

# TEACH

# reduce, reuse, recycle

## IN THE CLASSROOM

**T**eachers and caregivers have long used recycled items for children's learning activities. Tight budgets demanded it. Recycling makes even more sense in today's worrisome economic times and increasing concerns about climate change.

From a content perspective, it's important to teach children recycling as a life skill, just as we teach them hygiene, safety, and nutrition, for example. We teach children the foundation of the academic three R's—reading, writing, and arithmetic—and we can teach the foundation of the environmental three R's—**reduce, reuse, recycle**.

The best way to teach all the R's is to practice them in everyday activities. Make sure any items you use in learning activities are safe for children. They need to be clean and free of sharp edges or points. For children 3 and younger, items should not pose a choking hazard.

As you begin the activities below, explain your efforts to parents and urge their cooperation. Encourage parents to talk to their children about how they reduce, reuse, and recycle at home.

### **Garbage collage**

(Age 3 and older)

#### **Here's what you need:**

- large paper bag or cardboard box
- poster board (preferably a used one)
- glue
- small discarded items such as the pop-tops from aluminum cans, straws, plastic lids, candy and gum wrappers, all washed and dried

1. After a routine activity, such as eating lunch, engage children in a discussion about trash. Sample questions: "Now that we've finished, what do we do with things that are left over or things we don't want?" "What is trash?" "Where do we put trash?" Explain which items

you *reuse* (such as metal spoons) and which you throw into the trash can (paper napkins).

2. For the next day or two, ask similar questions as children engage in learning activities. "What do we do with leftover paper scraps (clay, crayons, paint)?"
3. Show children discarded items you've collected. Ask: "Where do we put things we don't want anymore?" Use words like *trash, wastebasket, and litter*.
4. Invite children to make one or two rules about what to do with trash, such as "Put trash in a wastebasket." "Don't throw trash on the ground."
5. Invite children to glue the items on a poster board to make a class collage. Write the rules on the poster board.



## Litter walk

(Age 4 and older)

### Here's what you need:

- large paper or plastic bag
- camera
- gloves, mittens, or socks for protecting children's hands (optional)
- graph paper and marker

1. Prepare for the activity by scouting for a spot along a nearby street or park where you can pick up litter. Choose a spot free of ants, poison ivy, and other hazards.
2. Talk with children about litter. Explain the purpose of your litter walk and discuss safety precautions.
3. Take children for a walk along the selected street. Photograph the area before picking up litter. Invite children to fill the bag with litter. Supervise children so they avoid broken glass and other hazardous items. Or have children protect their hands by wearing gloves, mittens, or socks. Photograph the area afterward.
4. When you return, have children sort the items. Make a graph showing items such as aluminum cans, plastic bottles, glass bottles, potato chip bags, and paper cups. Ask: "Which items did we find most often?" "Which can we recycle and which go into the garbage can?"
5. Have children wash their hands after handling litter.
6. Compare the before-and-after photos. Talk about which scene is more appealing and why. Encourage children to make a rule about not throwing trash along roadsides. Post the pictures and write the rule on the bulletin board.

## Back to the earth

(Age 3 and older)

### Here's what you need:

- apple core, lettuce leaf, or other fresh food scrap
- plastic bottle
- polystyrene meat tray
- glass
- empty food can
- sheet of newspaper
- small shovel
- craft sticks
- pencil or marker

1. Take children outdoors. Show the items and ask them to predict what would happen to them if they were buried in the ground
2. Have children dig holes, one for each different item. Write the name of each item on a craft stick to mark where it will be buried.
3. Place one item in each hole and cover with at least 3 inches of dirt.
4. Wait for a month, and go back to dig up the items. Compare their findings to their earlier predictions. Ask the children to describe what they find. Use words such as *decay* and *decompose*. Ask which products are biodegradable and which are not?

**Variation:** With school-age children, discuss how anthropologists and paleontologists dig up things in the ground and learn about how ancient peoples lived.

## Let's talk trash

(Age 4 and older)

### Here's what you need:

- chart of plastic recycling codes (Copy "Know Your Plastics" on page 15.)
- book on garbage collection (see list at the end of this article)

1. Take children on a brief tour of your building and ask them to point out containers of trash, such as wastebaskets, recycling bins, and dumpsters. Ask about what they see and smell. Talk about how some trash, such as soiled tissues and diapers, contains germs and must not be handled.
2. Have children examine the bottom of plastic bottles in the recycling bin. Ask them to describe what they see. Ask: "What do the chasing arrows mean?" "What do you think the letters and numbers mean?"
3. Show children the chart and read it. Compare the codes on the bottles to those listed in the chart. Explain that only one or two are accepted for recycling now, but that may change in the future. Encourage them to look for the codes on plastic items at home.

### Don't Mess with Texas

"Don't Mess with Texas" is a successful anti-litter campaign sponsored by the Texas Department of Transportation. Since 1988, the goal has been to keep litter off Texas roads.

A free litter bag or decal is available to Texas residents. To order, go online to [www.dontmesswithtexas.org](http://www.dontmesswithtexas.org).

4. If possible, arrange to take children outdoors when garbage and recycling trucks arrive for pickup. Ask children to describe what's happening. Note whether trash containers are emptied by hand or machine. Ask: "Why is it important to get rid of trash?" "What do the workers do with the trash at the end of the day?"
5. Read a book about garbage collection and show photos. Or find photos on the Internet. Ask: "Where do newspapers and plastic bottles go?" "Where does the rest of the trash go?" "What's a landfill?"
6. Invite a sanitation engineer to talk about recycling centers and landfills. Encourage the visitor to bring photos. Ask: "What would happen if we couldn't get rid of all our trash?" Talk about why it's important to reduce the amount of trash we throw out.
7. Brainstorm with children some ways they can reuse and reduce at school and at home. **Note:** Invite children to check out this Web site for children done by Larimer County, Colo., [www.larimer.org/SolidWaste/kidspages/funpages.htm](http://www.larimer.org/SolidWaste/kidspages/funpages.htm).

## Start a classroom compost pot

(Age 4 and older)

### Here's what you need:

- unpeeled oranges for snack
- plates
- napkins
- old ceramic crock pot or other container with a snug lid

1. Have children wash their hands before snack. Show children the oranges and discuss the texture, color, and shape.

Invite children to peel the oranges and eat the sections for snack

2. As children are eating, ask: "What should we do with the peelings?" Accept all answers, such as "Throw it away" and "Put it in the trash."
3. Suggest that children put the peelings in the crock pot. Ask children to predict what will happen to the peelings.
4. Invite the children to check the peelings every two days. Ask them to describe what they see and smell. Use words like *moldy* and *rotting*.

**Variation:** Use any fresh fruit with rind or peelings, such as grapefruit, pineapple, or kiwi fruit. Bananas are not advised because they tend to attract fruit flies. Add vegetable scraps, such as potato peelings, wilted lettuce leaves, and celery tops.

## Make a compost pile

(Age 4 and older)

### Here's what you need:

- wire fencing, 36 inches wide and 5-8 feet long
- pliers
- shovels
- dried leaves, six parts by volume to kitchen waste
- fruit and vegetable peelings and green grass clippings, one part
- water in spray bottle or watering can
- yardstick

1. Prepare for the activity by joining the sides of the fencing to make a circular bin. By bending the snipped wire ends on one side so they hook into the other side, you will be able to open and close the bin as needed.

2. Identify a sunny, level area in a corner of the yard or another spot with good drainage and out of traffic flow. Collect fruit and vegetable peelings in a classroom compost pot (see activity above) and green grass clippings from the yard. Make sure the pieces are no larger than 2 inches in size.
3. Take children outdoors and ask what happens to leaves and other plant matter as it dies and falls to the ground. Use words such as *decay*, *soil*, *nutrients*, *fertilizer*. Explain that nature does not waste anything.
4. Encourage children to gather up dried leaves, dried weeds, and twigs. Explain that these are "browns." Have children pile them on the selected spot for the compost pile. Make sure items are no larger than 2 inches in size and the pile is no higher than the bin, about 3 feet high.
5. Bring out the "greens" (grass clippings and fruit and vegetable peelings). If you have been saving these for a week or more, these will look slimy. Add the greens to the pile.
6. Invite children to spray or sprinkle water on the pile and then stir the mixture. Add more "browns" on top as a cover.
7. Stand the wire bin upright over the pile. Encourage children to measure the height of the pile with a yardstick and record the measurement.
8. Every day, ask two or three children to turn the pile from the inside out, using the shovels. You will probably need to lift the bin off the pile for turning and replace it afterward. Keep the pile damp but not wet.



9. Talk with children about what is happening to the plant matter. Use words like *rotting*, *decaying*, *breaking down*, and *decomposing*. Ask children if they can see this process at work elsewhere in the yard. Measure the pile's height at least once a week.
10. Three or four weeks later, talk with children about the pile's

- smaller size and deep brown color. Remind them that this was once a pile of plant waste and now it's soil, called compost. Talk about the cycle of growth and decay and how nature recycles materials. Ask: "What's the difference between a compost pile and a landfill?"
11. Remove the wire bin, and invite children to spread the

compost on a flower bed or garden plot.

**Note:** If the bin needs support, place stakes around the bottom. Let children take turns hammering the stakes into the ground. Use plastic tie-wraps or heavy cord to hold the bin to the stakes.

## Socks—not just for feet

(Age 4 and older)

*Here's what you need:*

- cotton sock with a hole in the toe or heel
- needle and matching thread
- used tennis or golf ball
- plastic water bottle
- leftover soap chips or bar soap
- torn stocking, cotton balls, or other stuffing
- string, yarn, or rubber bands
- marker

1. Show children the sock. Ask: "What do we do with a sock after it gets a hole in it?" Accept all answers, such as "Throw it away."
2. Insert the ball into the sock under the hole. Demonstrate how to mend the sock with needle and thread. Let children make a few stitches. Ask: "Is mending hard or easy?" "Can you make it look like new?" Explain that everyone used to mend socks—and other clothing—and that some families still do.
3. Ask: "What else can we do with socks that have holes in them?" Brainstorm with children. Here are some ideas:
  - Insert your hand into the sock and show how it can be used for dusting, or to erase writing from a dry-erase board.
  - Use two socks as gloves, arm warmers, or leg warmers.
  - Slip a plastic water bottle into

### Composting basics

Plant wastes can occupy up to 20 percent of a landfill. By composting, we divert plant wastes from landfills and thereby reduce the need for them.

Composting is a natural process in which plant matter breaks down, or *decomposes*, into smaller forms, such as nitrogen, phosphorus, and potassium. These are nutrients the plants absorbed in growing, and they are the same nutrients found in fertilizer. Decayed material from a compost pile, then, is a rich, fertile soil we can add to our plants and yard. By composting, we are returning nutrients to the soil.

Plant matter breaks down because billions of microorganisms, such as bacteria and fungi, in moist, green plants react with oxygen. We commonly refer to this process as *rotting*.

You can make compost in heap on the ground or in almost any kind of large container. A container, even as simple as a wire bin, is a good idea because it helps keep out dogs, raccoons, and other critters.

For ingredients, you will need "browns" and "greens." Browns include dried leaves, straw, wood chips, and brown paper bags. You can even include newspapers and dryer lint. Greens are grass clippings and kitchen wastes such as orange rinds, potato peelings, coffee grounds, and egg shells.

Don't use meat and fish scraps, oil, grease, dairy products, and bones. Meat and grease will smell, and they will attract rodents. Don't add anything with chemicals or toxins, such as charcoal from the barbecue grill or pet droppings.

Aim for a ratio of roughly six parts browns to one part greens. Experts vary widely on what this proportion should be. You can experiment, or simply add plant waste as it becomes available and let nature take its course.

For faster decomposing, the plant matter needs to be in small pieces, and it needs to be turned every day to replenish the oxygen. It also needs to stay damp, but not soaking wet.

As the plant matter decomposes, its temperature will rise. On cold mornings, you may see steam rising from the pile. If it's not heating up, it probably needs more greens. It will also stop heating up when it's finished. If it begins to smell like ammonia, it needs more browns.

Why compost? It's good for the environment, it costs almost nothing, and it's easy.

For more information, see [www.plowhearth.com/magazine/compost\\_how\\_to.asp](http://www.plowhearth.com/magazine/compost_how_to.asp).

the sock to absorb “sweating” or keep the water cold longer.

- Drop the soap chips into the toe and tie the soap off with string for use as a soapy washrag.
  - Stuff the toe with cotton and tie it off with string for use as a sock doll. Or omit the stuffing, draw eyes on the toe, and use as a hand puppet.
  - Stuff the sock with more cotton and tie off in two or three places to make it into a caterpillar toy.
  - Cut off the foot and use the tube top for a doll to wear.
  - Cut up several socks to sew and make into a pot holder. Or cut up lots of socks to make into a quilt.
4. Invite children to choose a project, like the ones above, that they would like to do. Collect materials and place them in the art center for children to do on their own.
  5. Invite children to talk with their parents and grandparents about clothes that get torn or no longer fit. Do they mend rips and tears? Do they hand clothes down to younger siblings or cousins? Explain that mending clothes and passing them along to others is *reusing*, and that making socks into something different is *recycling*.

## Geometric building units

(Age 5 and older)

**Here’s what you need:**

- card stock paper for patterns
- pen
- ruler
- string or yarn
- scissors
- polystyrene meat trays, washed and dried, about 4 for each child

1. Invite children to draw a square, triangle, and circle on the card stock to use as patterns. Encourage them to use a ruler to draw the square and triangle, 3 inches on a side. Show them how to tie string around the pen and draw a circle, 3 inches in diameter.
2. Have children cut out the patterns, place them on the polystyrene, and trace around the edges. Children can make as many of each shape as they wish. The size of the trays and patterns will determine how many shapes they will get.
3. Encourage children to cut out the shapes. In the middle of each side edge of the square and triangle, cut a slot about a half inch long. The slot should be slightly wider than the thickness of the polystyrene, about  $\frac{1}{4}$  inch. On the circle, cut four slots around the edge at equal distances from each other: top, bottom, and each side.
4. Invite the children to build with the shapes by slipping a slot of one shape into a slot of another. They can use their own set of shapes or combine several sets as a group. Talk with children about how they have recycled meat trays that would otherwise have gone into the garbage.

## Papermaking

(Ages 4 and older)

**Here’s what you need:**

- blender (for use by adults only)
- scrap paper of various types, including construction paper, typing paper, wrapping paper
- dishpan or rectangular cake pan
- plastic pitcher for pouring water
- stacks of old newspapers
- fine mesh wire or fiberglass screen that will fit into the dishpan
- rolling pin

1. Invite a small group of children to tear paper scraps into small pieces.
2. Invite them to fill the blender half full with the paper, and pour in enough water to cover the paper.
3. Run the blender about five seconds. If the mixture seems too thick and the blender labors, add a bit more water. If the mixture seems too runny, add more paper. Blend until the paper scraps form a mash or pulp.
4. Have children take turns doing the following steps. Place the screen in the bottom of the dishpan, and pour in water about 1 inch deep.
5. Pour about a cup of pulp over the screen, and swish it around evenly with fingers.
6. Holding the screen level, lift it from the water and let it drain.
7. Place the screen, pulp side up, on one section of newspaper. Place another newspaper section on top and flip the screen so the pulp is face down.
8. Roll the rolling pin over the newspaper to remove excess water.
9. Open the newspaper and remove the screen. Let the pulp dry overnight.

## Paper making as craft

Many paper makers use a mold and deckle. The mold is a framed screen that holds the pulp, and the deckle is a corresponding frame that establishes a consistent edge around the recycled paper. You can make this item quickly and cheaply.

### Here's what you need:

- 2 flat picture frames of identical size, glass and backing removed (the frame size determines the size of the finished paper)
- fine wire mesh or fiberglass screen
- stapler
- wire cutters or scissors

1. Stretch the screen over the back of one frame. Staple in place. Trim the screen. This is the mold.
2. The second frame is the deckle. You will hold the deckle firmly to the mold for straight edges. Or you can screw two small hinges to one side of the mold and deckle so it stays firmly in place.

You can also buy a mold and deckle from craft stores or papermaking suppliers, such as the following:

- Arnold Grummer's Papermaking, Milwaukee, Wisconsin. See [www.arnold-grummer.com](http://www.arnold-grummer.com)
- Museum store at the Robert C. Williams Paper Museum, Georgia Tech in Atlanta. See [www.ipst.gatech.edu/amp/shop/museum\\_shop\\_diy.htm](http://www.ipst.gatech.edu/amp/shop/museum_shop_diy.htm)

10. In the morning, peel the recycled paper from the newspaper. Talk with children about how they have *recycled* old paper into new paper. Invite children to use the recycled paper in an art project or as a note card.

**Variations:** Experiment with colored paper to vary the shades of the finished paper. Add small bits of leaves, flower petals, and grasses to the paper mash for a nature effect, or use glitter and bits of ribbon for glamour. Press a cookie cutter or empty can on the drying pulp to make shaped paper or to create designs.

## Conduct a waste audit

(Age 6 and older)

Invite schoolagers to take a close look at what is being thrown out at your school. They might choose to gather up the trash thrown out after snack or after a whole day. Analyzing what you find can give you some ideas for reducing trash. It also gives you a benchmark for measuring the improvement your school can make over time.

Download a manual for conducting the waste audit at [www.zerowaste.co.nz/assets/BusinessSolutions/wasteaudit.pdf](http://www.zerowaste.co.nz/assets/BusinessSolutions/wasteaudit.pdf). This 18-page manual describes how to do it, gives safety precautions, offers sample audit forms, and suggests how to write the report of findings.

## Books for children

- Bourgeois, Paulette. 1998. *Garbage Collectors (In My Neighborhood series)*. Toronto: Kids Can Press, Ltd.  
Charming story and illustrations follow Sam the garbage collector as he stops at houses to pick up trash. A neighborly fellow, he helps Mrs. Green whose false teeth have mistakenly found their way into the trash. The book contains explanations of landfills, recycling, and litter.
- Jacobs, Francine. 1996. *Follow That Trash! All About Recycling*. New York: Grosset & Dunlap.  
Colorful illustrations and simple text describe what happens to materials at a recycling center—how trash is sorted and packed into bales for delivery to factories.
- Maas, Robert. 2000. *Garbage*. New York: Henry Holt & Co.  
This book has simple text and excellent color photographs of sanitation trucks and landfills as well as examples of recycling.
- Skidmore, Steve. 1991. *What a Load of Trash!* Brookfield, Conn.: Millbrook Press.  
Humorous cartoons define trash, describe a landfill and incineration plant, explain how to make a compost heap in a trash can, illustrate the life cycle of a glass bottle, and describe recycling of clothing, toys, and metals.
- Turnbull, Stephanie. 2005. *Trash and Recycling*. London: Usborne Publishing.  
Simple text with color photographs and illustrations show how trash is transported to a landfill or burned in an incinerator. It also shows toilet and bath water going into a sewer. It describes how recycled metal and plastics are melted, glass is crushed, paper is made into newspaper, and garden waste is composted.