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Reading the World: The Importance of Teaching Content Knowledge through Trade Books

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Reading the World:
The Importance of Teaching Content Knowledge Through Trade Books

By

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<u>Introduction</u>

If asked the title of your favorite non-fiction book, what would you say? Would you say anything, at all? If at least one title comes to mind, you are a member of a small portion of the American population who recognizes the benefits and enjoyment to be found in expository text. You are fortunate that your interest in non-fiction was not extinguished by years of dull, poorly composed textbooks or that you did not lose interest in reading altogether through over-exposure to fictional texts. In past years, it has been an unfortunate result of the American educational system to post-pone the introduction of non-fiction texts until 4th grade (Duke, 2000; Moss, 2005; Yopp & Yopp, 2000), at which time students are bombarded with incomprehensible textbook readings and often become disillusioned as to the importance of non-fiction in our information driven society.

Nearly all educated American adults have read at least a portion of a textbook. As you are reading this non-fiction text, it is assumed that you are such an educated adult, and whether you have read a single chapter of a textbook or the whole text, it is unlikely it was your first choice in reading material. If you were fortunate, your innate interest in the subject of study was expanded upon by the text. Sadly, most of us are not members of this lucky minority, and instead harbor memories of struggling through torturous reading assignments from poorly written books. As adult readers, we realize that there are times when our need for information surpasses the format of the text, yet as adult readers we also possess numerous strategies that allow us to work through issues regarding inappropriate formatting, inaccuracies, and poor writing styles. Is it necessary to use texts with such deficiencies in elementary classrooms though? No, there are more educationally sound methods of content area instruction. One such example exists in the

form of trade books, for through the use of trade books, children's interest in the veritable

genre of non-fiction can blossom. For years subject-area instruction primarily occurred

through the reading of textbooks, and even to this day, researchers find that a majority of

teachers rely on textbooks to teach content (Kragler, Walker, & Martin, 2005; Morrow,

Pressley, Smith, & Smith, 1997; Palmer & Stewart, 2003; Sullivan-Palincsar & Duke

2004). Textbook inadequacies can be ameliorated through the incorporation of trade

books into the curriculum. High-quality trade books provide students with a meaningful,

engaging, and accurate presentation of content material. The extensive amount of

research supporting this position will be presented in the first portion of this thesis, along

with various implications for classroom practice. It will be followed by an annotated

bibliography of exemplary non-fiction science trade books and sample lesson plans that

demonstrate the use of trade books in the classroom. Each section will provide evidence

in support of the position that extensive exposure to a wide variety of texts is one of the

best methods for maintaining student interest and preparing them for a future powered by

the exchange of information.

<u>Rationale</u>

To culminate my studies at Eastern Michigan University, I decided to investigate a topic that reflects many of the major themes associated with my specialization in the field of education. As my major is reading, the focus of my thesis is a topic concerning literacy education. My minors are integrated science and early childhood education, so I chose to incorporate the knowledge I have gained from each of these areas of study and apply it to the use of non-fiction trade books in the early elementary classroom (Kindergarten - 3rd grade). By reflecting on my knowledge of the use of textbooks in classrooms at all levels of education, and noting students' negative attitude toward assigned readings, I hypothesized that this stance toward textbooks was a result of mediocre quality and insufficient use at the elementary school level. Textbooks appeared to lack meaningful and engaging writing styles, so I contemplated a possible solution. Before I began my review of the literature, I thought the best solution was to replace the dry expository texts with books that employed a narrative structure, for not only would the aesthetic value of the text increase, but also the narrative structure would promote information recall (Kucan & Beck, 1996; Romero, Paris, & Brem, 2005). What better way to introduce children to factual knowledge than by masking it in a narrative text?

As I reviewed the research on textbooks and trade books, I realized that my original solution was incomplete. Non-fiction expository text serves an important function in society, and high-quality informational texts are often as enjoyable to read as fiction. Rather than eradicating expository text from elementary schools, a more beneficial solution is to improve the quality of such text where it is lacking. Therefore, the elementary curriculum should include a balance of both high-quality fiction and non-

fiction texts, to prepare students for the information driven future that they face. This

paper shares the knowledge I have gained regarding the use of non-fiction texts in the

classroom and contributes to the growing compilation of educational literature supporting

the implementation of authentic, high-quality educational environments for all students.

Review of Research and Literature

The Importance of Non-Fiction

Non-fiction, or informational text, plays a critical role in both academic and professional endeavors. Nearly every profession and lifestyle requires skill at using some type of informational text, whether it is deciphering the results of a medical breakthrough, determining the components of a plumbing system, or simply reading the daily newspaper. Just as non-fiction reading encompasses all spheres of life, it also bridges every academic field (Neufeld, 2005), making it an integral component of any educational program. The impact of this genre on current society cannot be overemphasized. As stated by educational scholars Moss, Leone, & Dipillo (1997), "if today's students are to survive in the 'Information Age,' it is imperative that they develop greater familiarity with and understanding of expository text" (p. 418). It logically follows that to develop the necessary degree of familiarity and understanding, students must be taught to effectively interact with such text (Duke, 2004; Hite 2004; Kucan & Beck 31; Narvaez, Van Den Broek, & Barron Ruiz, 1991; Palmer & Stewart, 2003; Piccolo, 1987). Unfortunately, the current American educational system is lacking in the degree of exposure, as well as instruction, that students receive in regards to informational text (Donovan & Smolkin, 2001; Duke, 2000; Dymock, 2005; Palmer and Stewart, 2003).

The "fourth grade slump," a term coined by reading researcher Jeanne Chall (Duke, 2000; Moss, 2005; Yopp & Yopp, 2000), is a prime example of an American educational issue. What causes such a decline in achievement across the nation at this particular grade level? Many researchers suspect it is the challenge posed by a unique

type of reading material students may face for the first time at this level - non-fiction. Researchers Donovan & Smolkin (2001), Duke (2000), and Palmer & Stewart (2003), found that there is a significant lack of non-fiction materials in early elementary classrooms. As a result, when students are exposed to such reading in later years, reading comprehension slides. All is not lost though, and teachers do not need to eradicate fiction or overhaul current early childhood practices, instead they must examine the role of both of these genres - fiction and non-fiction - and assess why students may encounter such difficulty.

One cause for students' difficulty arises from the fact that the brain processes factual information differently than fictional text, and thus the two genres must be read differently (Galda & Liang, 2003; Hite, 2004; Kucan & Beck, 1996; Narvaez et al., 1999; Pappas, 2006; Romero et al., 2005; Rosenblatt, 1980). The first and most notable difference between the genres is simply the stance from which the texts are approached (Galda & Liang, 2003; Hidi & Baird, 1988; Rosenblatt, 1980). While fictional text is and *should be* approached with an aesthetic stance, one concerned with the artistry of writing and global theme of the work (Galda &Liang, 2003; Hite, 2004; Kucan & Beck, 1996; Narvaez et al., 1999; Romero et al., 2005; Rosenblatt, 1980), non-fiction reading requires an efferent approach, focused on individual details to be recalled at a later time to serve a particular purpose (Galda & Liang, 2003; Kucan & Beck, 1996; Romero et al., 2005). As there are separate purposes for reading fiction and non-fiction text, each is composed with different text structures (McGee & Richgels, 1985; Meyer & Freedle, 1984; Piccolo, 1987). While narrative texts generally follow the relatively simple story format, which includes a problem, a climax in action, and a conclusion, along with descriptions of

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setting and characterization, expository texts rarely have any of these components. Instead they may use a combination of structures, including description, sequence, cause and effect, problem and solution, or compare and contrast (McGee & Richgels, 1985; Meyer & Freedle, 1984; Piccolo, 1987). Despite the complexity of textual structures, both fiction and non-fiction texts can be comprehended by even the youngest students (Duthie, 1994; Pappas, 1993; Pappas, 1991). This is only the case though if young children are allowed to access such text.

Despite research to the contrary, the tendency is to approach reading in early childhood education with a "narrative is primary" stance, by which young children interact with texts only written in a narrative or story-like format (Duke, 2000; Palmer & Stewart, 2003; Pappas, 1993). The result is a severe lack of non-fiction materials in the early elementary classroom (Duke, 2000; Palmer & Stewart, 2003). No research exists to support such an exclusion of expository text, and instead, researchers have found that young children understand and even enjoy informational texts (Moss, 1995; Palmer & Stewart, 2003; Pappas, 1991; Yopp & Yopp, 2000). It is likely that failure to provide such texts during a child's early years results in greater difficulty reading expository text later (Duke, 2000; Moss, 2005). Varying structures prevent skills from easily transferring from one genre to the other (Beck & McKeown, 1991; Galda & Liang, 2003; McGee & Richgels, 1985; Pappas, 1991). If a child can identify character, setting, and plot in a narrative story, that does not guarantee he or she will be able to identify the important facts in a selection that compares two expository concepts. Children need examples of both fiction and non-fiction texts to gain skill at navigating both (Meyer & Freedle, 1984; Moss, 2005; Pappas, 1991; Soalt, 2005; Yopp & Yopp, 2000).

In addition to the important role non-fiction text plays in future endeavors, it also has been found to improve children's current level of achievement, especially in regards to factual knowledge, vocabulary, reading fluency, and motivation (Duke, 2004; Moss, 2005; Sullivan Palincsar & Duke, 2004; Palmer & Stewart, 2005). As noted in the research of Palmer & Stewart (2005), "nonfiction can help young readers engage in the critical thinking and research skills needed to build meaningful knowledge and understanding of content area subjects" (p. 427). Each subject has a specialized language, and non-fiction texts can introduce students to such language in context (Pappas, 2006; Soalt, 2005), as opposed to the non-contextual exposure students face with the use of vocabulary drills and quizzes.

Additionally, it is a goal of the National Council for the Social Studies (NCSS) that students "develop the ability to make informed and reasoned decisions for the public good as citizens of a culturally diverse, democratic society in an interdependent world" (as cited in Saul & Dieckman, 2005, p. 509). The ability to make such informed and reasoned decisions requires critical thinking skills, and such skills are identified with the use of high-quality, engaging non-fiction text (Duke, 2004; Moss et al., 1997; Norton, 2003; Saul & Dieckman, 2005). Yet again, these skills can only be achieved if one has experience using the genre of expository text.

A final reason non-fiction is such a vital element to every instructional level is perhaps the most simple -- some students prefer to read informational text (Palmer & Stewart, 2005; Palmer & Stewart, 2003; Pappas, 1991; Romero et al., 2005; Yopp & Yopp, 2000). It is exciting to discover seemingly new information that reveals answers to pressing questions and explains the physical world. The love of leaning is nurtured by

this genre, and the pursuit of knowledge is a passion all teachers should encourage. For students who prefer non-fiction text, the provision of such materials will motivate them to read. Boys in particular, seem to possess great interest in many non-fiction topics (McFann, 2004; Taylor, 2004). Providing them with such materials may serve as a possible solution to alleviating the reading achievement gap between genders (Taylor, 2004). Interest in reading is essential to increasing the development of reading skills. The more interested students are in reading, the more they will read and gain practice using reading skills. As stated by Saul & Dieckman (2005) "reading skills improve because students attracted to these books read more and with greater attention because the books … are interesting and inviting" (p. 506).

Reviewing such research, one can conclude that the role of non-fiction in the classroom is as vital as the role of reading instruction in general. By incorporating quality informational literature into classroom instruction, there is more to be gained than lost, regardless of the students' educational level.

The Textbook Debate

While there is little debate regarding the importance of including non-fiction literature in the classroom, the issue of how to effectively present non-fiction selections is of greater contestment. Two types of non-fiction text have found their way into American classrooms. First, the reading material that is most commonly used in the classroom is the textbook – a thick compendium of knowledge often concerned with "extensive, not intensive, treatment of subject matter" (Vacca & Vacca, 1999, p. 38). The second is a relatively new genre that emerged in the 20th century and has since

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increased in popularity (Giblin, 1992; Vacca & Vacca, 1999) – children's informational

trade books.

The term *trade books* refers to the group of texts one can purchase in a local

bookstore. Such texts are not created solely for instructional purposes, but also with the

intent to entertain or at least be of interest to the reader (Donovan & Smolkin, 2001).

Trade books can be separated into the two familiar categories of fiction and non-fiction

literature. Additionally, non-fiction trade books can be divided into three additional

categories based on the linguistic style of the writing – narrative, expository, and

combined-text (Donovan & Smolkin, 2001; Duke, 2000; Dreher & Voelker, 2004).

Narrative text is written following the familiar story format with a linear

progression from problem to solution (Dreher & Voelker, 2004). Generally, the primary

purpose of a text written in a narrative tone is to entertain, and readers should globally

process the text, as opposed to focusing on detail, logic, and reason (Galda & Liang,

2003; Kucan & Beck, 1996; Romero et al. 2005). In such a text, non-fiction information

is often of secondary importance to the story (Donovan & Smolkin, 2001).

In contrast, expository text seeks to transmit knowledge and factual information

on a topic and can take the form of a variety of structures including, description,

collection, cause and effect, problem and solution, and comparison (McGee & Richgels,

1985; Meyer & Freedle, 1984). [1] Although expository texts can be divided into five

categories, it is important to note that most texts contain a combination of these structures

(Beck & McKeown, 1991; Galda & Liang, 2003; Scharer, Lehman, & Peters, 2001), and

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[1] The terms for specific patterns may vary, but most research correlates with these five.
The term *causation* sometimes replaces cause and effect and *collection* may be replaced
by enumeration or sequence (Piccolo, 1987).

it is this great variety in structure that can make expository text difficult to comprehend, especially if children do not become familiar with it at an early age (Duke, 2000; Moss, 1995; Pappas, 1991). In addition to text patterns, Yopp and Yopp (2000) identified specific differences in the writing style present in non-fiction texts, including the use of timeless verbs, generic nouns, technical vocabulary, and the repetition of the topical theme.

The third category of non-fiction trade books, one that is particularly prominent in children's literature is combined text or multigenre books (Chapman & Sopko, 2003; Tompkins, 2005). This type of text employs characteristics of both narrative and expository texts. It is usually written in a narrative format with sidebars that contain informational text. The most common example is the Magic School Bus books by Joanna Cole, which carry an entertaining story line infused with snippets of science content knowledge.

Currently, the majority of content area instruction relies on the use of textbooks (Kragler et al., 2005; Morrow et al., 1997; Palmer& Stewart, 2003), while classroom libraries are dominated by fiction selections (Dreher & Voelker, 2004; Duke, 2004; Duke, 2000). As Duke (2000) found in her research on non-fiction instruction in the primary grades, primary level classrooms suffer from a significant lack of non-fiction reading materials, with the result that children merely receive 3.6 minutes of non-fiction reading each day. As narrative and expository text structures are inherently different, skill at reading narrative does not automatically transfer to expository texts (Pappas, 2006; Yopp & Yopp, 2000). Thus, a lack of exposure to expository text results in students' inability to adequately comprehend it.

Such research leads one to the conclusion that there is a significant need for non-fiction in the elementary classroom, but not just any type of non-fiction book will do. Quality is of paramount importance if trade books are to effectively support students' interest and engagement in text.

The Trouble with Textbooks

The breadth of textbooks allows for a great deal of information to be shared in a short amount of space. Such construction may help students identify broad ideas across a genre and possibly encourage students to delve further into the topic. As stated in the introduction, textbooks are a literary format students must use as they progress to higher levels of education, and familiarity with textbooks will ease this transition.

Yet, textbooks pose a number of problems for young readers. The most prevalent issue is that in an effort to cover a wide scope of information, textbooks are generally lacking in detail, and thus students are provided with an insufficient amount of explanation on a greater number of concepts than they can easily process (Donovan & Smolkin, 2001; Palmer & Stewart, 2003; Vacca & Vacca, 1999). This is especially problematic for young readers who lack the prior knowledge necessary to construct the missing connections (Donovan & Smolkin, 2001; Soalt, 2005). Research has shown that when students are able to connect their own prior knowledge to the text, comprehension increases (Beck & McKeown, 1991; Beishuizen et al., 2002; Lapp & Flood, 1993; Lehman & Schraw, 2002; Scharer, Lehman, Peters, 2001; Soalt, 2005; Street, 2002). Thus, effective books need to provide students with the necessary prompts and details that will allow them to make such connections. Without these connections, the words that students decode are meaningless and little content knowledge can truly be learned.

In addition to the deficiency of detail, another issue textbooks pose for readers is in regards to writing style. The writing style textbooks employ is often dry or beyond the students' reading level (Donovan & Smolkin, 2001; Moss et al., 1997; Palmer & Stewart, 2003; Villano, 2005). In turn, this results in students' loss of interest in the text, resulting in a loss of interest in the topic. Interest often correlates with comprehension such that as interest decreases so does text processing, strategy use, and comprehension (Guthrie et al., 1996; Hidi & Baird, 1998; Saul & Dieckman, 2005).

Also, textbooks rarely encourage readers to question the text or the point of view from which it is written (Beck & McKeown, 1991), leaving definite gaps in both reading skills and content knowledge. Rather than enticing children to exercise critical thinking and reasoning skills, textbooks serve as knowledge dispensers – with a quarter's worth of reading, students may gain a handful of knowledge. In a study conducted by Palmer & Stewart (2003), it was discovered that classroom "use" of a textbook, usually consisted of the teacher interpreting the text for the students, as they could not comprehend the text on their own due to missing background information and an inappropriate reading level. In Beck & McKeown's (1991) analysis of textbooks, they found that many books employed obscure language and inconsistent structures, or were simply above most students' reading level.

While the organization of any expository material may pose as an obstacle for students unfamiliar with expository writing, illustrations can offer an alternative method of comprehension. Yet in some textbooks, the illustrations are not placed near the corresponding text, impeding this element of comprehension assistance (Camp, 2000).

The combined elements of poor writing style and confusing text organization contribute to the difficulties that students face when reading high-density textbooks.

A final issue regarding textbook use is accuracy. Although textbooks have become more accurate in recent years (Holiday, 2004), some textbooks, especially in the field of science, either are published with inaccuracies or become inaccurate quickly due to new developments in the field (Bamford & Kristo, 2003; Dowd, 1992). To replace a series of texts is too expensive to do frequently, so teachers must be wary of inaccuracies that will lead to the misinformation of students and cause gaps in comprehension.

Textbooks also often fail to provide a variety of perspectives on a topic, which will lead students to believe there is simply one way of approaching an issue. Thus, teachers must take note of any biases in the textbook and provide students with more complete versions of the information. Even though Holiday (2004) and Shanahan (2004) note that textbook publishers have improved the quality of texts in recent years by incorporating more concrete examples to enhance background knowledge, higher-quality language, and fewer errors, textbooks still do not provide the depth of content or variety of reading levels and structures that can be found in trade books.

Benefits of Trade Books

Trade books ameliorate many of the issues that arise from the use of textbooks. Unlike textbooks, trade books tend to focus on a single concept and cover it in great detail, thus providing students with the amount of background information necessary to fully comprehend the topic (Camp, 2000; Morrow et al., 1997, Saul & Dieckman 2005, Vardell 1991, Vacca & Vacca, 1999). As described by Moss (2005), " these books [non-

fiction trade books] let children explore the real world through texts that are inviting, accurate, and accessible" (p. 51).

Not only does sufficient depth provide a greater number of prompts for activating prior knowledge, but it also provides a higher degree of accuracy (Bamford & Kristo, 2003). As such, the texts become more authentic, for they are similar to the reading selections adults choose when exploring a topic. In a study conducted by Purcell-Gates & Duke (Sullivan Palincsar & Duke, 2004), it was found that more authentic examples of reading selections increase students' ability to read and write information, as well as process text.

Providing a variety of texts encourages students to evaluate the quality of the texts, as they determine which books are both enjoyable and applicable to their goal in the exploration of the topic of study (Dreher &Voelker, 2004; Vacca & Vacca, 1999; Bamford & Kristo, 2003). Trade books teach students "*how* to think, not *what* to think," (Vardell, 1991, p.474) as each text offers a unique point of view and serves a separate purpose, encouraging critical thinking skills (Bamford & Kristo, 2003; Morrow et al., 1997; Vacca & Vacca, 1999; Vardell, 1991). Only if the teacher brings such a concept to students' attention, will they will recognize the multiplicity of viewpoints an issue may present.

In addition to offering a lighter concept load than textbooks, generally trade books also offer a more attractive writing style, which in turn makes content material more accessible *(*Moss et al., 2005; Vacca & Vacca, 1991*)*. As discussed earlier, research has found that the more engaging the text, the greater the reader's comprehension of the information (Hidi & Baird, 1988; Guthrie et al., 1996; Saul & Dieckman, 2005), thus an

engaging writing style is a vital component to any text. Many trade books employ techniques common to narrative literature, such as figurative language and scene setting, which add to the aesthetic texture of the material, increasing student engagement (Duthie, 1994; Giblin, 1992; McClure, 2003; Moss, 1995). Saul & Dieckman (2005) point out that in trade books, the scientific language and terminology associated with the subject is contextualized, helping students develop greater understanding of vocabulary and how it is used. Additionally, the page format itself is organized to be more attractive to readers, with illustrations, charts, and diagrams (Donovan & Smolkin, 2001; Dowd, 1992; Vardell, 1991; Villano, 2005).

When reading non-fiction trade books, students should still approach the texts from a primarily efferent stance, as the purpose of such reading is to gain information, but they should enjoy the more aesthetic features of the text as well (Bamford & Kristo, check; Vardell, 1991). Since trade books are sold in bookstores, authors must focus on "selling" the book, thereby requiring the text to be entertaining, yet accurate and up-to-date. Trade books easily surpass textbooks in their ability to provide high quality, attractive writing styles.

Finally, all these characteristics of trade books increase student engagement and enjoyment in the text. The variety of styles leads to variety in reading levels, thus with informational trade books, teachers can select the most appropriate text for their students (Bamford & Kristo, 2003; Tompkins, 2005; Vacca & Vacca, 1999). This ensures that students develop the self-reliance that will allow them to develop a love of learning (Norton, 2003).

Trade books offer teachers an engaging, developmentally appropriate way to introduce expository text structures and content information, and when "students… have the opportunity to make connections between what they read and what they already know [they] are also more likely to read for their own pleasure outside the classroom" (Scharer et al., 2001, p. 297). Furthermore, more reading leads to more practice using skills that will last a lifetime.

Assessing the Quality of Trade Books

While many of the qualities of trade books remediate the inequities of textbooks, this evidence should not be misconstrued to support the use of only trade books and the complete exclusion of textbooks. All trade books do not provide the above benefits, just as all textbooks are not fraught with errors and inaccuracies. Teachers need to carefully evaluate and select the most appropriate text for their classroom by evaluating students' abilities and interests. Once teachers have decided to explore a topic through the use of trade books, they must have an efficient method by which to independently determine the quality of such a text, for unlike the process through which textbooks are chosen, there will not be a committee to debate the benefits and disadvantages of the material.

Fortunately, a number of researchers and educators have established various methods for determining the quality of a non-fiction trade book. Before examining the individual components of non-fiction books, it is wise to remember an eloquent statement made by author Russell Freedman (1992), that "an effective non-fiction book must animate its subject, infuse it with life … create a vivid and believable world that the reader will enter willingly and leave only with reluctance" (p.3). The best fiction texts

achieve such a grand ideal, and there is no reason why non-fiction books cannot accomplish the same feat.

To assist teachers with the process of choosing non-fiction trade books, many prominent writers in the field of literacy have developed parallel lists establishing the components of high-quality non-fiction. Moss (1995) describes the five "A's": Authority of the Author, Accuracy of the text, Appropriateness of the Book, Artistry (literary), and Appearance. These five characteristics parallel Bamford and Kristo's (2003) elements of Accuracy, Organizing Structure, Access Features, Writing Style, and Visual Aspects. While each set offers valuable insight on the genre, Sylvia Vardell's (1991) categories seem to combine and condense Moss' and Bamford & Kristo's categories, thus her evaluative method appears to be the most comprehensive and efficient of the three. Vardell's description combines Moss' characteristics of "author authority" and "accuracy of text" into the single category of *accuracy*, and combines Bamford and Kristo's "organizational structure" and "access features" into the category of *organization*. Thus, Vardell's four categories are accuracy, organization, writing style and design (1991).

Accuracy

No informational text is worth the paper upon which it is written if it does not accurately portray the topic. Vardell (1991) lists seven specific criteria that must be present for a book to be deemed accurate. First, she states that facts should be current and complete, a matter that can be assessed by checking the copyright date and by comparing the book to others on the same topic, searching for discrepancies. While

generalizations may be helpful in simplifying complex topics for young readers, content

material must not be oversimplified so as to foster misleading conclusions (Bamford &

Kristo, 2003). For example a physical science book may explain that when the

temperature of matter increases, the movement of the atoms causes the matter to expand

in size. This statement is true for most objects, though it is quite inaccurate regarding the

most common molecule on Earth, water, which expands as it freezes. If exceptions to a

rule exist, they should be noted, regardless of the book's reading level (Bamford &

Kristo, 2003).

Dowd (1992) also describes an issue related to this element of accuracy, the

importance of making clear distinctions between fact and theory. Scientists theorize that

a natural disaster resulting from the collision between a large meteor and Earth's surface

led to the extinction of the dinosaurs. While a significant amount of evidence has been

collected to support this conclusion, it is not a fact, and books on the topic should provide

evidence supporting this theory as well as the speculation concerning additional theories.

Not only does the inclusion of such detail improve the book's accuracy, such

explanations demonstrate the method of scientific inquiry, another important aspect of

quality non-fiction trade books (Lapp & Flood, 1993; Pappas, 2006).

Vardell 's (1991) description of the elements of accurate texts also includes the

necessity for the provision of various viewpoints and an absence of stereotypes. And, her

final two aspects of accuracy include adequate author qualifications and authentic details.

Author authenticity is an issue approached by numerous evaluators and researchers of

children's non-fiction literature (i.e. Bamford & Kristo, 2003; Dowd, 1992; Vardell,

1991). While it is a common and well-accepted aspect of children's trade literature that

authors are rarely an "authority" on the topic about which they write, a list of sources or collaborating authorities should be listed to ensure accuracy (Dowd, 1992; Moss, 1995). In the text by Bamford & Kristo (2003), evaluators are reminded of the importance of identifying author bias.

The characteristic of authentic detail is clarified by Dowd (1992), who argues that texts with anthropomorphic and teleological elements (i.e. portraying animals/objects/natural events with human characteristics which they do not have) should be avoided. While Guthrie et al. (1996), McClure (2003), and Moss (1995) point out that the elements of non-fiction texts such as action verbs, character identification, and scene setting, increase engagement in text, anthropomorphism depicts an inaccurate example of the topic. Dowd (1992), Giblin (1992), and Pappas (1991) suggest that if a book is read for its factual content, fictionalization detracts from the accuracy of detail.

Organization

While accuracy is the most important element in regards to the text authenticity, the students' ease of comprehension relies on Vardell's second two categories – organization and writing style (Beck & McKeown, 1991; Beishuizen et al., 2002; McNamara, Kintsch, Songer, & Kintsch, 1996). Expository text organization is generally regarded as the aspect of non-fiction text that causes the greatest amount of difficulty for students (Beck & McKeown, 1991; Duke, 2000; Dymock, 2005; Kucan & Beck, 1996; Moss, 2005). It is the numerous text patterns of this genre that are cited for resulting in the "4th grade slump" when children are often met with a significant quantity of expository text for the first time (Duke, 2000; Moss, 2005; Yopp & Yopp, 2000).

A research study conducted by McNamara (1996), found that a coherent text is especially helpful in improving comprehension when readers are unfamiliar with the topic, thus while the organization of expository text may not be as linear as narrative text, the pattern should be logical (Vardell, 1991). The chosen text pattern, be it description, sequence, cause and effect, compare and contrast, problem and solution, or any combination of such patterns must flow from the text (Bamford & Kristo, 2003). While a single text can employ a variety of these organizational structures (Bamford & Kristo, 2003; Beck & McKeown, 1991; Galda & Liang, 2003), Vardell (1991) asserts that all quality texts should follow a predictable pattern moving from general to specific or simple to complex concepts, so as to be easily understood.

Writing Style

Similarly vital to comprehension is Vardell's element of writing style. Uninviting writing styles plague textbook materials (Palmer & Stewart, 2003; Villano, 2005). Palmer and Stewart's (2003) research reveals a lack of well-written, age-appropriate texts in elementary classrooms. Trade books provide a method by which to remedy this problem, but only if teachers carefully analyze the quality of prose in the selected trade books. An ideal book "goes beyond facts to present an eloquent, informed, and well-crafted discussion of those facts…[thereby generating] the same involved, enthusiastic response" (McClure, 2003, p. 79). While maintaining the accuracy and the scientific language of the field, trade books may also employ poetic devices of narrative literature such as figurative language and comparisons (McClure, 2003; Moss, 1995), which create a more vibrant and enticing style.

The language should denote a voice that demonstrates enthusiasm and passion for the topic (McClure, 2003; Vardell, 1991). Rather than condescending, the best books have a conversational or humorous tone (McClure, 2003), for such language appeals to children's curiosity (Vardell, 1991) and will lead them to seek additional knowledge (Guthrie et al., 2003). Specific elements of language to locate in well-written texts include varied sentence structures, the use of appropriate vocabulary, precise verbs, and leads and conclusions that draw the reader into the text (McClure, 2003). In addition to the elements of fine writing, teachers must ensure that books are available to match each student's reading level, so as to encourage self-reliance through the construction of personal meaning from the text, rather than dependence on the teacher (Morrow et al., 1997; Palmer & Stewart, 2003).

Design

A final aspect of Vardell's evaluative guidelines is the design of the text. It is the most aesthetic aspect of the book and includes its illustrations, format, and typeface (Vardell, 1991).   The long stated aphorism "a picture is worth a thousand words," certainly applies to non-fiction texts. The inclusion of illustrations in a text allow for a variety of readers to engage in text regardless of reading abilities, by clarifying and organizing information with minimal use of words (Vacca & Vacca, 1999; Villano, 2005).

Dowd (1992) lists four criteria that illustrations must meet to achieve such a purpose. First, Dowd states that illustrations should be an extension of the text, not a mere ornament. They should support the facts provided in the prose without embellishment – thus once again anthropomorphism and teleology should be minimized,

as well as images that have been doctored by a computer. Photographic images should include appropriate size relationships, so that children will realize when a magnification or enhancement to the picture has occurred. Dowd's second criterion correlates with the third -- which is the necessity of clearly captioned and labeled illustrations. It is immensely frustrating for both adults and children to scour the body of the text in search of an explanation for an image of interest. Lastly, the fourth characteristic Dowd lists is effective layout.   Illustrations, charts, and graphs should be placed in close proximity to the corresponding text, so students do not have to flip pages to find the pictorial material to which the text refers. This error is common in many textbooks (Camp, 2000), yet when corrected, immeasurably improves text readability. Not only do illustrations increase readability, they help to break up long sections of text, which -- along with small typeface, narrow margins, and a lack of subheadings, often discourage readers from attempting to decode the text (Dowd, 1992).

It takes time to sufficiently evaluate trade book materials, and while this expansive variety is beneficial to readers, it can be overwhelming to teachers. As a result, many teachers come to depend on textbooks to teach content area material (Morrow, et al., 1997; Palmer & Stewart, 2003), despite the inadequacies of such texts. What would be more advantageous is for teachers to assist each other by creating lists of books they have found effective for a particular unit, and share these lists with co-workers and peers. Organizations, such as the National Science Teachers Association, the National Council of Teachers of English (Orbis Pictus awards), the American Library Association, and the National Council for the Social Studies (Hepler, 2003, p. 5) all have produced lists of exemplary trade books, which can be accessed on-line and may be used

in a variety of classrooms across the country. Such resources are described in greater

detail in the *Applying Research to Practice* portion of this paper.

Even students can help evaluate books when given the proper prompts (Moss,

2005).   Both teachers and students must simply remember that non-fiction should "speak

to their questions about their world and about themselves, as well as model an inquiry

process worthy of emulation" (Vardell, 1991, p. 476).

Research Conclusions

As we soar into the "Information Age," never before has non-fiction text played

such an important role in both content area and literacy instruction. Access to

information through the Internet and other forms of media technology requires skill at

effectively comprehending and evaluating expository text. Fortunately, the number of

age-appropriate and engaging non-fiction trade books has increased, providing a palpable

variety of materials through which teachers and parents can introduce factual information

(Vacca & Vacca, 1999).

When young children are exposed to various types of reading materials, they

develop greater facility using a number of texts as they grow older, learning skills they

can use across the content areas and throughout a lifetime (Duke, 2004; Duke, 2000;

Hite, 2004; Moss, 2005; Palmer & Stewart, 2003). Wide exposure to a variety of

materials is one of the best methods for maintaining student interest and preparing them

for the future (Moss et al., 1997; Palmer & Stewart, 2003). Textbooks provide a concise

outline of content material, and since they are a challenging text format, students must be

prepared to confront such a format as they grow older. Eliminating such texts would fail

to prepare students for later educational endeavors, a mistake as damaging as never providing authentic trade book materials at all.

Research reveals that a balance between textbooks and trade books in elementary classrooms is of greatest benefit to students (Kragler et al., 2005; Morrow et al., 1997). Textbooks can provide an outline of content material, while trade books support in-depth research and the evaluation of alternate perspectives, as well as offer the quality and variety necessary to attract a kaleidoscope of readers. The depth of knowledge provided by trade books helps children learn how to learn. With trade books, students can explore topics that interest them through up to date, meaningful, and authentic texts, thereby constructing a solid knowledge base and empowering their minds with the critical thinking skills that will help them become better students and better citizens of a global society (Moss, 2005; Moss et al., 1997; Pappas, 2006).

<u>Applying Research to Practice</u>

Applying Research to the General Classroom

The research regarding trade book use provides us with significant insight on the importance of using various texts in the classroom. However, such research is of little consequence if not applied to classroom practices. Many of the above-cited researchers extend their studies to provide suggestions as to what actions teachers can take to improve the quality of non-fiction reading and learning. Duke (2004) addresses four needs that must be met to adequately incorporate non-fiction into any classroom.

Providing Access

First, the students must have access to appropriate materials. As found in the study conducted by Palmer and Stewart (2003), there is a lack of engaging, age-appropriate materials in present-day elementary classrooms. Generally, teachers are forced to lead the class through a text that is too difficult for students to manage on their own (Moss, 2005; Palmer & Stewart, 2003). As a result, students retain little of the content material and fail to develop the skills necessary for independently engaging with non-fiction text (Moss, 2005). Before these skills can be learned and knowledge gained, students must have access to quality, age-appropriate materials. Additionally, before such materials can be provided, teachers must overcome what Vacca & Vacca (1999, p. 47) propose as one of the greatest difficulties teachers face -- selecting appropriate texts. To assist teachers in achieving this goal, various organizations have crafted book lists of well-respected non-fiction literature. Such book lists include the Orbis Pictus Award, Outstanding Science Trade Books for Children – NSTA, and the International Reading

Association's Children's Choices (Bamford & Kristo, 2003 p. 5 – add to bib.)[2]. Access

to these texts can be achieved with relative ease, for trade books are available at most

bookstores and libraries, unless the book is out of print. The use of such lists reduces the

time a teacher must spend scouring the shelves of local bookstores and libraries for

quality literature. Instead he or she must only identify the particular texts that are most

appropriate for the class at that time. Both children and parents can be encouraged to use

the lists, creating an even more authentic learning experience as students travel down a

path of individual discovery. Additionally, access to magazines and newspapers,

additional forms of authentic expository text, will promote even greater individuality,

independence, and interest, as these sources will reflect topics of immediate relevance.

For example, an article on the contamination of a local wetland can be used to spark a

class discussion on the topic of pollution and how to prevent it. The class may even

pursue the topic further by bringing the issue to the attention of the community through a

class project and presentation.

Providing Time

The second element necessary to improve expository text instruction is time

(Duke, 2004). There is no instant recipe for knowledge, thus students must be allowed to

explore and study a topic for a sufficient length of time to ensure that authentic learning

occurs. Moss (2005) recommends that at least one-third of the reading that occurs in an

early elementary classroom be of non-fiction text. Such an extension of time would

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[2] A list of such resources is provided at the end of this thesis, along with an annotated
bibliography of trade books that can be incorporated into the elementary science
classroom.

certainly be an improvement over the current 3.6 minutes per day of non-fiction reading that occurred in most early elementary classrooms according to Duke's study (2000).

Unfortunately, in an ever more comprehensive curriculum, time is a commodity that often runs short, so to alleviate some of this pressure, a popular suggestion is for teachers to implement an integrated curriculum (Lapp & Flood, 1993; Morrow et al., 1997; Moss, 2005). Rather than dividing the day into separate subjects, an integrated curriculum incorporates a number of subjects into one unit of study, allowing both content material and skills instruction to be taught through one broad topic. The integrity of any individual subject must not be lost, thus instruction must be carefully managed to ensure students receive adequate instruction in all subjects (Lapp & Flood, 1993; Morrow et al., 1997). The techniques of learning can be taught through any content area, and by allowing students to choose the direction of an investigation, the learning that occurs will be ever more meaningful. In everyday life, people employ a number of skills from various genres to achieve their goals, thus integration ensures that authenticity is maintained. An integrated curriculum would use a variety of texts to teach content area information, as well as literacy skills, such as the ability to recognize text structures, decode vocabulary through contextual clues, and choose the appropriate book for a task. Once armed with the tools to learn, these skills can be applied to nearly any leaning situation, opening the doors to all genres of knowledge.

Providing Authentic Opportunities

The concept of integration leads to Duke's third requirement for the improvement of content area instruction -- opportunities to interact with authentic materials (Duke, 2004; Guthrie et al., 1996; Moss, 2005; Sullivan Palincsar & Duke, 2004). The more

authentic a learning experience is, the greater the improvement in student ability (Duke 2004; Guthrie 1996; Sullivan Palincsar & Duke, 2004). One method by which to increase the authenticity of a learning experience is to let students choose the topic of research (Palmer & Stewart, 2005), to ensure that it is a reflection of their interests. As authentic learning occurs, the students' use of various skills will improve (Guthrie 1996; Saul & Dieckman 2005; Sullivan Palincsar & Duke, 2004) for the more relevant the topic is, the more deeply the brain processes the information (Lehman & Schaw, 2002; Scharer, Lehman, & Peters, 2001). When students are studying a topic of personal interest to them, they experience an intrinsic motivation to learn (Guthrie, 1996), and such an intrinsic motivation is required for one to truly enjoy the academic environment and set the foundation for life-long learning. The use of various texts will support students' independence and motivation for learning, and when empowered with the skills necessary to read such texts, students will be able to choose multiple sources of information and use them with confidence.

Providing Instruction

Finally, and perhaps of greatest concern to teachers, students must receive instruction on how to effectively mediate the difficulties they face when reading expository text (Duke, 2004; Kragler, Walker, & Martin, 2005; Kucan & Beck, 1996; Palmer & Stewart, 2005; Piccolo, 1987). Researchers offer a plethora of methods to transition students from teacher-directed to independent learning experiences with expository materials. Trade books can be an integral part of such a process.

This process of transition from teacher led to student led learning is mediated through the use of instructional scaffolding. Scaffolding is an instructional method

associated with Vygotsky's "zone of proximal development," a theory that states that optimal learning occurs when the new information is just beyond the student's independent level of knowledge (Tompkins, 2005, p. 11). With this instructional technique, teaching becomes a "gradual release of responsibility", as students are provided with only enough instruction to guide them to the next level of the learning process (Clark & Graves, 2003; Tompkins, 2005, p.12). Palmer and Stewart (2005) list three levels of instruction that can be used to transition students from teacher-directed lessons, to scaffolded instruction, and finally to independent inquiry.

A number of teacher-directed instructional strategies exist, and while such strategies explicitly present the material to be learned, no single method is decidedly the best, it is simply dependent upon the teacher's personal style. No single method should be used exclusively, as a method of instruction that fits one context one year, may not be as appropriate the following year. For this reason, it is important for teachers to be familiar with a variety of practices including: modeling (Palmer & Stewart, 2005; Piccolo, 1987), read-alouds (Moss 1995; Moss et al., 1997; Yopp & Yopp, 2000), explicit instruction/mini-lessons (Duthie, 1994; Neufeld, 2005), and teacher led discussions of the text (Camp, 2000).

Some teachers may begin a topic of study by reading a science selection aloud and directing students' attention to the structure and features of the text (Moss, 2005; Moss 1995; Yopp &Yopp, 2000). Read-alouds are especially helpful in introducing non-fiction text to young children, and with greater exposure to this genre, students will develop knowledge of its format and organization (Duke, 2004; Moss et al., 1997; Palmer & Stewart, 2005; Pappas, 2006). As the most prominent problem students encounter with

non-fiction reading is a lack of familiarity with text structure, discussing specific types of expository texts and how they are organized will help students achieve success by independently working with text (Clark & Graves, 2005; McGee & Richgels, 1985; Piccolo, 1987). Teachers may even have students model the writing style used in a particular non-fiction trade book to emphasize the elements of this genre. Such an activity is commonly performed with alphabet books, but can be applied to any number of texts at any grade level.[3]

Teachers may also use various methods to prime students' prior knowledge (Beck & McKeown, 1991; Palmer & Stewart, 2005), leading to a greater number of text-to-life connections. One method of structuring such a lesson is through Directed Reading-Thinking or Listening Activities (DR-TA or DR-LA). In DR-TA or DR-LA, the teacher asks students to reflect on prior knowledge, identify the facts they know are correct, and read the expository material to clarify facts of which they are unsure (Camp, 2000). This will guide students to identify important information. Reciprocal teaching, where students question, summarize, clarify, and make predictions to teach themselves material, is a similar method by which to address text use in the content areas (Clark & Graves, 2005).

Along with direct instruction on specific text structures and features, teachers can also scaffold student learning. This can be accomplished through the use of graphic organizers and beginning-, during-, and after-reading activities. Such "scaffolds" include creating a KWL chart where students list what they Know before reading a text, what

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[3] A sample pattern book lesson is included in Appendix C.

they Want to learn from reading it, and what they did Learn after completing the selection (Camp, 2000; Tompkins, 2004, p. 429).

A similar activity is QAR (Question-Answer-Relationship), which helps students recognize that the answer to a question may be found directly in the text or it may require the student to reflect on their own thoughts to create the answer (Tompkins, 2004, pp. 300-301). Taffy Raphael, the creator of this strategy, lists four levels of questions that increase in the degree of inferential thinking required to elaborate on an answer: Right There Questions (directly from the text), Think and Search Questions (in the text but may be spread across a section), Author and Me Questions (the student must use their own as well as the author's ideas to formulate a response), and On My Own Questions (the student reflects on his or her own ideas) (Tompkins, 2004, p. 301).

Another popular method of content reading instruction is SQ3R, which is an acronym for Survey, Question, Read, Recite, and Review. SQ3R is a procedure students can use to approach non-fiction text, in which they individually survey the text to take note of headings, write a question for each heading, read the text, recite the answer to their questions, and review the material upon the completion of their reading (Tompkins, 2004, p. 446).

Teachers may also provide various graphic organizers, including concept webs and Venn diagrams (Camp, 2000), which are especially helpful at addressing the varied patterns of expository text. Separate graphic organizers can be used to illustrate each text pattern. Problem/Solution and Cause/Effect can be summarized in the form of a two column graphic organizer; compare and contrast is effectively portrayed through a Venn

diagram; descriptive text can be extrapolated through a concept web, and when the facts

denote a certain order, students may create a numbered list.

Another method of scaffolding involves selecting a class topic and moving the

class through the stages of inquiry, from identifying the question or topic, collecting data,

and presenting this information in an appropriate format (Palmer & Stewart, 2005). At

the culmination of this process, students have the skills necessary to break free from their

teacher's guidance and pursue their own topics through independent research and writing.

It is at this stage of the process that students can explore a subject of individual interest

and choose a method by which to share it with others. The greater variety of non-fiction

texts students read, the greater their ability to compose their own non-fiction texts (Lapp

& Flood, 2004, p. 75; Moss, 2005; Moss et al., 1997; Palmer & Stewart, 2005; Saul &

Dieckman, 2005). To accomplish this feat, students must use many of the strategies they

learned above and have access to classroom, school, and public libraries, as well as

sufficient time to use these resources. Even the students' parents and members of the

community can become involved in the learning process, as students seek out factual

information and use it for an authentic purpose of informing others. In this way, students

become capable of one of the most authentic and meaningful learning experiences --

individual inquiry; and non-fiction text is the key that opens the door to this world.

Applying Research to the Science Classroom

Science is often second to reading and math in the early elementary school

curriculum, and many teachers seem to find this subject more difficult to integrate into

the curriculum than social studies, yet it is a subject that ignites curiosity. Science

reveals answers to the questions young children have about the world: why is grass green? Why do some things float and others sink? Why don't objects fall up?

While certainly the ability to read and calculate is necessary to fully participate in the scientific process, science instruction should not be lost at the expense of other subjects (Duke, 2004). Science provides a context for the skills gained in reading and math. The inclusion of science, without the loss of math and reading instruction, can be accomplished with an integrated curriculum approach (Lapp & Flood, 1993, p. 80; Morrow et al., 1997; Pratt & Pratt, 2004, p. 397).

What is the best method of instruction for the science classroom? Effective strategies for any particular teacher depends on the teacher's own style and strengths, as well as the interests of the students. No single approach is best, yet certainly some methods offer more benefits than others (i.e. methods that allow students to experience the nature of science and the construction of knowledge, as opposed to the memorization of facts and formulas). Science is not simply the learning of data and facts, but also the understanding of how scientific thinking is practiced or the "nature of science" (Donovan Smolkin, 2001). Even though science often calls for a hands-on approach to content, text is also an important element of the scientific process (Dyasi & Dyasi, 2004, p. 420; Guthrie, 1996; Neufeld, 2005; Pappas, 2006).

A significant amount of research supports subject integration as an effective means of achieving an authentic learning environment in which science and reading are balanced (Lapp & Flood, 1993; Morrow et al., 1997; Moss, 2005; Sulivan Palincsar & Duke, 2004). As Moss (2005) states, children "learn to read, at the same time they read to learn," (p. 50) and through this process students can develop self-reliance and

meaningful learning experiences. As the study of science is the study of the natural

world, it is of great benefit to keep instruction as authentic as possible (Donovan &

Smolkin, 2001; Dyasi & Dyasi, 2004, p. 420; Morrow et al., 1997; Saul, 2005*).* Students

must be allowed to construct their own understanding of the subject through the same

process scientists use to construct knowledge and evaluate phenomena (Dyasi & Dyasi,

2004, p. 420; Morrow et al., 1997). This can be accomplished with even the youngest of

students with adequate support and guidance from teachers, and selection of appropriate

text.

To teach the true "nature of science," teachers must use multiple texts as well as

provide meaningful hands on experiences (Dyasi & Dyasi, 2004, p. 427; Guthrie, 1996;

Morrow et al., 1997). If students are to be prepared for a future driven by the power of

knowledge, we must teach them what scientists do, and how they think (Donovan &

Smolkin, 2001; Pappas, 2006). To achieve such a goal, teachers need to provide students

with both textual instruction and contextual experiences in careful balance, so as not to

lose the vital aspects of science or literature (Dyasi & Dyasi, 2004, p. 424).

Common Misconceptions

Donovan & Smolkin (2001) discuss three misconceptions teachers tend to have

about science. First they believe science needs to be "made" fun; second, many teachers

also believe narrative literature must be used to make reading science fun; and finally,

many teachers believe that information books are inappropriate material for read-alouds.

Yet research reveals that none of these assumptions hold true (Donovan & Smolkin,

2001). Young children are eager to learn about the world, and thus, science and non-

fiction text are of innate interest to them. It is this innate interest that ensures the fact that

science texts do not have to be fictionalized to be engaging, but just of high quality (Donovan & Smolkin, 2001; Pappas, 1991). And finally, information books should certainly be read aloud, especially if they model the characteristics of high-quality text.

Use of Combined-Texts

Despite evidence to contradict these assumptions, many teachers maintain these misconceptions, especially in the early elementary grades, where teachers habitually choose narrative or combined-text books to teach science to their students (Donovan & Smolkin, 2001). Yet combined and narrative texts will restrict the scope of student knowledge, both in regards to genre and content, if they are the only type of literature used (Donovan & Smolkin, 2001; Pappas, 1991). Combined-text books, such as the Magic School Bus, are often read so that only the narrative story is exposed, offering minimal conceptual material for the science program (Chapman & Sopko, 2003; Smolkin & Donovan, 2004, p. 308). Only when the expository portion of the text is emphasized through discussion, will scientific concepts be learned (Chapman & Sopko, 2003). Chapman & Sopko (2003) and Dean & Grierson (2005) assert that combined texts may be read aloud, but teachers must instruct children on how to approach the text. It is recommended that teachers preview the illustrations with the class, read the informative portion of the text, then read the book again focusing on the narrative, and finally add in any side details found within the text. Just as other expository text structures must be taught through teacher modeling and guided practice, so must combined-structure texts.

An even less effective approach to the integration of science and literary instruction occurs when teachers use purely narrative text (Donovan & Smolkin, 2001; Pappas, 2006). Smolkin & Donovan (in Sulivan Palincsar & Duke, 2004) found that

discussions regarding concept comprehension occurred 83 percent of the time with non-fiction texts, yet only 16 percent when fiction text was read. Thus, an integrated curriculum must employ a variety of high-quality text[4], and not just narrative text with a dash of science.

By gaining access to a variety of texts, students receive greater exposure to the inquiry process and develop a greater aptitude for scientific inquiry (Kragler et al, 2005; Lapp & Flood, 1993; Moss, 2005; Pappas, 2006). Children of all ages need access to fiction and non-fiction, poetry and prose, textbooks and trade books, newspapers and magazines. Each genre of text has a unique style and perspective that can bring a topic to life.

Even science textbooks can be used for authentic purposes. Textbooks are especially useful as a guideline for curriculum development, a map to the discovery of a topic the class wishes to delve into deeper. The right textbook can be used to expose the process of scientific inquiry, for some textbooks contain authentic material (Sulivan Palincsar & Duke, 2004, p.193), which opens opportunities to introduce the language of science, a language different than that provided by narrative texts (Papas, 2002). For example, Palincsar and Magnussan (Sulivan Palincsar & Duke, 2004, p.193) created a series of science "notebook" texts, which mimic the process of scientific inquiry by presenting science content through questions, experiments, and data tables. Such a text will lead students to understand how a scientific theory is developed.

While such a text certainly constitutes authentic science literature, few textbooks have implemented this innovative approach to instruction, thus teachers must turn to

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[4] For a description of general characteristics that classify a text as high quality see page 18 for the section titled *Assessing the Quality of Trade Books*.

trade books to find similarly structured texts. Ford (2004, pp. 286-288) encourages

teachers to find books that do not simply tell students what science is, but how science is

done by including descriptions of the process of data collection and analysis, theory

development, and scientific communication. By starting with these basic skills, children

as young as kindergarteners will be able to contribute to scientific inquiry[5].

Scientific Inquiry

As with expository text from every subject, teachers must model and explain text

patterns, though with science trade books, teachers must also focus on the unique features

of scientific inquiry. These elements include formulation of a question, followed by

research and experimentation from which data is gained and used to support or contradict

the original hypothesis. By gaining facility with this process, students will develop a

deeper understanding of scientific text.

The study of these elements can be conducted through the use of modeling,

scaffolding, and independent inquiry (Clark & Graves, 2005; Palmer & Stewart, 2005).

Graphic organizers and learning logs (Dean & Grierson, 2005; Kragler et al., 2005; Moss,

2005) can be used to help students organize information in the science books they

choose. By completing such activities, students will become adept at the skills necessary

for independent inquiry assignments, which provide a more authentic learning format

(Dyasi & Dyasi, 2004, p. 430; Moss, 2005; Palmer & Stewart, 2005). Palmer and

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[5] A focus on text inclusion should not diminish experiential learning as emphasized by
and Dyasi & Dyasi (2004, pg. 420) and Guthrie (1996). Students must experience the
world for themselves and construct their own knowledge. It is the combination of
multiple texts and experiential based instruction that will produce a well-rounded
education.   As stated by Dyasi & Dyasi (2004), by "combining the world and the word in
children's learning of science can advance both their science and literacy education" (pg.
443).

Stewart (2005) suggest that teachers start by modeling a whole class inquiry topic, thereby demonstrating the use of literature in scientific research. Then, allow students to choose their own topics of interest.

Trade books will allow students to independently delve into a topic unique to their own interests (Morrow et al., 1997). They provide a manageable source of information for seeking out answers to questions regarding the natural world. Boys are especially enticed by this genre and thus non-fiction trade books may be the reading niche that entices them to become life-long readers (McFann, 2004; Taylor, 2004).

To effectively integrate science into the curriculum, teachers must provide students with a variety of non-fiction choices, whether through classroom libraries, public libraries, or booklists (Duke, 2000; Guthrie et al., 1996, p. 323; Lapp & Flood, 1993, p.79; Moss, 2005; Pappas 1991). Students must also be taught to independently evaluate these books for accuracy (Dreher & Voelker, 2004, pg. 267; Palmer & Stewart, 2005). With skills at evaluation, students will be able to use trade books for individual inquiry, creating a more experiential science program as they use these resources to research answers to their own questions and design their own experiments.

Trade books are an appropriate choice for this task, as they offer greater depth and variety of topics than textbooks (Morrow et al, 1997; Kragler et al., 2005; Saul & Dieckman, 2005). Many trade books are more reflective of the scientific process, leaving students with questions instead of simply providing blunt answers in an effort to save time and space, as textbooks do (Morrow, 1997; Pappas, 2006). Trade books have a prominent role in any science classroom where the goal is to develop meaningful and authentic learning experiences for students. The younger children are when introduced to

this genre, the greater their potential of discovery. Even the youngest learners will enjoy non-fiction trade books (Duke, 2000; Moss, 2005; Pappas, 1991), and teachers must capitalize on children's curiosity about the world around them to ensure their interest in the text remains. Simply by reading-aloud expository materials, teachers guarantee that students gain exposure to this vital genre, and with experience children will gain facility at using these texts.

Classroom Implications

While the research on expository text instruction provides a plethora of examples of why and how teachers should include trade books in their classrooms, there are certain practices that I feel are still ignored in early elementary grades (Kindergarten - 2nd grade), despite their value to education and learning. First, few teachers choose to include informational text during daily read-alouds in early elementary classrooms. Often the only time children are encouraged to pick up expository material is during the process of a research project, and as research projects are rare in the primary grades, students at this age gain little exposure to this vital genre. This is a great loss, for many children enjoy and may even prefer expository texts (Duke, 2000; Palmer & Stewart, 2005; Palmer & Stewart, 2003; Pappas, 1991; Romero et al., 2005). Additionally, just as fiction can be admired for its aesthetic qualities, so can informational text, though in order for students to recognize these qualities, teachers must present them through engaging and interactive formats.

Read-Alouds

One way this can be accomplished is by including informational texts as read aloud selections. Regardless of reading level, children can listen to and appreciate texts that they may not be able to read independently (Harp & Brewer, 2005). When nonfiction text is read with enthusiasm, and supplemented with brief descriptions of the qualities that make the book an exceptional non-fiction selection, children gain knowledge of content as well as a deeper understanding of non-fiction texts. For

reluctant readers, exposure to this genre may be just what they need to gain interest in text.

Teachers should read aloud not just trade books, but a variety of expository materials including magazine and newspaper articles, brochures and bulletins. Young children will truly benefit from hearing the teacher read a newspaper article describing a recent event in the local neighborhood, and the local context makes it authentic and meaningful. Such reading also provides an introduction to topics that may ignite student interest and answer the questions reflective of young children's natural inquisitiveness.

Reader's Theatre

While reading aloud non-fiction text is a vital step in the process of integrating trade books into the curriculum, children should also be actively engaged with the text. It is common practice now for teachers to select a book and ask students to perform it in a Reader's Theatre format. The text serves as the basis for a student created script. The same activity can be applied to informational texts. For example, the non-fiction trade book *Postcards from Pluto*, can be read-aloud or as a shared reading activity. The class can then be divided into groups, in which each set of students act as inhabitants of a particular planet while one group of students serves as tour guides and another as travelers. Research shows children gain a more thorough and lasting understanding of a topic when they are physically and mentally engaged in the learning experience (Piaget as cited in Kieff & Casbergue, 2000, p. 4). Since Reader's Theatre requires children to read, listen, write, and perform, it does just that, providing students with multiple opportunities for learning. Additionally, this activity broadens students' awareness of

multiple perspectives as they act out roles from a particular point of view -- an important social-emotional benchmark in the early elementary years.

Patterning

Similarly, primary students can also gain deeper understanding of expository text by patterning books. In this activity, a non-fiction book is shared with the class, and the class then works together or individually to create a text modeled after the original. It is a more engaging process than a traditional book report, and helps students understand the structure of expository text. Additionally, by writing an information text of their own, children gain greater familiarity and deeper understanding of it (Duthie, 1994; Dyasi & Dyasi, 2004, pg. 444; McGee & Richgels, 1985; Moss et al., 1997). Teachers may even require children to seek additional texts to support their particular topic. By dividing the task among the class, even a school's youngest learners can fully participate in the creation of a class book[6].

Research Reports

A third way teachers can easily integrate trade books into the classroom is likely the most commonly used, though rarely used in early grades -- the classic research report. With young children, teachers may guide the class through the process, reinforcing the scientific method by formulating a question, researching, experimentation, collection of data, and summarizing findings. While teachers may expect that children this young cannot comprehend the scientific process, such is not the case, for children use this process in everyday learning as they explore the world – by observing, experimenting,

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[6] Located in Appendix C is a lesson plan for patterning with science trade books.

and asking questions. Even though children may not easily recognize their own thinking process, this does not mean they should not be offered the opportunity to explore their world through such methods. On the contrary, students at this age are likely to be more receptive of the scientific process, for their natural curiosity will encourage them to question phenomena and seek answers to these questions.

With young children a formally written report may not be attainable, but there are other options. Posters and brochures, which share information through fewer words, may be sufficient. The teacher may also have the class collaborate on a project with a class of older students. Students can also become scientists (or historians) and verbally share information through performance presentations. With some creativity it is easy to break research into manageable chunks for an early elementary class and scaffold instruction appropriately. In the process, students will gain experience using trade books for authentic purposes, which as stated earlier, leads to students' increased understanding (Hidi & Baird, 1988; Guthrie et al., 1996; Saul & Dieckman, 2005).

Issues with Implementation

In the course of my research, I identified two issues classroom teachers may commonly face. First, there is the issue of school districts and administrators requiring the use of certain textbooks across the grade level, regardless of the quality of the text. To remedy this situation, teachers can use these texts as a non-example. Teachers should discuss with students why this particular text is not appropriate in all situations, and then supplement instruction with trade books. If the text must be used, the teacher can read aloud portions of it that are necessary for student comprehension, for students' listening

comprehension is greater than their reading comprehension (Harp & Brewer, 2005, p. 356)[7].

Another option is to divide the students into groups and have each group silently read and discuss a section of the text. These small group discussions can be followed by a whole group discussion, during which each group shares the most important points from the passage. This strategy allows children to practice reading textbooks, yet minimizes their level of frustration. Precocious readers may prefer to read the text on their own, and teachers should allow them to do so. A teacher may even suggest that a student read the text, summarize it, and share the summary with the class. Summaries can even be filed away and used as reference material for future class projects.

Teachers may also encounter the predicament of students' lack of interest in a topic – an understandable circumstance as no two people share quite the same tastes in reading material. In such a situation, I feel combination texts and narrative texts may be immeasurably helpful. These texts place nonfiction information in context, and students will make connections between the text and the world. Teachers can also prompt students to develop questions that stem from the combined text material, and then encourage the class to seek the answers in additional non-fiction texts, be they textbooks or trade books.

Young children need access to quality texts through classroom activities and experiences, and the possibilities are limitless once teachers realize the potential benefits of trade books in the classroom. These books can serve as a fundamental method of

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[7] Only proficient readers should read aloud to the whole class. Round-robin reading is an inappropriate practice, as it is boring for students who read well, and brings unnecessary stress to students who do not (Tompkins, 2005, p. 118).

incorporating content studies into the heavily burdened early elementary curriculum. The use of trade books, in addition to textbooks, will provide students with a more thorough understanding of content. Also, by filling bookshelves with both fiction and expository text, children will have the freedom to explore any topic of interest. Reading beyond the classroom should be encouraged with trips to the library and instruction on how to choose a book. Also, teachers should be sure to point out the benefits and purpose of various books, be they trade or text, and encourage students to recognize multiple viewpoints across a topic. Such experiences will give young children skill at exploring and understanding the world around them.

With exposure to expository material in the primary grades, students will develop facility with it for later use, as well as learn to pursue their innate interests in the world. By reading and interacting with expository text in a variety of ways, children gain a deeper understanding of the world, a fundamental goal for readers at any age -- but especially for our youngest learners.

Research References

Bamford, R.A. & Kristo, J.V. (2003). Chapter 2: Choosing quality nonfiction literature: Examining aspects of accuracy and organization. In R.A. Bamford & J.V. Kristo (Eds.). *Making facts come alive: Choosing quality nonfiction literature K-8* (pp. 21-40). Norwood, MA: Christopher-Gordon Publishers Inc.

Beck, I. L. & McKeown, M. G. (1991). Social studies texts are hard to understand: Mediating some of the difficulties. *Language Arts, 68*, 482-490.

Beishuizen, J., Stoutjesdijk, E., Spuijbroek, S., Bouwmeester, S., & van der Geest, H. (2002). Understanding abstract expository texts. British Journal of Educational Psychology, 72, 279-297.

Camp, D. (2000). It takes two: Teaching with twin texts of fact and fiction. *The Reading Teacher, 53,* 400-408.

Chapman, V. G. & Sopko, D. (2003). Developing strategic use of combined-text trade books: These teaching methods should help students use combined texts effectively. *The Reading Teacher*, *57*, 236-239.

Clark, K. F. & Graves, M. F. (2005). Scaffolding students' comprehension of text: Classroom teachers looking to improve students' comprehension should consider three general types of scaffolding. *The Reading Teacher, 58*, 570-580.

Cullinan, B.E. (1993). Fact and fiction: Literature across the curriculum (Report No. Cs213724). Newark, DE: International Reading Association. (ERIC Document Reproduction Service No. ED 354 548).

Dean, D. & Grierson, S. (2005). Re-envisioning reading and writing through combined-text picture books. *Journal of Adolescent & Adult Literacy*, 48, 456-468.

Donovan, C. A. & Smolkin, L. B. (2001). Genre and other factors influencing teachers' book selections for science instruction. *Reading Research Quarterly*, 36, 412-440.

Dowd, F.S. (1992). Trends and evaluative criteria of informational books for children. In Freeman, E.B. & Person, D. G. (Eds.), *Using nonfiction trade books in the elementary classroom: From ants to zeppelins* (pp. 34-43). Urbana, IL: National Council of Teachers of English.

Dreher, M.J. & Voelker, A.N. (2004). Choosing informational books for primary-grade classrooms: The importance of balance and quality. *Crossing Borders in Literacy and Science Instruction: Perspectives on Theory and Practice* (260-276). Newark, DE: International Reading Association.

Duke, N. K. (2004). The case for informational text. *Educational Leadership*, 61, 40-44.

Duke, N. K. (2000). 3.6 Minutes per day: The scarcity of informational texts in first grade. *Reading Research Quarterly*, 35, 202-224.

Duthie, C. (1994). Nonfiction: A genre study for the primary classroom. *Language Arts*, *71*, 588-595.

Dyasi, H.M. & Dyasi R.E. (2004). Chapter 24: "Reading the world before reading the word": Implications for professional development of teachers of science. In E.W. Saul (Ed.), *Crossing Borders in Literacy and Science Instruction: Perspectives on Theory and Practice* (420-446). Newark, DE: International Reading Association.

Dymock, S. (2005). Teaching expository text structure awareness. *The Reading Teacher, 59*, 177-181.

Freedman, R. (1992). Fact or fiction? In Freeman, E.B. & Person, D. G. (Eds.), *Using nonfiction trade books in the elementary classroom: From ants to zeppelins* (pp. 2-10). Urbana, IL: National Council of Teachers of English.

Ford, D. J. (2004). Highly recommended trade books: Can they be used in inquiry science?. In E.W. Saul (Ed.), *Crossing borders in literacy and science instruction: Perspectives on theory and practice* (pp. 277-290). Newark, DE: International Reading Association.

Galda, L. & Liang, L. A. (2003). Literature as experience or looking for facts: Stance in the classroom. *Reading Research Quarterly*, *38*, 268-275.

Giblin, J.C. (1992). The rise and fall and rise of juvenile nonfiction, 1961-1988. *Using nonfiction trade books in the elementary classroom: From ants to zeppelins* (pp. 17-25). Urbana, IL: National Council of Teachers of English.

Guthrie, J. T., Van Meter, P., McCann, A. D., Wigfield, A., Bennett, L., Poundstone, C.C., Rice, M. E., Faibisch, F. M., Hunt, B., & Mitchell, A. M. (1996). Growth of literacy engagement: Changes in motivations and strategies during concept-oriented reading instruction. *Reading Research Quarterly*, *31*, 306-332.

Hall, K., Sabey, B., & McClellan, M. (2005). Expository text comprehension: Helping primary-grade teachers use expository texts to full advantage. *Reading Psychology, 26*, 211-234.

Harp, B. & Brewer, J.A. (2005). Chapter 11: Supporting Literature and Literacy in the Classroom-Selecting Books for Read-Alouds (pp. 356-357). *The informed reading teacher: Research-based practice*. Upper Saddle River, N.J.: Pearson

Merrill Prentice Hall.

Hepler, S. (2003). Chapter 1: Nonfiction books for children: New directions, new
    challenges. In R.A. Bamford & J.V. Kristo (Eds.), *Making facts come alive:
    Choosing quality nonfiction literature K-8* (pp. 3-20). Norwood, MA:
    Christopher-Gordon Publishers Inc.

Hidi, S. & Baird, W. (1988). Strategies for increasing text-based interest and students'
    recall of expository texts. *Reading Research Quarterly, 23*, 465-483.

Hite, C. E. (2004). Expository content area texts, cognitive style and gender: Their
    effects on reading comprehension. *Reading Research and Instruction*, *43*, 41-74.

Holliday, W.G. (2004). Chapter 21: Choosing science textbooks: Connecting research
    to common sense. In E.W. Saul (Ed.), *Crossing borders in literacy and science
    instruction: Perspectives on theory and practice* (pp. 383-394). Newark, DE:
    International Reading Association.

Kieff, J. E. & Casbergue, R. M. (2000). Chapter 1: Defining play from many
    perspectives. *Playful leaning and teaching* (pp. 1-16). Boston: Allyn and Bacon.

Kragler, S.; Walker, C. A., & Martin, L. E. (2005). Strategy instruction in primary
    content textbooks. *The Reading Teacher*, *59*, 254-261.

Kucan, L. & Beck, I. L. (1996). Four fourth graders thinking aloud: An investigation of
    genre effects. *Journal of Literacy Research, 28*, 259-287.

Kurkjian, C. & Livingston, N. (2005). Learning to read and reading to learn:
    Informational series books. *The Reading Teacher, 58*, 592-600.

Lapp, D. & Flood, J. (1993). Chapter 5: Literature in the science program. In B. E.
    Cullinan, *Fact and fiction: Literature across the curriculum* (pp. 68 - 79),
    (Report No. Cs213724). Newark, DE: International Reading Association. (ERIC
    Document Reproduction Service No. ED 354 548).

Lehman, S. & Schraw, G. (2002). Effects of coherence and relevance on shallow and
    deep text processing. *Journal of Educational Psychology, 94*, 738-750.

Livingston, N. & Kurkjian, C. (2004). Literature links: Expanding ways of knowing.
    The Reading Teacher, 58, 110-118.

Livingston, N., Kurkjian, C., Young, C., & Pringle, L. (2004) Nonfiction as literature:
    An untapped goldmine. *The Reading Teacher, 57*, 582-591.

McClure, A. A. (2003). Choosing quality nonfiction literature: Examining aspects of
    Writing Style. In R.A. Bamford & J.V. Kristo (Eds.), *Making facts come alive:*

Choosing quality nonfiction literature K-8 (pp. 79-96). Norwood, MA: Christopher-Gordon Publishers Inc.

McFann, J. (2004). Boys and books. *Reading Today*, 20-21.

McGee, L.M. & Richgels, D.J. (1985). Teaching expository text structure to elementary students. *The Reading Teacher, 38*, 739-748.

McMackin, M. C. (1998). Using narrative picture books to build awareness of expository text structure. *Reading Horizons, 39*, 7-20.

McNamara, D.D., Kintsch, E., Songer, N.B., & Kintsch, W. (1996). Are good texts always better? Interactions of text coherence, background knowledge, and levels of understanding in learning from text. *Cognition and Instruction, 14*, 1-43.

Meyer, B.J. & Freedle, R.D. (1984). Effects of discourse type on recall. *American Educational Research Journal, 21*, 121-143.

Morrow, L. M., Pressley, M., Smith, J. K., & Smith, M. (1997). The effect of a literature-based program integrated into literacy and science instruction with children from diverse backgrounds, *Reading Research Quarterly*, *32*, 54-76.

Moss, B. (2005). Making a case and a place for effective content area literacy instruction in the elementary grades. *The Reading Teacher, 59*, 46-55.

Moss, B., Leone, S., & Dipillo, M.L. (1997, October). Exploring the literature of fact: Linking reading and writing through information trade books. *Language Arts, 74*, 418-429.

Moss, B. (1995). Using children's nonfiction trade books as read-alouds. *Language Arts, 72*, 122-126.

Narvaez, D., van den Broek, P., & Ruiz, A. (1999). The influence of reading purpose on inference generation and comprehension in reading. *Journal of Educational Psychology, 91*, 488-496.

Neufeld, P. (2005). Comprehension instruction in content area classes. *The Reading Teacher, 59*, 302-312.

Norton, D. E. (2003). Chapter 12: Nonfiction biographies and informational books. *Through the eyes of a child: An introduction to children's literature, 6th ed.* (pp. 530-589). Upper Saddle River, NJ: Pearson Merrill Prentice Hall.

Palmer, R.G. & Stewart, R. A. (2005). Models for using nonfiction in the primary grades. *The Reading Teacher, 57*, 38-48.

Palmer, R.G. & Stewart, R.A. (2003). Nonfiction trade book use in primary grades. *The Reading Teacher, 57*, 38-48.

Pappas, C. C. (2006). The information book genre: Its role in integrated science literacy research and practice. *Reading Research Quarterly*, 41, 226-250.

Pappas, C.C. (1993). Is narrative "primary"? Some insights from kindergartners' pretend readings of stories and information books. *Journal of Reading Behavior, 25,* 97-129.

Pappas, C.C. (1991). Fostering full access to literacy by including information books. *Language Arts, 68*, 449-462.

Piccolo, J.A. (1987). Expository text structures: Teaching and learning strategies. *The Reading Teacher, 40,* 838-847.

Pratt, H. & Pratt, N. (2004). Chapter 22: Integrating science and literacy instruction with a common goal of learning science content. In E.W. Saul (Ed.), *Crossing borders in literacy and science instruction: Perspectives on theory and practice* (pp. 395-405). Newark, DE: International Reading Association.

Romero, F., Paris, S. G., & Brem, S. K. (2005). Children's comprehension and local-to-global recall of narrative and expository texts (computer file). *Current Issues in Education*, *8*, 1. Retrieved June 25, 2006, from http://cie.asu.edu/volume8/number25 /index.html.

Rosenblatt, L.M. (1980). "What facts does this poem teach you?" *Language Arts, 57*, 386-394.

Rupley, W. H. & Willson, V. L. (1996). Content, domain, and word knowledge: relationship to comprehension of narrative and expository text. *Reading and Writing*, *8*, 419-32.

Saul, E.W. & Dieckman, D. (2005). Choosing and using information trade books, *Reading Research Quarterly*, *40*, 502-513.

Scanlon, M. & Buckingham, D. (2002). Popular histories: 'education' and 'entertainment' in information books for children. *The Curriculum Journal*, 13, 141-161.

Scharer, P. L., Lehman, B. A., & Peters, D. (2001). Pondering the significance of big and little or Saving the whales: Discussions of narrative and expository text in fourth- and fifth-grade classrooms. *Reading Research and Instruction, 40,* 297-314.

Shanahan, C. (2004). Chapter 20: Better textbooks, better readers and writers. In E.W. Saul (Ed.), *Crossing borders in literacy and science instruction: Perspectives on*

theory and practice (pp. 370-382). Newark, DE: International Reading Association.

Smith, C.B. (n.d.). The importance of expository text: Reading and writing. Clearinghouse on Reading, English, & Communication. (ERIC Document Reproduction Service No. ED480886).

Smolkin, L.B. & Donovan, C.A. (2004). Chapter 16: How not to get lost on *The Magic School Bus*: What makes high science content read-alouds? In E.W. Saul (Ed.), *Crossing borders in literacy and science instruction: Perspectives on theory and practice* (pp. 291-313). Newark, DE: International Reading Association.

Soalt, J. (2005). Bringing together fictional and informational texts to improve comprehension. *The Reading Teacher, 58*, 680-683.

Street, C. (2002, May). Expository text and middle school students: Some lessons learned. *Voices from the Middle, 9,* 33-37.

Sullivan Palincsar, A. & Duke, N. K. (2004). The role of text and text-reader interactions in young children's reading development and achievement. *The Elementary School Journal, 105*, 183-197.

Taylor, D. L. (2004, December). "Not just boring stories": Reconsidering the gender gap for boys. *Journal of Adolescent & Adult Literacy, 48*, 290-298.

Tompkins, G. E. (2004). Compendium of instructional procedures. *Literacy for the 21st century: Teaching reading and writing in grades 4 through 8* (pp. 408-456). Upper Saddle River, NJ: Pearson Merril Prentice Hall.

Tompkins, G. E. (2005). Chapter 3: The reading and writing processes. *Language Arts: Patterns of practice*, *6th ed.* (pp. 102-155). Upper Saddle River, NJ: Pearson Merril Prentice Hall.

Tompkins, G. E. (2005). Chapter 10: Reading and writing information. *Language arts: patterns of practice*, *6th ed.* (pp. 426-473). Upper Saddle River, NJ: Pearson Merril Prentice Hall.

Vacca, R.T. & Vacca, J.L. (1999). *Content area reading: Literacy and learning across the curriculum (6th ed.).* New York: Longman.

Vardell, S.M. (1991). A new "picture of the world": The NCTE Orbis Pictus Award for outstanding nonfiction for children. *Language Arts, 68*, 474-479.

Villano, T. L. (2005). Should social studies textbooks become history? A look at alternative methods to activate schema in the intermediate classroom. *The Reading Teacher*, *59*, 122-130.

Yopp, R. H. & Yopp, H. K. (2000) Sharing informational text with young children. *The Reading Teacher, 53*, 410.

Yussen, S., Huang, S., Mathews, S., & Evans, R. (1988). The robustness and temporal cause of the story schema's influence on recall. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 14*, 173-179.

<u>Appendices</u>

Appendix A:

Annotated Bibliography

of

Science Trade Books

ANIMALS AND NATURE

Cole, J. & Degen, B. (1987) *The Magic School Bus Inside the Earth*. New York:
    Scholastic, Inc.   (P, E)

After exhausting a study of animal habitats, the charismatic Ms. Frizzle decides

it's time for an introduction to geology. When her class has trouble finding rocks, she

decides it's time for a field trip and the students soon find themselves digging their way

to the center of the Earth. With the help of a giant drill and the magic school bus, they

make it through the center of the Earth and back to school while compiling an amazing

rock collection. As is always the style with Cole's Magic School Bus series, this book

employs a narrative text supported by sidebars of "Student Reports," which reveal

scientific data and explain the terminology associated with the subject. Degan's

drawings not only illustrate the information, but also bring the characters to life through

comic dialogue. On the final page of the book is an earth science vocabulary and

pronunciation guide.

Collard III, S. B. (2005) *One Night in the Coral Sea*. Watertown, MA: Charlesbridge
    Publishing, Inc.   (P, E, M)

In this book, readers travel to Australia's Great Barrier Reef to witness a special

night when the coral's mass spawning event occurs. From the first page, this book

engages readers with its narrative style before leading into a more expository-style text

that describes the various ocean life found in the reef. Scientific terms are clearly

explained throughout the text and are followed by a guide for pronunciation. Each term

can also be found in the glossary at the end of the book. Magnificent, intricate

illustrations appear to emerge from the page and the unique sea creatures pictured are plainly labeled. For additional information on the topic, a list of books and websites is also provided.

Hooper, M. & Coady, C. (1998) *The Drop in My Drink: The Story of Water on Our Planet*. New York: Viking.   (E, M)

In this picture book, readers are transported across time and around the world following a droplet of water. The poetic language paints a vivid picture of the scientific concepts of the water cycle, geologic history, and water's function in various environments around the world. Full-page painted illustrations provide a visual accompaniment to the descriptive text. The text concludes with a page on water conservation, an explicit description of the water cycle, and a list of amazing water facts.

Jenkins, S. (2002) *Life on Earth: The Story of Evolution*. New York: Houghton Mifflin. (P, E, M)

Life on Earth introduces readers to the concept of evolution and the process of natural selection. The first portion of the text explains the order in which the various species appeared on the planet, followed by a description of the process of natural selection that underlies the evolutionary process. The text appears in two font sizes ,with a general overview of the topic in a large font and more descriptive facts in a smaller font size. Jenkins' stunning collages illustrate each page and stimulate the eye as well as the mind. At the end of the book there is a list of sources for additional exploration of the topic, as well as a timeline that condenses geological time to a more comprehendible 24-

hour day period. The concise descriptions and colorful collages provide a wonderful

introduction to this complex and often controversial concept.

Jordan, H. J. (1992) *Let's-Read-and-Find-Out: How a Seed Grows* (Revised Ed.). New
    York: Harper Collins.   (P, E)

      This picture book for beginning readers explains the process of seed growth by

providing the step-by-step procedures for an experiment that allows children to

experience first hand the development of a plant from seed to bean sprout. The text is

written to encourage children to conduct the experiment on their own and providing

instruction on how to plant seeds and dig them up at various points during the growing

process to examine the root structure. Each page of text is accompanied by vibrant

colored-pencil illustrations. Originally published in 1960 as part of the Let's-Read-and-

Find-Out book series, the book has since been revised by experts in the fields of science

and education to ensure both accuracy and appeal.

Pratt, K.J. (1994). *A Swim Through the Sea*. Nevada City, CA: DAWN Publications.
    (P, E, M)

      A *Swim Through the Sea*, is an alphabet book that alerts readers to the diversity of

sea life around the world. Seamore the Seahorse travels through the Oceans of the world

finding creatures that begin with each letter of the alphabet. Pratt's vibrant illustrations

fill each page with bold colors. Apart from the alliterative sentence introducing each

letter/creature pair, there is a short paragraph that provides additional details. The

repetitive structure makes this a prime book for patterning and the concluding message –

that we all must work to preserve the variety of life that colors our seas – is one that readers of all ages should learn.

Pringle, L. & Marstall, B. (1997) *An Extraordinary Life*. New York: Orchard Books. (E, M)

Through the narrative text of *An Extraordinary Life,* readers experience the life journey of a monarch butterfly named Danaus. Though written in a narrative style, each page is saturated with facts and vocabulary regarding the life cycle of a monarch butterfly. The margins of each page include a pencil and watercolor illustration captioned with a fact regarding one of the topics on the page. Information on how to raise monarch butterflies and support the efforts to save their winter habitat are provided at the end of the text. Also included in this book is a list of books for further reading and an index of terms. This book will impart in students a thorough understanding of a monarch butterfly's journey from chrysalis, to migration, to mating and egg laying, and finally death.

Robbins, K. (2005) *Seeds*. New York: Antheneum Books for Young Readers.   (P)

The book *Seeds* exposes readers to the variety of sizes, shapes, and forms of this life form. On each page, Robbins includes a close-up photograph of a particular seed set against a white background and accompanied by a two or three sentence description of how the seed displayed is different from other seeds, as well as how the seed is dispersed into the environment. Many familiar foods and plants, such as wheat and dandelions, are included in the text, in addition to more exotic plants, such as avocados and lotus

blossoms. By reading this text, young children will certainly gain a basic understanding

of the incredible diversity of items that belong to the category of seeds.

WEATHER

Cole, J. & Degan, B. (1995) *The Magic School Bus Inside a Hurricane*. New York:
  Scholastic Inc. (P, E)

  Ms. Frizzle is at it again, this time taking her class on a wild ride into a hurricane.
While on the way to the weather station, the bus transforms into first a hot air balloon and
then a weather plane to transport the children on a journey right into the eye of a
hurricane. The multi-genre text is a blend of scientific facts and comic narrative,
revealing the stages of hurricane development a hurricane from the cycling winds of the
tropics to the gradual fade as the storm moves inland. Degan's colorful illustrations and
character captions support the factual content allowing children to visualize the message
being conveyed. Additional facts are presented in the sidebars through "student projects"
and "reports," and the character's dialog bubbles add comic relief as well as give each a
distinctive personality. The last page is bedecked with letters that clearly emphasize the
fictional aspects of the text.

Hiscock, B. (1993) *The Big Storm*. New York: Antheneum. (P, E)

  In *The Big Storm*, Bruce Hiscock relates the story of a large storm that traveled
across the continental United States in the spring of 1982. Woven into the text are
informative paragraphs describing how patterns of air movement create the dramatic
weather changes we witness throughout the year, from snow storms and thunderstorms to
dazzlingly clear skies. Full-page watercolor paintings depict how various people respond
to the arrival of the storm, as well as illustrate the abstract scientific concepts related to

invisible air currents. By reading this book, children will gain a functional understanding of how our daily weather is produced and what tools can be used to predict changes.

Simon, S. (1993) *Weather*. New York: Morrow Junior Books.   (P, E)

Seymour Simon's *Weather* does a magnificent job of capturing the complexity of this subject as he describes the various qualities of the Earth system that produce our weather. By using simple language integrated with appropriate terminology, such as the greenhouse effect and isolation, he presents the information in a context children can easily understand. Interspersed throughout the descriptive text are interesting facts to pique student interest. In addition to the information on how daily weather evolves, Simon also provides information on the topic of cloud formation and precipitation. As he has does in every book, Simon has selected stunning photographic images that reflect the content of the book, and also provides simple diagrams to illustrate more abstract concepts, such as air movement. This book serves well as an introduction to an everyday topic many of us take for granted.

PHYSICAL SCIENCE

Branley, F. & Schuett, S. (1998) *Day Light, Night Light: Where Light Comes From*
(Revised Ed.). New York: Harper Collins Publishers.   (P)

In this book, children are introduced to the concept of light through a comparison of objects that produce light and those that absorb and reflect it. By relating this abstract concept to common daily experiences, Branley ensures that children can develop a clear understanding of the information. The text and terminology is at a level second grade readers can manage independently. The new illustrations in the 1998 edition, pull readers into the text, which at times is a bit dry. Included near the end of the book is an experiment for children to complete and thus gain first hand knowledge of how light is present even in a dark room. The book concludes with a general summary of the content, reinforcing the major points presented throughout the text.

Cobb, V. & Gorton, J. (2004). *I Fall Down*. New York: Harper Collins Publishers.
(P)

In this picture book, children explore the concept of gravity by responding to a series of questions posed by the author. From the experiments suggested by the text, readers learn that gravity pulls all objects down at the same rate, yet different objects land with different amounts of force. The brevity of this book is ideal for preschool and primary age children and the bold illustrations on the white backdrop are not over-stimulating for young eyes. The integration of experimentation into the text provides children with first hand experiences that make the abstract concept of gravity more concrete, and thus comprehendible.

Lampton, C. & Nicklaus, C. (1991). *Marbles, Roller Skates, Doorknobs: Simple Machines that are Really Wheels*. Brookfield, CT: The Millbrook Press. (E, M)

The concept of wheels and how they make work easier is explored through the cheery explorations of an elephant and a worm in this science trade book. The tone of the book is conversational and full of questions that encourage readers and listeners to reflect on their knowledge of the topic. Content vocabulary is integrated into this dialogue and highlighted in bold. Additionally, all bold words are included in the glossary at the end of the book. The bright illustrations help to clarify concepts young readers may have trouble visualizing on their own. The content, style, and organization make this book an excellent choice for elementary and even middle school readers.

Simon, S., Fauteux, N. & Cushman, D. (2001) *Let's Try It Out in the Air*. New York: Simon and Schuster Books for Young Readers.   (P)

Through a series of experiments, young children are introduced to the concept of air pressure and air's ability to carry invisible objects. The text is peppered with engaging questions that activate imaginative and reflective thinking. Through active participation in the experiments, the scientific concepts expressed in this book become more memorable. The pencil and watercolor illustrations depict four five-year-old children as they try out the various experiments, making this an ideal non-fiction book for the primary classroom.

Wells, R. E. (1996). *How Do You Lift a Lion*? Morton, Illinois: Albert Whitman & Company. (P, E)

This book describes the components and uses of three simple machines: levers, wheels and axles, and pulleys. Each machine is introduced as the solution to an animal

related "problem." The information is very basic, allowing this book to be an excellent

introduction to the topic. The colorful illustrations help clarify student understanding by

providing visual diagrams of the machines. Additionally, the text includes bold words,

which are used in context and also listed in the glossary.

ASTRONOMY & SPACE

Bailey, J. & Lilly, M. (2001) *The Birth of the Earth*. Tonawanda, NY: Kids Can Press, Ltd.   (E, M)

In this first title of a two part series on Earth history, readers journey from the Big Bang, to galaxy formation, continue on to the emergence of our sun and planets, and stop with the very beginning of life on Earth. As it is written in a comic book format, the written text is contained in boxes attached to the illustrations on each page and the galaxies, planets and stars in the pictures voice their thoughts through dialogue bubbles. Though this book contains a considerable amount of information on the structure of the universe, the child friendly language makes it an engaging read. For those interested in additional information, asterisks mark sections of the text on which more information is available and can be obtained by reading the signs help up by a mysterious green hand. At the end of the book there is a glossary and index.

Gibbons, G. (1997) *The Moon Book*. New York: Holiday House.   (P, E)

This book informs young readers about a familiar nightly image – the moon. The concise text and simple sentences allow readers to easily comprehend the history and function of Earth's closest neighbor. Gibbons includes descriptions of the moon's phases, definitions of eclipses, and major events in lunar exploration. To conclude the text is a timeline of moon milestones, a list of facts, as well as a short summary of various legends and stories associated with the moon.

Karas, G. B. (2005) *On Earth*. New York: G.P. Putnam's Sons.   (P, E)

With poetic language, this picture book explains how the motion of the Earth causes night, day, and the seasons. Terms such as revolution, rotation, and tilt are used throughout the text and the last page of the book summarizes each of the concepts described on the preceding pages. The soft tone of the watercolor and colored pencil pictures support the text with visually appealing images of this abstract concept.

Leedy, L. (1993) *Postcards from Pluto: A Tour of the Solar System*. New York:
        Holiday House.   (P, E)

In this book, readers travel with a class of students from the planet Earth on a journey through the solar system. Through the children's dialogue with their robot tour guide, facts about the solar system are disclosed. At each stop along the way, one child from the group sends a postcard home explaining additional facts about their present location. The entirety of the written text is split between the dialogue captions and postcards, providing a non-intimidating format for reluctant readers. Although the focus on simple facts does not provide in-depth knowledge of the solar system, *Postcards From Pluto* gives readers a general overview of our solar system and may ignite greater interest in the topic. ***Note**: A up-dated version of this book was published in 2006 when Pluto was officially classified as a dwarf planet.*

Redfern, M. (1998). *The Kingfisher Young People's Book of Space*. New York:
        Larousse Kingfisher Chambers, Inc.   (E, M)

A comprehensive reference tool for elementary age students, this book provides detailed information on various elements of space. A table of contents divides the book

into five chapters and a reference section. In the first chapter, there is information

regarding advancements in space exploration, then the focus switches to our solar system,

followed by chapters on the life cycle of stars, the structure of the universe, and questions

scientists have yet to answer. Over 200 photos and illustrations are contained in the text,

as well as a table of facts, glossary of terms, and index.

Simon, S. (2002) *Destination: Space*. New York: Harper Collins Publishers.   (E, M)

      In this Seymour Simon work, readers explore the universe through an eclectic

collection of images from the Hubble Space Telescope. Each page displays a fascinating

full-page photographic image, paralleled by a page of text that provides readers with a

current explanation of the astronomical phenomena depicted on the opposing page.

Subjects of study include the planets Saturn and Mars, numerous stars, nebulae, and even

a black hole. Simon's focus on basic facts about the topic will pique children's interest on

the broad topic of space. As there is no particular order to the arrangement of the images,

the book easily compliments a unit on space for different pages can be read at different

points during the unit.

HEALTH & THE HUMAN BODY

Rowan, K. & McEwen, K. (1998) *I Know How We Fight Germs*. Cambridge, MA:
Candlewick Press.   (P)

Young children are introduced to the immune system as young Sam and his mom

discuss how people battle germs. Terms such as virus, bacteria, and white blood cells are

used throughout the text and are illustrated by bright pencil and watercolor pictures. It's

a delightful read for young children as they can identify with Sam and gain a basic

understanding of germs and how we fight them.

Seuling, B. & Miller, E. (2002) *From Head to Toe: The Amazing Human Body and How
It Works*. New York: Holiday House.   (P, E, M)

A comprehensive guide to the human body, this book includes an explanation of

various body systems including the skeletal, muscular, nervous, and cardiovascular

systems. The questions embedded in the text give it a conversational tone and requires

readers to actively reflect on their previous knowledge of the topic. Though great detail

is provided for each system, the table of contents allows readers to easily locate the

section of text that correlates with their topic of study. Accompanying the text, are

Miller's colorful cartoon diagrams labeled with anatomical terms. Two-tiers of text

provide general information along with additional facts children will find intriguing.

Also, located in the sidebars are various experiments to assist with student

comprehension of the topic. *From Head to Toe* is an excellent book to read during a unit

on the human body or as reference tool to study individual bodily systems.

Showers, P. & Miller, E. (2001) *Let's-Read-and-Find-Out What Happens to a Hamburger?* New York: Harper Collins Publishers.   (P, E,)

In this book, the cook from a friendly diner explains the digestive system. Readers follow food from the first bite and into the stomach, until nutrients are transferred to the bloodstream and waste is transported through the bile duct. Each part of the digestive track is described using simple vocabulary and sentence structure, to be easily comprehended by elementary age children. Particularly attractive are Miller's illustrations, which employ distinctive colors and are labeled with scientific terms. On some pages, the illustrations are accompanied by photographs of the various organs in the digestive system, as seen through a microscope. This added component to the text provides readers with the best of both art forms, as it contains both realistic images as well as an artist's creative interpretations. Two activities are suggested at the end of the text, so interested readers may explore the topic in greater detail.

Simon, S. (1997) *The Brain: Our Nervous System.* New York: Morrow Junior Books. (E, M)

Visually stunning images are the cornerstone of Simon's books, and *The Brain* continues this tradition. Through the use of X-ray and computer technology, concrete visual images of this complex body part are revealed to readers. The informational text explains how the nervous system works and what doctors have discovered about the structure of the brain. Although the text is saturated with factual information, Simon relates these concepts to familiar experiences thereby providing a more meaningful and engaging context for the information.

Terkel, S. N. & Harvey, P. (1993) *All About Allergies*. New York: Lodestar Books. (E, M)

All About Allergies contains seven chapters, each focusing on a different topic associated with allergies. Explanations are provided for why allergic reactions occur, who gets allergies, how to tell when you have an allergy, treatment for allergies, and different types of allergies. At the end of the book is a glossary, along with a list of books for further reading. Technical vocabulary such as hemoglobin and antihistamine are used, but clearly explained. The text is also accompanied by black and white cartoon style illustrations. Each concept is explained with short, realistic examples and scenarios that make it easy to relate the information to everyday experiences.

Appendix B:

Science Trade Book Lists

Science Trade Book Lists

❖ **National Science Teacher's Association: Outstanding Science Trade Books**

> http://www.nsta.org/ostbc

The lists on this site group exemplary science trade books by category providing a short description of the book, the suggested grade level, and national benchmarks that can be met by the text. Lists date from 1996 to the present.

❖ **Orbis Pictus Award Winners**

> http://www.ncte.org/elem/awards/orbispictus/106877.htm

This site provides access to PDF files of the National Council of Teacher's of English Orbis Pictus Award Winners. The award is given to outstanding non-fiction children's literature and includes some science titles.

❖ **Children's Science Book Fair – Association of Science – Technology Centers**

> http://www.astc.org/exhibitions/csbf/dcsbf.htm

A list of the outstanding science trade books currently included in the Association of Science – Technology Centers' traveling book fair.

❖ **PBS Recommended Science Books**

> http://www.pbs.org/teachersource/recommended/rec_books_science.shtm

This site lists recommended books on various science topics for a wide range of ages. It also allows one to search for specific topics and titles.

❖ **Choosing and Using Children's Literature Across the Curriculum**

> http://oncampus.richmond.edu/~pstohrhu/profdevelop/childlit.html

This site lists a large number of additional websites that provide book lists as well as methods for integrating literature from across the curriculum into everyday learning.

Appendix C:

Sample Lesson Plans

Pattern Book Activity: *Exploring the Earth*

Materials:
- *A Swim Through the Sea*
- Letter pages
- Construction paper
- Scrap paper
- Coloring materials

Introduction
- Read the book, *A Swim through the Sea* by Kristin Joy Pratt.
- Direct the students' attention to the structure of the text.
  - The alphabet/word correspondence
  - Sentence alliteration
  - Descriptive paragraph

Activity
- Explain to the class that they will create a book modeled after Pratt's text, but on a different topic: Natural Resources/Earth layers.

- Write the introductory phase on the board:
  - *If Eli the earthworm, who lives underground, one day went exploring, what was it that he found?*

- If necessary, model the writing process for the students.
  - **B** – *He burrowed up into a beautiful butte.*
  - *A butte is …*

- Every student will receive a different letter of the alphabet and a piece of scrap paper.
    1. First, the students must pick a word related to the topic of natural resources/Earth layers that begins with their selected letter.

    2. The students will then write a sentence that incorporates that word as well as a number of descriptive words that begin with the same letter.

    3. The students will then write one sentence that either defines the science word they used, or provides a piece of factual information on the topic.

    4. When the students are finished writing these two sentences, they will show it to the teacher who will approve the sentences and provide them with the final copy letter page.

    5. The students will write their sentences on the final copy page and then draw and color a picture to illustrate the concept.

6. After finishing their letter page, the students will select a color of construction paper to which the final copy page will be stapled.

7. All pages will be compiled into a class book.

- Note: Throughout the activity, encourage students to use the textbook, thesaurus, and dictionary to find words.

Conclusion
- Have the class create a title for the book.
- Add a teacher created introduction and conclusion page (may be class created if time permits).
- Laminate and bind the pages to create a class book.

Reader's Theatre Activity: *Traveling the Solar System*

Materials:

> **Note:** New versions of this book exist and are accurate! *Postcards from Pluto* was updated in Fall 2006 when Pluto was reclassified as a dwarf planet.

- Book: *Postcards from Pluto*
- Writing supplies
- Simple props

Introduction

- Read the book, *Postcards from Pluto* by Loreen Leedy.
- Direct the students' attention to the characters in the text, as well as the factual information.
    - o Dr. Quasar, the robot guide
    - o Students
    - o Family members
    - o Information about the planets

Activity

- Divide the class into groups representing each of the characters.

- Explain to the class that they will create a script modeled after Leedy's book.

- Review any necessary aspects of script writing.
    - o *Dialogue*
    - o *Action directions*
    - o *Props*

- If necessary, model the writing process for the students.
    - o *"On page xx, Dr. Quasar leads the class to xxx. What are some things he might say?"*
        - *– Responses.*
    - o *"You can write that like this: Dr. Quasar:*

- Every group of students will receive a copy of the book and a piece of scrap paper and be given time to write the dialogue for their character.

- After each group has finished their script, rehearse the story once or twice with the whole class seated at their desks.

- Once the script flows smoothly together, allow the students to perform the story, reading from the script. When not involved in the action the students will be audience members.

- If the class is interested, invite other classes to see the performance!

Read-Aloud Activity: *Simple Machines*
(An Integrated Language Arts and Science Lesson)

<u>Text</u>: Wells, R. E. (1996). *How Do You Lift a Lion*? Morton, Illinois: Albert Whitman & Company.

Goals/Purpose:
The purpose of this lesson is for students to gain the knowledge necessary to create a device consisting of various simple machines that will solve a problem identified by the class. The students will need to use expository texts of various structures (i.e. descriptive and compare and contrast) to adequately research the solution to the problem.

Objectives:
- The students will be able to organize information from various expository texts, including descriptive and compare/contrast structures, by completing the appropriate graphic organizer for the text structure.

- The students will be able to design a device that solves a problem by drawing a diagram that depicts an integrated use of at least three different simple machines.

- The students will be able to identify at least three of the six simple machines by listing the simple machines included in each of the team created devices.

Michigan Content Standards:

English Language Arts Content Standards and Benchmarks
Content Standard 1: All students will read and comprehend general and technical material.
>   3. Employ multiple strategies to construct meaning, including word recognition skills, context clues, retelling, **predicting, and generating questions**.

Content Standard 7: All students will demonstrate, analyze, and reflect upon the skills and processes used to communicate through listening, speaking, viewing, reading, and writing.
>   1. Use a combination of strategies when encountering unfamiliar texts while constructing meaning. Examples include retelling, **predicting, generating questions**, examining picture cues, analyzing phonetically, discussing with peers, and **using text cues**.

Content Standard 8: All students will explore and use the characteristics of different types of texts, aesthetic elements, and mechanics – including text structure, figurative and descriptive language, spelling, punctuation, and grammar- to construct and convey meaning.
>   3. Identify and use characteristics of various informational genre (e.g. periodicals, public television programs, textbooks, and encyclopedias) and

elements of expository text structure (e.g. **organizational patterns**, supporting details, and major ideas) to convey ideas.

Content Standard 11: All students will define and investigate important issues and problems using a variety of resources, including technology, to explore and create texts.
      1. Generate questions about important issues that affect them or topics about which they are curious, and use discussion to narrow questions for research.

ELA Grade Level Content Expectations (Grade 4)
      R.IT.04.02: Identify and describe information text patterns including compare and contrast, cause and effect, and problem and solution.

      R.CM.04.04: Apply significant knowledge from grade level science, social studies, and mathematics texts.

Science Content Standards and Benchmarks:
Strand 4- Content Standard 1: All students will describe how things around us move, explain why things move as they do, and demonstrate and explain how we control the motions of objects:
      EL.2: Explain how forces (pushes or pulls) are needed to speed up, slow down, stop or change direction on a moving object.
      EL.4: Identify and use simple machines and describe how they change effort.

Lesson Plan:

Prereading Activity: *Prereading Plan*

1. Announce that the topic of today's science lesson is Simple Machines, specifically levers, wheels and axles, and pulleys (write this topic on the board).

2. Ask the class to take out a piece of paper and write down as many words as possible that are related to this topic. If students seem to be struggling, the teacher may write some sample words on the board (i.e. pulley, force, lever, etc.).

3. After sixty seconds, tell the students to stop writing and ask for volunteers to share some of their words. Write these words on the board. Accept all responses, for as students listen to the teacher read the text they will decide which words should remain on the board and which ones will be taken off the board.

4. Once all of the students' words are on the board, have the class do a two-minute quick-write on the back of the paper they used for their word list. Tell them to use as many of the words that they think are related to the main topic as possible. Also, ask them to start each new sentence on a separate line, for after the read aloud, the students will return to the quick-write and mark whether their sentences were accurate or inaccurate.

5. Ask if any students want to share their quick-writes with the class.

During Reading Activity: *Directed Reading-Listening Activity (DR-LA)*

1. For the first step of the DR-LA, use the classroom list of brainstormed words. First, the teacher introduces the text, emphasizing the expository structure it models (i.e. description). After this introduction, the teacher can ask if the class wants to add any additional words to the list on the board.

2. Next, the class will decide which words are definitely related to the main topic by placing a check mark next to these words. Words that are not related to the topic can be crossed off, and words the class is unsure of can receive a question mark.

3. When the majority of the class is satisfied with the label given to each word, the teacher will begin reading the story. At appropriate times during the reading of the text, the teacher will stop and students will be allowed to add words to the list or change the marking next to the brainstormed word or phrase. The teacher should also point out important aspects of the text's structure such as the:
   - Bold words
   - Glossary
   - Diagrams

4. During the reading of the text, students may also mark whether the sentences from their quick-writes are true or false.

Post Reading Comprehension and Response Activities:
Part A: ***Comprehension Activity*** - *Completion of Prereading Quick-write and Graphic Organizers*

1. After finishing the read aloud, the teacher will give the students a few minutes to finish marking whether the sentences from their prereading quick-write are correct or incorrect.

2. Ask each student to share one of his or her correct and incorrect sentences.

3. After each student has had a chance to share, direct the class' attention back to the board. Determine if all of the words have the correct marking and then erase the words that are not associated with the simple machines topic.

4. Explain that the book followed a descriptive structure. (Say: "While narrative books have a beginning, middle, and end with characters, problems, and solutions, informational books have different formats. We know that this book had a descriptive structure because each topic sentence was followed by sentences that provide more detail about the topic. To remember this information it helps to create a graphic organizer.")

5. Distribute a **Simple Machine web map** to each student. Through class discussion and by using the key words on the board, guide the class to completing the **Simple Machine Chart**.

6. Explain to the class that another method of organizing information is called compare and contrast. (Say: To understand more about simple machines we can compare and contrast the different types of simple machines, or write how they are similar and different.)
   Ask students to look at the back of the Simple Machine Chart worksheet. On the back of the worksheet is a chart with two simple machines (levers and pulleys) listed in bubbles. Explain that in the center bubbles should describe how levers and pulleys are alike. The information from the descriptive chart on the front of the handout can be used to help fill in the bubbles. Demonstrate this process if necessary.

7. Share each set of compare and contrast answers with the class so each student can check his or her response.

Part B: Response Activity - Quick-write
1. After the students have completed their descriptive and compare/contrast graphic organizers, they are ready to respond to the reading selection.

2. The teacher writes the following prompt on the board:
   "What is one problem you have dealt with that can be solved by simple machines? What simple machines would you use?"

3. The students are given 5 minutes to brainstorm and write a response to this question in their science journals.

4. After responding to the question, ask for some students to share their "problem." Various problems will be written on the board, and the class will vote on which problem is the most interesting.

Assessment Activity:
1. Each group of 4-6 students will be given time to meet and discuss a solution to the chosen "problem" from the post reading quick-write.

2. Each student will locate information on simple machines from a text (other than the one read during the read aloud) and complete a graphic organizer for the book. This graphic organizer will be given to the teacher at the culmination of the project for assessment purposes.

3. With their group members, the students will design a machine that solves the class "problem." If time and resources permit, the group can physically create the machine, though if not, a diagram of the machine will do.

4. After each group has created a diagram or machine, the students will take turns presenting their solutions. The students in the audience will list what simple machines the group presenting used in the solution. Each audience member's list will be collected at the end of the presentation, and given to the teacher for assessment purposes.

5. To conclude this lesson, the students can vote on the best machine, and discuss reasons for this choice. Reasons may relate to effectiveness, aesthetics, ease of use, or any other criteria the students deem important.

Appendix D:

Presentation Materials

for the

**Michigan Reading Association
51st Annual Conference
March 10th-12th, 2007**

&

**Eastern Michigan University
27th Annual Undergraduate Symposium
March 30th, 2007**

Power Point Slides

Reading the World

Teaching Content Knowledge through Trade Books

What book is your favorite for use in the classroom?

"An effective non-fiction book must animate its subject, infuse it with life...create a vivid and believable world that the reader will enter willingly and leave only with reluctance."

- Russell Freedman, author

Chapter 1:
Why use trade books?

Fact:

Children need to read and comprehend informational texts.

Fact:
Young
Children need to read and comprehend informational texts.

Fact:
Informational texts are different than narrative texts.

Fact:
Children learn best when fully engaged in the learning process.

"[when] students…have the opportunity to make connections between what they read and what they already know [they] are also more likely to read for their own pleasure outside the classroom."

– Patricia Scharer, Barbara Lehman, Donna Peters

Fact:
Textbooks may not be enough.

Fact:
Trade books are an effective means through which content can be conveyed.

Chapter 2:
How to Use Trade Books

From Nell Duke's "The Case for Informational Text" in *Educational Leadership* (March 2004).

---

1. Provide **Access** to:

- High-quality
- Age-appropriate
- Wide variety

...of books!

---

2. Provide…

TIME

---

3. Provide…

Authentic Opportunities

---

4. Provide **Instruction**

- Modeling
- Read-Alouds
- Graphic Organizers
- Patterning
- Student-Led Investigations

Scenario:
It is the middle of the school year. The students are bored with the textbook; you are bored with the textbook; thus, very little "learning" is occurring.

What will you do?

1. Read Aloud
2. Patterning ABC...
3. Reader's Theatre
4. Student-Led Investigation

End

Read-Aloud

1. Choose a book
2. Stimulate prior knowledge
3. Focus on text structure
4. Foster discussion
5. Introduce additional books

Choose Again

Patterning ABC...

1. Select book with apparent pattern
2. Read aloud and focus on structure
3. Assign each student a page
4. Compile pages in class book
- Benefits
  - Understand text structure, not just facts
  - Reinforce through writing

Choose Again

Reader's Theatre

1. Select books
2. Group students
3. Model script construction
4. Provide time to read, write, rehearse
- Benefits
  - Kinesthetic experience
  - Social skills
  - Group supports multiple reading levels

COMING SOON!

Choose Again

Student-Led Investigation

1. Begins anytime/anywhere
2. Students identify question
3. Model how to find resources
4. Provide access to materials
5. Provide time
6. Assess through culminating project

Choose Again

Conclusions

- **Trade books** provide depth.
- **Trade books** provide variety.
- **Trade books** can be used in a wide range of activities.
- **Teachers** must provide...
  - Access   – Time
  - Opportunity   – Instruction

Bibliographic Information

Duke, N. (2004). The case for informational text. *Educational Leadership, 61*, 40-44.

Freedman, R. (1992). Fact or fiction? In Freeman, E.B. & Person, D.G. (Eds.), *Using nonfiction trade books in the elementary classroom: From ants to zeppelins (pp.2-10)*. Urbana, IL: National Council of Teachers of English.

Moss,, B. (2005). Making a case and a place for effective content area literacy instruction in the elementary grades. *The Reading Teacher, 59*, 46-55.

Scharer, P. L., Lehman, B.A. & Peters, D. (2001). Pondering the significance of big and little or saving the whales: Discussions of narrative and expository text in fourth- and fifth-grade classrooms. *Reading Research and Instruction, 40*, 297-314.

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Hand-Outs

Trade Book Lists

❖ **Orbis Pictus Award Winners**

> http://www.ncte.org/elem/awards/orbispictus/106877.htm

This site provides access to PDF files of the National Council of Teacher's of English Orbis Pictus Award Winners. The award is given to outstanding non-fiction children's literature across the subject areas.

❖ **National Science Teacher's Association: Outstanding Science Trade Books**

> http://www.nsta.org/ostbc

The lists on this site group exemplary science trade books by category providing a short description of the book, the suggested grade level, and the national benchmarks that can be met by the text. Lists date from 1996 to the present.

❖ **National Council for the Social Studies – Notable Books for Young People**

> http://www.socialstudies.org/resources/notable/

Lists of notable social studies trade books are available through PDF files linked to this site. The books are listed by title and grouped by thematic strands. Each title's annotation includes a brief description, approximate age level, the price at publication, and the national standards to which the text can be linked.

❖ **Children's Science Book Fair – Association of Science – Technology Centers**

> http://www.astc.org/exhibitions/csbf/dcsbf.htm

A list of the outstanding science trade books currently included in the Association of Science – Technology Centers' traveling book fair.

❖ **PBS Recommended Math/Science Books**

> http://www.pbs.org/teachersource/recommended/rec_books_math.shtm
> http://www.pbs.org/teachersource/recommended/rec_books_science.shtm

These sites list recommended books on various math and science topics for a wide range of ages. It also allows you to search for specific topics and titles.

❖ **Choosing and Using Children's Literature Across the Curriculum**

> http://oncampus.richmond.edu/~pstohrhu/profdevelop/childlit.html

This site lists a large number of additional websites that provide book lists as well as methods for integrating literature from across the curriculum into everyday learning.

🌍 **Reading the World:** Teaching Content Knowledge through Trade Books 🌍

Lesson Ideas

★ ACCESS 📖 TIME ⛰ AUTHENTIC OPPORTUNITY 🗂 INSTRUCTION 🔑

★

- **Read-Aloud** 📖
    1. Choose book
    2. Identify notable aspects of content and structure
    3. Read aloud and discuss

    Benefits
    + Enhances aesthetic features of non-fiction
    + Increases student exposure to non-fiction
        + Ignites discussion of various topics

- **Provide Graphic Organizers** ▦
    1. Choose book
    2. Identify structure
    3. Choose corresponding graphic organizer
    4. Introduce to students

    Benefits
    + Promotes understanding of non-fiction text structure
    +Identifies/organizes important information
    +Prepares students for writing

- **Patterning** ①②③
    1. Choose book with prominent pattern
    2. Share with class
    3. Discuss structure
    4. Assign a page to each student
    5. Compile into class text

    Benefits
    + Students gain knowledge of text structure
    + Encourages students to re-read information
    + Writing after reading improves students recall
        + Finalized piece is an intrinsic motivator for research

-

    2. Divide class into groups
    3. Each group reads book
    4. Each group writes script/portion of script
    5. Rehearse
    6. Perform for class

    Benefits
    + Provides verbal and kinesthetic experience
    + Group work supports multiple reading levels
    + Rehearsal encourages repetition of content
        + Writing allows students to "own"

- **Student Initiated Investigations** 🗂
    1. Students choose topic
    2. Locate some resources
    3. Guide students in locating additional resources

    Benefits
    + Topic is of interest to class
        + Authentic reason for reading non-

Michigan Standards and Benchmarks (Elementary Science)
A Swim through the Sea Lesson

Constructing New Scientific Knowledge (C) I.1
All students will learn from books and other sources of information:
5. Develop strategies and skills for information gathering and problem solving.

Reflecting on Scientific Knowledge (R) II.1
All students will show how science is related to other ways of knowing:
2. Show how science concepts can be illustrated through creative expression such as language arts and fine arts.

Organization of Living Things (LO) III.2
All students will use classification systems to describe groups of living things:
1. Explain characteristics and functions of observable body parts in a variety of animals.

Evolution (LE) III.4
All students will compare ways that living organisms are adapted to survive and reproduce in their environments and explain how species change through time:
2. Explain how physical and behavioral characteristics of animals help them survive in their environments.

Postcards from Pluto Lesson
Constructing New Scientific Knowledge (C) I.1
All students will learn from books and other sources of information:
5. Develop strategies and skills for information gathering and problem solving.

Reflecting on Scientific Knowledge (R) II.1
All students will show how science is related to other ways of knowing:
2. Show how science concepts can be illustrated through creative expression such as language arts and fine arts.

Solar System, Galaxy and Universe (ES) V.4
All students will compare and contrast our planet and sun to other planets and star systems.
1. Compare and contrast characteristics of the sun, moon, and earth.

ConSTRUCTing Knowledge

Non-fiction books are what I read,
When information is what I need.
Unlike stories these books use facts,
Like who did what and how things act.
The characters are you and me,
The setting is the world you see,
There is no plot, but a structure unique
To help you find the answers you seek.

Description tells us what we'd see
Sequence says first 1, 2, then 3
Compare/Contrast shows how things are the same and different
Problem/Solution explains that something went wrong and how to fix it
Finally, there is cause and effect, when something happens
something happens back.

Each of these styles of writing texts
Can be combined to the best effect.
When you understand each of these
Then all information can be read with ease!

-- Brigit Locke