Title: My Big Green Teacher Recycles
Grades: Pre K-K
Subjects: Science, Language Arts
Time: 60 minutes

Objectives:

- Explain the need to reduce the amount of trash they generate, and describe ways in which they can make changes in their actions to support waste reduction.
- Listen to gain knowledge and share information, perform a task, and converse with an adult or peer.

Standards:
Science Standard 14: Understands how human actions modify the physical environment

- Benchmark #1: Knows how people affect the environment in negative (e.g., litter, pollution) and positive (e.g., recycling, picking up litter) ways.

Language Arts Standard 8: Use listening and speaking strategies for different purposes.

- Benchmark # 1: Make contributions in class and group discussions.
- Benchmark # 2: Ask and respond to questions.
- Benchmark # 5: Use grade level appropriate vocabulary in speech (e.g., terms related to waste reduction and recycling).

Technology Standard 3: Understand the relationship among science, technology, society and the individual.

- Benchmark # 3: Know that man-made materials, products and systems can affect the environment adversely, yet there are things that can be done to circumvent this process (e.g., disposing of waste properly, reusing objects, recycling, reducing the amount of trash created, composting, shopping green, buying in bulk).

Materials:

- A copy of the book "My Big Green Teacher: Recycling" by Michelle Y. Glennon
- Green teacher outfit (optional)
- Sample not green lunch (paper bag, can or bottle, plastic wrap, foil, zip lock bag, etc.)
- Sample green lunch (reusable lunch bag, thermos or reusable drink bottle, reusable containers, piece of fruit, etc.)
- Chart paper
- Pack Lunch provided worksheet

Overview: The average US citizen generates approximately one ton of trash annually, but seldom gives it any thought once they throw it away. So what happens to it all? Well, it goes into the waste stream where it is collected and hopefully, disposed of in a manner that least impacts the environment. This process is known as solid waste management.

The Environmental Protection Agency has designed a plan for this process, which they refer to as "integrated solid waste management", and has identified five ways to properly handle waste materials: a) source reduction and reusing, b) recycling, c) composting, d) converting to energy, and e) burying it in a sanitary, engineered site. The EPA emphasizes that there is no definitive approach to waste management and encourages communities to combine these five methods to effectively address the issue.

Most recyclable materials are sent to a single stream materials recovery facility. (The term "single stream" refers to the fact that the recyclables are not pre-sorted by the consumer.) Trucks transport the

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recyclables to the facility, where they are unloaded onto the “tipping floor”. From there they are placed on a conveyor belt and sorted by hand and by machine into the four main recycling categories: a) plastics, b) paper, c) metals, and d) glass. Once sorted plastics are further sorted by color and type. Some facilities use air to separate lighter plastics from heavier ones, while others use optical scanners, or both methods, to separate by type (e.g., PET, HSPE, etc). After sorting, the plastics are baled and sent off to manufacturing plants where they are ground up, washed, melted, and reformed into plastic pellets. These plastic pellets are what is used to make other consumer goods.

Paper recyclables are sorted into four categories: a) corrugated boxes, b) newspaper, c) mixed paper, and d) office mix. These are each baled and sent off to paper mills. Used newsprint, for example, is washed and rinsed and simultaneously has the long and short fibers separated from it. The long fibers are then mixed with wood scraps from lumber mills and together combine to make up pulp. The pulp is then poured onto large rollers, drained, and run through heated rollers. The paper that results is trimmed, rolled onto tubes and sent to printing plants.

Glass recyclables are sorted by color. This may take place before or after crushing the glass, depending on the facility, and sometimes it is shipped without sorting. Once glass is crushed it is cleaned of any debris and contaminants. Then the crushed glass, or “cullet”, is loaded onto trucks and transported to manufacturers. Crushed glass is used for a variety of purposes, including the production of new containers, kitchen counter-tops, and in the construction of roadways. To make new glass containers the recycled, crushed glass is mixed with sand, soda ash, limestone and feldspar. This mixture is then melted down in large furnaces and reformed into new containers. Recycling one ton of glass saves 1330 pounds of sand, 433 pounds of both soda ash and limestone, and 151 pounds of feldspar that would otherwise be used to produce new glass.

Magnets are used to separate steel from other recyclables, and aluminum is separated mechanically using an eddy current. Once separated the steel and aluminum are crushed, baled and sent to processing mills. Aluminum is melted down, and either poured into molds or rolled into sheets, to await use by manufacturers to make new products. Tin and steel require the process of electrolysis to be recovered. Following the recovery they are purified, melted and poured into molds. When it is time to make them into new products, the steel is melted down, poured onto sheets and then coated by the tin before forming. Once these and the other recyclables mentioned above have been processed and transformed into useful items, they are placed back on the shelves for consumers to purchase, and the cycle starts once again.

Kid’s Speak: Recycling is the process of reprocessing materials into new items. For example, a plastic bottle can be recycled and emerge as a fleece jacket. If trash is not recycled, it is taken to landfills which are rapidly filling. Eventually more land will be needed for landfills so that land will be unavailable for environmentally friendly use by people, plants, or animals.

Items made from glass, paper, aluminum, and plastics can be recycled. Recycling prevents valuable resources from being wasted. These items are sorted and separated into material types. If you are unsure if an item or its packaging material can be recycled, check for the recycling symbol.

Typically recycling occurs in one of these ways. For household recycling often curbside collection is available. Typically presorted recyclable materials left by residents in front of their homes in boxes, bags, or bins are collected by a recycling vehicle. Another alternative if for residents to take recyclable items to a recycling collection facility. Schools districts may have contracts with companies to haul away trash and recyclables. Guidelines for sorting vary by locale: sometimes by town and sometimes by state.

Many students and their families may already recycle. These lessons are designed to educate and inform students about why recycling is important and encourage students to be proactive in helping the environment at an early age. Students will learn vocabulary and complete activities to become

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environmentally aware. After students have learned the benefits recycling provides for their planet, they may encourage families who don't currently recycle to adopt this process.

Eco-fact: If only 10% of Americans bought products with less plastic packaging 10% of the time about 144 million pounds of plastic could be eliminated from US landfills.

Procedure:
Before Conducting the Lesson:

- Teacher poses the question, "What is recycling?" teacher accepts answers from several children. Teacher can ask by a show of hands how many students in class think that they recycle at home. Do we recycle here at school?
- Teacher tells children that she has a great book to help us answer her question and learn more about recycling. The teacher introduces the book "My Big Green Teacher: Recycling" by Michelle Y. Glennon. Teacher may wish be all dressed in green to be a "big, green teacher".
- Teacher introduces and reads the book aloud to the class.

Learning about Recycling:

- Following the reading the teacher poses additional questions to the students:
    - What is recycling?
    - How did the characters in the book recycle?
    - Why is recycling an important thing to do?

- Tell students that you want to be a "big, green teacher" when you pack your lunch each day. Show the students two lunches on in a paper bag and one in a reusable lunch bag. Explain to them that we are going to unpack each lunch and decide which one a big green teacher would bring to school each day.

- Before unpacking the lunches make a T chart on the board or chart paper: Big, Green Lunch and Not Green Lunch. Let's make a list of what types of materials or containers would go into each lunch. Record responses in appropriate columns. (Note: While doing these lessons teachers should inform students about sorting rules for their area. Adaptations to some of the lessons may be needed to align with sorting rules in the local area.)

- Unpack the LUNCH 1: It's in a bag that needs to be recycled. Bring a single serving drink and snack. Wrap sandwich in plastic wrap or zip lock bag. Bring another item wrapped in foil. A paper napkin and plastic utensils can also be included. Discuss you would dispose of each item when you were finished your lunch. On the chart write LUNCH 1. Count and record the number of items that would be recycled and number of items that would go into trash basket.

- Unpack LUNCH 2. It's in a reusable lunch bag. Drink is in reusable bottle or thermos. Sandwich and snack is in reusable containers. A cloth napkin and reusable utensils can be included. A piece of fruit is included. On the chart write LUNCH 2. Count and record the number of items that would be recycled and number of items that would go into trash basket. Explain to students that the remains of the fruit are biodegradable materials. They can be recycled in a special way called composting and do not have to go into trash. (Compost is made by layering organic materials in a pile and letting it decompose. A balance of "browns" and "greens" ensure a healthy and odor-free compost. Browns include carbon materials such as as dried leaves and broken twigs, and the greens constitute fruit and vegetable peelings, green plants, etc.)

- Tell students that now it's time for us to decide how I can be a "big, green teacher" each day when I pack my lunch. Remind students which lunch is LUNCH 1 and LUNCH 2. Explain to students that you are going to count to 3. When you say "3" They are going to raise one hand or two hands. If they think LUNCH 1 is the big, green lunch they will raise one hand. If they think

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LUNCH 2 is the big, green lunch they will raise two hands. (Note: Hand raising can be practiced if needed. For example, on the count of “3” raise one hand if you are wearing jeans and two hands if you are not.)

- Conclude activity with a discussion. Teacher says, “Now I know how to be a big, green teacher when I pack my snack and lunch. How can you be a big, green student?”
    - Stress that if parents pack snacks and lunches, students can encourage or remind parents to include reusable containers.
    - Students can encourage or remind parents to buy in bulk and put in reusable container rather than buying single serving packages.
    - Tell students that all stuff starts somewhere. If we don’t use plastic wrap, plastic, bags, or foil to begin with we don’t have to throw it away. Stress that each student can help make a difference by making good choices and reminding parents to do the same.

Follow-up Activity:

- This activity can be brought home when finished and used as a means for students to communicate to parents what they have learned about recycling and reusing. Students will select the items that could be found in a big, green lunch. These items will be cut out and pasted into box at bottom of worksheet.

Adaptations:

- Teacher may wish to discuss bringing healthy snacks such as fruit and vegetables during this lesson.

Extensions:

- Teacher can use the songs, dance, and recycling activities and ideas in “My Big Green Teacher: Recycling” by Michelle Y. Glennon to extend concepts from the book and lesson.
- Visit this link on this GEF site for more details about composting.
- For lessons about composting, visit these links on this GEF site:
- Sort the Compost Bin
- Build an Indoor Compost Bin
- Build an Outdoor Compost Heap

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