Our local science teachers association arranged to bring together six Nobel Prize winners as keynote speakers at their annual conference. Each speaker testified to his belief that proficiency with reading and writing was fundamental to the preparation of good scientists (Ebbers, 2001). Scientists read to keep up with the work of their colleagues, they read for interest, they read and write grant proposals, and they keep written records of their findings, which are then discussed and debated (often via print) before being presented in a final report form.

The National Science Education Standards (National Research Council, 1996) emphasizes the need for scientifically literate students who engage in inquiry. Developing the strategies for scientific literacy and inquiry can be done in such a way as to be mutually beneficial. Inquiry is not only about doing hands-on investigations, for it includes “examining books and other sources of information to see what is already known; and planning investigations” as well as “proposing answers, explanations, and predictions; and communicating the results” (p. 23).

Scientific literacy is more than reading about science. “It means that a person can ask, find, or determine answers to questions that derive from curiosity about everyday experiences. It means that a person has the ability to describe, explain, and predict natural phenomena. Scientific literacy entails being able to read with understanding articles about science in the popular press and to engage in social conversation about the validity of the conclusions” (p. 22). Thus, in elementary classrooms, the scientific practices of observing, questioning, predicting, describing, explaining, and investigating should be woven together with the literacy practices of reading, writing, speaking, and listening.
Science trade books are a wonderful tool for encouraging both literacy and inquiry practices. They introduce children to the lives and work of past and present members of the scientific community. Although nonfiction books are commonly lumped together under “informational books,” Doiron (1995) states that nonfiction actually contains a variety of textual genres, “mainly written in expository text although some use narrative structures” (p. 35). Rather than continuing to view this category as relatively undifferentiated, it is useful to unbraid the various textual genres and examine how they might be used in science, where informational text is paramount. By deliberately gathering a collection of genres of science trade books—a science text set—teachers can introduce students to current scientific practices while they support literacy practices in science.

In this article, I compare the traditional view of science with the more multidimensional view outlined in science reform documents. I outline different genres of science nonfiction trade books and suggest how they can be useful tools for illuminating different aspects of the various science communities. Finally, I describe a science text set and how it is used to encourage both science inquiry and science literacy practices in a unit on sound and hearing.

Moving Away from a Traditional View of Science

Researchers suggest elementary teachers often view science as a “fixed, somewhat daunting body of knowledge” (Herwitz & Guerra, 1996, p. 22) and as a series of discoveries that fail to “communicate contemporary issues in science, or to portray the actual working practices of scientists” (Osborne, Driver, & Simon, 1998, p. 29). Like the rest of the population, most elementary teachers have little contact with scientists, and so ideas regarding the nature of science must be gleaned from the media and from schooling (Gallagher, 1991). Many of us who graduated from high school ten or more years ago went through a school system that portrayed science largely as a body of unrelated knowledge, gathered through a particular neutral and objective process (Duschl, 1988; King, 1991). Science learning appeared to be nothing more than the transmission of facts from one generation to the next. Scientists, ethnographers, sociologists, historians, and philosophers have begun to articulate a more authentic view of science (Martin, Kass, & Brouwer, 1990) upon which teachers can draw when representing scientific activity in their classrooms. Rather than being isolated from society, science occurs in the context of ethical, economic, religious, ideological, and cultural values (Abrams & Wandersee, 1995; Chalmers, 1999; Israel 1996; Longino, 1990; McGinn & Roth, 1999).

This expanded view of science is evident in recent governmental documents produced to guide the work of curriculum writers and ultimately science as experienced by elementary (and secondary) students. Science needs to be presented as “an intellectual and social endeavor” (American Association for the Advancement of Science, 1993, p. 3). Thus children are introduced to the practices of scientists through an emphasis on inquiry methods and through the “creation of communities of science learners” (National Research Council, 1996, p. 4).

Re-presenting Science to Our Students

Elementary teachers are in the unique position of offering their students a view of science that may be very different from the one they experienced during their schooling. A current emphasis on inquiry encourages the participation of students in genuine scientific activity, gradually developing their abilities to test theories and construct explanatory models (Driver, Leach, Millar, & Scott, 2000). New images of how the science community operates as an intellectual enterprise need to replace the old model of knowledge transmission.

Sutton (1996) suggests science can be seen as a two-step process of modeling in that new insight involves a “re-description of the phenomenon being studied” (p. 144). The discovery process is seen as the reconceptualization of what is already known. He convincingly draws examples from chemistry, physics, and biology to show how scientists have redescribed aspects of their field using new analogies and metaphors. For example, in the 1600s William Harvey began to speak about the heart in terms of circular motions rather than as a spring, and in 1644 Torricelli re-described air as a fluid with the famous line we are living at the “bottom of an ocean of air” (as cited in Sutton, 1992, p. 41).

The importance of metaphor and analogy as tools in developing scientific understanding cannot be
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Not all science trade books limit themselves to divulging information about specific topics. Many writers give us tales of scientists engaged in all stages of inquiry, including the development of explanatory structures.

about Galileo in secondary school, where he is often portrayed as one of the fathers of astronomy. We were impressed with ‘his’ invention of the telescope and subsequent discoveries. But how many of us actually read Galileo’s original letters found in Sidereus Nuncius? Consider the following segment written by Galileo in January 1610:

All three little stars were to the west of Jupiter and closer to each other than the previous night, and separated by equal intervals as shown in the adjoining sketch. Even though at this point I had by no means turned my thought to the mutual motions of the stars, yet I was aroused by the question of how Jupiter could be to the east of all the said fixed stars when a day before he had been to the west of two of them. I was afraid, therefore, that perhaps, contrary to the astronomical computations, his motion was direct and that, by his proper motion he had bypassed those stars. For this reason I waited eagerly for the next night. But I was disappointed in my hope, for the sky was everywhere covered with clouds. (Galilei, 1989, p. 65)

What rings through the segment is not only that Galileo is in the process of “discovering” several of the moons of Jupiter, but that his explanation appears to be riddled with doubt. Galileo is in the process of working out an explanatory model for one aspect of the solar system, and hence his writing reflects a certain hesitancy.

In a second stage of modeling, scientists try to persuade others to appreciate the new model. In this stage science may also be viewed as “argument” (Kuhn, 1993), for scientific thought is advanced through intense debate and discussion as models undergo scrutiny within the rest of the scientific community. An arena is provided in which “these ideas are articulated, questioned, clarified, defended, elaborated, and indeed often arise in the first place” (p. 321). Several competing theories can develop in response to a particular scientific question because the “facts” of previous scientific endeavors become the basis of arguments and are not simply memorized for their own sake.

The building of explanatory structures is an important dimension of the inquiry process. Medawar (1996) describes this explanation building as scientists “telling stories” which are scrupulously tested to see if they are stories about real life (p. 30). These stories/explanations are tentative at times, rather than the fixed and objective writing one usually associates with science writing. Unless students are cognizant of these initial exploratory suggestions, scientific discoveries will be seen only as the end result with no sense of the processes used to build communal scientific understanding.

Science as Represented by Genres of Trade Books

Even the most cursory glance at any children’s bookstore shows shelves of science trade books covering topics in biology, physics, and chemistry written expressly for children. They are often beautifully illustrated, well written, and so enjoyed by readers that “new science textbooks aspire to match the trade book models” (Walpole, 1999, p. 358). Not all science trade books limit themselves to divulging information about specific topics. Many writers give us tales of scientists engaged in all stages of inquiry, including the development of explanatory structures. Some books portray scientists in the field, some detail the wide variety of practices used by scientists, and others depict the reality of scientists’ political and social struggles.

Figure 1 lists some of the genres of science trade books useful for illustrating different aspects of the various science communities.

In the following sections I describe these various genres and identify one or two books that I consider to be exemplary in each category. Please note that the lines of distinction are not always clear because many authors choose to blend genres when presenting information. My point is not to argue that all books must be characterized as one or the other. Instead, I encourage teachers and researchers to carefully select science text sets so...
that all genres are sufficiently represented within a particular classroom science inquiry.

**Reference Books**

Reference books give an account of phenomena based on current scientific understanding and are similar to a textual genre used frequently by scientists, namely, reports. Reference books (and reports) usually begin with an organizing statement that is somewhat general and considered to be commonsense understanding. By introducing specialized vocabulary and constructing new categories, this commonsense perspective on reality is translated into more specialized knowledge (Unsworth, 1994). Some reference books give a lot of information about a limited topic; others give a little information on a variety of topics.

When choosing reference books that facilitate an understanding of science as modeling, one must look at the way in which the information is presented. Read this selection on Jupiter:

> Jupiter’s most obvious feature is its Great Red Spot. This is actually a storm that has been raging in Jupiter’s atmosphere for at least as long as people have been observing the planet... and that is over 300 years. The Great Red Spot is constantly changing. Three oval cloud systems formed in 1940. One is visible below the Great Red Spot in the picture below. (Graham, 1991, p. 14)

Compare it with the following selection written for the same audience:

> One of the many mysteries on Jupiter is the Great Red Spot. The spot was first seen through a telescope from Earth more than three hundred years ago. But no one knows when it first formed. The giant spot is probably an enormous storm, a super-hurricane more than twice as big as our whole Earth.

The Great Red Spot has changed through the years. Sometimes it shrinks and becomes a dull pink. Other times it grows and becomes bright red. But unlike other clouds on Jupiter, the Great Red Spot does not change its position and it has kept the same oval shape for centuries. (Simon, 1985, p. 9)

The first excerpt contains a series of assertions that state exactly what is. The reader is not told how scientists have determined the information, nor is any evidence provided to support the assertions. Östman (1998) points out that in everyday language the word *is* generally signals the result of using our senses and thus “is connected with giving statements a specific epistemological value” (p. 57). When children read scientific information framed primarily in the form of assertions, they get a “companion meaning” (Roberts, 1998)—in this case, the message that the information is without doubt.

The second excerpt is more tentative about the knowledge it reveals. By use of phrases such as “is probably” and “many mysteries,” the reader is subtly reminded that this information, while generally accepted by the scientific community, is by no means certain. There remains the possibility that new understandings may be forthcoming as other information is brought to light. This excerpt is congruent with the current view that scientific knowledge is dynamic, tentative, and communally based and is thus the preferred message we wish to pass on to readers.

I regularly read science trade books aloud to my students. Moss (1995) suggests that listening to literature provides children with the opportunity to expand their knowledge base and to learn concepts and terms related to situations they may never encounter. Through

<table>
<thead>
<tr>
<th>Nonfiction Genre</th>
<th>Use</th>
<th>Find Books That</th>
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<tbody>
<tr>
<td>Reference</td>
<td>Account of phenomena</td>
<td>Limit assertions</td>
</tr>
<tr>
<td>Explanation</td>
<td>Explain causality</td>
<td>Demonstrate tentativeness</td>
</tr>
<tr>
<td>Field guides</td>
<td>Organize and classify</td>
<td>Show how/why the explanation was generated</td>
</tr>
<tr>
<td>How-to</td>
<td>Illustrate specific procedures</td>
<td>Show redescription over time</td>
</tr>
<tr>
<td>Narrative</td>
<td>Information through narrative mode</td>
<td>Clear show relationships</td>
</tr>
<tr>
<td>Expository</td>
<td>Tell a story first</td>
<td>Embody what is known in the scientific community</td>
</tr>
<tr>
<td>Biography</td>
<td>Show male and female scientists</td>
<td>Include non-Western scientists</td>
</tr>
<tr>
<td>Journal</td>
<td>Portray both male and female scientists</td>
<td>Show many dimensions of their lives</td>
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![Figure 1. Using Nonfiction Genres to Promote Science Practices.](image-url)
books, prairie children may experience life on the tidal flats, while those on the coast may become aware of mountain wildlife. At the same time, by listening to nonfiction, and through artful teaching, students become familiar with particular textual features.

I have just begun reading aloud *The Snake Scientist* (Montgomery, 1999). More than 60 photographs taken by Nic Bishop, a well-known wildlife photographer, support the clearly written and often humorous text. My students enjoy hearing the information about snakes presented in terms of what has been discovered by zoologist Bob Mason and what is still unknown. They are curious about the seemingly uncomplicated investigation that, contrary to their ideas about working scientists, involves simple equipment and a house rather than a laboratory! For those students who wish to pursue independent questions about snakes, an index at the back has proved to be helpful, as is the section titled “For Further Reading,” which lists other books of interest. Our artifact table now houses a snakeskin found by one of the students at the exact snake pits of Mason’s research.

**Explanation Books**

The primary focus of explanation books is to describe purpose and demonstrate causality. The information is arranged specifically to encourage children to build understanding from one explication to the next. Explanation books may be used to delineate sequential explanations, which explain *how* something occurs, or causal explanations, which explain not only how but *why* it occurs (Veel, 1993). In either case, explanations usually divulge a lot of factual information and use many technical terms.

Books of this genre often use the same technique as reference books by employing assertions to deliver the message that scientific explanations are certain. At the same time, authors often reduce explanations only to what is known by the scientific community at the present time without any indication of how or...
why the information was obtained. In order to encourage the development of a more current view of science, teachers must be careful to select books that offer a glimpse into the epistemological and methodological aspects that have generated current understanding. Note the following excerpt from Exploring the Sky by Day (Dickinson, 1989):

Two hundred years ago, the clouds had no names. Big puffy clouds, thin streaky clouds and dull rain clouds were all just clouds. Nobody knew how they formed or why different types of clouds occurred. Luke Howard, an English pharmacist who spent his spare time studying nature, decided in 1803 that he would name the various cloud types so that people could properly describe and study them. This system he developed is still being used.

Howard had noticed that all clouds belonged to one of three basic groups. The puffy clouds often seen on a summer afternoon he called cumulus, which means “heap” or “pile” in Latin. The second distinct family is made up of wispy high-level clouds. Howard named them cirrus, the Latin word for “curl.” The third group in his classification, the clouds that lie in great horizontal blankets, he called stratus, which means “stretched out.” (p. 10)

When we study weather, my students and I go outside and look at the clouds for a number of short time periods. I ask students to draw what they observe and then use these diagrams as a basis for cutting out different cloud shapes to compare similarities and differences. Then I use this passage to introduce the scientific classification of different clouds. Thanks to Dickinson, my students know the method by which the classification system was developed and why it was considered necessary as the basis for description and discussion among scientists.

To promote the characterization of science as modeling, teachers must search for historical stories that trace the shaping of current scientific understanding and make a deliberate attempt to locate books that demonstrate a “re-presentation” of scientific explanations. The stories of Copernicus, Galileo, and other astronomers, for example, can be used not just to describe planetary motion but to illustrate how scientific explanations involve debate, political context, cultural perspectives, and ultimately acceptance by a majority of peers.

Shelley Tanaka is an author who can be depended on for providing the necessary contexts for explanations. In Discovering the Iceman (Tanaka, 1996), the 1991 discovery of a body from the late Stone Age is detailed. I have used this book with a number of different classes. I generally use it as a read-aloud early in the year. Through the artful use of photographs, my students are gradually drawn into this “real” story. They are fascinated to find out how the bodies are dated (which usually spurs a rash of reading about Egyptian mummies), they are entertained by the political disputes that influenced the procedures, and they are struck by the interconnectedness of the scientific community. Whenever I get to the passage, “And even when all these things are sorted out, we may still never know exactly who the Iceman was” (p. 43), we have a wonderful discussion about the nature of scientific knowledge and the fact that, in spite of millions of scientists around the globe, much remains unanswered.

Field Guides

Although field guides are similar to reports in that they serve to organize knowledge, the point of field guides is to label and classify rather than to provide an account of phenomena. They are used in areas such as botany, geology, and zoology. I find field guides to be an excellent vehicle for demonstrating to children why scientists have developed particular classification schemes. I have my students sort and organize our classroom collections of natural phenomena such as leaves, rocks, animal pictures, and shells. As they debate and discuss the merits of their personal framework, we uncover the value of having a common language/classification scheme. This leads to looking at the organization of field guides and the use of attributes that are considered essential. As students become familiar with the field guides, they use the language of particular classification schemes when discussing the phenomena (e.g., describing leaves in terms of their lobes or margins rather than just their type) in their writing.

Publishers are beginning to produce guides that suit the needs of even very young readers. These simplified
How-to books illustrate particular procedures in science and thus reveal a specific epistemology of the scientific community in which knowledge is gained through experimentation and observation.

How-to Books

How-to books illustrate particular procedures in science and thus reveal a specific epistemology of the scientific community in which knowledge is gained through experimentation and observation. Each investigation or activity is usually shaped after the traditional experimental method with a very clear structure: purpose, method, result, conclusion (Martin, 1990). At times an explanation is included to help interpret the experiment’s results. This explanation may be found at the beginning of the experiment in the form of a statement about what the activity seeks to demonstrate, or it may be found at the end to help in the debriefing process. The activities may all be on one theme or topic, such as experiments concerning electricity, but there are also books that contain investigations and activities in a variety of fields. Books filled with investigations or activities that children merely duplicate show a narrow conception of science practices. Carrying out processes for the sake of doing an investigation is not really science. Investigations happen as a result of the need for particular questions to be addressed. Scientific endeavor happens within specific contexts that cannot be divorced from the process, particularly when one is promoting a more current view of science. Thus this genre must be carefully selected with a specific purpose in mind.

I use how-to books in my classroom to teach students the skills of reading, following, and writing procedures and as a way of gathering evidence to support concepts that I am currently highlighting. The Kingfisher Young Discoverers Series provides contexts for the science activities rather than presenting a series of science “recipes.” Photographs are used in every book to provide concrete examples of conceptual statements. Thus the reader is given the opportunity to see light shining in straight lines through a grove of trees (Glover, 1993), the meandering paths of glacier meltwater (Taylor, 1993b), and the damage caused by acid rain on forests (Taylor, 1993c). Examples are used to make new science information meaningful to children. In Mountains and Volcanoes (Taylor, 1993a), for example, lava is compared to liquid taffy while the pressure of magma is compared to the bubbles of gas in a can of soda. The books are well organized with a table of contents and index pages, as well as clear headings and a judicious use of text boxes.

Narrative Expository Books

Narrative expository refers to books that give the reader information about a specific topic using narrative as the primary means of expression. In other words, scientific information is told through story. Examples of narrative used in science include anecdotes, retelling of events, biography, and metaphors. Narrative expository is different from narrative in that the information is embedded in the narrative and can be extracted only through dissection. Although books in other genres may use narratives to illuminate certain points, narratives in these instances are distinguished from the rest of the writing. Narrative expository blends narrative and expository writing so carefully that it is nearly impossible to decide where the expository begins and the narrative leaves off. The thrust of narrative expository in science is to illuminate part of the world or the scientific community through story.

I recently used Mary Anning and the Sea Dragon by Jeaninne Atkins (1999) to begin a unit on systems. The picture book story of 11-year-old Mary, who patiently uncovered one of the first ichthyosaurs, was an excellent way to introduce children to the science community and to dispel the myth that all discoveries are made by men in lab coats. The students were fascinated at the idea that this 11-year-old girl was one of the first people to make a living from excavating fossils. They marveled at her perseverance in the face of obstacles and opposition. The story also sparked a discussion of the value of classification systems and has brought a flurry of old and new di-
Other examples of excellent narrative expository are *Sea Otter Inlet* (1997b), *Wolf Island* (1993), and *Ladybug Garden* (1997a) by Celia Godkin. Each book is wonderfully written and depicts what happens when something interferes with the food chains in specific ecosystems.

**Biographies**

Biographies tell the life story of a particular individual. Some are written sequentially, telling what steps led to an eventual discovery. Others are written through narrative expository and paint a picture of the life of the individual. Until recently this genre severely underreported the accomplishments of female scientists (other than the popular Marie Curie) or discoveries made in cultures other than Europe or North America. Although there were many biographies written about several select scientists (e.g., Einstein, Edison, and Salk) there were few, if any, written about others.

In the past five years this has begun to change as books such as *Scientists: Women in Profile* (Hacker, 1998) become available. Books that compile biographies, such as *Talking with Adventurers* (Cummings & Cummings, 1998), make a deliberate attempt to include women, but there continue to be few books at the elementary level written about scientists outside North America and Europe.

**Journals**

Journals are another genre that portrays the nature of extended scientific study rather than a particular methodology. Journals are written as a narrative expository rather than as a procedure and usually promote a multifaceted view of science by giving readers the opportunity to see the many dimensions of life in the field. I am itching to use Sophie Webb’s *My Season with Penguins: An Antarctic Journal* (2000). It will give my students a fascinating first-hand account of what it is like to be part of a team of scientists in the Antarctica. Besides reading a volume of information about the Adelie penguin and the practices involved in collecting information about these birds, they will learn what it is like to prepare for, and survive in, barren and isolated conditions. At the same time, my fourth and fifth graders, who want every investigation to be done in half an hour, may begin to understand the necessity of time in data collection. Although the main character describes a two-month period, the entire study takes place over six years.

**Using a Text Set to Encourage Iteration between Literacy and Inquiry Practices**

Over the years I have had several occasions to teach a unit on sound and hearing. I always begin, as I do every science unit, by gathering a text set. Figure 2 is a partial listing of this text set.

These books are displayed in a prominent position along one side of the room, and I encourage their use during independent reading time as well as during science. At the same time, I design activities that encourage the students to use the books as part of their inquiry process. In the sound and hearing unit, there were three major phases that specifically facilitated the iteration between literacy and inquiry.

**Developing Questions**

To set the context and purpose for collecting data, I chose to read aloud the big book *River of Fire* (James, 1992), which describes the events of a five-month period during the 1992 eruption of Mount Etna and asked the children to note the different sounds that are important to the people in the story. During this read-aloud, the children...
began making the noises they heard and soon discovered that our English language has a limited vocabulary for describing sounds. We listed all the different sounds we could think of and talked about similarities and differences in sounds, the significance of sounds in daily life, and the many sounds we ignore.

Students were fascinated by the sounds that they had not noticed in the classroom, such as the furnace, the air-filtering system, and the muted outside noises. They animatedly asked each other “Do you hear ____?” Based on our classroom discussion, we collected the different sounds heard in a day to find out what sounds we attend to and what sounds we ignore. This began our first class inquiry, with the students deciding whether they wanted to investigate different locations or different times of the day. Once the students and I collected data, we examined the many different ways we chose to represent it—charts, lists, webs.

During this inquiry, many questions arose about the mechanics of hearing, the production of sound, and the criteria for distinguishing pleasant versus unpleasant sounds. We charted the questions and posted them in the room. Some of the students noted different bird sounds so I used the opportunity to teach the use of a field guide and made field guides available for those students at recess or at home on weekends.

**Investigating through Inquiry**

As the students read the different books in the text set, they noticed the different instruments illustrated in many of the how-to books. I took this opportunity to read *The Sound That Jazz Makes* (Weatherford, 2000), a powerful narrative exposition that rhythmically traces the roots of jazz. After much discussion (and some listening to music excerpts), we went back to the text set and examined the different instruments that are represented. At this point I challenged the students to create an instrument that could make music varying in pitch as well

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**Reference**


Assorted reference books on different animals, each including a section on how that animal hears.

**Explanation**


**Field Guides**


**How-to**


**Narrative Expository**


**Biography**


**Journals/Diaries**


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**Figure 2.** Partial Text Set Collected for a Unit on Sound.
as volume. Some elected to follow the directions in the books, whereas others used their own ideas.

Once the instruments were brought back to school, they became the basis for investigating how pitch and volume can be changed. I referred students back to the questions we posted, and we talked about how we might investigate some of these questions. Many of the children elected to read from the text set during their free reading time and were eager to try the investigations and activities found in books. Others used these investigations as a starting point to develop their own questions as a basis for inquiry. Soon some children engaged in changing water levels in glasses, cups, and bottles to determine what factors are involved in changing pitch. Others preferred to examine how sound travels through solids, liquids, and gases by building personal telephones, listening to sound traveling through their desks and other surfaces, and engaging in inquiry at home in the bath tub. Still others investigated the power of vibrations to make things dance as they proceeded with inquiries involving speakers and tuning forks. All of the results were reported back to the class as evidence to support their growing understanding of how sound waves travel and other concepts relate to sound.

**Investigating through Research**

As an initial probe, I had the students draw their understanding of how the ear operates. Once the students began reading the different books on sound, they looked closely at the diagrams of the ear. They also began to carefully read about how sound travels in the explanations, descriptions, and sidebars that surround the pictures. I encouraged the students to write their own descriptions of the ear and explanations of how sound travels from the source to the brain. This fostered a discussion about the shape of the pinna (external ear) and similarities among ears of other animals. We then read aloud excerpts from the biographies and journals of scientists who study animal communication and the narrative expository of the life of the little African elephant Elly in *Little Big Ears* (Moss, 1997).

Our discussion following these readings gave birth to research projects on the hearing and communication of different animals. For these research projects we used a variety of reference books on animals collected from our library.

**Science trade books for children provide tremendous opportunities for understanding science as a way of thinking about the world.**

**SUMMARY**

By using a science text set, teachers can encourage connections between the literacy and inquiry practices of science. Field guides encourage identification and classification. How-to books encourage independent investigation. Explanation, narrative expository, journals, and reference books stimulate questions and build and express scientific understanding. Science books with their various genres are also extremely useful for teachers who are concerned about characterizing science in a way that is more authentic than the traditional way in which science has been represented in the past. With careful selection, teachers provide children with windows into a welcoming scientific community. These windows include stories about its current and historical members, explanatory frameworks, descriptions, and examples of scientific practices. They also include the social and political contexts and historical stories that describe the development of current understandings. Science trade books for children provide tremendous opportunities for understanding science as a way of thinking about the world.

**Children’s Books Cited**


References


Author Biography

Margaretha Ebbers is an assistant professor in the education department of Concordia University College of Alberta, Canada, and teaches science to grades 4 and 5 at High Park Elementary School two afternoons a week.