Title: Grade 3: Reduce Your Trash
Grade: 3
Subjects: Social Studies, Math, Language Arts, Science
Time: 30-40 minutes per day for one week

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.
- Measure and compare the weight of objects using a scale.
- Collect, record, organize, and interpret data using a variety of graphic representations.
- Analyze collected data and draw logical conclusions.
- Communicate their ideas in writing and inform readers about their actions to reduce waste

Standards

Geography Standard 16: Understand the changes that occur in the meaning, use, distribution and importance of resources.

- Benchmark # 5: Know advantages and disadvantages of recycling and reusing different types of materials.

Geography Standard 18: Understand global development and environmental issues.

- Benchmark # 2: Know ways in which resources can be managed and why it is important to do so (e.g., conservation practices, recycling non-renewable resources).

Mathematics Standard 3: Use basic and advanced procedures while performing the process of computation.

- Benchmark # 5: Perform basic mental computations (e.g. addition and subtraction of whole numbers).
- Benchmark # 6: Determine the effects of addition, subtraction, multiplication and division on the size and order of numbers.

Mathematics Standard 4: Understand and apply the basic and advanced properties of the concepts of measurement.

- Benchmark # 3: Know the basic standard units (e.g., ounces, pounds, liters, grams) and relationships between them (e.g. between ounces and pounds).

Mathematics Standard 6: Understand and apply the basic and advanced concepts of statistics and data analysis.

- Benchmark # 1: Understand that data represents specific pieces of information about real-world objects or activities.
- Benchmark # 4: Organize and display data in simple bar graphs, pie charts and line graphs.
- Benchmark # 5: Read and interpret simple bar graphs, pie charts and line graphs.
- Benchmark # 6: Understand that data comes in many different forms and that collecting, organizing and displaying data can be done in many ways.

Science Standard 12: Understand the nature of scientific inquiry.

- Benchmark # 3: Plans and conducts simple investigations.
- Benchmark # 4: Use appropriate tools (e.g., scales) to gather scientific data and extend the senses.

Language Arts Standard 1: Use the general skills and strategies of the writing process.

- Benchmark # 12: Write personal letters.

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

- Benchmark # 3: Respond to questions and comments (e.g., gives reasons in support of opinions).

Materials

- Large, clear plastic trash bags
- Scale
- Recycling bins
- Chart paper
- Grid paper
- Poster markers
- Paper and pencils
- Copy of the book "Sir Johnny's Recycling Adventure" by Rachael Paulson
- Copies of the Letter to Parents provided
- Copies of Snack Survey provided
- Bar graph worksheet provided

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.

In most communities across the country waste materials end up in at least one of three locations: a) a materials recovery facility, b) a waste-to-energy facility, or c) a landfill. A materials recovery center is where recycled materials are sent. Once at an MRF glass, metal, plastic and paper are sorted, separated, and baled. Then they are transported to manufacturers, processed, transformed into useful items and placed back on the shelves for consumers to purchase once again. A waste-to-energy facility burns the waste material and converts it to energy. The trash is used as fuel to produce heat energy, turning water into steam. The steam is channeled to turbine generators, which in turn produce electrical power. A landfill is a long-term disposal solution that buries trash in as safe and sanitary manner as possible. In a landfill trash is deposited and compacted overtime, burying layer upon layer of waste material and leaving it to decompose. The EPA recommends land filling as a last resort, after all other methods have been exhausted; however many communities find the other options too costly or impractical, and use a landfill solution as one of their primary methods of disposal.

While the technologies driving these methods have greatly improved in recent years, they still present a number of environmental problems; so the most desirable methods for reducing waste are composting and source reduction/reuse. According to reports from the EPA almost 70% of solid waste consists of organic materials, such as paper, food and yard waste. These materials can be composted by individuals or on the community level, using municipal solid waste composters. Either way, the result is a product that can be added to enrich and improve the quality of soil. Compost is a valuable agricultural resource.

However, even with all these other options source reduction is, by far, the most preferred method of solid waste management. It uses fewer resources, less energy and is essentially free. Unfortunately, it is also the most difficult concept to communicate to consumers. For manufacturers, source reduction means looking at and reducing the waste they generate during production, and the materials they use in packaging products. For individuals, it means reevaluating current practices, learning to do more with

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less, using what already exists responsibly, and recognizing the difference between needs, wants and what is ultimately best for the environment and the future of mankind.

Kid's Speak: Trash takes up space, uses valuable resources and harms the environment. People make a lot of trash. Every day they throw it away without even thinking about where it will go or what will happen to it. People need to understand the consequences of making all that trash, make better choices so the amount of trash they make is reduced, and have a plan to properly dispose of the trash they do make.

Not all trash needs to go in the garbage. There are other things that can be done. Some of it can be reused it in a different way, some of it can be recycled so it can be made into something else, and some of it, like scraps of food, leaves and grass clippings, can be composted and added to the garden. But there are also things that people can do so there isn't as much trash. They can use fewer items that make trash. Instead of using plastic sandwich bags to put snacks in, they can use a reusable container. Instead of a drink box, they can use a reusable water bottle. Instead of paper napkins and plastic utensils, they can use cloth napkins and washable forks and spoons. There are lots of things that people can do to make less trash. They just have to think about the choices they have and try to make the best ones for the environment.

Eco-Fact: For every ton of paper that is recycled, rather than thrown in the trash, seventeen trees are saved.

Procedures:
Before National Green Week:

- Sometime during the week of January 25, 2010 school appointed green keepers will collect one day's snack trash from each participating class. (Note: This day will be determined on an individual school basis. Please check with your school administrators for the date and time of your school's collection.) This trash will be combined with trash from all participating classrooms school wide, and weighed in total to determine the pre-weight of snack trash for your school. In order to achieve an accurate weight please include in the trash collection only the waste that was generated at snack time for the given day. Before giving the trash to the green keepers please remove any organic waste (e.g., fresh fruit, fruit cores and peels), but do not empty out any drink containers that still contain liquids.

- Explain National Green Week to students. Talk to students about what they can do to help reduce trash in the classroom. Explain to students that if they use reusable water bottles, reusable snack containers, cloth napkins, washable silverware (not plastic ware), and snacks without wrappers (e.g., apples, bananas, grapes,…) they can make a big difference in the amount of trash that will enter the waste stream. Request that they use reusable lunch sacks instead of paper or plastic bags.
- Send the Parent Letter home with the students. Ask students to talk to their parents about National Green Week and how they can all help reduce the trash that gets thrown away. Request parents send environmentally friendly snacks and lunches to school. (Note: If needed, change the dates in the parent letter to reflect the designated green week in your school.)
- To support the Waste-Free Snack Challenge in the classroom the following lessons are recommended.
- Before Conducting the Reduce Your Trash Lessons:

- On Monday introduce the lesson by asking students what they think you should do with the item (either an old magazine or newspaper) you are holding. Ask if you should throw it in the trash basket, or if there is something else you could do with it. They may suggest you recycle it, or give it to someone else, or use it in another way. Consider all suggestions, but act noncommittal, as if you were undecided about what would be the best thing to do.

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- Introduce “Sir Johnny’s Recycling Adventure” by Rachael Paulson. Tell the student that perhaps you will find your answer in the book. Read the story aloud to the class. After the reading pose the following questions:

    - What would happen if everyone threw away all of their trash? What kind of problems could this cause?
    - What types of things does Johnny learn about that can help reduce waste?
    - What type of items can we reuse? How can we reuse them?
    - What type of items can we recycle? How do we recycle them?
    - What type of items can’t we reuse or recycle at school? Why?
    - How can we help reduce the amount of trash we make when we are shopping?

- Discuss the importance of the 3 R’s: reduce, reuse, and recycle. Share the Eco-Fact with students. Ask them to think about how many pieces of paper they put in the trash every day and explain to them how they can help to reduce trash and recycle. Return to the previous discussion about the magazine or newspaper. Decide as a class what should be done with it.

- After students leave for the day, collect the trash that has accumulated over the course of the day and save it in a clear plastic trash bag. (Snack trash will have been collected by the green keepers.) Label the bag Day 1.

Reduce Your Trash Lessons:

- On Tuesday morning, begin the class by drawing students’ attention to the bag of trash saved from Day 1. Explain to students that this bag contains all the trash that they threw away yesterday. Ask the students how much they think the bag of trash weighs. Create a Data Table. A sample "Reduce Your Trash Data Table" is provided below. Weigh the bag of trash and record the weight on the Data Table. If you do not have a scale that can accommodate the trash bag arrange to use the scale in the nurse’s office. Discuss with students the difference between their predictions and the actual weight of the trash. Ask students what they think might have been in the trash that made it that heavy, and what could have been reused or recycled so it would have weighed less? Make a list. Explain to students that today they should be careful to recycle things that can be recycled, and to reuse whatever they can, such as using the back of any paper, before recycling it.

- Save Tuesday’s trash. Label the bag Day 2. (Snack trash will have been collected by the green keepers.)

- On Wednesday, show students the trash bag for Day 2. Weigh the trash for Day 2. Record the weight on the Data Table. Using data from Days 1 and 2 find the difference between the two amounts, if any, and record it. Then ask students to use the data table to determine if there was more trash or less trash on Day 2. Discuss with students what might account for the difference. Remind students to continue to be careful about what is thrown away and what is recycled.

- After snack time have students fill out a survey of the types of items they brought to school for snack. A printable version of the "Snack Item Survey" can be found below. Collect the surveys and take a tally of the items using a tally chart similar to the one shown below. A sample chart called "Environmentally Friendly Snack Materials" is provided below. Discuss with students how they can help the environment by bringing reusable materials to school. Encourage them to continue the practice.

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- Please complete the Snack Item survey. Write a number under each category to show how many of each type of item you brought to school today for snack.

- Save Wednesday's trash. Label the bag Day 3.

- On Thursday morning, show the class the bag of trash for Day 3. Weigh the trash for Day 3. Record the weight on the Data Table. Find the difference between the weight of trash of Day 1 and Day 3, if any, and record it. Then ask students to use the data table to determine if there was more or less trash on Day 3 as compared to Day 1, compared to Day 2. What do they notice about the change, is it significant? Discuss with students what might account for the difference. Remind students to continue to be careful about what is thrown away and what is recycled.

- After snack time, return the survey sheet to students and have them complete it for today. Collect the surveys and add the information to the tally chart to show the different kinds of environmentally friendly materials students used. Find the count for Thursday. Were there more environmentally friendly materials used on Wednesday or Thursday? What conclusions can they draw from the data? Show students how to use the information on the tally chart to make a simple bar graph. Teach students how to read the bar graph.

- Save Thursday's trash. Label the bag Day 4.

- On Friday show students the trash bag for Day 4. Weigh the trash for Day 4 and record the weight on the Data Table. Using data from all four days, ask students to find the difference between Monday and each of the other three days. How much of a difference was there in the amount of trash generated on Monday and the amount generated on Thursday? What conclusions can the students draw about this?

After Conducting the Lessons:

- Using the data recorded on the Data Table students will make a bar graph on grade appropriate grid paper or use the printable bar graph worksheet is provided below at the bottom of this lesson. The bar graph should show the amount of trash collected on all four days. Discuss with students what the bar graph indicates. Ask the following questions:
    - On which day did the class have the most amount of trash? Why might that be?
    - On which day did the class have the least amount of trash? Why might that be?
    - On which day was there the greatest change? Why might that be?
    - On which day was there the least amount of change? Why might that be?
    - What conclusions can we draw from the bar graph about reducing the amount of trash we throw away?
- Students will write a letter home to their parents to describe how changing the way they bring their snacks and lunches to school has helped to reduce the amount of trash generated in the classroom. Students will share their bar graphs with their parents.

Adaptation: Students can create other types of graphic organizers to represent the data (e.g., pictographs, pie charts, line graphs).

Extensions:

- Students can transfer the data on the bar graph to a pie chart. Of all the trash collected over the week, what portion was collected on Days 1, 2, 3, and 4?
- Students can create a 3 R's journal. Students can write daily journal entries about how the amount of trash collected in the classroom is decreasing.
- Students can add journal entries about the ways they reduce, reuse, and recycle at home.

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