

# Sense of Wonder Science

*A roll of masking tape,  
a park, and preschool  
children's curiosity lead  
to discoveries about  
science and literacy.*

By Gregory Potter  
and William Ritz



**K**ids who do hands-on science are eager to talk about, write about, and read about their experiences. Those of us who have tried it know that this is true, but it's still one of the best-kept secrets of the world of education! Through the project "A Head Start on Science" at California State University, Long Beach, we've been working with Head Start teachers, children, and their parents since 1995, and our observations have convinced us that what we call "sense of wonder" science consistently opens the doors for teachers who are anxious to have their children meet the many language and literacy goals and standards called for at every level. Now, we have to convince administrators and Boards of Education, among others, that science is indeed an ideal entry point for helping children to want to learn and to achieve.

When we received a grant from the U.S. Department of Health and Human Services to carry out this project in 1995, we leaned heavily on a wonderful book written by world-renowned biologist Rachel Carson (of *Silent Spring* fame) entitled *The Sense of Wonder* (1956). Carson speaks eloquently about how science ought to build on a child's inherent curiosity about his or her everyday world, "...if a child is to keep alive his inborn sense of wonder... he needs the companionship of at least one adult who can share it, rediscovering with him the joy, excitement, and mystery of the world we live in."

What we invite teachers and children to do in "A Head Start on Science" is to explore that world together. It is that shared exploration that leads to an increased need and desire to communicate with each other, by depicting objects and events through drawings and words—both written and spoken.

A favorite program activity that embodies these traits is constructing "nature bracelets." This activity lets children explore the world outside, thereby expanding beyond the four walls of a traditional classroom. It also gets children and teachers to experience the joy and wonder of gathering data together. The best way to explain this process is to describe the excitement of making nature bracelets as we observed it unfold with a group of young students.

## Nature Bracelets in Action

It was a beautiful spring day. The flowers were in full blossom, and the children were full of the sort of energy only little ones can possess. In order to tap this energy and take advantage of the beautiful day, the teacher decided to build nature bracelets with her students.

The school didn't have much of an outdoor learning area, but there was a small park just a block away. The class had taken field trips to the park in the past, but today's walk was different. For this trip, the teacher would bring along a roll of masking tape. The children were excited to

be outside, as were the few parents who had volunteered to come along on the trip. The teacher had reviewed the area the day before to make sure it was free from plants such as poison ivy or oak. As the group entered the park, the students gathered around the teacher and listened to the field trip rules:



- Stay in grass field of the park and with your chaperone;
- Do not put leaves or anything else in your mouth;
- Don't take leaves that are still on a plant; and
- Don't pick any mushrooms.

The teacher also told the students their objective for this occasion was to collect leaves that had fallen from the trees or plants. *How many different types could they collect?* Then, the teacher gave each child a bracelet of masking tape around one wrist, sticky side out, and let them explore the designated park areas to see what treasures nature had to offer that they could attach to their bracelets. It was hard to get the bracelets on the kids fast enough. The park rapidly became a hive of activity as the children scrambled about finding different interesting things to include on their new jewelry.

One child, in a very excited tone, shared his discovery of a little pinecone; the beauty of a foxtail mystified another; and one little girl combed the lawn in search of those "little yellow flowers that her dad calls weeds."

In a very short time, the bracelets were filled and it was time to head back to class. The return walk was abuzz with discussion as the children eagerly showed one another what they found.

Upon returning to the classroom, the children were thrilled to discover that the teacher had made available a variety of books with pictures and words that describe plants just like the ones they discovered in the park. That afternoon, the line between the science area and the reading area disappeared completely as the children eagerly explored books to find pictures of their new "gems." One little boy excitedly showed us, the teacher observers, that he had found his flower in a book the class had recently read.

Children who often did not demonstrate a desire to read or even pick up a book were now delving into the class library to find the names of their specimens. With the promise of letting the children take the bracelets home the next day, students reluctantly left their treasures at school overnight to do more classifying with them the following day.

The next few days were filled with additional nature bracelet-related activities:

- The children told stories about their collected items to their fellow students.
- They wrote a class "book" that included personal descriptions of how the different specimens felt and smelled, and

**Figure 1.**

## Nature bracelet activity rubric.

Not Yet	Child does not participate in making a nature bracelet.
Emerging	Child participates with the help of an adult, asks one or two questions, does not join in the group discussion.
Almost Mastered	Child collects items for bracelet, asks questions about the items, and discusses the items with peers and adults.
Fully Mastered	Child collects items for the bracelet, sorts and compares the items independently, shares discoveries with peers and adults.

- They organized the items according to their colors and textures by gluing them onto sheets of construction paper.

In short, the “nature bracelets” had become a memorable range of activities that the children communicated enthusiastically with their peers, parents, and caregivers for a long time. Not only had the trip to the park tapped students’ innate senses of wonder, but also the exploration led students to use various literacy tools vitally important to their futures. A simple roll of masking tape, coupled with the teacher’s imagination and the time to better explore their own everyday world, gave these children a set of experiences long to be remembered!

### Making Connections

The teacher assessed the nature bracelet experience following the framework presented in the *Head Start Leaders Guide to Positive Child Outcomes* (2003). Our analysis of the Framework’s 8 domains, 27 domain elements, and 100 child behavior indicators shows that a “sense of wonder” activity like the nature bracelet experience addresses a high proportion of the indicators found in all 8 of the domains.

For example, any science activity in which children are discussing what they are discovering will include indicators under the “Language Development” domain and its element entitled “Speaking and Communicating.” And, as children classify, order, compare, and count objects, they are progressing in terms of their “Number and Operations” and “Patterns and Measurement” concepts.

The teacher used the rubric shown in Figure 1 to guide their assessment of students’ learning during this activity.

### Curiosity as Inspiration

Children are naturally curious about the world around them and are usually very willing to explore it through science. This natural curiosity can be used to drive an emergent literacy curriculum in which science topics are explored using the traditional literacy tools—reading books, writing observations, and discussing find-

ings. The science supports and enhances the literacy, while providing the children with a positive exposure to science that they need and deserve.

As you can see from the example shared in this article, a teacher accomplished these goals without sacrificing other aspects of the curriculum. Richgels (1995) describes the importance of “capitalizing on natural opportunities for

language and literacy teaching.” We cannot imagine a more natural opportunity than a child exploring her natural world and then using language to record her findings and reading books to gain even broader understanding—just as the young students discovered through their nature bracelets. ■

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### Resources

- Carson, R. 1956. *The sense of wonder*. New York: Harper and Row.
- National Research Council (NRC). 1996. *National science education standards*. Washington, DC: National Academy Press.
- Richgels, D.J. 1995. A kindergarten sign-in procedure: A routine in support of written language learning. In *Perspectives on literacy research and practice*, eds. K.A. Hinchman, D.J. Leu, and C.K. Kinzer, pp. 243–54. Chicago: The National Reading Conference.
- U.S. Department of Health and Human Services (HHS). 2003. *Head Start leaders guide to positive child outcomes*. Washington, DC: HHS. (Available from [www.head-startinfo.org/leaders\\_guideeng/tableofcontents.htm](http://www.head-startinfo.org/leaders_guideeng/tableofcontents.htm).)

### Connecting to the Standards

This article relates to the following *National Science Education Standards* (NRC 1996):

#### Content Standards

##### Grades K–4

Unifying Concepts and Processes

Constancy, change, and measurement

##### Standard A: Science as Inquiry

- Abilities necessary to do scientific inquiry

##### Standard C: Life Science

- The characteristics of organisms