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# Literature-based language arts extended to science

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## Literature-based language arts extended to science

### **Abstract**

Literature can link all areas of the curriculum. Extending a literature-based language arts program to the science area can provide a rich learning environment supported by many different genres of literature and related expressive activities that contribute to the dimensions of learning.

A science unit of study on the five senses, with special emphasis on touch, for kindergarten children, was expanded through literature experiences and related expressive activities. The literature presented offered much content on the senses and models of language to nurture the children's emerging literacy. During the one-week of study, learner enthusiasm and peer interaction for reading and writing were observed.

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### Abstract

Literature can link all areas of the curriculum. Extending a literature-based language arts program to the science area can provide a rich learning environment supported by many different genres of literature and related expressive activities that contribute to the dimensions of learning.

A science unit of study on the five senses, with special emphasis on touch, for kindergarten children, was expanded through literature experiences and related expressive activities. The literature presented offered much content on the senses and models of language to nurture the children's emerging literacy. During the one-week of study, learner enthusiasm and peer interaction for reading and writing were observed.

Language is viewed as a process. To learn language, children must engage in the language processes (Smith, 1994). Literature experiences support children's quest to acquire thinking-language abilities (Goodman, 1986).

### Literature-Based Programs

A literature-based program presents many genres of literature to support a theme, concept, or unit. Thus, the dimensions of the study can be greatly extended (Langer, 1995). From a well-developed literature base, many options for children's responses can be presented. Children can react to the literature experiences through different aspects of the language arts and graphic and performing arts (Harms & Lettow, 1998).

Because an extensive literature base provides content, models of language, and options for expressive activities, other instructional features can take place. For example, in depth exploration of a concept or theme and the use of more sophisticated thinking-language abilities can occur as children use the many resources. Such exploration can be done individually, in pairs, or small groups (Routman, 1991). From the rich literature environment, peer interactions can not only offer students opportunities to share their explorations but extend their thinking-language and personal-social abilities (Gambrell & Almasi, 1996; Roser & Martinez, 1995).

A literature base can unite the curricular areas, capitalizing on the common thinking tasks among the different areas. Such an instructional program can provide efficiency. In the case of a literature-based language arts program extended across the curriculum, children can engage in the functions of language in a genuine sense (Bosma & Guth, 1995).

Because a literature-based program can foster much student involvement, many avenues of qualitative assessment can be used to keep track of children's activities and interests and to describe their progress and instructional needs (Routman, 1991). Among these qualitative techniques for kindergarten are daily teacher logs, teacher conferences, checklists, and portfolios (Tierney, Carter, & Desai, 1991).

### Literature-Based Language Arts Extended to Science

Science is abstract for youngsters and must be seen as part of their own personal world if it is to be understood and remembered. The goal of science instruction is to learn and solve problems. During this process, emphasis must be put on opportunities to make first-hand observations and inferences that can be communicated in different ways (Butzow & Butzow, 1989). Students involved in exploring science through hands-on activities increases their chance of remembering key concepts that are taught (Short & Armstrong, 1993). Children need to be allowed to make mistakes and should be given opportunities for self-correction as they learn to comprehend (Butzow & Butzow, 1989).

In an age of science and technology, the building blocks of knowledge that lead to an understanding of these areas receive little emphasis until students are well into their academic careers. Children need to have opportunities to develop understandings and appreciation of science at an early age. Science must be taught as soon as youngsters enter school (Butzow & Butzow, 1989).

Science, reading, and the other language arts reinforce each other and teach the same strategies of reasoning and relationships. When a literature-based language arts program is extended to the science area, students are actively engaged in learning about science through observing, experimenting, and forming and testing hypotheses. Literature experiences support the science study by presenting facts and concepts in a narrative form that is motivating and understandable to children (Bosma & Guth, 1989). Bringing the different literature genres into science study expands children's learning opportunities (Langer, 1995).

### Implementation of a Literature-Based Science Unit for Kindergarten

In this study for kindergarten, the sense of touch was explored through literature experiences and expressive activities. The unit provided teacher-directed and student-initiated activities.

#### Teacher-Directed Activities

The teacher presented many literature experiences and related expressive activities to the students. After studying four of the five senses, the last mini unit focusing on touch began with the teacher reading aloud Bruce McMillan's story, Sense suspense: A guessing game for the five senses (New York: Scholastic: 1994). This story was chosen to see if any of the kindergartners could figure out what sense was going to be studied next. After reading aloud the book, the teacher led a discussion about the different touch sensations - hot, cold, rough, smooth, wet, dry, hard, and soft - and objects that are related to these sensations. From the responses of the students, a chart was created listing objects that are safe and not safe to touch. As a final activity, students explored the room and touched objects with different touch sensations, such as cool, soft play dough; gritty sand; and smooth blocks.

Another teacher-directed activity involved introducing a finger play, by Bernard Westcott, Peanut butter and jelly: A play rhyme (New York: Dutton: 1987). After listening to the book read aloud by the teacher, the students were guided to do the hand motions that accompanied the rhyme in the text. Following this activity, the teacher brought peanut butter and jelly for the children to taste and touch. Then, the students made a treat for birds: They cut out heart-shaped pieces of bread with a cookie cutter, spread peanut butter and bird seed on the bread, and tied pieces of ribbon through the bread to hang outside for the birds.

In another session, the teacher read aloud Lois Ehlert's book, Red leaf, yellow leaf (New York: Harcourt Brace: 1991). Following the reading of the story, the students



discussed fall leaves and trees. The kindergartners then sponge painted different colored leaves on white construction paper with a leaf-shaped sponge. The class also went on a fall walk and collected leaves that had fallen off of the trees, and used them for leaf-rubbings with wax paper and crayons. The children found many objects with different textures on the fall walk, such as rocks, pinecones, and sticks..

On another day, the children were able to go on a small creatures hunt after listening to Joanne Ryder's book, In my father's hands (New York: Dutton: 1987). Previously, each child was asked to bring a jar for the hunt. Ants, spiders, caterpillars, and some unknown small creatures were collected. The students carefully handled these small creatures and were able to tolerate some of them crawling on their hands and arms. The children felt the tickling of the creatures' prickly legs. On the same day, the city naturalist visited the classroom and brought some animals for the students to touch. They were able to feel different animal coverings, such as fur, feathers, and scales. Students made a big book of their favorite animal for the class.

Tana Hoban's book, Is it rough? Is it smooth? Is it shiny? (New York: Greenwillow: 1984), was another book read by the teacher. To do the related activity, each child had brought five items that represented different textures. Students were divided into pairs and traded their bags with their partners. The children had to guess the object by using only their sense of touch.

Other teacher-directed activities were conducted outside the schoolhouse. Students used their sense of touch through their feet instead of their hands. Students removed their shoes and walked barefoot in the grass and sandbox and discussed how the grass and sand felt on their feet. Also, the teacher presented four socks each filled with a different item - marbles, rice, sticks, and uncooked noodles - and closed with rubber bands. Students used their feet to feel the objects.

### Student-Initiated Activities

In the learning centers that offered options for children's responses, literature experiences representative of the different genres and an array of expressive activities designed to enhance the conceptual development of touch were presented. Two types of learning centers were offered: Sustaining centers, which changed with the content of the different units, and centers specifically focused on the study of touch.

#### Sustaining Centers

These sustaining centers were offered as part of the unit study on touch: Reading/Listening/Poetry, Writing, Author/Illustrator, and Bookmaking.

- Reading/Listening/Poetry

These books, along with teacher-made cassettes, were available in this center. The students used drawing paper and materials to illustrate the stories.

#### Books:

Aliki. (1989). My five senses. New York: Harper & Row.

Baylor, Byrd. (1977). Guess who my favorite person is? New York: Macmillan.

Brown, Ruth. (1985). The big sneeze. New York: Lothrop.

Bunting, Eve. (1987). Ghost hour, spook's hour. New York: Clarion.

Fort, Patrick. (1988). Redbird. New York: Orchard.

Horwitz, Elinor Lander. (1975). When the sky is like lace. New York: Lippincott.

Johnston, Tony. (1992). The cowboy and the black-eyed pea. New York: Putnam.

Lionni, Leo. (1967). Frederick. New York: Pantheon.

MacLachlan, Patricia. (1979). Through grandpa's eyes. New York: Harper & Row.

Moss, Thylia. (1993). I want to be. New York: Dial.

O'Neill, Mary. (1961). Hailstones and halibut bones. New York: Trumpet.

Ryder, Joanne. (1987). Chipmunk song. New York: Dutton.

Ryder, Joanne. (1989). White bear, ice bear. New York: Morrow.

Rylant, Cynthia. (1985). The relatives came. New York: Bradbury.

Steig, William. (1969). Sylvester and the magic pebble. New York: Simon & Schuster.

Stevens, Janet. (1982). The princess and the pea. New York: Holiday.

Stevenson, James, (1983). What's under my bed? New York: Greenwillow.

Wood, Audrey. (1984). The napping house. New York: Harcourt Brace.

Yolen, Jane. (1987). Owl moon. New York: Philomel.

- Writing

In this center, the children wrote about their favorite thing to touch and then drew a related picture. These illustrated writings were collected and made into a big book for the class. (Example of a child's writing: I touch the pillow with my hands. It feels soft.)

Students made two other big books: One in the shape of a hand and another in the shape of a foot. The books contained the children's drawings of images that the students liked or do not like to touch with their hands and feet.

- Author/Illustrator

Eric Carle and Lois Ehlert were the authors/illustrators chosen for this center. Eric Carle's books are appealing to children because they are interesting, colorful accounts that provide children with opportunities to learn about nature around them. For his illustrations, he paints on paper and then cuts images from these papers and pastes them on sheets of paper to make a collage.

Lois Ehlert presents simple concepts. Her illustrations are constructed from cutout pieces of paper, fabric, and objects to make collages.

Selected books:

Carle, Eric. (1979). The very hungry caterpillar. New York: Collins.

Carle, Eric. (1984). The very busy spider. New York: Philomel.

Ehlert, Lois. (1990). Color farm. Singapore: Harper Collins.

Ehlert, Lois. (1989). Color zoo. New York: Lippincott.

Ehlert, Lois. (1990). Fish eyes. New York: Harcourt Brace.

- Bookmaking Center

Each student designed a "feely" book. Objects of different textures were taped onto each page of the book and labeled as being rough, smooth, hard, soft, etc.

Centers Specific to the Concept Development

These centers were developed specifically for the science unit on touch.

- Texture Center

Science Standard: Students will explore different touch sensations.

Math Standard: Students will be able to classify objects into categories and graph according to texture.

Language Arts Standard: Students will gather information from graph to create meaning.

Literature Experience:

Knox, Camilla W. "Things to Touch," (p. 183). Poetry place anthology. (1983).

New York: Scholastic.

Expressive Activity:

Students were assisted by the teacher as they compared and sorted objects found in the classroom. They categorized the objects according to color, size, shape, and texture. Each object was then graphed by its touch sensation (hot-cold, rough-smooth, and hard-soft). The teacher assisted the students in making a class graph of their favorite textures.

- Computer Center

Science/Technology Standard: Students will point and click with the mouse and use the return key to explore the sense of touch.

Language Arts Standard: Students will use pictures from the computer program to gather information about the five senses.

Literature Experience:

Cole, Joanna, & Degen, Bruce. (1999). The magic school bus explores the senses.

New York: Scholastic.

Expressive Activity:

The students used the CD, The Magic School Bus: The Body at the computer center to find out more about the senses. Students shared information with each other.

- Art/Drawing Center

Science Standard: Students will use their sense of touch as they experiment with paint.

Language Arts Standard: Students will follow the guidelines of discussion as they share their experiences with their peers.

Art Standard: Students will foster creativity and self-expression through using their sense of touch.

Literature Experience:

Katz, Bobbi. (1995). Your five senses. New York: Scholastic.

Expressive Activity:

The children at this center had an array of choices that allowed them to explore their sense of touch. The painting opportunities that were provided included painting with finger paints, tempera paints, and using glue to write their names and then pouring sand on the glued area. Students could also experiment with shaving cream, play dough, sand trays, and a stamp pad to create fingerpaint drawings. During their exploration, the students shared and explained their drawings and projects to their peers.

- Interesting Objects Center

Science Standard: Students will compare objects by using only their sense of touch.

Language Arts Standard: Students will create verbal images from touching the objects.

Literature Experience:

Isadora, Rachel. (1985) I touch. New York: Greenwillow.

Expressive Activity:

In this center, objects differing in size, shape, color, and texture were placed in a Feely Box for the exploration of touch. Included in the box were fur, leather, velvet, corduroy, flannel, rocks, feathers, pinecones, leaves, sandpaper, sponges, cotton balls, plastic fork, corrugated cardboard, lotion, gel-filled ice packs, and oil. In another box, objects were grouped in sets of two. The students were to reach in the box and pull out the two objects that felt the same. Students helped create a class interesting objects box by collecting objects in the classroom that began with each letter of the alphabet: for example, one child found a crayon for the letter "C,c." The students enjoyed this activity, but they shared their frustration with the difficulty of finding objects for some of the alphabet letters (q, u, x, y, and z).

- Cooking Center

Science Standard: Students will be able to use their five senses to describe their experiences during a cooking project.

Language Arts Standard: Students will relate new information to prior knowledge and experience.

Literature Experience:

dePaola, Tomie. (1978). The popcorn book. New York: Holiday House.

### Expressive Activity:

In this center, the class used a popcorn machine to make popcorn. The students touched the corn before and after being popped. As a culminating activity, the teacher led a discussion on how all five of their senses are sometimes used simultaneously. The children told how they used their sense of sight, smell, taste, touch, and hearing during the popcorn activity. Then, they ate the popcorn.

### Conclusions

Students were actively engaged throughout this literature-based unit on the sense of touch. They enjoyed the literature experiences and expressive activities and worked cooperatively with each other in the centers. They became more and more interested in books as the unit progressed. Students were soon checking out books from the school library that related to the unit.

The value of the integrated program was evident as students shared ideas with their peers and continually developed a better understanding for science. Conceptual knowledge of science was integrated with the language processes, and the reading-writing and science processes were connected.

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