

Environmental Education Activities K-12

a potpourri of teaching ideas for the classroom

GRADES

K-2

Science

Back to the Earth

Display food items such as a boiled egg, apple, peanut butter, bread, jelly, strip of bacon, etc. Pictures can be used. Ask students to identify the food items you have on display. As the students respond, ask them to tell what their favorite food is. From answers they give, let them trace two or three through their many forms back to the soil. Example:

apple -tree-seed-soil
peanut butter-store-factory-peanuts-plant-soil
jelly-store-factory-berries-plant-soil
orange juice-store-factory-oranges-tree-seed-soil

As a follow-up, provide each student with drawing paper and crayons. Ask them to draw a series of pictures showing each step of the cycle of a product from its soil origin to the consumer. Post representative products on bulletin board.

Snail Spell

Read *Snail Spell* by Joanne Ryder. Have the students fantasize “shrinking” to the size of an insect and write a descriptive paragraph, of their experience.

Social Studies

Getting Down to Basics

List all the items below on the chalkboard. Then ask students, one at a



time, to erase something that could harm the environment.

Beds, foam cups, what, war, polio shots, oil, atom bomb, pine trees, friends, sneakers, car, hairspray, vegetables, television, plastics, hamburgers, gold, food coloring, love, lawnmower, oxygen, zippers, flowers, aspirin, rockets, ice cream, water, candy bar, computers, grass, chemical fertilizers, jets, school, mosquitoes, boom boxes.

Add to this list. Have students explain their reasoning. — KT

Mathematics

Geometric Shapes in Nature

Geometric shapes can be found in twigs, rocks, leaves, insects, and feathers. Look for cubes, cylinders, pyramids, cones, ovals, spheres, spirals, etc. have students put specimens in like piles. *Variation:* Human-made shapes. Triangles, squares, circles, rectangles, etc., can be found at school in sidewalks, buildings, clothing.

Language Arts

Finding Adjectives

Give each child a small piece of paper with one or more adjectives that describe something in nature (e.g., smooth, slimy, triangular, expanded, cool, soft and green, round and gooey). Have students explore a natural area to find items that meet these descriptions. Let students take turns sharing what they found. —JOD

Fine Arts

Make a Refracting Telescope

Use two small convex lenses, a toilet paper tube, cardboard, rubber cement, and paper.

1. Find the focal length of one of the lenses.
2. Cut a lens-size hole in the cardboard
3. Glue the lens over the hole.
4. Trace around the toilet paper tube with a pencil over the spot in the cardboard where the lens is located.
5. Cut on this line, and glue the cardboard-mounted lens in the end of the tube.
6. Wrap a sheet of paper around the tube.
7. Tape it in place.
8. Mount the other lens in the end of the paper tube.
9. Slide the tubes back and forth.

Natural Balance

Collect natural materials, or have students collect them. Suspend them with string under a crossbar of two sticks. Driftwood, acorns, and pine cones are among materials that are



effectively used. Hang these in the classroom to brighten the scenery.

GRADES

3-5

Science

Living in the Schoolyard

Teacher begins activity by drawing an outline of the classroom on the blackboard. Develop a key to one side of the outline to be used to represent the plants, animals and special features which exist in the classroom. “Let’s see if we can make a map of all the living things in our classroom. Does anyone see a plant? Skippy, will you come up and mark the plants on our map for us?”

Then provide a map of the schoolyard for groups of students (or for individual students depending on skills at map making). Take children outside and let them map all the living things that they see. Remind them that they have to look hard to see some of the things that are there.

After students have completed their maps, gather them together for discussion about the roles of the living things they found.

Forest Community

Discuss as a group the items a city has and make a list. Suggestions include people, factories, subways, cemetery, apartments, traffic, plumbing, stores, garbage collectors, streets, etc.

Divide the group into smaller ones of 3 to 4 each. Send each group out in a forest or

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wooded area and have them try and identify the natural item that corresponds to the ones on the list. —ECO

Social Studies

Water, Water Everywhere...NOT!

Point out that last year water was rationed in parts of California. It was shut off altogether in parts of Rhode Island when a leaking gas station tank polluted it. Our carelessness can hurt the water supply. Also, it is important not to waste water if we want to be sure of having enough for our needs. Have students name some ways each of us can help protect our water supply. (Ideas include using less water, not running water needlessly, not littering near bodies of water. Also some environmentalists suggest eating less meat to save water. A vegetarian diet requires much less water in its production than is used in the raising of cattle, for example.) —KT

Mathematics

Shoot the Moon

Knowing that the moon returns to a given position every 29 1/2 days, have students figure out the dates that will have full moons for the coming calendar year. From this they can make their own calendars and check up on themselves. —JOD

Language Arts

Get Your Story Straight!

Invent or find a story that conveys an environmental message you wish to have your students think about. Divide the story into individual events that have ideas or words that allow the student to sequence them in a particular order.

As a group, or individually, have the students read the passages. Have the students number the passages so that the story can be read in the correct order.

Read the story aloud in the correct sequential order.

Use discussion and questioning to strengthen the story's message. —IEEIC

Fine Arts

Wetlands Animal Masks

Students can create paper mache masks of their favorite wetlands creatures. Creative dramatics can be developed by students using their masks to play a role in a wetlands drama.

Students will need old newspapers, wallpaper paste or liquid starch, water, tempera or acrylic paint, round balloons, and scissors.

Choose a wetlands animal. Tear the newspaper into narrow strips. Blow up the balloon. Mix the wallpaper paste. Use one part wallpaper paste and 10 parts water or straight liquid starch.

Dip the strips of newspaper into the wallpaper and water mixture. Lay the paper over the balloon. Apply two layers to what will be the front of your mask. Let it dry completely.

Repeat procedure, building up the areas that will be noses, beaks, ears, etc. Let it dry completely.

Repeat the procedure, applying one last coat of paper over the entire mask. Let it dry completely.

Put the mask over your face. Feel where your eyes are. Have a friend mark the eye gently with a crayon or marker. Remove the mask and cut eyeholes. Put the mask over your face and check the eyeholes; remove it and make any corrections.

Cut a mouth hole.

Paint the mask and let it dry.

GRADES 6-8

Science

Rainforest Pyramid

Use artistic talents to create blocks symbolizing rainforest creatures. Build a pyramid, putting the prey species such as insects at the bottom - building up until the top predators like the jaguar and harpy eagle are at the top. Show what happens when prey species are taken away - such as if insects are killed by pesticides, or small rodents are killed as pests. The same activity can be done for temperate forests of the Northwest as well, or any other particular ecosystem. —RC

Social Studies

How Did They Do It?

Have students investigate the lifestyles of Native Americans on the prairie or along the coasts or in your local area. How were their needs met by these different environments?

Mathematics

Calculating Growth Rates

In 1990 the U.S. population was 248.71 million, in 1980 it was 226.54 million. If you need to determine the annual growth rate and

double the time from this information, use the following equation:

$$\text{growth rate} = (100 \div \text{number of years}) \times \ln \left(\frac{\text{pop. 1990}}{\text{pop. 1980}} \right)$$

To calculate natural log (ln), you will need a calculator with an "ln" key, which are available for under \$20. The following is the series of keystrokes required to work out this example:

KEY	DISPLAY	READS
ON		0
248.71	248.71	
divided by	248.71	
226.54	226.54	
=		1.0978635
ln		0.0933660
x		0.0933660
100	100	
divided by	9.336603	
10	10	
=		0.933660

Because of the uncertainty in the data, we will round this number up to 0.934. You now know that population in the U.S. increased between 1980 and 1990 at an average annual growth rate of 0.934 percent per year. Using the equation to determine doubling times (70 divided by the rate of growth), you can also figure out that the U.S. population at that continued growth rate will double in approximately 74 years. We cannot however, assume that the rate of growth will remain constant. The Immigration Law of 1990 for example, which increased immigration rates by 40%, will proportionately raise the U.S. population growth rate and thereby decrease the time it takes for our country to double its population. -CCN

Language Arts

What's the Idea?

Encourage students to be on the lookout for environmental articles in their magazine. Once they begin coming in, select one and duplicate as many as needed.

Distribute copies to students.

Instruct the students to read the selection very carefully. On a clean sheet of paper, or index card, they are to write the following:

- the main idea
- the problem
- a solution
- their personal opinion
- a summary (approximately eight sentences)

On the back they are to compose and write three quality questions with answers regarding the selection; one true-false, one multiple choice, and one fill-in-the-blank.

Collect papers and compose a comprehension quiz to distribute the next day, or perhaps create a game with which to exercise learned facts. —IEEIC

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Expectations

Students can write a paper that expresses their feelings about going to outdoor school. By knowing their anxieties, fears, and excitement, you may be able to better understand their individual needs. It is always fun for students to reread their own papers upon returning home. —JOD

GRADES 9-12

Science

What Eats?

For one game, divide the group into teams, with no more than 10 persons on a team. How write a column of numbers one to 10 in three widely separated places in the room. Each team has a piece of chalk or marking device.

At a signal, the first person on each team dashes to the column of numbers and writes the name of a plant or an animal opposite the number "1". Then he dashes back and gives the marker to the second person on his team. This person goes to the column and writes the name of something that eats what is written in number "1". The marker is then passed to the third person, and so on down the line.

If a player writes down an incorrect name, it can be erased only by the next player, who loses his turn to write a name. Winners are determined by the most correct food-chain connections identified by a group.

Once a group has developed some skill at playing, try limiting the habitat to that of the forest, a brook, a marsh, a pond, the ocean, or some biome or community.

Social Studies

Environmental Impact

Create a large mural on butcher paper of a natural area complete with wildlife, trees, mountains, rivers, etc. but no human development. After completing the mural, brainstorm a list of things that would happen if a much needed energy source (e.g., coal, oil, uranium, water) was discovered in that area. Draw pictures of these activities and facilities and place them in appropriate places on the mural. Discuss the positive and negative impacts the "new development" will have on the environment and wildlife, and create a list of these effects. Now, re-develop the energy source and see if you can come up with ways that the development can have less impact on the environment and still get the energy needed, at an affordable cost.

Move Over!

To begin this activity, tell your class they are going to try an experiment dealing with classroom arrangements. Don't mention the idea of overpopulation or limited resources.

These concepts will surface as the outcome of the activity.

Select an area of the classroom to be used in this overpopulation experiment. an area approximately 10'x10' should be marked with masking tape on the floor and two desks should be placed inside the area. Also provide a "Resources Box" with 4 pencils, 2 pens, 6 sheets of paper and 1 pair of scissors.

Select two volunteers to work in the square. They should take with them only the books they will need. One half hour later, select two more students to work in the square and add their desks to the other two. (Make sure to remove all "resource" from the desks first).

Continue to add students to the area in shorter intervals of time similar to the way population grows rapidly. When the area can no longer hold additional desks, add students and have them share desks. Make sure the tasks the children are involved in will require the use of resources in the "Resources Box."

When the limited resources and overcrowded conditions lead to bedlam, bring the class together for discussion. How is this like the real world? What "resources" are in short supply? —LLC

Mathematics

Differential Absorption

Types of soils differ in the amount of water they can hold. Collect a standard amount of each of five or six soil types. Place each soil sample in a sieve held above a container. Pour a measured amount of water onto the soil and measure how much is collected after 30 seconds, one minute, 10 minutes. The amount of water the soil can hold is total added, minus that which drained out at the bottom.

From the data obtained, determine which of the soils can hold the most or the least water. On what properties of the soil does this depend? Which soils would erode most easily? Which

would be best for plant growth? —ECO

Language Arts

Operation: Water

Invite the participants to imagine that they have landed on Earth from another planet. The planet they come from only has minerals and air. They had received word that a substance had been found on Earth that could move or hold its shape. They are here to see if the report is true and discover for themselves what this "water" is like. They are equipped with finely tuned instruments for sound, feel, sight, smell, and taste. They are to split into two search parties, one going to the pond area, one to the stream. They have 15 minute to gather sounds, smells, signs of animal and plant life, observe water clarity, etc. The groups then discuss and compare the two water sightings and make speculations about the role of water on this green planet. Have students write an essay on their exploration of this strange planet and the miracle substance "water." —JOD

Forest Essay

Have students write an imaginary story using one of the following titles: a) The Life of a Pencil; b) An Autobiography of a Tree from Seed to Lumber.

Fine Arts

Mother Earth

Students begin by brainstorming a list of all the ways they are dependent on the Earth. From that list should come some ideas for presenting that information to others. They may decide to have teams of students work on representing different items on the list. They may want to express their relationship to the land written in story format, in poetry, verbally on tape, through photographs, drawings, paintings, or soft sculpture. They should come up with a theme such as Native American philosophy, or a celebration of life-giving qualities of the Earth, or getting involved with conservation, and work from there. Ask for volunteers to write letters to local organizations requesting space to set up their display for others to view.

Encourage your students to express their feelings about our responsibility to live in harmony with the land. Is it our responsibility? Can the actions of one person make a difference? What kinds of actions does living in harmony with the Earth require? —LLC

Sources of activities:

- CCN — Carrying Capacity Network Clearinghouse Bulletin, June 1992.
- KT — *Kind Teacher*, Natl. Association for Humane and Environmental Education
- IEEIC — Integrating Environmental Education Into the Curriculum... Painlessly, National Educational Service, 1992.
- RC — Rainforest Conservation, Rainforest Awareness Info. Network, 1992.

