Lesson: Let’s Reduce, Reuse, And Recycle!

Grade Level: Kindergarten, First

Content Area: Earth Science

Core Area: Earth’s Natural Resources

Lesson Overview: Students will investigate where their garbage goes (in a tasty way) and explore ways they can use the 3 R’s, Reduce, Reuse and Recycle, to help the earth!

2005 Standards Correlation:

Standard K-5: The student will demonstrate the understanding that objects can be described by their observable properties.

Indicators
K-5.2 Compare the properties of different types of materials (including wood, plastic, metal, cloth, and paper) from which objects are made.

Standard 5-3: The student will demonstrate an understanding of features, processes, and changes in Earth’s land and oceans.

Indicators
5-3.6 Explain how human activity (including conservation efforts and pollution) has affected the land and the oceans of Earth.

Standard 5-4: The student will demonstrate an understanding of properties of matter.

Indicators
5-4.8 Explain how the mixing and dissolving of foreign substances is related to the pollution of the water, air, and soil.

2014 Standards Correlation:
Kindergarten
Standard K.P.4: The student will demonstrate an understanding of the observable properties of matter.

K.P.4A. Conceptual Understanding: Objects can be described and classified by their observable properties, by their uses, and by whether they occur naturally or are manufactured (human-made). Different properties of objects are suited for different purposes.
Performance Indicators: Students who demonstrate this understanding can:

K.P.4A.1: Analyze and interpret data to compare the qualitative properties of objects (such as size, shape, color, texture, weight, flexibility, attraction to magnets, or ability to sink or float) and classify objects based on similar properties.

K.P.4A.2: Develop and use models to describe and compare the properties of different materials (including wood, plastic, metal, cloth, and paper) and classify materials by their observable properties, by their uses, and by whether they are natural or human-made.

K.P.4A.3: Conduct structured investigations to answer questions about which materials have the properties that are best suited to solve a problem or need.

First Grade
Standard 1.E.4: The student will demonstrate an understanding of the properties and uses of Earth’s natural resources.

1.E.4B. Conceptual Understanding: Natural resources are things that people use that come from Earth (such as land, water, air, and trees). Natural resources can be conserved.

Performance Indicators: Students who demonstrate this understanding can:

1.E.4B.2: Obtain and communicate information to explain ways natural resources can be conserved (such as reducing trash through reuse, recycling, or replanting trees).

Materials:
- It’s Easy Being Green! Presentation, computer and projector
- Activity materials (listed with each activity)
- 2 jars with lids filled with water
- Cornstarch recycled packing peanuts
- Styrofoam packing peanuts

Procedures:

Ø Introduce the Essential Questions: What are the 3R’s? Why do we reuse, reduce and recycle? How can we help the environment?
Ø Ask if the students have heard of recycling? Tell them there is more we can do with trash than just recycle. Go over the many ways we can help our Earth.

• Reduce: The most effective way of managing waste is not to produce it in the first place. By not buying packaging we save things from being thrown out. Always look out for packaging that is recycled. Buy things from places that use fewer containers or let you use your own recycled ones.

• Reuse: This is the continued use of a product in its original form. For example, instead of throwing out your old microwave when you get a new one, you could sell it at a garage sale or trade it in. Try and use containers, plastic bags and newspapers as many times as possible.

• Reinvent: This is when you make new, useful things from recyclable objects. For example, using old plastic containers as lunch boxes, making crafts from old boxes and containers, making jewelry boxes from old containers, making original toys and dolls out of unwanted objects or even making costumes from recycled material. Junk isn't always something messy like a banana peel, it can include perfectly useable, clean objects that just no longer serve their original function.

• Recycle: Wash, squash and recycle. Fold up old newspapers and tie them together. Make old things into new or different products
Activity 1: The 3 R Scramble

Background: The 3 R’s, Reduce, Reuse Recycle are keys methods for environmental protection. Reducing the items we use in the first place, reusing the ones we do use and recycling whenever possible makes for a much healthier and happier community and planet. Simple steps taken by families and children, schools, businesses, cities and governments can add up to big changes!

Materials:
• Its Easy Being Green! Presentation, computer and projector
• 3 Signs, each reading Reduce, Reuse or Recycle hanging in three different areas of the classroom
• A couple empty bulk containers: large dog food bag, large bottle of refill soap, warehouse-sized cereal box, detergent bottle, etc. (Reduce)
• Computer or lined paper written on just one side (Reuse)
• Cloth shopping bag (Reduce)
• Plastic juice bottle (Recycle)
• Water bottle (Recycle)
• Detergent bottle (Recycle)
• Lunch box (Reuse)
• Reusable plastic cup (Reuse)
• Dishrags (Reduce)
• “Nalgene” type water bottle (Reduce)
• Tupperware (Reuse)
• Newspaper (Recycle)
• Rechargeable Batteries (Reuse)
• Soda can (Recycle)

Procedures:
1. Introduce the ideas of reduce, reuse and recycle by starting the presentation. Make sure students know what they mean and how they benefit communities and the environment.
2. Point out the “Reduce”, “Reuse” and “Recycle” signs around the room. Explain to students that you will be presenting them with a variety of items and they are to move to these signs that describe the best way of using or disposing of this item once it has already been used once.
3. Hold up each item and allow students to get up and move to the different areas of the room representing the answer to the challenge in number 2. Call on at least 1 student at each area to explain why they chose that response. Please note that the 3 R’s are not mutually exclusive and there are no “wrong” answers. As long as the student can articulate a reasonable explanation for their choice, the answer is valid.

Activity 2: Incredible Edible Landfill

Background: Where does your garbage go when you throw it away? Landfills. A landfill is created in or above the ground where garbage is collected and kept separate from air, soil and water through use of liners. We will be making a model of a landfill that is a bit yummier then you would expect! Each student will have his or her own “Landfill” but it is recommended that the class does each step together.

Materials:
Base layer
Plastic cup or container", 1 tsp. Oreo cookie crumbs, 2 tsp. vanilla pudding, Two 4" Twizzlers®, One shortbread cookie

Municipal waste (middle layer)
1 tsp. Trix® cereal, 2 tsp. Rice Krispies® cereal, 1 tsp. white chocolate chips, 1 tsp. butterscotch chips, Six mini marshmallows, Four chocolate rings, 1 tsp. mini M&M's®, Chocolate syrup

**Final Cap (top layer)**
2 tsp. vanilla pudding, 1 tsp. Oreo cookie crumbs, 1 tsp. green sprinkles, Two 4" chocolate licorice pieces

**Procedures:**
Add each ingredient in order listed to plastic cup. The layers of a landfill are described below.

**Base Layer:** Designed to protect the environment by disposing of garbage safely.

**Layer 1 (cell):** Landfills range in size from four to six acres of land. The area, or cell, must be free of debris and able to hold the weight of the landfill mass. *This is represented by the plastic cup.*

**Layer 2:** This layer is three feet of clay which prevent fluids from seeping out of the landfill. *This is represented by pressing 1 tsp. of Oreo cookie crumbs firmly into bottom of cup.*

**Layer 3:** This layer is a thin liner of plastic which is designed to prevent leaks in the ground beneath the landfill. *This is represented by adding 2 tsp. of pudding.*

**Layer 4:** These are pipes that make the leachate collection system. They collect leachate which is a liquid that is squeezed out of the garbage. Leachate then travels to a treatment pond. *This is represented by laying two Twizzlers across pudding.*

**Layer 5:** This is a drainage layer that protects the pipes from being damaged. *This is represented by laying the shortbread cookie on top of the Twizzlers.*

**Municipal Waste (middle layer): Municipal solid waste is all of the garbage from peoples’ homes and businesses.**

**Layer 6:** This layer is composed of the following:
- Organic waste (Trix) is yard waste and food scraps.
- Paper (Rice Krispies) consists of cardboard, newspaper, and, packaging products.
- Copyright © 2014 by the Board of Trustees of the University of South Carolina http://rpsec.usca.edu/student/
- Plastics (white chocolate chips) include milk and soda bottles and food containers.
- Glass (butterscotch chips) range from bottles to old building windows.
- Metals (mini marshmallows) include tin and aluminum cans and appliances or sheet metal.
- Tires (chocolate rings) include those from cars and trucks.
- Other garbage (mini M&M’s) contains old toys, shoes, and clothing.
  *This is represented by adding 1 tsp. Trix, 2 tsp. Rice Krispies, 1 tsp. white chocolate chips, 1 tsp. butterscotch chips, six mini marshmallows, four chocolate rings, and 1 tsp. mini M&M’s. Spread evenly.*

**Layer 7:** This layer is the leachate that forms. It seeps through all of the layers to the pipes which filter the liquid out of the landfill. *This is represented by squirting chocolate syrup around the edge of the cup.*

**Final Cap (top layer): This outermost layer prevents rainwater from entering the landfill and keeps gases from leaching and polluting our air.**

**Layer 8:** This layer is the top plastic barrier that seals the landfill.
*This is represented by adding 2 tsp. of pudding.*

**Layer 9:** This layer is five to seven feet of soil.
*This is represented by sprinkling 1 tsp. of Oreo cookie crumbs onto pudding.*

**Layer 10:** This layer is grass which prevents soil erosion. *This is represented by adding 1 tsp. of green sprinkles.*

**Gas collectors.** These pipes are placed in the closed cell and act as methane gas collectors. They prevent fires by collecting the gas produced from decaying trash. *This is represented by inserting two chocolate
1. Now that we know what goes into a landfill, let’s do an experiment to see if water can get rid of all the trash. You will need two jars filled with water. You will need one Styrofoam packing peanut and one Cornstarch recycled packing peanut. Place one peanut in each jar. Get two volunteers to shake each jar. As they shake the jars, ask if you think water can get rid of these pieces of trash? After a minute of shaking, observe the jars. The recycled peanut will dissolve and the Styrofoam will stay the same. Tell students that water cannot get rid of all the trash that we create but we can make changes to the things we use so that it they are Earth friendly. The cornstarch peanut will not harm the Earth and easily “washes” away.

Activity 3: “The Reuse It” Game

Background: One of the most important R’s is reusing items – Once is Not Enough!

Materials:
• It’s Easy Being Green! Presentation, computer and projector
• Reuse It! Sheet (provided)
One of each or one per student group of the following:
• Paper used on one side, Ziploc Bag, Tin Can, Torn piece of clothing, Egg Carton, Magazine that has already been read, Old Calendar, Cereal Box, Paper Towel Roll, Paper Bag

Procedures:
1. Continue to the “Reuse It! Game” slide on the presentation.
2. Pass out Reuse it! Sheets and items (or display at front table).
3. Allow time for groups to brainstorm how these items could be reused.
4. Have students Upcycle these items to reuse in the classroom or at home!

Activity 4: “Adventures of a Plastic Bottle”

Background: Learn about recycling from a new perspective! Peek into this diary of a plastic bottle as it goes on a journey from the refinery plant, to the manufacturing line, to the store shelf, to a garbage can, and finally to a recycling plant where it emerges into its new life...as a fleece jacket! Told from the point of view of a free-spirited plastic bottle, kids can share in the daily experiences and inner thoughts of the bottle through his personal journal. The diary entries will be fun and humorous yet point out the ecological significance behind each product and the resources used to make it. Readers will never look at a plastic bottle the same way again!

Materials:
• It’s Easy Being Green! Presentation, computer and projector
• Adventures of a Plastic Bottle by Alison Inches (can be purchased from Amazon)

Procedures:
1. Continue onto the next slide of the presentation.
2. Ask the students what a journal or diary is. Ask any of the children if they keep a diary or a journal? Explain that you will be reading a diary written by a plastic bottle describing all its stages of life.
3. Read story to class.
4. Review each stage of the plastic bottle’s “life” with the class.
Activity 5: Plastic Number Game

Background:
The next time you use a plastic disposable item, take a look at the symbol on the bottom to see what kind of plastic it is. On most plastics, you'll see the recycling symbol (three arrows chasing each other in a triangle) and a number 1-7 in the middle. Information about each is in the chart to the right.

Materials:
• Its Easy Being Green! Presentation, access to a computer and projector
• Variety of plastics
• Plastics Scavenger Hunt

Procedures:
1. Pass out Plastics Scavenger Hunt and a variety of plastics to each group.
2. Allow students to go through the plastics and fill in which plastics had which number.
3. Then allow student to go hunting through the room to find additional plastics. This can also be a homework assignment for students to find these numbered plastics at home.

Activity 6: 3R Posters

Background: Now that students are Green Experts, they need to spread the word!

Materials:
• Large Paper, Art Supplies, Old Magazines and Calendars

Procedures:
1. Have students create posters to put up around their campus encouraging other students to follow the 3R’s.
2. Consider having students create booklets or give presentation to other classes.

➢ Let’s Review: Revisit the essential questions and check for understanding.

➢ Extend: Consider setting up a compost box in the classroom using earthworms. Students can add to the soil with food scraps, leaves, etc…Be sure to turn the soil often as well as mist it with water. Observe and watch “nature’s recyclers” go to work! Or to extend student understanding, plan a field trip to a local recycling center.
### Activities: 7Es, Science and Engineering Practices, and Cross Cutting Concepts

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