



Project Instructions and Lesson Plans Grade 2 -12

Getting Started:

1. Choose 4-6 of the lessons below to teach to your students. (Please use the same groups of students for all of the lessons. In other words, students must be exposed to a minimum of 4 lessons about environmental stewardship, sustainability, personal responsibility for our natural world. You may substitute your own lessons/activities for one or all of the lessons included here, as long as they connect students to learning about the concepts cited above. The California EPA in conjunction with the CA Department of Ed. have created an exception set of core content integrated and standards-based environmental literacy lessons. Please feel free to use any of these as well: <http://www.californiaeei.org/Curriculum/default.htm>

2. Most lessons and activities here are aligned with the new Common Core State Standards. (To find a direct correlation, please see the Common Core ELA and Math Standards available at: <http://www.corestandards.org/the-standards>.)

3. Explain to students that after the lessons on recycling/environmental stewardship, they will be creating an illustration on one side of a re-usable shopping bag. The bags should be illustrated with pictures, words and designs that represent an idea, image, thought, or feeling related to something that they learned during the lessons on sustainability and recycling, re-using, reducing. Students will be given a template to sketch out their idea, prior to using fabric paints to illustrate the bags. This final product will give students the opportunity to share what they have learned with an authentic audience. A digital photograph can be taken of the bag to be placed in the student's portfolio. Students will then get to take their bags home, share with their families and use them!

4. Be sure to check out the cool "Online Recycling Games" list and Teacher Resources at the end of this document. Alternative lesson plan links can also be found at the end of this document.

5. Upon completion of the 4-6 lessons a contact person from each participating school (please choose this teacher from those that are participating) should email Mitch at: Mitch@BagSpeak.org and let him know that all of the teachers have finished their lessons and are ready for the bags and fabric paint to be delivered. Schools will have one class set of fabric paints and enough bags for all participating students sent to them. The class set of paints will need to be shared and rotated around to all of the participating classes. Bag painting instructions, including a template for students to "practice" their illustration on will be emailed to teachers at this time. All participating teachers will have 2-4 weeks from the time

the bags and paint arrive at their site until they must complete the bag illustrations with their students. (This is to allow other schools to utilize the sets special fabric paints.)

6. We will keep your principal updated with the project via email.

7. Bags will then be given to each student to take home and share with their families. It is our vision that students will also begin using a reusable bag themselves and convince their parents and other family members about the importance of using the bags and to make other changes to help sustain our planet (i.e. take shorter showers, turn off the lights when not in use, use a reusable water bottle....)

Any questions/concerns/ideas...please feel free to email us at: Info@BagSpeak.org or call: (831) 244-0925.

Thanks and have fun with this important and creative project!

Lesson Plan List

Choose 4-6 lessons/activities.

You may substitute any/all of the lessons below for your own (or activities found on the Internet) as long as the lessons integrate concepts on environmental stewardship, sustainability and/or taking personal responsibility towards our environment.

We ask that you complete a minimum of 4 lessons/activities with your students in order for us to ship you the reusable bags and fabric paints.

Snack Sort

Grades 4-12

Materials:

- Garbage from class garbage can (after a class snack)
- 2 or 3 large plastic garbage bags (to sort trash on)
- Class set of plastic gloves or plastic baggies that can be used as gloves.
- Chart paper
- Anti-bacterial soap.

Have a snack in class. (Bring in various packaged and non-packed (fruit) snack items. Throw waste into a garbage can. Now take a look at what is left. Wrappers? Paper? Cups? Crumbs? Unfinished food?

Next, spread out contents of garbage can on a table (using large plastic garbage bag cut in half to cover the table.) Have plastic gloves (or baggies to use as gloves available) Have groups of students sort the trash first by what will decompose (break down and disappear naturally.) Ask students to set this trash on one side of the table. Talk about the idea of composting. (If the school has a composter bring the items down to it. If not, explain the concept and how people all over the world are starting to compost their waste food scraps instead of throwing them away. This compost turns into fertilizer (rich dirt-like substance that is used in the garden to help plants grow fast, strong and produce high yields of crops.

Now ask students what else do they think can be recycled? (Made into something else of the same element again?) Have them pull out these items by type and place them on another area of the table (i.e. all paper products, any

plastic bottles, metal...)

Chart sorted garbage by item, type, or weight. See what you have the most of.

Take a look at what is left in the original trash pile. Is it much smaller? Talk about how if everyone on our planet started sorting his or her trash on a daily basis how much less garbage we would have every day.

If available have students take sorted trash (paper, metal and plastic to appropriate bins.) If not available, tell students you will take the sorted trash home and place them in the correct bins at your house. (Or offer a student to do this....)

Talk about where trash goes after the garbage trucks pick it up (landfills) and how our landfills are becoming fuller and fuller and soon will not have room for more garbage. Talk about the resources it takes to produce wrappers and paper products from scratch and how we can minimize the taking of these resources if we choose to recycle.

Finally, talk about our own individual ability to do good and recycle. How it is important to make sure we do it at home and at school (if available.) How we can remind our parents, family members and other people in our building. How even if we think how can I make a difference, know that we can, that other people will look up to us as leaders and as helping our planet.

Have students wash their hands with anti-bacterial soap.

For homework/follow up, have students do the same activity at home. (Be sure to have them explain/ask permission from their parents.) Go through the kitchen garbage can or the garbage can in their bedroom. Tell them to do it exactly how we did it in class (using a plastic bag or newspaper to sort the trash on, using gloves or a plastic bag in place of gloves and recording the results according to trash type.

(You can make a worksheet with the Recycling categories at the top and have them tally items. Paper/Plastic/Metal/Food Scrapes/Non-recyclables (real garbage)

Work with this data the next day in class...Have students take sorted garbage at home to the correct recycling bin (Blue for plastic AND metal, Green for ALL paper products (even little cardboard pieces in candy wrappers and serial boxes

and toilet paper core rolls! And black garbage bags for everything else. (Unless they have a compost site in/near their home.)

Biodegradability (Note: Need 1-2 months time)

Grades 4-8

Materials:

- 8 biodegradable plastic bags (use two different brands)
- 8 nonbiodegradable plastic bags (use two different brands)
- 4 brown paper bags
- 4 pages of newspaper
- 3 nets (plastic or cotton)
- wire or string
- 6 wooden posts
- mulch pile (about 3-4 feet high) consisting of grass clippings, leaves, rotting vegetable matter, fertilizer, dirt, compost culture, etc...make or buy a composter (chicken wire ring 3-4 feet high 4-6 feet in diameter)
- leaf pile (2-3 feet high)
- 8 plastic containers (1 gallon each)
- tapwater
- saltwater (15 percent by volume)

Objective:

The students will test several types of plastic bags in different environments to determine in the same environment: direct sunlight; a mulch pile (which simulates an active landfill); a leaf pile (which simulates a dry landfill); and salt water (simulates an ocean).

Procedure:

Requires a time period of at least two months. Fold and secure two types of biodegradable and nondegradable plastic bags on top of a net with wire or string. Tie a wooden post to each end of the net and place each post into the ground, leaving the plastic bags exposed to the sun. Do the same with one

paper bag and a page of newspaper. Place two types of biodegradable and non biodegradable plastic bags, a piece of newspaper, and a brown paper bag in the middle of the mulch pile. Wet the pile thoroughly with water. Place the same types of materials that were used in previous steps in the middle of the leaf pile. Place two biodegradable plastic bags, two nonbiodegradable plastic bags, one paper bag, and one page of newspaper into four separate containers of tap water. Then, place the same types of materials into separate containers of 15 percent (by volume) saltwater. Allow all the materials to stay in their environment for three months or longer. Record the changes that occurred to the plastic bags, paper bags, and newspapers in the different environments upon removal.

After you have the different types of landfills constructed, have community members to visit and discuss the importance of recycling and the community landfill, for example, mayor, city manager, members of the community beautification committee. Take a field trip to the city landfill. Have students to determine if the landfill could be made environmentally safer.

Evaluation:

Did any materials decompose? If so, which materials decomposed most thoroughly? Was the degradation greatest in the exposed to the sunlight mulch pile, leaf pile, tap water, or salt water? Did the plastic bags that were advertised as biodegradable appear any different from the nonbiodegradable bags?

Extension:

Participate on a committee and take a census, getting public input on whether landfills are needed and how they would feel if one were going to be built near their homes.

EGGS? A Toxic Waste Simulation

Grades 6-8

Materials:

- raw egg for each team of students
- scissors
- tape
- staples meter stick
- balance

- materials brought in by students (various)

Objective:

Students will design, construct, and test a toxic waste transportation vehicle.

Focus:

Hold up a raw egg for the students to observe. Explain to them that this simulates toxic waste that must be transported by trucks across the country without any leakage.

Background:

Many times we think that only large companies produce hazardous or toxic wastes. Many common household products contain ingredients that are toxic which makes them hazardous when used and disposed of improperly. When disposed of improperly, household hazardous wastes can contaminate soil, air, and water.

Procedures:

Assign each student a partner. Tell students that they will be working together to design and test a vehicle that contains a raw egg (toxic waste). They will enclose the raw egg in a device/vehicle that will be dropped on concrete from the top of a second story staircase. You have just been hired as the Chief Hazardous Waste Disposal Engineers for the Environmental Goo and Gross Stuff Company, known as EGGS. EGGS (company) is faced with new government regulations for the transport of toxic wastes produced during the production of a new pesticide, yellow outdoor lice killer strips (yolks). As hazardous waste disposal engineers, your team is assigned to design, build, and test a model of a new hazardous waste transport vehicle. This vehicle will be used to transport YOLKS waste to a landfill, about 2,500 miles away from the factory. Your team must bring materials from home for the construction of your vehicle.

You will be given one class period to completely construct your vehicle. Your vehicle will be tested (dropped) the following class period. Sorry, no trial runs allowed!

Note: The size of your next raise (your grade) will be evaluated on the following criteria:

1. Egg does not crack or break-20 points
2. Egg breaks, but does not leak from container-20 points
3. Vehicle completed on time-20 points
4. A written description of materials used and directions for construction of vehicle to boss (teacher)-20 points
5. Vehicle must fit inside 40 cubic centimeter area-10 points

6. Empty vehicle must not weigh more than 500 grams-10 points

It is also very important for EGGS to maintain good public relations as an environmentally conscious company. Your team may earn bonus points by demonstrating environmental concern with the following criteria:

1. Vehicle is made from recycled materials-two points
2. Vehicle is constructed from recyclable resources-two points
3. Vehicle's exterior is decorated to show that you are an environmentally concerned company and safety signs are clearly visible-two points

Evaluation:

Ask students these questions: How did your vehicle rate or perform? If the egg withstood the impact, describe what feature of your model allowed this to happen. If the egg cracked or broke, what major problem did your vehicle have and how could you correct it?

Submitted by: Sandra Weaver, Lamar University TES Course, 1994.

Recycled Poetry

Grades 3 – 6

Objectives

- * Students will write "found" poetry.

Materials

- * Old newspapers and magazines
- * Scissors
- * Envelopes
- * Paper

Procedures

1. Before beginning, explain to the children that they will be writing a poem.
2. Explain the "blank verse" and read the example below.
3. Then explain the procedure.

Step 1: Clip interesting words from magazine ads and article titles.

Step 2: Put the strips in a box or large manila envelope.

Step 3: Arrange the children into pairs or trios.

Step 4: Have one child in each group take a pinchful of strips.

Step 5: Use the strips as the foundation of a blank verse poem. Let the word strips

suggest a topic.

Step 6: Use a process approach to write and publish the poems. They usually solicit awe from readers who don't know how they were created.

Example:

Given the words:

blast, risk, hunting down, corners, beasts, brain, safety

My brain was once a place of safety.
Now it is filled with risk.
I must begin hunting down
The beasts in the corners of my mind
and blast them from the shadows.
– A fifth-grade boy

Excerpted from Themes Across the Curriculum.

How Long Does Trash Last?

(A Cooperative Learning Activity)

Grades 3-8

Materials:

- * aluminum can (soda pop can)
- * banana
- * cigarette butt
- * cotton rag
- * glass bottle
- * leather boot
- * paper bag
- * plastic 6-pack rings
- * plastic jug
- * rubber sole of the leather boot (above)

Subjects

- * Arts & Humanities:
Language Arts
- * Arts & Humanities:
Visual Arts
- * Educational Technology
- * Mathematics:
Measurement
- * Mathematics:
Statistics
- * Science: Physical Science:
Environmental

Brief Description

Student learn how long trash lasts in landfills in this cooperative activity.

Objectives

Students will

- * work together in groups to formulate their best estimate of how long some trash items might last in a landfill.
- * learn about environmental consequences of not recycling.
- * use a graph-making tool to create a graph. (Optional)

Keywords

Trash, recycle, biodegrade, longevity, garbage, landfill

- * Styrofoam cup
 - * tin can (soup or vegetable can)
 - * wool sock

Write the above list of items on a chalkboard or chart.

Lesson Plan

Before the Lesson

Display for students the materials you have collected (see Materials section above). Provide a chart on which you have written the names of those materials.

Draw students' attention to the items you have gathered. You might ask, What do all the items have in common? If your students are too young to figure out the answer to the question, you can share with them that each of the items will likely end up in a landfill one day.

Next, ask What will happen to these items when they end up in the landfill? How long do you think they will last there? Do they disappear/disintegrate/degrade immediately? Or will they continue to take up space in the landfill? Let students freely discuss those questions.

Draw students' attention to the list on the board or chart. Ask students to copy the list. Then ask them to

- * think on their own about how long each of the items on the list might last when buried in a landfill.

- * recreate the list by writing each item in order according to how long they think it might last in a landfill. Students should start their lists with the item they think will degrade fastest and end with the one that will last the longest.

Next, arrange students into small groups. (Groups of 4 to 5 students will work best.) Let students share their lists and discuss what they believe to be the correct sequence. Ask each group to come to a consensus about the correct order of the items.

Now it is time for the groups to share their lists. Call on one group to share their answers first. Have them tell you the sequence they decided on. As they call out "sheet of paper -- number 1," write a number 1 on the chart next to the words sheet of paper. Do the same for the other groups. When that activity is completed, draw students' attention to the discrepancies on the chart. For example, Why did some people include the sheet of paper before the banana? At the conclusion of the discussion, reveal to students the best guess-timates of scientists, who say the following is the correct sequence:

- * banana
- * paper bag
- * cotton rag
- * wool sock
- * cigarette butt
- * leather boot

- * rubber sole of the boot
- * tin can (soup or vegetable can)
- * aluminum can (soda pop can)
- * plastic 6-pack rings
- * plastic jug
- * Styrofoam cup
- * glass bottle

Point out to students that conditions could result in some items degrading more or less quickly than the list indicates.

Now, turn the assignment back to students. Now that they know the correct order, ask them to brainstorm in their groups how long (how many weeks, months, or years) each item will last. Repeat the procedure above as groups discuss, then share, their best guesses about how long items will last. Then share scientists' approximations listed below:

- * banana -- 3 to 4 weeks
- * paper bag -- 1 month
- * cotton rag -- 5 months
- * wool sock -- 1 year
- * cigarette butt -- 2 to 5 years
- * leather boot -- 40 to 50 years
- * rubber sole (of the boot) -- 50 to 80 years
- * tin can (soup or vegetable can) -- 80 to 100 years
- * aluminum can (soda pop can) -- 200 to 500 years
- * plastic 6-pack rings -- 450 years
- * plastic jug -- 1 million years
- * Styrofoam cup -- unknown? forever?
- * glass bottle -- unknown? forever?

Note: The data above was gathered from sources such as the Bureau of Land Management and the Oregon Department of Environmental Quality.

After you have provided students with data about the longevity of the displayed items, discuss the following questions: What does the data tell you about landfills? Do items continue to degrade and make room for new garbage? Or will those landfills eventually fill up? Do those trash life spans say anything to you about the importance of recycling? Why or why not?

Extension Activities

* Have students use a graph-making software program to create graphs that illustrate the lifespan of trash items discussed in the activity. If students do not have access to such a program, introduce them to the free and easy-to-use online Create a Graph tool.

* Have students create posters to encourage recycling the items listed on the chart. Display those posters where students in the school will see them or in prominent public places, such as the library or a grocery store.

Assessment

Have students write a paragraph explaining what they learned about landfills or recycling from the activity.

Lesson Plan Source

Education World

Submitted By

Gary Hopkins

National Standards

In Search of Reused and Recycled

Grades 3 - 8

Materials:

- * empty plastic containers
- * empty cardboard boxes
- * aluminum cans
- * empty cans (glass containers are not recommended for this age group but the labels can be brought in)
- * scissors
- * glue
- * large piece of butcher paper to cover the blackboard or to span the length of a wall

Objectives:

The students will be able to:

1. Identify recycled and recyclable products by reading their packaging
2. Understand the impact of solid waste on landfills
3. Relate the idea of conserving natural resources to the importance of recycling and buying recycled products

Background:

Landfills across the country are full of items that could have been reused or recycled instead of thrown away. Recycling and reusing products uses less energy and natural resources than manufacturing items from scratch. The market for the recycling industry, however, is based on the demand for recycled products. The recycling loop includes collecting recyclable products, manufacturing recycled items from the used materials, and, finally, purchasing items made from recycled materials.

Vocabulary:

- * recycle
- * recyclable
- * reuse
- * landfill
- * natural resources
- * non-renewable

Procedure:

1. Part one should include a lesson on landfills, the importance of recycling, the use of natural resources in manufacturing
2. Part two: students are asked to bring labels from cardboard boxes, labels from glass products, labels from canned products, plastic containers and aluminum cans. The students should complete the following: a. circle the Mobius symbol in red. b. on the cardboard boxes, note how much of the cardboard comes from recycled paper c. on the labels for the steel cans, note the Mobius symbol and recommendations to recycle d. on the glass labels, note that not all glass products have the Mobius symbol and circle those that do e. on the plastic bottles, note what number is inside the Mobius symbol f. students should list the products that come in recycled or recyclable containers by brand name and list the kinds of containers most often used in their homes.
3. Part three: students make a large mural on butcher paper, titled " Buy In Recycled Containers" or " Look for These When You Shop".

Assessment:

Students should turn in their notes from part 2 and display their mural for the rest of the school.

Enrichment:

1. Evaluate recycling procedures in school and identify areas that need improvement.
2. List some products that are not recyclable and come up with ideas as to how these products can be more effectively disposed of or re-packaged.

Submitted by: Lydia Zambrano EDCI

Classroom Landfill

Grades 4-12

Materials:

- 1 glass jar, gallon size per group
- terra cotta pots
- plastic bags
- straws
- plastic draining trays
- topsoil
- 20 oz. Cups
- poster board
- markers
- rubber cement
- rings
- cardboard squares
- paper
- pencils
- magnifying lenses
- tape
- string
- jars with lids
- water
- litter (Suggestions for litter: orange peels, Styrofoam cup, paper, aluminum foil, apple core, bone, and plastic wrap.)
- grease pencil

Objectives:

Students will be able to describe how a landfill works and compare the decomposition rate of different materials in a landfill. Students will observe results of a properly constructed landfill vs. the results of leachate due to improper construction. Students will collect data through pictures, observation, and recording observations. Students will compile collected data,

pictures, and knowledge into a report emphasizing right and wrong ways to construct a landfill.

Focus:

What to do with trash: Unwrap a piece of candy inconspicuously, place it in your mouth, and throw the wrapper on the floor of your classroom. A child will invariably ask why you threw trash on the floor. Ask the class what you are to do with trash. After they answer that you are to throw it in a trash can, ask what happens to it after it goes into the trash can. Most children know that the trash truck picks it up or that it is taken directly to the dump by an individual. This will lead to your question, "What happens to trash after it is taken to the dump (landfill)?"

Background:

Discuss the fact that a landfill is a way to dispose of many different kinds of litter, and that after a landfill becomes full of litter it is covered up with soil and left so that the trash will decompose, or begin to rot and simply disintegrate. But what if some things don't decompose? What happens then? What sort of items might not decompose? Explain to the class that as groups you are going to construct a landfill in your classroom.

Procedure:

Activity #1: Landfill Decomposition

Cover the bottom of the jar with topsoil. Add a few pieces of trash close to the sides of the jar. Using the grease pencil, mark the places where the litter is touching the side of the jar. Repeat this procedure to make another layer of soil and trash. Finally, cover both layers with topsoil and add enough water so that the soil is slightly moist. Place the lid on the jar and leave where it will be undisturbed. Observe your landfill every week for one month. Have the children describe what they see happening to the litter in the landfill, and compare the rate of decomposition between the items. Ask the children to explain other methods of disposing of items in their landfill that are not decomposing. Explain that this is a good reason to be conservative with items, to reuse them, and if you are unable to reuse them that you should start separating your trash and recycle certain items.

Activity #2: Landfill construction and leachate

Students will construct two landfills, one built according to proper specifications, one representing an improper "dump." Students will visit a landfill to look for evidence of leachate and the effects it has on the environment. Students will use cooperative groups to compile data gathered into a report. Calculate the volume of a 20 oz. cup to determine the amount of each type of trash. Fill the hole in the bottom of a terra cotta pot with clay. Line that pot with a plastic bag. Fill each cup (representing a "trash truck") with the proper amount of each type of garbage and empty it into the flower pot. (NOTE: You can also use the "garbage pizza" lesson from Keep America Beautiful's Waste in Place curriculum supplement to determine percentages of each amount of material that goes into the landfill.) Put a layer of soil over each layer of trash. Continue layering until the flower pot is full. Insert straws to represent the different types of methane gas vents needed in a landfill. Cover the top of the pot with a thick layer of clay and set the pot aside. Fill the second pot, but do not line with a plastic bag or fill the hole in the bottom with clay. Use the same procedure as before to fill the pot with "garbage." Top the second pot

with a layer of soil.

Place both pots in plastic trays and water each thoroughly. Observe the results.

Landfill Visit Procedures: Before the visit, make "magic squares" from 10 1-2 inches cardboard squares. Cut out the center, leaving a 1-2 inch border. Lace string holes spaced two inches apart, to make a grid. At the landfill, place the magic square on the ground.

Photograph the area for future reference. Using a magnifying glass, closely observe the vegetation and soil in each square and record the data on a matching grid drawn on paper.

Collect water samples to analyze later. After returning to the classroom, students with similar data should work together to arrange pictures, combine data, and share observations. Each group of students should document their findings in a report.

Evaluation:

Restate objectives and ask children to list items that might not decompose as fast as others and how this could affect our environment. Discuss why more stringent landfill construction and monitoring requirements are necessary to protect the environment.

Extension:

Study local areas to document how many landfills are operating and how many have closed since 1990 due to new regulations. Contact local communities to determine the effect on garbage collection fees in local communities as landfills have closed. Study the work of landfill archaeologists and report on what they have learned.

Submitted by: Sunny Whittington, Stephen F. Austin State University TES Course, 1994.

Household Hazardous Waste Identification

Grades 4-12

Materials:

- worksheets
- baking soda
- vinegar
- lemons
- Borax

Objectives:

Students will be able to:

- Learn about reduce, reuse, and recycle.
- Identify household hazardous products.
- Learn about less hazardous alternatives.
- Complete an inventory of hazardous materials in a typical household.

7.

Background:

Almost every household in Texas has some household hazardous product(s) in it. Paints, poison, pesticides, cleaning agents, degreasers, automotive products, and many more items which have labels having the signal words warning, danger, and caution can be classified as hazardous household materials. These items become household hazardous wastes when they are no longer usable or wanted for the use they were intended.

When these materials are disposed of in the trash, contaminants can leak through the landfill and into the groundwater supply where many cities obtain their drinking water. When these materials are poured into the storm sewer or on the ground, they can contaminate drinking water supplies in our streams and lakes. (Empty containers which are not recyclable can be placed into the trash.)

The problem of having hazardous household wastes can be lessened by using the reduce, reuse and recycle principals. Households can reduce the amount of waste they have by buying only the amount they need to do the job and reading the label thoroughly before purchasing a product. Households can reuse hazardous household materials by giving materials to a neighbor who can use the materials as indicated on the label. Household hazardous wastes such as used motor oil, batteries, and paint can be recycled at collection centers. Less hazardous alternatives can work just as well as commercial hazardous materials but for a fraction of the cost and to no danger to our health or the environment. For unusable or unrecyclable household hazardous wastes that have already been created, the best disposal method is to bring these materials into a household hazardous waste collection event. Materials brought into these collections are properly disposed of at a hazardous waste disposal facility such as an incinerator or properly designed landfill. Call the TNRCC at 512/239-4747 for information on HHW in your area.

Procedure:

List hazardous household products in each room of a typical home. Some examples are given.

Kitchen:

- drain openers
- oven cleaners
- bleach cleaners
- bug sprays
- abrasive cleaners or powders
- disinfectants
- ammonia-based cleaners
- household batteries

Laundry room:

- spot removers
- bleach cleaners

Garage:

- Paints
- paint and varnish remover

rust proof coatings
thinners and turpentine
wood preservatives
stains and varnishes
auto batteries
used motor oil
brake fluid
transmission fluids
antifreeze
pesticides
fertilizers
insecticides
ant killers
weed killers

Bathroom:

drain openers
deodorizers
disinfectants
abrasive cleaners
prescription drugs
mirror cleaners
fingernail polish and removers

Workshop:

hobby chemicals
photographic chemicals
woodworking chemicals
Degreasers

Other rooms:

household batteries
rug and upholstery cleaners
furniture polish
moth balls
pool chemicals.

Less hazardous alternatives Activity:

Match the less hazardous alternative in the first list with the job that it will do in the second list.
(Some alternatives may be used more than once).

Less Hazardous Alternatives:

baking soda
lemons
vinegar, salt, and water
salt and boiling water

Borax
salt and cold water
corn meal and borax
lemon oil and mineral oil
olive oil
cedar chips
corn meal
Cleaning Jobs
bathroom cleaner
blood stain remover
room deodorizer
furniture polish
instead of moth balls
abrasive scouring powder
rug cleaner
all purpose cleaner
drain opener
sink cleaner
carpet cleaner

ANSWERS TO LESS HAZARDOUS ALTERNATIVES

Baking soda - a,c,f,h,i,j
Lemons - c
Vinegar, salt and water - h
Salt and boiling water - i
Borax - a,f,h,j
Salt and cold water - b
Corn meal and borax - g,k
Lemon oil and mineral oil - d
Olive oil - d
Cedar chips - e
Corn meal - g,k

Submitted by: Ingrid Dierlam-McDonald, TNRCC staff

The Recycling Games

Grades 4-12

Materials:

- 10 liter size beverage bottle
- soccer ball or other small ball (to use as a bowling ball)
- Newspaper (lots!)
- 5 coffee cans
- 5 plastic bottles

- 5 Golf balls/5 putters
- a ton of uncrushed aluminum cans (for building with...)

Subjects

- * Physical Education: Games
- * Science: Physical Science:
Environmental

Brief Description

These Recycle Games provide great exercise while teaching about the importance of recycling.

Objectives

Students will

- * get physical exercise as they learn about local recycling efforts.
- * learn about the importance of recycling.
- * learn how to sort trash for recycling.
- * display good sportsmanship during all activities.

Keywords

Exercise, recycle, phys ed, physical education, relay, race, Olympics, field day
Materials Needed

* Required materials depend on the races that comprise your Recycle Games. Most materials are common classroom, phys ed, or recycling props. See activity ideas below for specific materials.

Lesson Plan

In this lesson, students participate in relay races and games that make use of recycled materials and other "trash."

Before the Lesson.

Before the lesson, you might want to look at one or more of the following resources offering activity ideas you can include in your Recycle Games:

Recycle Relay

Recycle Relay

Games/Activities: Recycling Relay (pdf document, scroll to page 4)

Some of the activities found in the above resources are just for fun, but others have purposeful instruction at their root. For example, some activities provide students with practice deciding which trash items are recyclable and sorting those items appropriately. Those activities are easy to adapt so they will relate to the specific rules/guidelines of your community's recycling program.

Additional relays and games can be found below.

The Lesson

Decide in advance which activities will be part of your Recycle Games and how you plan to organize the games. Many of the activities can be adapted for use for individual or team fun and learning.

For a fun and healthful exercise and education experience, incorporate the lesson ideas above with some additional ideas that emphasize the use of recyclable materials. You might

- * record individual students' times,
- * arrange students into relay teams (the first student to complete the course taps the next team member in line; the race continues until all team members have run the course),
- * or do the activities just for fun.

The activity instructions below are written with small-team competition in mind.

* **Trash Can Relay.** Set up five classroom trash cans in an obstacle course. The first student on the team runs the course, weaving in and out around the cans. When the student reaches the last can, he or she turns around and weaves back to the team. The runner taps the next team member in line, who takes his/her turn running the course...

* **Bottle Bowling.** Set up bowling pins made from 2-liter soda pop bottles, small bleach bottles, or tall dishwashing detergent bottles. Tip: Put about an inch of sand in the bottom of the bottles; the pins will still be easy to bowl down, but the bottles won't fall as easily as they would if there was no sand in them.

* **Waste No Water.** Fill a clean open-topped non-breakable container (a plastic spaghetti sauce jar or a soup can work well) with water for each team; be sure

the containers are the exact same size and filled to the brim with water. Set a start and finish point. At a signal, the first runner heads for the finish line, walks over the line, turns around and heads back to his or her team, and passes the container to the next person in line. At the end of the race, the team with the most water still in the container is the winner.

* Newspaper Relay. Provide a stack of newspapers for each team and have team members divide the stack evenly among themselves. Set up a paper bag or recycle bin (or whatever container your community uses for recycling newspaper) at a finish line. At a signal, the first member of the team carries his or her stack of newspaper to the finish line, deposits it in the container, runs back to the team, and taps the next person in line.

* Putt for Points. Paint five coffee cans with bright colors. Paint or draw a point value on each can. (Suggestions: Paint the number 5 on one can, the number 10 on another, 15 on a third, 20 on a fourth, and 50 on the fifth.) Set up the coffee cans in a row. Give students three golf balls and three chances to accumulate points for their team.

* Tumbling Towers. This activity can be done one team at a time. Provide a recycle bin full of clean aluminum cans (for example, soda pop cans). At a signal, students have 2 minutes to stack the cans one atop another. Each student takes a turn at building a tower by stacking cans one atop the other. The student on each team who builds the tallest tower then represents his or her team in a final team-against-team stacking competition.

Assessment

Congratulate students on their good sportsmanship during the relay games.

Lesson Plan Source:
Education World
Submitted By
Gary Hopkins
National Standards

Test your recycling skills

Grades 4-8

Objectives:

This lesson was designed for second thru fourth grade students. The main objectives of this mini-teach are to identify and be aware of how much garbage we can produce, identify landfills and their purposes, and explain how recycling saves energy and resources while reducing pollution.

Materials Needed:

Rubber-bands, brown paper bag, tape, crayons, scissors, 1 gallon glass jar, measuring cup (250ml), red food coloring, 1 gallon jug water, paper plate, china plate, paper towel, terry cloth dish towel, plastic bag, plastic foam cup, glass, plastic wrap, reusable refrigerator container, carrots in a plastic bag, carrots out of plastic bag. This lesson is designed for whole class participation.

Strategy:

Do an activity called Test Your Recycling Sense. Tell students that you are going to hold up two objects and that they must tell you which object is better for our environment. Paper plate-china plate, paper towel-terry cloth dish towel, plastic bag-paper bag, plastic foam cup-glass, carrots in plastic bag-carrots out of plastic bags. (Note: The second items in each pair, above are better for our environment.)

A second activity is an experiment showing how pollution affects wildlife. Pour one-half cup of water into the gallon jar. Add and stir in two drops of food coloring. Add one cup of water at a time to the jar until the red color disappears. It takes about 7 or more measuring cups of clear water to make the red color disappear. The children should know that when pollutants are put into streams, they go through the entire stream. They do not disappear. They merely spread out just like the food coloring did in the experiment. However, they are still present in the stream and are very dangerous to wildlife and humans.

A third activity is an experiment with rubber bands to determine one effect of plastic garbage pollution on sea animals. Hook one end of the rubber band around your little finger. Stretch the rubber band across the back of your hand and hook the free end on your thumb. Try to remove the rubber band without touching anything. Seals and fish do not have hands. How can they remove the plastic rings from six-packs of beverages if they get these around their bodies.

Note: These activities are designed to give students a visual and hands-on activity after formal lessons have been conducted. They can be done either before a lesson to enhance curiosity or afterwards to wrap up a unit.

Conclusion:

At the conclusion of these mini activities have the students identify the ways we can dispose of garbage and the many ways they can recycle. You can do this as a writing prompt for older grades or verbally in a class discussion for younger students.

Additional Lessons:

All links below in blue provide direct access to the website page through an open browser...)

Most lessons below can be adapted for grades 9-12

- 1. History of Trash - Grades 4-8 (Social Studies, ELA, Technology)**
http://www.montgomeryschoolsmd.org/curriculum/socialstd/grade5/Recycle_5_1.html
- 2. Ways Early Americans Recycled - Grades 5-8 (Social Studies, ELA)**
http://www.montgomeryschoolsmd.org/curriculum/socialstd/grade5/Recycle_5_3.html
- 3. Which Bin does it go in? (Science)**
<http://www.epa.gov/osw/kids/games/bingame/>
- 4. THE LORAX and SUSTAINABLE DEVELOPMENT – Grades 6-12 (ELA, Social Studies, Science)**
<http://www.tpwd.state.tx.us/learning/resources/activities/lorax.phtml>
- 5. Online Internet Scavenger Hunt - Grades 3-8 (Technology, ELA)**
(Can be done individually in the computer lab or as a class with LCD projector and laptop connected to the Internet.)
http://www.educationworld.com/a_lesson/hunt/hunt030.shtml
- 6. Trash Pizza! - Grades 4-8 (Math, Art, Science)**
<http://www.kid-at-art.com/htdoc/lesson59.html>
- 7. The Great Lunch Dilemma - Grades 4-8 (Math, Science, Social Studies)**
<http://www.lalc.k12.ca.us/target/units/recycle/activities/activity4.html>
- 8. The Garbage Diet: A Skit - Grades 4-6 (Drama, Social Studies, ELA)**
<http://cwmi.css.cornell.edu/TrashGoesToSchool/GarbageDiet.html>
- 9. Recycling Bingo - Grades 4-12 (Science, ELA)**
<http://web.archive.org/web/20050308110057/www.tnrcc.state.tx.us/exec/sbea/tes/lessons99/bingo.html>
|
- 10. Crossword Recycling – Grades 4-8 (ELA, Science)**
<http://xtasy.lib.indiana.edu/dliub5/docs/crossw.html>
- 11. Environmental Jeopardy Grades 4-12 (Science, ELA, Social Studies)**
<http://web.archive.org/web/20050308113032/www.tnrcc.state.tx.us/exec/sbea/tes/lessons99/envjeopar>

[dy.html](#)

12. Unwrapping Packaging – Grades 4-12 (Science, Math, ELA)

<http://www.depweb.state.pa.us/enved/cwp/view.asp?a=3&q=473196>

13.. Basic Classroom Composting – Grades 4-8 (Science, Math)

<http://web.archive.org/web/20050308111036/http://www.tnrcc.state.tx.us/exec/sbea/tes/lessons99/composting.html>

14. Edible Landfill – Grades 8-12 (Chemistry, Science, Social Studies)

<http://www.iit.edu/~smile/ch9202.html>

****15. Series of Experiments on Recycling – Grades 5-10 (Science, Biology)**

<http://www.galaxy.net/~k12/recycle/index.shtml>

****16. Make A Difference – Grades 6-12 (Math, Social Studies)**

<http://www.cancentral.com/canc/nontext/lesson5.htm>

***Highly Recommended*

Online Interactive Recycling Games:

(Can be done together as a class with an LCD project and laptop or individually on classroom computers.)

1. US EPA's Recycle City Game:

<http://www.epa.gov/recyclecity/mainmap.htm>

*Lesson that can be used along with *Recycle City*:

<http://www.williamstown.k12.ma.us/weblessons/WasteRecycleWebQuest/>

2. US EPA's Garbage Gremlins:

<http://www.epa.gov/epaoswer/non-hw/recycle/gremlin/gremlin.htm>

3. US EPA's N Trouble and the Environauts:

<http://www.epa.gov/epaoswer/osw/kids/space/index.htm>

4. Paper University: (Good for 6-12)

<http://www.tappi.org/paperu/welcome.htm>

5. The ABC of Superfund: (Good for 6-12)

<http://www.epa.gov/superfund/kids/stories.htm>

6. Eddie the Eco Dog

<http://www.eddytheeco-dog.com/recyclegame/recyclegame.html>

7. Disney's JunkDunk:

<http://disney.go.com/games/junkdunk/>

8. Ollies World

<http://www.ollierecycles.com/>

9. Kaboose Learning Games for Earth Day:

<http://resources.kaboose.com/games/earthday.html>

Resources:

NYC Department of Sanitation NYCWasteLe\$\$ in Schools

http://www.nyc.gov/html/nycwasteless/html/at_agencies/at_school.shtml

New York State Department of Environmental Conservation Education Page

http://www.nyc.gov/html/nycwasteless/html/at_agencies/at_school.shtml

United States EPA Educational Resources (Very Good!!)

<http://www.epa.gov/epaoswer/education/index.htm>

US EPA's Student Center

<http://epa.gov/students/>

Recycling Online (Good source of statistics to use in math)

<http://www.recycle.cc/>

Kids Saving the Earth

http://www.kidsforsavingearth.org/index_low.html

Recycling School Action Plan

<http://www.awarenessideas.com/recycling-school-action-plan-a/128.htm>

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