Selecting and Evaluating Science Materials for Children at the Elementary Level

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The science collection in a library, if it is broad, wide and deep enough, is where the action is. Children are curious. They find science exciting; their interests may range from apes to butterflies, feathers to radioactivity, chlorophyll to birds, cryogenics to space medicine. And with each succeeding generation children not only become more sophisticated in their interests, but they become less print-oriented. This presents a real challenge to authors, publishers, teachers, librarians and reviewers.

Science books for children cover an amazing variety of subject matter from a simple concept in a book such as Round is a Pancake by Sullivan to the complexities of relativity. How do those responsible for selecting for an elementary school collection choose? What are the guidelines? The first consideration in selecting science books for children must be the children themselves. A child's interest, reading ability and background of experience should be the guidelines. Above all, the selector must care about children and know a great deal about books.

It is essential that science books be written from the child's point of view, and most authors know this. Children are quick to recognize the patronizing tone. The Branleys, the McClungs, the Podendorfs, Selsams, Bendicks and the Milgroms seem to have a keen knowledge of the child's mind and thought processes. Such writers do not offend the child's dignity and sensitivity by offering him pablum.

Clarity and good organization are of primary importance. Grasslands Around the World by Naden is a good example of a book which presents material in a logical, step-by-step, neat and clean fashion. Good organization also means a table of contents and a well-developed index.

The reviewer looks for accuracy in judging a science book. A scientifically incorrect book that confuses and misinforms the reader...
should be eliminated immediately, regardless of need, low cost or currency. Any such books in an existing collection should be discarded, not given away; deprived children should not be the recipients of inaccurate, outdated or shabby books.

Knowledge of an author's credentials is helpful in selecting books, although some authors with the "proper" background are not always able to present their materials at a child's level. Science writers with the magic formula are the ones to lean on and feel comfortable about buying their books. Even so there is an occasional letdown; books should be considered individually.

Everyone selecting children's science books knows that the date of copyright is especially important, unless the book has a timeless quality such as The New Golden Treasury of Natural History or The Fossil Book. Librarians must be aware that changes in teaching methods should be reflected in selection. Fortunately, the publishers are right on top of this, and may actually be changing teaching methods. New methods include such devices as the discovery method, or open-ended books which lead the reader to discover for himself. Odds and Evens by O'Brien or Estimation by Linn are examples of the open-ended approach, as is Science Projects that Make Sense by Stone, in which the experiments lead young readers to find out for themselves.

However, the discovery method is not for every child. Some children are completely at a loss with open-endedness, because they are timid, insecure, apathetic, or conditioned to wait to be told what to do and how to do it. It is important then, to have both kinds of books in the collection. A Children's Book of Simple Science Experiments by Pacilio is an example of a book that leads each step of the way, but it also allows a reader to think.

Another important criteria of the experiments described is safety. Frequently children perform science experiments as independent projects in school or at home. Perhaps it is being overly cautious not to recommend a book which includes an experiment that suggests the use of matches, a Bunsen burner, or plastic bags, even though the author stresses safety precautions, but one can never be sure that every child will read them in the excitement of carrying out an experiment, or, if he does, one cannot be sure that he will follow them. I fear for the one child who might come to harm.

One must be alert to stereotyped science books, either in text or illustrations, as much as to fiction or picturebooks. There is evidence that authors and publishers are breaking away from the mold, but the market still has few books showing women in laboratories or Black
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scientists. Although the illustrations in today's books may show a variety of ethnic backgrounds, there is still some tokenism, e.g. of ten science experiment books surveyed at random, seven were addressed to boys. Ours is a rapidly changing society and children are deeply affected by it. Any group will question books that leaves them out.

Is the coverage of the book adequate? In The True Book of Spiders, Podendorf answered most of the questions a primary child would ask. In an easy-to-comprehend text, it tells where spiders live, what they eat, how they move from place to place, how they protect themselves, and how they are helpful and harmful to humans. Rosen wrote Spiders are Spinners in charming rhyme, and although scientifically accurate as far as it goes, it is much less appealing to children who like their facts straight.

Carrick dedicated Swamp Spring "to the conservationists who hold back the day when swamps exist only in books" and related it closely to the social problems of today, a criterion not to be overlooked. Children are very interested in the land, and conservation is one of their big concerns. Beaver Pond is a stunning picture book which vividly described the chain of ecological events that result from the damming of a stream. It is both an explanation of ecological balance and the story of an animal's life chain. The Dead Tree is another impressive picture book by Tresselt which deals with the life cycle of a tree and the interdependence of the birds and animals that live in it and around it. In The Mountain, Parnall, with the briefest of texts, graphically illustrates the ways man is devastating the land.

Science books are generally reviewed more for their content than for their literary value, yet the style and quality of writing is just as important in a science book as it is in any other kind of children's book. Some years ago, when my school district was assembling a collection of manuscripts, letters, and original drawings and paintings for children's books, Garrett Griffin wrote, "Good literature for children is a rare thing and the shame of it is that it is so important. Authors tend to write down to children. They spare vocabulary when a child is pleased and flattered to hear words he doesn't know. They produce banal books instead of leaving us a heritage for our children. . . . Well, fortunately there are classics in each generation." These classics would include The Pine Tree, The Big Snow, Houses from the Sea, The travels of Monarch X, The Gull's Way, All Around You, and Birth an Island.

The format of a book can make it or break it. Primary children turn away from the printed page if the type is too small, if there is too much print or if it is too complex. On the other hand, students in the
intermediate grades will scorn a book if its print size or style of illustration look like elementary fare. This is both the publisher's and the librarian's dilemma. The plaintive cry of librarians, if they work in a secondary, middle or elementary school, is "How can I tell? Reviewers seldom let me know whether the size of the print or the illustrations are suitable for a particular level." Fortunate librarians can swap books with another level.

As a reviewer, I am interested in good quality paper and comfortable margins. I make sure that the illustrations clarify and extend the text. I note whether size relationships are made clear, as in McClung's *Aquatic Insects and How They Live* or Webster's *Track Watching*. If the text is printed on colored paper I deliberate over whether a child can read it with ease.

For all levels librarians are faced with the enormous problem of readability. Is the book written within the comprehension of the age for which it is intended? Vocabulary, sentence length and attention span of the reader are all factors to be considered. School librarians would do well to examine the school's basal readers for vocabulary guidance. Some authors work from a basic word list which requires considerable gnashing of teeth and talent on the part of the writer, as Dr. Seuss was to discover when he wrote *The Cat in the Hat* using only 223 words. He survived to tell about his experience in an amusing article, "How to Write a Book for Beginning Readers":

In writing for kids of the middle first grade, the writer gets his first ghastly shock when he learns about a diabolical little thing known as "The List." School book publishing houses all have little lists. Lists of words that kids can be expected to read, at various stages in their progress through the elementary grades.

How they compile these lists is a mystery to me. But somehow or other . . . with divining rods or something . . . they've figured out the number of words that a teacher can ram into the average child's noodle. (Also the approximate dates on which these rammings take place.)

Perhaps storybooks can be written from a word list, but I wonder if all the things a child wants to know about—cells, atoms, ultrasonics—can be? Books like *Good Morning, Mr. Sun, Sounds All About*, and *Light and Dark* are a few examples of successful controlled vocabulary books. (Whether the authors used a list, however, I cannot say.) Happily, there are more and more meaningful science books being published for the primary readers. Youngsters no longer have to depend upon the textbook which, quite often, is too
difficult. A good collection of science books for all levels can more than extend the classroom; it might even replace the textbook.

Fry’s “Graph for Estimating Readability” is a quick and easy way to check the reading level of a book (excluding math books which deal wholly with numbers, some science experiment books, poetry, and audiovisual materials). With the fifth edition supplement, The Elementary School Library Collection began to provide a closer estimate of the reading difficulty of individual books, based upon the Fry graph. Although this ambitious project is by no means completed, of the approximately 1,130 book titles in the science area (eighth edition), about 40 percent of the titles indicate a readability level.

It is not recommended that the reading level of every library book be determined. This would be an appalling task. It is recommended, however, that every librarian be familiar with the process, thus making it possible to come up with the readability answer should teachers or parents request, as they often do, a book at a particular grade level.

When you know that an elementary school reader is selecting books which are too difficult for him, you might show him how to apply Veatch’s “rule of thumb” method which is rather fun and nonthreatening—“Choose a middle page with a lot of words. Read silently. If you come to a word you don’t know, put down your thumb. If you find another, put down your first finger, etc. If you use up all your fingers, the book is too hard, so put it back and try another.”

But if the child still wants a book that is too difficult, let the child have the book he wants. Too often I have heard teachers, librarians and parents say, “No, Johnny. It’s too hard for you. You can’t have it.” What a way to discourage kids! Sometimes a child wants the same book his peers have chosen, for status. Or he wants the book because it is pretty, or the pictures fascinate him. Most children cannot read the Life Nature Library, but they are willing to try. The pictures are indeed fascinating, and I would wager that few adults read them in their entirety, yet they enjoy looking at the pictures. I think that these kinds of books expand the child’s vocabulary and widen his horizons.

Having patiently reviewed the criteria that a librarian considers, or should consider when selecting science books, are librarians going to disregard it all because the curriculum is the only consideration? Will librarians still accept anything if it meets a need? I hope they will reconsider what they owe their patrons.

Science books can be both a jumping off place and a jumping in place. Children who are interested in science can be led easily into a biography of a scientist—Audubon, Carver, Curie, Drew, Faraday or
Fermi, to name a few. Or into poetry. Try Fisher's *Going Barefoot*, which is the lilting story of a boy's joy in going barefoot and his observations of the animal world, or the gay verses about the world of crickets, chipmunks, turtle doves and dandelions, in her *Cricket in a Thicket*. On the other hand, readers of fiction books such as *Everything Happens to Stuey*, *The Space Ship under the Apple Tree*, or *The Enormous Egg* may be motivated to jump into some of the science books.

Caney's *Toy Book*, originally placed in the professional collection, has been located and read by our children. Although directed to adults, it is great fun for kids who learn many scientific principles as they work along with the author who can think the child's thought and talk his talk.

Since science periodicals and audiovisual materials are discussed elsewhere in this issue it would seem repetitive to go into any great detail. Magazines are a vital part of any library collection. *Alaska, Animal Life, Arizona Highways, Audubon Magazine, National Wildlife, Natural History, National Geographic Magazine, School Bulletin, Ranger Rick's Nature Magazine* and *Zoonooz* continue to be useful and popular and are recommended.

Audiovisual materials intended to enrich and support the curriculum should meet many of the same criteria applicable to books. Authentic, current and well-organized materials which are suitable for the range of listening and viewing abilities of the student are desirable. In addition, the technical production should be examined. Look at the artwork quality, photo quality, composition, audio quality, vocal quality and ease of coordination. Is the material economically feasible?

Unfortunately, some producers are unclear about copyright dates. The unwary buyer can get stuck with out-of-date or ancient materials that have been dressed up in a new multimedia package. Even worse, so-called "sets" sometimes include such a variety of subjects that not even Dewey himself could cope.

Being forced to purchase a whole set of sound filmstrips simply because four of them go with one record, or because two filmstrips go with the flip side of the record (which you do not want) is maddening. However, producers are now beginning to offer the consumer some options. It is possible today to purchase a sound filmstrip either as an individual unit or as a set. All in all, it would seem that producers are getting things in hand, making every effort to meet current needs. They do listen to their customers.

The ideal situation is for the buyer actually to see the materials in which he is interested. How else can he apply the criteria? Although
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guidelines are known for evaluating and selecting science materials, not everyone is fortunate enough to see the materials firsthand. There are some librarians who have to select from a state-prepared list (a deplorable practice), while others are locked into a central processing system which is inclined to order multicopies of an item, whether it meets a particular library’s needs or not.

Librarians are, then, dependent on reviews, such as those found in School Library Journal, The Horn Book Magazine, Booklist, Science Books, or Appraisal. All of them are recommended selection sources. Some are more critical than others. Some have a noticeable time lag, but, on the whole, they are useful tools and we cannot do without them. Reviews of audiovisual materials may be found in a growing number of sources. The Booklist, Educational Screen and Audio-Visual Guide Previews, and K-Eight cover a variety of audiovisual materials. A lesser known, but excellent review source is The Bay State Media Evaluation Guild (filmstrips).

Finally, if librarians do not have what patrons are looking for, they might take the advice of one of our little ones. The conversation went something like this:

First grader: “Do you have a book about monsters and what’s inside them?”

Librarian: “I’m sorry but we don’t.”

First grader: “Well, will you make me one ‘cause that’s what I want to learn about.”

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