1996

Integrated science unit: Rain and water

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Integrated Science Unit: Rain and Water

A Graduate Project

Submitted to the

Department of Curriculum and Instruction

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts in Education

UNIVERSITY OF NORTHERN IOWA

by

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May 1996

This Project by: Susan M. Van Woert

Entitled: Integrated Science Unit: Rain and Water

has been approved as meeting a project requirement for the Degree of Master of Arts in Education.

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Abstract

The process of instructional development was engaged in to extend the literature base, representative of different genres, and to integrate the language arts with the established science curriculum. The unit on rain and water for grades one and two was the focus of the project. Learning centers were developed to enrich the learning environment. They will provide experiences with quality literature works and many options for expressive activity which will allow children to be more in control of their learning. The major goal was to capitalize on the commonness of the processes in the language arts and science areas to nurture children's thinking-language abilities.

In response to the current concern for literacy in the United States, educators in the elementary school need to consider how children learn language. They learn language through involvement in the language processes and learn the purposes of language while engaged in its functions. The language processes assist children in creating meaning out of their experiences. As a result, they develop thinking-language abilities (Smith, 1994).

Many components in a school instructional program can nurture children's thinking-language abilities, one of which is a literature base representing the many genres. Another is genuine experiences with the functions of language. When the language arts program with a rich literature base is integrated into other areas of the curriculum, the instructional program can offer many meaningful experiences with the functions of language (Beane, 1995).

In this article, a primary teacher of first and second graders engages in an instructional development project. She explores the process of extending the language arts through the different genres of literature and related expressive activity to the science area of an established curriculum.

Rationale for an Integrated School Program

Children's learning is thwarted by fragmenting the curriculum into small sections with no connection to real life

experiences. Integrating the curriculum through a unit of study or a theme provides a focus for students to engage in the functions of language, thus extending their thinking-language abilities. Such an instructional approach provides real purposes for reading, writing, listening, and speaking (Goodman, 1986).

Learning concepts across the curriculum can assist children in making connections with the world while engaging in the processes and functions of language. Routman (1991) writes:

> Integration is implicit in whole language teaching. Integration, or integrated language arts, is an approach to learning and a way of thinking that respects the interrelationships of the language processes--reading, writing, speaking, and listening--as integral to meaningful teaching in any area (p. 276).

The science and the language arts processes form a natural partnership to enhance instruction. "Reading, writing, and science are . . . inseparable because the science activities that introduce children to a particular way of looking at the world also help them gain the skills they will need as readers" (Fisher & Fisher, 1985, p. 23). Experiences in the language arts and science areas reinforce each other, for their processes involve some of the same tasks: observing, comparing, classifying, predicting, interpreting, communicating, making judgments, and evaluating (Butzow & Butzow, 1989; Mechling & Kepler, 1991).

Value of Literature-Based Language Arts Extended to the Science Curriculum

Whole units of meaning as found in literature works can involve children in exploring concepts and processes in-depth in both the language arts and science. From these experiences, children can begin to make generalizations in both areas (Butzow & Butzow, 1989). Strickland (1995) writes that children should not become holding tanks of information but rather be able to think, understand, and interact with the text. Therefore, quality experiences with literature can strengthen science study.

Informational books are essential when developing a literature-based integrated unit of study. They can enhance a unit of study with greater clarity and artistry than typical classroom textbooks. Even though the text may be difficult for students to read independently, much can be learned from the illustrations and captions (Huck, Hepler, & Hickman, 1993).

Other genres of literature can also contribute to a print rich learning environment by offering other perspectives of concepts in a unit of science study. Fiction usually places humans in the center of the experience. Dynamic characters initiate action resulting in the resolve of the conflict. As a result of experiences with fiction works, children can identify more closely with themes related to science and come to realize that they have some control over their destiny and some

responsibility to others and the world around. Folk literature provides a perspective of the universality of the human conflict in the world. It puts children in touch with all people in all times in their environments. Poetry offers a strong, fresh, sudden awareness of the emotions in experiences. Children from poetry experiences can become more aware of the world around and develop more of an appreciation for its elements (Huck et al., 1993).

Integrated Science Unit: Rain and Water

The process of extending literature-based language arts to the science area of the school program from grades one and two was explored. This integration of curricular areas not only extended the print environment but provided for involvement in the functions of language and the in-depth study of concepts. The unit on rain and water was chosen because first and second graders closely identify with the elements of weather. Smith (1983) writes that "Learning always involves relating the new to something that is known already" (p. 78). Students need to be able to relate what they are learning about in school to their own lives (Routman, 1991).

Goals of the Unit

The goal of this instructional development project is to extend an established science curriculum with literature-based

language arts experiences. The specific expectations for the unit include children's observation, measurement, and descriptions of states of matter, specifically as they relate to the water cycle. Experiences with measurement, recording of weather and temperature changes and observation, descriptions, and identification of different types of clouds are also included in the study.

Introduction of Unit

This unit on rain and the water cycle can be introduced by having the class listen to a commercial recording of a rain shower or a thunderstorm, sampling the beginning, middle and ending and by viewing Peter Spier's book with little text, Rain, (N.Y.: Doubleday, 1982), which tells of children's experiences in a rain storm from beginning to end. The students' experiences and feelings associated with rain, both positive and negative, can be shared and discussed.

Centers to Enhance Unit

The concepts of the unit will be presented by teacher-directed sessions and through learning centers. In order for students to have many options to create meaning in this unit, many learning centers will be made available. These centers, based on literature experiences, will allow students to engage in the processes of listening/reading texts while experiencing the

functions of language. Centers, both sustaining and specific to the unit, will be offered. Sustaining centers are maintained throughout the school year to provide a secure, predictable learning environment with their content changing with the units.

Sustaining Centers

Listening/reading center. This center will offer books from many genres and tapes of several of these books, as well as accompanying flannel board pieces and puppets to engage students in retelling activities. Suggestions and materials for related expressive activities will also be provided.

Books to enrich the reading/listening experience specific to the themes:

Aardema, Verna. (1981). Bringing the Rain to Kapiti Plain, illus. Beatriz Vidal. N.Y.: Penguin.

Brown, Marc. (1993). Arthur's Family Vacation. Boston: Joy Street.

Gershator, Phillis. (1994). Rata-pata-scata-fata, illus. Holly Meade. Boston: Little, Brown.

Ketteman, Helen. (1991). The Year of No More Corn, illus. Robert Andrew Parker. N.Y.: Orchard.

Martin, Bill & John Archambault. (1988). Listen to the Rain, illus. James Endicott. N.Y.: Holt.

Mwenye Hadithi. (1990). Lazy Lion. Boston: Little, Brown.

Serfozo, Mary. (1993). Rain Talk, illus. Keiko Narahashi. N.Y.: First Aladdin Books (Macmillan).

Seuss, Dr. (1957). The Cat in the Hat. N.Y.: Random House.

Shulevitz, Uri. (1969). Rain Rain Rivers. N.Y.: Farrar, Straus & Giroux.

Wood, Audrey. (1984). The Napping House, illus. Don Wood. San Diego: Harcourt.

Yashima, Taro. (1958). Umbrella. N.Y.: Viking.

Zolotow, Charlotte. (1975). When the Wind Stops, illus. Howard Knotts. N.Y.: Harper & Row.

Possibilities for expressive activities include writing about personal experiences with rain or making a list of things to do inside on a rainy day. Students can explore the themes through painting or select a story to retell or dramatize. An interpretive dance of a rainstorm from beginning to end supported by a tape can also be engaged in. Students can band together to present a reader's theater using one of the books listed, such as Gershator's Rata-pata-scata-fata (illus. Holly Meade. Boston: Little, Brown, 1994).

Poetry center. This center can offer collections of poetry, tapes of poems, and poetry charts on the themes. Students' poems can also be displayed here.

Directions for related expressive activity with poetry can also be presented in this center. After listening to "Summer

Rain" by Eve Merriam in Blackberry Ink (illus. Hans Wilhelm. N.Y.: Morrow, 1985), students can be invited to draw or write about the smells of rain. "Rainy Week," by Myra Cohn Livingston in The Moon and a Star and Other Poems (illus. Judith Shahn. N.Y.: Harcourt, Brace, Jovanovich, 1965), presents an invitation for students to write a patterned story about what they would like to do each day of a rainy week. Lilian Moore's "Sun on Rain" in Something new begins (illus. Mary Jane Dutton. N.Y.: Atheneum, 1982) can be a springboard for children to reflect upon the colors of the rainbow. Children can write their responses to the poem and their experiences with rainbows.

Children can have the option of creating their own poems while responding to the sound, smell, taste, and feel of rain. Paint or chalk on wet paper can be made available to illustrate these poems. Children can work cooperatively to create a mural about a rainstorm from beginning to end. Children can use scarves as a part of an interpretive dance about the wind and the rain.

Author/illustrator center. Opportunities for studying authors/illustrators can be offered in this center. The work of Peter Spier will be the focus in this unit on rain and the water cycle. A brief biography of the author/illustrator as well as examples of his works, some related to the themes of rain and water, will be exhibited. These books will be included:

Father, May I Come? (1993). N.Y.: Doubleday.

Circus. (1991). N.Y.: Doubleday.

Rain. (1982). N.Y.: Doubleday.

People. (1980). N.Y.: Doubleday.

Bored, Nothing to Do. (1978). N.Y.: Doubleday.

Noah's Ark. (1977). N.Y.: Doubleday.

Crash! Bang! Boom! (1972). N.Y.: Doubleday.

Children can experiment with his style by selecting a topic of interest and dividing paper into many small rectangles to illustrate in detail.

Interesting objects center. This center can provide students with opportunities to explore the sensory components of objects. Many interesting objects related to the unit will be offered. These items can include: a variety of umbrellas, a pair of buckle galoshes, a pair of rubbers, sunglasses, rain bonnets, a windmill, a tornado tube, bubbles, balloons, parachutes, billow, a terrarium, a rain gauge, and a small weather vane. Children's exploration of these items can lead to a dramatization about rain or can serve as props or sound effects for a reader's theater developed from a poem or story about the rain.

Bookmaking center. This reference center can offer ideas for bookmaking as well as the materials. A variety of materials to encourage engagement in the writing process can be provided: reference books on bookmaking; paper of all shapes, sizes, and

colors for writing and book covers; and writing tools, such as pencils, pens, markers, crayons, and colored chalk.

Centers Specific to the Unit

Cloud center. The goal of this center is to learn about the different kinds of clouds and their interesting shapes, real and imagined.

Literature Experience

Brown, Margaret Wise. (1942). Runaway Bunny. N.Y.: HarperCollins.

de Paola, Tomie. (1975). The Cloud Book. N.Y.: Holiday House.

Spier, Peter. (1986). Dreams. N.Y.: Doubleday.

Expressive Activity

1. Students can experiment with many ways to make cloud shapes from cotton balls and chalk, or by blowing paint through a straw onto dark paper.

2. Children can make a class book about cloud shapes in the style of Peter Spier.

Storm center. The goal of this center is to extend students' experiences with the destructiveness related to the weather. Literature experiences can also include opportunities for students to reflect on their experiences with fear related to storms.

Literature Experience

Conrad, Pam. (1992). The Lost Sailor, illus. Richard Egielski. N.Y.: HarperCollins.

Freeman, Don. (1964). Dandelion. N.Y.: Viking.

Martin, Jacqueline Briggs. (1992). Good Times on Grandfather Mountain, illus. Susan Gaber. N.Y.: Orchard.

Polacco, Patricia. (1990). Thunder Cake. N.Y.: Philomel.

Stolz, Mary. (1988). Storm in the Night. N.Y.: Harper & Row.

Expressive Activity

1. Students can write about overcoming fears, such as fears about storms.

2. Children can retell stories using objects to make sounds representative of storms.

3. Polacco's Thunder Cake, can be dramatized using props to represent each ingredient needed to make the cake. The cake can then be baked using the recipe provided in the text.

Flood center. The goal of this center is to examine flooding in the lives of people.

Literature Experience

Geisert, Arthur. (1994). After the Flood. Boston: Houghton Mifflin.

Ketteman, Helen. (1991). The Year of No More Corn, illus. Robert Andrew Parker. N.Y.: Orchard.

Lent, Blair. (1992). Molasses Flood. Boston: Houghton Mifflin.

Lyon, George Ella. (1990). Come a Tide, illus. Stephen Gammell. N.Y.: Orchard.

Murphy, Shirley Rousseau. (1983). Tattie's River Journey, illus. Tomie de Paola. N.Y.: Dial.

Spier, Peter. (1977). Noah's Ark. N.Y.: Doubleday.

Expressive Activity

1. Children might retell any of these stories.

2. Children can write and draw about their own experiences with flooding, particularly memories of the flood of 1993.

3. Students might make up their own story about an unusual flood with a liquid in the style of Lent's Molasses Flood.

Tall tale center. The goal of this center is for students to examine and experiment with the element of exaggeration in the tall tale.

Literature Experience

Barrett, Judi. (1984). Cloudy with a Chance of Meatballs, illus. Ron Barrett. N.Y.: Atheneum.

Ketteman, Helen. (1991). The Year of No More Corn, illus. Robert Andrew Parker. N.Y.: Orchard.

Lent, Blair. (1992). Molasses Flood. Boston: Houghton Mifflin.

Martin, Jacqueline Briggs. (1992). Good Times on Grandfather Mountain, illus. Susan Gaber. N.Y.: Orchard.

Murphy, Shirley Rousseau. (1983). Tattie's River Journey, illus. Tomie de Paola. N.Y.: Dial.

Expressive Activity

1. Students can retell one of the stories using flannel board pieces.

2. Children can be invited to create their own tall tale based on an experience related to the weather.

Weather forecasting center. The goal of this center is for students to explore the science of weather forecasting. Many nonfiction books about weather and weather forecasting can be available at this center, such as the following:

Branley, Franklyn M. (1985). Flash, Crash, Rumble, and Roll, illus. Barbara & Ed Emberly. N.Y.: HarperCollins.

Gibbons, Gail. (1993). Weather Forecasting. N.Y.: First Aladdin Books (Macmillan).

Simon, Seymour. (1989). Storms. N.Y.: Morrow.

Expressive Activity

A bulletin board area can be available which contains a variety of maps, thermometers, props, and lists of weather-related vocabulary from which students can dramatize a news station forecast.

Conclusions

Through integrating the language arts with the science area, supported with a literature base representative of the different genres, children can engage in the processes of both areas while experiencing interesting content. Within a content area, such as science, children can engage in the functions of language. The integration of these two areas can extend knowledge of concepts and related vocabulary and thinking-language abilities.

Integrating the language arts and science areas can also facilitate efficiency of instruction. Both areas have many processes in common. Making use of these overlaps can reinforce learning.

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