc.

10 different non-organic items, such as plastic
2 one-gallon milk jugs
Scissors
Shovel
Writing surface
Classroom set of almanacs/encyclopedias

Key Term(s): Decomposition
Organic
Recycling

Background Information

An important part of the life cycle is ***decomposition***—breaking down dead plants and animal tissues and returning the nutrients to the soil. If dead plants and animals did not decompose, they would pile up. 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 is important to a plant's roots.

Interest Approach

What do you think when you see someone throw his or her trash on the ground? What do you think happens to that that coffee cup, candy wrapper or other trash? Our topic today is what decomposes and what doesn't.

NOTES

Use a Descartes e-Moment® to introduce the lesson. Seek to determine what students know, think they know and what they would like to know concerning decomposition.

OBJECTIVE 1: **Define decomposition.**

Wow, I am impressed. Many of us have a pretty good understanding, but let's dig deeper. **Decomposition** is the process by which leaves and other **organic** matter breaks down. This process brings the nutrients back into the soil. Crops grow better in soil that is rich in nutrients. Some things do not decompose, as our experiment will show.

OBJECTIVE 2: **Define organic.**

Organic is another important term for understanding what decomposes and what does not. It means something that originally came from a plant or an animal.

Let's make two lists. When I say LIST, let's create one list of items that are **organic** and one list of items that are non-**organic**. Ready – LIST!

Use a writing surface and record items as students call them out.

OBJECTIVE 3: **Demonstrate composting.**

*Note: It is best if you have set this activity up in advance so students can see the effects of decay on items immediately. Place readily decaying items in the **organic** jug and set the jugs in the ground one week before the class. Longer periods of time will be needed if the **organic** items used decay slowly. If samples are created and buried ahead of time, the last part of this lesson may be modified.*

Great job! We are really starting to understand the difference between what decomposes and what doesn't, but let's conduct an experiment to see if we are right. Follow my instructions carefully.

- Cut the tops off the milk jugs.
- Carefully punch holes in the bottom and the sides.
- Place the 10 organic items in one container.
- Record what you have placed in this container.
- Place the 10 non-organic items in a second container.
- Now let's go outside and dig two holes, each about one square foot.
- Place one container in each hole.
- Cover with soil.
- Now for the hard part. We have to wait approximately one to three months.

NOTES

Let's go back in the classroom for our final activity of the day.

Use an Almanac and Encyclopedia e-Moment® to identify items that decompose and those that do not.

Wait approximately one to three months to re-visit this lesson. To promote student interest, revisit the jugs periodically. You may need to add water if the weather remains dry for long periods.

Welcome back to our very long lesson concerning what decomposes and what does not. Let's do a quick review. What is decomposition? Good! What is organic? Great! Can you think of some examples of each? Great job! Let's go dig up our jugs.

Dig up both your samples. What do you think happened to these items that decomposed to the point where we cannot even identify them?

Solicit responses. Comment positively on each.

Some agricultural products are replacing materials that are not biodegradable. For example, corn is now made into packing pellets.

If possible, obtain some of these pellets. Have students pour water on the pellets. What happens?

OBJECTIVE 4: **Define recycling.**

What can we do to cut down on the amount of inorganic material that scatters our earth? What do you do with a cola can when you are done with it? What is **recycling**?

Recycling can also be referred to as the re-use of inorganic materials. Let's challenge ourselves and encourage others we know to recycle at home and school.

NOTES

SUMMARY/REVIEW

Use a Soundtrack e-Moment® to have students demonstrate the problems and solutions associated with decomposition, organics vs. in-organics, and recycling.

REFLECTIVE REVIEW QUESTIONS:

- What do we know about items that are organic compared to items that are inorganic?
- Why is it important to use organic materials in items that may become trash?
- Describe decay. What do different materials look like as they break down?

APPLICATION

APPLICATION 1: **Make recycled paper.**

Warning: This activity is very messy. It also requires a food processor and an electric iron. If you do this activity in class, you will need two or three parent volunteers.

For each piece of recycled paper, you will need:
2 full sheets of newspaper, torn into small (about 2 inch) squares
2 tablespoons white glue
2 or 3 cups water
Large basin (or sink) that can hold 4 inches of water
Old panty hose
Coat hangers
Food processor and electric iron

Use the coat hanger to make a flat rectangle about 6" x 8". Stretch a piece of panty hose over the rectangle. When it is tight and flat, tie the ends. Place some of the paper (not all) and some water in the food processor. Process until it is a smooth liquid. Keep adding paper. When the paper has liquefied, run the food processor for two minutes. Add the glue to the water in the basin. Pour in the liquefied paper. Mix well, using hands. Mix a second time. Then put the frame in the basin. Press it to the bottom and lift it very slowly. Let the water drain for at least one minute. Hang the frames on a line or set them in the sun to dry. When they are completely dry, peel off the paper. Iron with an electric iron set at the highest setting.