

Biodegradable Is Best

Lesson Plan

Grade Level: 6-8

Curriculum Focus: Conservation

Lesson Duration: Two class periods

Student Objectives

- Investigate the properties of biodegradable materials
- Invent a biodegradable product

Materials

- Discovery School video on *unitedstreaming: Invention: Recycling*
Search for this video by using the video title (or a portion of it) as the keyword.

Selected clips that support this lesson plan:

- Casey Golden's Biodegradable Golf Tee
- Computer with Internet access
- Research materials about biodegradable materials
- Materials to make models of their biodegradable inventions (students who choose this option should determine what materials are needed)

Procedures

1. Review with your students what they know about biodegradable materials. Be sure they understand that biodegradable materials are those that disintegrate easily in nature.
2. Ask students why biodegradable materials are more “environmentally friendly,” and therefore preferable to those that are not biodegradable.
3. Tell your students that in the early 1990s, a young student invented a golf tee made entirely out of biodegradable substances. Discuss with the class why this invention was important. (*Millions of golf tees are used each year, and many people leave them on the golf course after they have used them. Standard golf tees take a long time to disintegrate.*) Tell students that they will be asked to come up with their own biodegradable inventions.
4. Divide the class into pairs or small groups, asking each group to dream up a product that consists only of biodegradable materials they can find in their homes or outside. Have them begin by brainstorming ideas for products and writing down their ideas.

5. Students should then write a list of materials they would need for each product and then determine which idea seems most practical. They should research their materials to make sure they are, in fact, biodegradable.
6. Once groups have chosen their inventions, they should either make models of their products or draw detailed diagrams, showing how and where each material would be used.
7. Have groups create marketing campaigns to convince other people to purchase their environmentally friendly products.

Discussion Questions

1. Do you think that one day most of our clothing or other everyday items, such as notebooks or paper cups, will be made from recycled materials? What changes would have to be made to society in order for this to occur?
2. Are you more likely to buy a product if you know it is made from recycled materials? What if that product isn't quite what you're looking for – not as close, say, as a similar nonrecycled product? What if it was more expensive?
3. Discuss whether you think some countries are more interested in recycling and the environment than others. Explain your answers.
4. Explain the reasons why someone might not choose to recycle in their home. Discuss the things you could say to this person to convince him or her to recycle.
5. Think about the packaging that you see in grocery stores today. Discuss and debate whether most products are packaged in an environmentally friendly way.
6. Hypothesize the reasons why some communities have set up elaborate recycling programs while others have no recycling programs at all.

Assessment

Use the following three-point rubric to evaluate students' work during this lesson.

- 3 points: Students' products use only biodegradable materials; models or diagrams clear and carefully executed; marketing campaigns persuasive and creatively conceived.
- 2 points: Students' products use only biodegradable materials; models or diagrams adequate; marketing campaigns moderately persuasive.
- 1 point: Students' products use only biodegradable materials; models or diagrams unclear or inadequately executed; marketing campaigns weak.

Vocabulary

biodegradable

Definition: Capable of being broken down especially into innocuous products by the action of living things.

Context: Biodegradable materials will disintegrate easily in nature. Things that aren't biodegradable will take a very long time to disintegrate and are therefore more wasteful.

environmentalism

Definition: Advocacy of the preservation or improvement of the natural environment; the movement to control pollution.

Context: In the name of environmentalism, it is important to reduce the amount of garbage with which we burden the environment.

landfill

Definition: A system of trash and garbage disposal in which the waste is buried between layers of earth to build up low-lying land.

Context: When garbage leaves a house, its most common destination is a landfill, where it will join other garbage in a giant pile.

polyester

Definition: Any of a group of polymers that consist basically of repeated units of an ester and are used especially in making fibers or plastics.

Context: A polyester fleece can be made from recycled plastic.

recycle

Definition: To process in order to regain material for human use.

Context: Scientists have learned how to recycle plastic materials into fleece jackets.

Academic Standards

Mid-continent Research for Education and Learning (McREL)

McREL's Content Knowledge: A Compendium of Standards and Benchmarks for K-12 Education addresses 14 content areas. To view the standards and benchmarks, visit

<http://www.mcrel.org/compendium/browse.asp>.

This lesson plan addresses the following national standards:

- Technology: Understands the relationships among science, technology, society, and the individual.
- Geography – Environment and Society: Understands how human actions modify the physical environment.



- Geography – Environment and Society: Understands the changes that occur in the meaning, use, distribution, and importance of resources.
- Geography – Uses of Geography: Understands global development and environmental issues.

National Academy of Sciences

The National Academy of Sciences provides guidelines for teaching science in grades K-12 to promote scientific literacy. To view the standards, visit this Web site:

<http://books.nap.edu/html/nses/html/overview.html#content>.

This lesson plan addresses the following national standards:

- Science and Technology: Abilities of technological design

The National Council for the Social Studies (NCSS)

The National Council for the Social Studies (NCSS) has developed national standards to provide guidelines for teaching social studies. To view the standards online, go to

<http://www.socialstudies.org/standards/strands/>.

This lesson plan addresses the following thematic standards:

- Science, Technology, and Society
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Support Materials

Develop custom worksheets, educational puzzles, online quizzes, and more with the free teaching tools offered on the Discoveryschool.com Web site. Create and print support materials, or save them to a Custom Classroom account for future use. To learn more, visit

- <http://school.discovery.com/teachingtools/teachingtools.html>