



Curriculum Units by Fellows of the Yale-New Haven Teachers Institute  
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## **Environmental Sciences: A Hands-On Approach**

Curriculum Unit 93.05.10  
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### **Introduction**

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Environmental Science is a vast pool of facts, experiments and concepts that describe the world around us. For the K-2 teacher, Environmental Science may seem too complex a subject to communicate to the students. On the contrary, Environmental Science is one of the easiest subjects to convey to the primary level student. The study of Environmental Science begins with the immediate surroundings of the K-2 child. Familiar topics such as weather, your home and garbage provide the classroom teacher with a foundation of knowledge great enough to introduce each lesson's concept. Seasons, community helpers, and the food chain are basic concepts taught in the primary grades. These concepts, which are integral parts of the study of Environmental Science, are expanded to allow for a firm understanding of the environment and how we can control it.

The main approach of this unit is to convey knowledge through hands-on activities and applications. Classroom experiments, active field trips and home/school participation are encouraged with each topic introduction. The hindering science-phobia is camouflaged by the on-level tasks and age appropriate activities found in this unit. All sciences lend themselves to active participation. All K-2 level children lend themselves to tireless curiosity. By combining science and children in a hands-on curriculum unit, Environmental Science will find itself entering the minds of many young ecologists.

In this unit, various Environmental Science topics will be discussed. Each topic contains a number of subtopics which provide the major concepts for each lesson plan. All subtopics under each heading are described in three Environmental Science lessons: Level-K, Level-One and Level-Two. The Level-K lessons are designed to be used in a Kindergarten classroom as early as September or October. The lessons require little to no independent reading and are basically used to inform students through songs, active learning and exposure to environmental concepts. The Level-One lessons contain the same information as the Level-K lessons with more emphasis on independent activities, projects and reading. The Level-Two lessons are the most independent in orientation. Topics are introduced by the teacher and questions are answered through independent and/or cooperative activities in and out of the classroom. Students are expected to understand specific concepts regarding each topic heading and must prepare an experiment or project that will aid the world population in cleaning up the environment. In general, the lessons include a mixture of oral/silent reading (Level-K: teacher read activities) and hands-on activities regarding the subtopic concepts. In addition each subtopic contains a field trip guide of available museums, centers and businesses in the area. Integrated lesson plans in Mathematics and Language Arts are also provided with each subtopic heading.

## **The Earth**

Give something back . . . The earth keeps us alive. But we can't just take from it all the time. We also need to give something back.(1)

The major concepts covered in this unit span from the general to the more specific. "The Earth," with its weather and seasons is used as the introductory topic of the curriculum unit. Simple comprehension of day and night and altering weather and temperature are the subheadings for how the Earth functions at Level-K, while tracking weather patterns and planning for the environment with each season are found in the Level-One and -Two lessons .

## **Ecology**

Ecology, the study of the relationships between living things and their environment, is not simply another specialized science or a momentary fad. According to a prominent biologist, 'The first law of ecology is that every thing is related to everything else.' We must remember that none of our natural resources is unlimited. Damage to any of them has far-reaching effects on all life.(2)

"Ecology" follows "The Earth in the order of topics. Homes and shelters are discussed which lead into the discussion of living and non-living things. Producers and consumers are explained and a home/classroom food chain is developed through experimentation and active study. The value of the ecosystem is stressed and used as the final subheading for Ecology.' Teacher-guided discussions are the basis for this topic at Level-K. Team and individual webbing activities are used in some of the Level Two projects within this unit topic.

## **The Refuse Disposal Process**

Aboard one of the U.S. Navy's deep submersible craft, fifty miles off the coast of San Diego, and 2,450 feet down, Admiral R. J. Galanson, chief of naval wonders, peered through the portholes to view an undersea world no man had ever seen. The first thing he spotted, only two feet away on the ocean floor, was an empty beer can.(3)

"The Refuse Disposal Process" provides each K-2 child with a further understanding of the Earth and ecology by exposing the students to the poorly maintained dumps and the closing landfills in their city. Pollution problems are addressed and alternative forms of disposal are provided as delightful hands-on opportunities in the classroom and in the home. This section of the unit opens the students minds to the options for garbage placement and organization. Recycling is emphasized and becomes the catalyst for all future unit endeavors. At Level-Two this topic provides a crucial base for planning and implementing the unity culminating project/activity.

## **Organic Living**

Plant a tree, or plant a window box. If you don't have plants of your own, adopt some. Protect and take care of growing things in the parks and along the streets or roads.(4)

"Organic Living," which follows "The Refuse Disposal Process," introduces each student to composting and personal gardening. The ecosystem concepts covered under Ecology" are expanded as the students create their own backyard (or school yard) ecosystem. The Level-K, and possibly the Level-One, teacher holds a more active role in planning and maintaining the compost heap and school garden, while the Level-Two teacher has the opportunity to set-up student maintained gardens and composting systems.

## **Environmental Protection**

The planet and mankind are in grave danger of irreversible catastrophe . . . Man may be skeptical about following the dodo into extinction, but the evidence points increasingly to just such a pursuit. There are four interconnected threats to the planet—wars of mass destruction, overpopulation, pollution, and the depletion of our natural resources.(5)

“Environmental Protection” through citizen participation presents the topics of wildlife and natural resource conservation in the classroom, the home and the world. Environmental Protection” carries recycling back to the source and uncovers the misuse and mismanagement of the Earth’s inherent assets. Through this section of the unit, the Level-Two, and possibly Level-One, culminating projects could be submitted to various environmental protection agencies for reactions and comments.

## **Environmental Vocations**

In the long run, man might be more successful biologically and find greater meaning to life if he tried to collaborate with natural forces instead of conquering them.(6)

“Environmental Vocations” provide the students with defined career prospects and volunteer access in many environmentally conscious organizations in their city, state and world. The students are given the opportunity to actively participate in the curriculum unites philosophy toward the earth in their future career choices. Level-K and Level-One students are encouraged in the direction of environmental vocations through whole-class field trips, while Level-Two students are given the chance to spend a day on the job with and environmental worker.

## **The Earth Day Culmination**

The Lord God planted Man in a garden of delight, to dress it and to tend to it.(7)

“Earth Day,” the ultimate undertaking furnished by the Environmental Science Unit, is employed as the culminating activity for the students. Earth day-everyday, or as an annual celebration is planned and implemented by the students with guidance from the classroom teacher . The “Earth Day” project is sponsored by the Environmental Science students and used as an eye-opener to other children who may not have had the opportunity to actively participate in the salvation of our Earth. Level-One and -Two projects are presented and displayed in a school-wide Earth/ Environmental Science Fair.

*Environmental Science: A Hands-on Approach* is a fully active curriculum unit. The many facts, concepts and experiments permit academic and personal growth for the K-2 student. The simplified complexities and the integrated subject matter make *Environmental Science: A Hands-on Approach* a positive encounter with high level science in the primary grades.

## **THE EARTH**

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### **Weather: Level K**

#### ***Learning Center:***

Provide the children with samples of fabrics and other materials that are used to make clothing. Include swatches of linen, cotton, wool, fur, and vinyl or other weatherproof material. Provide photographs or draw separate pictures to illustrate hot, sunny weather; rainy weather; and cold, snowy weather. cut out a paper doll figure from a piece of oak tag or cardboard. Instruct the children to place the doll on one of the weather scenes. Tell them to look at and feel each piece of material. Explain that they must decide which materials should be used to make clothing for the doll to wear in that weather scene. You may wish to have the children explain their choices to the class.

**Books:**

Branley, Franklin. *Flash, Crash, Rumble and Roll* . New York: Thomas Y. Crowell Co.

Eta, Marie Hall. *Gilberto and the Wind* . New York: The Viking Press.

Keats, Ezra Jack. *A Letter to Amy* . New York: Harper & Row, Publishers.

Shaw, Charles. *It Looked like Spilt Milk* . New York: Harper & Row, Publishers.

**Filmstrip:**

*The Weather* . Morristown, NJ: Silver Burdett Co., 1987. Color; Cassette.

**Objectives:**

To identify a variety of weather conditions. To record daily weather conditions on a weather chart.

**Concepts:**

\*Weather conditions may vary from day to day.

\*Existing weather conditions affect the way people dress.

**Vocabulary:**

weather/ windy/ cloudy/ sunny/ rainy snowy/ hot/ cold/ warm/ cool

Materials: large pieces of oak tag magazines scissors/ paste/glue/ poster board/ 1" squares(several each of yellow, gray, blue, and white)

**Motivation:**

Have each child find and cut out a picture showing an outdoor scene. Have each child describe his/her picture and tell what kind of weather is depicted. Tell the children that they will be studying the weather and will use the cut outs for a weather montage. Use the oak tag to label the major types of weather shown and categorize the picture cut outs for mounting. Introduce the five weather types listed in the vocabulary section of this lesson.

**Lesson:**

Take the children outdoors or allow them to look outside through a large window. Ask: What kind of weather are we having today? To stimulate further discussion ask: Is it hot or cold? Is it warm or cool? Is it sunny? What does the wind sound like? ETC .

Take the children back to the classroom. Use poster board to prepare a weather chart in the form of a bar graph, as shown below. Choose one child to act as a "weather reporter". Have that child mount a colored square on the chart next to the weather symbol that best describes the day's weather. If it is a windy day,

note it by writing a W on the square for that day.

Continue the graphing activity each day for several weeks. When the weather chart is complete, help the children add up the number of days on which each type of weather occurred. Ask: What type of weather occurred most often? What type of weather occurred least often?

**Subject integration:**

Mathematics: classification greatest/least

## ECOLOGY

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### Living and Non-living Things: Level One

**Learning Center:**

Have the children cut out pictures of living and non-living things from magazines and newspapers. Ask the children to separate the living things from the non-living things. Display the words living and non-living on a nearby bulletin board. Have the students glue/tack the pictures under the correct heading. Help the children label each picture for future reference.

**Books:**

Arbuthnot and Root. *Time for Poetry*. Glenview, IL: Scott, Foresman & Company, 1968. (especially: "At the Seaside," "Upon the Beach," and "Shore.")

Farjeon, Eleanor. *Eleanor Farneon's Poems for Children*. Philadelphia: J.B. Lippincott Company, 1951. ("especially: "Waves" and "Sand.")

Mizumura, Kazue. *I See the Winds*. New York: Thomas Y. Crowell Company, 1966.

**Mini-Field Trip:**

Take the children on a walk around the school grounds or in a nearby park to help the children become more aware of living and non-living things in their environment. Have the children observe, classify, and label the things they have found. Help the children construct a mobile of living things and non-living things. Hang the mobiles in the classroom or school hallway.

**objectives:**

To observe and describe properties of living and non-living things. To identify living and non-living things shown in pictures. To identify living and non-living things found in the school yard/local park.

**Concepts:**

\*Living things eat, move and grow.

**Vocabulary:**

living/ non-living

**Materials:**

bulletin board/ labels for objects/ magazines/ newspapers/ paste/tacks string/ hangers/ poster board/ living things/ non-living things

**Motivation:**

Point to different things in the classroom and various objects seen through the windows. Ask the children to classify these things as living or not living. Ask them how they know whether something is alive or not.

**Lesson:**

Tell the children that they will be studying the differences between living and non-living things. Show the children a picture with living and non-living things displayed. Ask them to look at the picture and describe what they see happening. In three columns on a poster board write the words eating moving and growing. Define each term (eating: taking food into the body; moving: changing position without help from anything around it; growing: getting bigger). Ask the children to name the things in the picture that are eating, moving and growing, and list them under the appropriate poster column(s). Show the children another picture and repeat the above exercise.

Write the word living on the chalkboard and pronounce it. Tell the children that all living things eat, move and grow. Ask the children how the various living things in the last picture shown are alike.

Open up the learning center and display the two pictures used in the lesson for future reference.

**Subject Integration:**

*Mathematics:* classification

*Art:* mobiles and mural displays

## THE REFUSE DISPOSAL PROCESS

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### Recycling (maintaining our world): Level One

**Learning Center:**

Cover a bulletin board with brown paper, either from a roll or from cut up brown paper bags. Place the words "I DON'T WASTE. I CARE FOR MY SPACES" at the top of the bulletin board. Mount nine drawings, photographs and/or magazine cut outs on construction paper and arrange them under the heading. Attach two envelopes to the bulletin board with the appropriate label and direction (Put an x on the wasteful picture/Put an o on the conserving picture). Fill the proper envelopes with x's and o's. Provide tacks or use velcro to stick the x's and o's on the pictures. Discuss each picture after the children have made their decisions. Change the pictures daily or after each use of the center.

**Books:**

Jonas, Ann. *The Trek* . New York: Greenwillow Books, 1985.

Rockwell, Ann. *Our Garage Sale* . New York: Greenwillow Books, 1984.

Rockwell, Ann and Harlow. *My Back Yard* . New York: Macmillan Publishing Company, 1984.

**videotapes:**

*Turn off Pollution* . 11min., color, Encyclopedia Britannica Educational Corporation.

**Objectives:**

To identify personal space and shared space/ environment. To identify who takes care of personal and shared space. To list what needs to be done to care for space/environment.

**Concepts:**

- \*Your environment is the space around you. and all living and non-living things in that space .
- \*You are responsible for the care of your environment.
- \*People share large environments.
- \*Shared environments must be cared for by everyone in that environment.
- \*Our future environment depends on the care and use of our present environment.

**Vocabulary:**

space/ environment/ personal space/ shared space

**Materials:**

various scenes showing space (at least 36)

construction paper/ brown paper/ envelopes/ tacks/velcro

large cut outs of letters x and o (9 each) yarn/rope/ ditto A (below)

*(figure available in print form)*

**Motivation:**

Ask: Where is your favorite place? Make a short list of favorite places on the chalkboard. Ask: Why do you like this place? Introduce the word environment as the space around you and all of the things living and non-living found in that space. Explain to the children that they will learn about different environments and how to take care of them.

**Lesson:**

Have the children to look around their desks and their classroom. Ask: Who shares this space? Who should take care of it? Place a circle of yarn around a child's desk. Ask the children to list everything that is in the

circled area. Place another circle of yarn around the desk next to the first child's. Compile a list everything in the second space and list everything shared by both spaces (circles). give each child a circle of string and instruct them on it's placement. Have each child draw the things found in their space on ditto A. Ask the children to share their drawings. Discuss who is responsible for caring for the objects in circle and in the overlapping areas.

**Subject Integration:**

*Mathematics:* sets

*Social Studies:* responsibility cooperation

**Who Takes Care of Your Space?**

Name \_\_\_\_ Date \_\_\_\_

Draw what is in your space.

Draw what is in the space you share.

*(figure available in print form)*

**Notes**

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1. Laurie Krasny Brown and Marc Brown, *Dinosaurs to the Rescue!* (Boston: Little, Brown and Company, 1992) 22.
2. Gabel 5.
3. The remarks of Leslie Robinson, Nebraska State Senate (qtd. in Gabel 7).
4. Gabel 18.
5. Gabel 45.
6. Gabel 37.
7. The New American Bible, Genesis (2:15)



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