

EVALUATING PRIMARY GRADE-LEVEL SCIENCE TEXTS FOR EVIDENCE OF  
SCIENCE INFORMATION, QUALITY OF LITERATURE, AND ELEMENTS OF CRITICAL  
LITERACY WITH THE MODIFIED ANALYTICAL SCIENCE TRADE-BOOK RUBRIC

A Dissertation

by

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This dissertation meets the standards for scope and quality of  
Texas A&M University-Corpus Christi and is hereby approved.

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## ABSTRACT

Critical literacy is an essential element of science and should be present in science trade-books. The purpose of the study was to examine the efficacy of modifying an existing two-subscale survey instrument, the Science Trade Book Evaluation Rubric (STBER), in order to add critical literacy elements as a third subscale.

Texts reviewed represented Award Winning Trade-Book (AW) sources: the National Science Teachers Association's Outstanding Science Trade Books (NSTA) (OSTB), National Council of Teachers of English's (NCTE) Orbis Pictus Award (OPA), the International Reading Association's (IRA) Teachers Choices Reading List (TCRL), and the Association for Library Service to Children's (ALSC) Robert F. Sibert Medal (RFSM) and the Curriculum-Selected Trade-Books (CS) from the Booklist K-8+ (Fountas & Pinnell, 2009). The Modified Analytic Science Trade-Book Evaluation Rubric (MASTER) was employed to evaluate 321 randomly selected science trade-books from five sources. The study was guided by two research questions: (1) How accurately can the instrument distinguish Award-Winning Trade-Books (AW) from the Curriculum-Selected Trade-Books (CS) booklists? and (2) What Critical Literacy elements and topics can be found in primary grade-level Science trade-books as identified by the MASTER instrument?

Data were analyzed using Cronbach's Alpha, Shapiro-Wilk's Test of Normality, Kruskal-Wallis, and Mann-Whitney U test. Total scores considering the Decade Factor, pre-twenty-first century (1986-1999), first millennial decade (2000-2009), and last millennial decade (2010-2014) were examined. Significant differences were indicated between Decade 1 to 3 and

Decade 2 to 3 in the Literacy subscale and all three decades in the Critical Literacy subscales.

Decade 2 and 3 were analyzed across all subscales with Cross-tabulations; results indicated more books from Decade 3 in the award-winning category and more books in Decade 2 from the curriculum-selected category.

Findings suggest the MASTER is a statistically reliable tool to evaluate primary grade-level trade-books. The MASTER identifies Critical Literacy elements in some science trade books and marks missing elements in others. The five resource booklists offered few books in physical sciences. Further research would employ a wider expert panel to validate the MASTER. Books from other sample populations could be used to replicate the study.

## DEDICATION

To The One who endowed me with a quest for learning, curiosity, and a desire to help young students acquire a thirst for learning about the scientific principles created to direct the natural world, including its habitats, its wildlife, and its ecology.

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## CHAPTER I: INTRODUCTION

Critical Literacy (CL) is an outcome of the convergence of Critical Theory (CT), Critical Discourse Analysis (CDA), Critical Pedagogy (CP), Critical Inquiry (CI), and Critical Thinking (CT) within the content area classroom (Lankshear & McLaren, 1993). Furthermore, Critical Literacy influences analysis of print texts, nonprint texts, and illustrations for respectful representations of race, gender, authority, culture, and multiple perspectives of socially relevant life challenges (McLaughlin & DeVogd, 2004). The practice of Critical Literacy classrooms leads to students' understanding that multiple perspectives exist on discussion topics. Behrman (2006) and Vasquez (2003, 2004) agree that Critical Literacy increased empathy for others' viewpoints. Students' engagement in Critical Literacy research about real world community-based learning projects requires a discussion-rich learning environment to achieve negotiated solutions to complex problems and ensures that students are properly equipped for academic endeavors and prepared for later enterprises.

The intersection of literacy, Science Literacy, and Critical Literacy is where content area is wedded to CL. Elementary teachers need a large inventory of grade-leveled Science trade-books to inform their students on curriculum-related topics, in addition to needing classroom libraries with trade-books with dissimilar topics which are sought by inquisitive primary students. In Science classrooms, readers research Science trade-books to help answer the array of questions developed while encountering the world. They learn to discern authors' agendas while practicing one part of Critical Literacy (Boydston, 2008). Students are also practicing Critical Literacy when they assess the illustrator's and author's expertise and examine story characters for non-stereotypical depictions and learn empathy for diverse perspectives of others during Critical Literacy activities (Comber, Thomson, & Well, 2001). Critical Literacy strategies

remold flexibly to fit the genres of fiction, fantasy, expository, and nonfiction texts, averting standardization of rote text comparison techniques (Heisey & Kucan, 2011).

John Dewey (1893) wrote “Cease conceiving of education as mere preparation for later life, and make of it the full meaning of the present life” (Boydston, 2008, p. 50). Dewey observed teachers and students in action within context of the learning process. He considered constant repetition and memorization without application to problem-solving real world problems to be a waste of precious learning time for students. In current day classrooms, Dewey would prefer to see students collaborating in cross-curricular literacy-related research projects to solve real, not contrived problems.

Teachers of Dewey’s time told students how the information they learned at school would be important to them when they were adults (Boydston, 2008), but teachers made no application of the information to their current life. Without current application, students did not grasp the necessity of learning academic skills. Dewey was more concerned about teaching skills and strategies that applied to critical analytical thinking to students, solving essential social issues, and conducting research that led to student-based problem-. The theme of education, for use as an adult, remains present in the classroom today. As teachers assign the work of Critical Literacy, students learn skills that are useful in their current and future lives: evaluating texts for authors’ agenda, engaging in rich discussions that lead to understanding multiple perspectives of topics, and problem-solving that meets the needs of diverse cultural populations.

Memorizing math facts and detailed characteristics of animals, as well as their habitats, has its importance, but using that wealth of information to obtain a more in-depth understanding of the world to problem-solve community challenges through application of skills, strategies, and information is the greater lesson (Boydston, 2008). Critical Literacy leading students to



community service is not preparation for a future life, it is making “the full meaning of the present life” by connecting acquisition of knowledge, learning skills and strategies, applying them to real world experiences, as well as synthesizing school learning with home and community life (Boydston, 2008, p. 50). Moving student learning from acquisition of facts and into applying, analyzing, evaluating, and creating are the characteristics of Dewey’s “full meaning of the present life” for students (Boydston, 2008, p. 50).

### **Learning in Student-Collaborative Community-Based Projects**

We no longer live in agrarian-based communities; but, instead, we live in a print-discerning and nonprint-discerning global society (Vasquez, 2003). Nonprint texts can be in the form of graphic illustrations, audio or video productions, theatrical productions, movies, and musicals, as well as, political yard signs or speeches. All of these can be transcribed into print form and thus represent “texts.” An observation of television commercials demonstrates that people are sellers and buyers of meaning-laden communications, hidden and clearly discernible messages devised to influence thinking. Critical Literacy-based classrooms permit skills and strategy acquisition to discriminate message meanings. Books often portray historical problems and solutions to societal challenges. However, students in early elementary grade-levels have a deficit of life experiences that creates an innocence, encouraging acceptance of fiction and nonfiction as equally factual (Fazio & Marsh, 2007; Marsh, Meade, & Roediger, 2003). The primary grade-level teacher possesses the responsibility of teaching subjects and teaching their students about the existence of authors’ agendas, as well as, how to compare multiple texts and evaluate texts for agendas. At this juncture, Critical Literacy transforms students’ thinking to make them wiser consumers of messages and agendas as they work in collaborative project learning groups.

As the cofounder of Stanford Institute for Educational Leadership and author of *Who Owns the Learning?*, November (2012) suggested that students work harder in project learning activities that contribute to a community-based goal than they work to achieve a grade for a course. November (2012) also hosts Building Learning Communities conferences during the summer months. Collaborative community learning for the greater good of the community harkens back to the contributions made to the family and the community during the agrarian societies of the past. He proposed that it is through engagement in Critical Literacy projects that connect to their global and local communities that students live full present lives while they gain skills, strategies, and understanding of the global world, as well as competence in problem-solving the challenges of society.

### **The Critical Literacy Classroom Environment**

Science Critical Literacy classrooms are ones in which students read Science trade-books while they discern the author's agenda and expertise (Boydston, 2008; Vasquez, 2003). Students also engage in socially constructing the meaning of the text, apply that meaning to their personal experiences, engage in small group discussion, understand that there are multiple perspectives on issues in the texts, and brainstorm methods of problem-solving.

Students are not isolated humans interacting only with people of their own age. They interact with many adults who are relatives, daycare providers, healthcare providers, teachers, custodians, school secretaries, and principals (Sticht & James, 1984). Children are engaged through trade-books with community authorities and leaders as they study professions in social Science activities, but they also interact with other community authorities and leaders as they accompany their parents to laundromats, or grocery stores, and take the trash to the curb for trash

collectors. Young students observe the activities of adult life and notice how well some systems function and how poorly other systems function.

Elementary students frequently listen to adult conversations about community problems that need solutions to improve the lives of residents (Sticht & James, 1984). Sometimes students listen to wise but introverted adults who have solutions but are too timid to speak up or do not know who to contact about implementing these solutions (Fairbanks, 2000; Sisk, 2002). Unlike adults, however, students are not timid about approaching school personnel with problems or solutions that would develop into positive content area Critical Literacy learning projects for local communities. Consequently, elementary students can serve as an ear for adult members of the community who are often uncomfortable sharing their own voices (Antonini, 2010).

McLaughlin and DeVogd (2004) suggested high interest topics proposed by students could be adapted for use in Science Critical Literacy classrooms. Solutions for many community challenges increase opportunities to accommodate diverse literacy needs of students through whole class, small group, and individualized instruction with multiple grade-leveled texts (Elley, 1981). Community-based Critical Literacy learning projects create natural, not contrived, opportunities for parents and guardians to interact with students at home and at school with learning activities (Sisk, 2002). These learning projects contribute to positive relationships between school, home, and community, as well as, solidify students' positive attitudes toward continued education. Expanding learning to outside the classroom to include the local community illustrates the necessity for students to become educated members of local and global societies. Science Critical Literacy activities that are community-based projects clarify a student's need for math, Science, reading, and interpersonal skills in ways that lecturing cannot and additionally projects demonstrate students' place in local society. Furthermore, these

projects bridge cross-curricular activities that assist a student's understanding that skills and strategies in one content area are to be transferred to the learning in other content areas as they read, investigate, write, and engage in discussions.

### **Statement of the Problem**

The integration of Critical Literacy and would appear to be a worthwhile educational endeavor. It is important, therefore, that educators have access to appropriate Science texts and be able to evaluate Science trade-books. When the researcher conducted an investigation to locate a tool for evaluating trade-books for identifying elements of Critical Literacy, an instrument could not be located. In fact, it was difficult to locate an existing survey instrument that could be used to evaluate literacy and Science Literacy trade-books for identification of quality texts.

Atkinson, Matusevich, and Huber (2009) originally developed the Science Trade-book Evaluation Rubric (STBER) to evaluate the quality of literacy and amount of accurate, up-to-date Science information in Science trade-books. Supporting the Science education curriculum and offering a variety of grade-leveled texts for diverse reading populations is imperative in today's culturally diversified classrooms.

### **The Purpose of the Study**

The purpose of the study was to modify an existing Science trade-book tool, the STBER by Atkinson et al. (2009) by adding a subscale related to Critical Literacy elements. The modified instrument would then be used to evaluate a large population of Science trade-books to identify what Critical Literacy elements were present in primary grade-level Science trade-books and to identify quality Science trade-books for use in primary grade-level classrooms.

### **Research Questions Guiding the Study**

The study was guided by the following research questions:

1. How accurately can the instrument distinguish Award-Winning Trade-Book (AW) from the Curriculum-Selected Trade-Book (CS) booklists?
2. What Critical Literacy elements and topics can be found in primary grade-level Science trade-books as identified by the MASTER instrument?

### **Definition of Terms**

This research employs a large volume of specialized vocabulary. The following section defines several terms used throughout this study.

1. Stakeholders - are students, parents, teachers, principals, administrators, community residents, and future employers that are or could be impacted by decision making in relation to academic, social, or building maintenance topics regarding school (Williams & Bauer, 2006).
2. Critical Discourse Analysis (CDA) - is a theoretical framework that analyzes language as it is used in social and political practices that influence domination of others through word choice, both written and spoken (Bloome & Talwalker, 1997; Green & Lee, 2006; McCormick, 2011).
3. Critical Thinking (CT) - is reflective thinking that focuses on what to believe or what to do (<http://www.criticalthinking.net/definition.html> ).
4. Critical Literacy (CL) - is a method during which readers seek explanations, attain a reader perspective, negotiate authors' views, convey multiple intrinsic perspectives, exchange multiple ethnic considerations, understand multiple viewpoints, reach

understandings, derive relevant complex problems, as well as, propose and recommend possible solutions (Behrman, 2006).

5. Nonprint Texts - are any form of audio or visual media that impart information to persuade readers, observers, and consumers (Vasquez, 2003).
6. Science Critical Literacy - is the use of most practices of Critical Literacy while conducting research and projects within the Science content area classroom. Within the primary grade-levels that would include appraising the expertise of authors and illustrators professional background for knowledge of the Science topic about which they have written or illustrated for a specific text. It also refers to students interacting within a discussion-rich environment so that students become aware of and accepting of diverse opinions on topics as related to cultural, ethnic, racial, and gender correlated Science topics (McClune & Jarman, 2010; McLaughlin & DeVoogd, 2004).
7. Nonfictions Texts and Expository Texts - for the purposes of this study, are considered the same as informational texts (Dymock, 2005).
8. Blended Texts - are informational texts that are written in a narrative form, imparting factual information imbedded in a fictional story. They may contain anthropomorphic representations of animals and plants.
9. Trade-Books - are fiction or nonfiction books published that focus on content area topics such as Science, health, math, or social studies subjects (Donovan & Smolkin, 2002; Shiro, 1997).
10. Curriculum-selected trade-books (CS) - are trade-books that have been identified as “quality literature” by authors and booklists. They are frequently grade-leveled for accommodating the diverse reading levels of readers (Fountas & Pinnell, 2009).

11. Content Area Reading - includes trade-books, textbooks, magazines, or digital print for the purpose of gaining knowledge on curriculum topics such as math, social studies, health, Science, or other objectives (Wilson, 2008).
12. Text Set - is two or more fiction or nonfiction books paired together to increase readers' understanding of a topic or diverse perspectives about topics (Soalt, 2005).
13. Third Space - is a respectful mental space that Critical Literacy students designate to give room in their minds for the diverse perspectives of others (Moje et al., 2004; Vasquez, 2003).
14. Reflections - are the thoughts and ponderings about texts, voiced perspectives of participants of discussions, and how those perspectives impact the thinker (Rowe, 2008; Vasquez, 2004).
15. Social Actions - are the actions that resolve topics, solve problems, or influence stakeholders to work together. They are frequently the goal of participants in Critical Literacy reading, investigations, discussion, and reflections, especially when resolution occurs for the benefit of historically marginalized individuals and groups (Hyslop-Margison & Pinto, 2007; Lapp, Moss, & Rowsell, 2012).
16. Multiliteracies - is the term used to recognize literacy elements contained in non-traditional print text formats such as technology, the internet, and nonprint texts (e.g. audio and video, graphic novels, and other audio-visual media). The importance of "reading" these sources is because they contain valuable information that helps student stimulate critical thinking, gain perspectives held by others, and learn to use third space. (Hansen, 2009; Mills, 2001; Tan & Gao, 2010).

17. Multiple Texts - are texts that focus on the same topic or theme used to increase students' understanding of complex problems to create student awareness of multiple stakeholders (Clarke & Whitney, 2009).
18. Intertextuality - is related to multiple texts and recognizes that in today's world, readers and authors are often so well read that the commonalities of information in their minds and what they write span across and through texts (Bloome & Egan-Robertson, 1993; Buxton & Austin, 2003).
19. Social Construction of Meaning - emerges when readers engage in dialogue about multiple texts and work together to compare, contrast, and integrate various stakeholders' silent and voiced perspectives of the texts (Gee, 2001; Halliday, 2004; Hanrahan, 1999; Lawrence & Snow, 2011).
20. Bridging Diverse Reading Levels - is a method of using multiple reading levels within the same book so that students of various reading levels can access information and be both supported and challenged with the sidebars and extensions. Bridging diverse reading levels requires different font sizes for main text and other texts within the body of the book, use of sidebars, and back-of-the-book extensions with 1-2 partial reading grade-levels above the "on-level" main text.
21. Mentor Texts - are texts that serve as a pattern of language and theme that students use to develop their own writings; an example is *Brown Bear, Brown Bear* which a child then patterns his/her own writing to describe animals other than those seen in Eric Carle's book.



## **The Modified Analytical Science Trade-Book Evaluation Rubric (MASTER)**

This study set forth to provide an instrument for the evaluation of texts that could supplement teaching in primary grade-level Science classes (Atkinson et al., 2009). The instrument evaluates for quality literature, evidence of scientific information, and elements of Critical Literacy.

Modification of an existing instrument for identification of quality Science trade-books for Science classrooms that practice Critical Literacy was considered vital to provide teachers with criteria for selection of nonfiction, especially Science-related texts. Using an instrument to evaluate texts is appropriate for beginning a Science Literacy classroom library for use in research activities.

### **Summary**

This chapter described various principles supporting this study. The researcher cited academic opinions of classroom teachers that students should engage with learning strategies, skills, and information because these academic endeavors would be important to them one day in the far-off future of adulthood rather than engaging students in educational concepts to problem-solve current community problems in their current life. Another guiding principle was a desire to modify an existing literacy and Science texts instrument, the STBER, for identification of Critical Literacy elements in primary grade-level trade-books.

This chapter also listed the two research questions guiding the study, in addition to the definitions of relevant terms used in the study. This study is significant in the literacy community because it provides a modified instrument that teachers can use to evaluate the quality of literacy, Science, and Critical Literacy elements in primary grade-level trade-books for the purpose of teaching Science, supporting the Science curriculum, and extending reading, writing, and oral

communication skills of primary grade-level students. The research design, research assumptions, and the study's limitations were described in this chapter.

## CHAPTER II: REVIEW OF THE LITERATURE

This chapter reviews previous literature related to Critical Literacy, Science education, and Science texts. The following topics addressed in this chapter are: (a) the prism of multiple perspectives, (b) curricular considerations of the study, (c) sources for Science trade-books, (d) Fountas, Pinnell and Curriculum-Selected trade-books, (e) the critical ingredients of Critical Literacy, (f) the “Criticals” converge, (g) reading or literacy?, (h) comprehension: reading to understand texts, (i) writing as comprehension in response to reading, (j) reading disability: a struggling student’s pathway to comprehension, (k) cultivating fully literate readers, (l) Science content area and Critical Literacy, and (m) summary

### **The Prism of Multiple Perspectives**

The real world is full of problems to be solved, such as crises, sensitive topics, and challenges (Vasquez, 2003). Critical Literacy students conduct collaborative research in content area courses in order to understand complex problems, seek explanations, and socially negotiate comprehension of texts through the prism of multiple intrinsic cultural and ethnic perspectives (McLaughlin & DeVogd, 2004; Morgan & York, 2009). According to Lapp and Fisher (2010), students learn to identify relevant topics, appraise contexts in which topics arise, and detect causes and consequences, as well as, isolate their personal role within the topic’s context while ascertaining their personal role in a future solution. These skills have application in the classroom and in participating in the global world.

### **Curricular Considerations of the Study**

The Common Core State Standards for Mathematics, English Language Arts, and Literacy (CCSS, 2010a) and the development of the Next Generation Science Standards for Students and Tomorrow’s Workforce (NGSS, 2013) provided the foundations for curricular

considerations of this study. The CCSS were written by the Council of Chief State School Officers (CCSSO) as members of the National Governors Association Center for Best Practices (NGA Center). The CCSS have been adopted by 44 of 50 states. The National Academy of Science's subgroup, the National Research Council (NRC), published their report in 2011, *A Framework for K-12 Science Education*, which delineated Science teaching and learning concepts, ideas, and practices (NRC, 2011). The NRC partnered with The National Science Teachers Association (NSTA), the American Association for the Advancement of Science (AAAS), and Achieve to write Next Generation Science Standards (NGSS, 2013) for classroom teaching in support of the NRC's report. Instead of writing curriculum standards for the teacher, the NGSS focused on implementing classroom Science procedures that mirrored professional scientists' investigative processes in their work environment so that students and parents would understand what was expected of students during the classroom activities (NGSS, 2013). Scientists routinely use text resources to inform their understanding of existing Science knowledge. They conduct research investigations to validate, refute, or expand upon existing knowledge, often leading to scientific and technological innovations. In order for student learning to emulate professional scientists' work processes, teachers and students depend upon a large collection of text resources.

### **Common Core State Standards**

In 2010, the National Governors Association Center for Best Practices, and the Council of Chief State School Officers authored and published the Common Core State Standards (CCSS) (National Governors Association for Best Practices, Chief State School Officers, 2010). These groups were seeking a way for parents, students, and state departments of education to understand what information and practices were necessary to prepare students for adult life.

Students would know what they needed to learn, teachers would better understand what was necessary to help students accomplish learning, and parents would understand the academic justifications supporting classroom learning expectations. The heart of CCSS emphasized students' early education understanding of content area concepts and procedures. It was the authors' goal that a structured environment would develop and transfer to future learning situations, as students practiced procedures. Rather than constant memorization of facts, students would learn how to locate and identify factual information through procedural learning and facilitated investigation. Furthermore, publishing the CCSS would bring all education stakeholders together to share ownership of academic goals, enjoy success as students progressed, and yield prepared students for postsecondary education and the adult world of work (CCSS, 2010).

The adoption of the CCSS in 2010 stipulated increased use of complex texts in multiple genres in K-12 classrooms for reading, research, and writing activities (CCSS, 2010a). Students were to conduct short research investigations using multiple print and digital sources, conveying the author's stance, write responses that communicated distinct reasons for their opinion about the knowledge they gained, publish their finished work, and share it with others. These requirements mirror the structured activities in a Critical Literacy learning environment.

Common Core State Standards has increased the interest in teaching students to be adept at reading and writing for the purpose of informing, persuading, expressing personal experiences, and generally improving academic interactions with reading and writing content area texts (Fisher & Frey, 2013). According to Fisher and Frey (2013), the 2000 NAEP exam had 50% of the texts as information for the fourth grade, 55% for the eighth grade examinees, and 70% for the twelfth grade examinees. As a result of the data from the NAEP, Common Core for State

Standards and the National Governors' Association set expectations for students in early elementary years to read at least 50% informational texts with increasing text complexity (e.g. difficult to read and comprehend) during K, 1<sup>st</sup>, and 2<sup>nd</sup> grades (CCSS, 2010b). For K, 1<sup>st</sup>, and 2<sup>nd</sup> grade students participation in both speaking and listening, making oral presentations, communicating in formal and informal manners during learning experiences in small groups and participating in cross-curricular activities is part of the Language Arts standards. Furthermore, students in K, 1<sup>st</sup>, and 2<sup>nd</sup> grades are to learn formal argumentation of expressing opinion and supporting opinion through verbally citing information gained during personal research on a specific topic (Fisher & Frey, 2013).

### **Next Generation Science Standards**

In another collaborative state-led processes, the National Academy of Sciences, Achieve, the American Association for the Advancement of Science, and the National Science Teachers Association developed Next Generation Science Standards for students based on the National Research Council's (NRC) report titled *A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas* (Framework; NRC, 2011). Twenty-six states, many corporations, universities, school districts, and organizations contributed in some fashion to the development and publication of NGSS. Standards for K-12 were developed to focus on practices that scientists used in their daily investigative processes, concepts that overlapped all scientific domains, and core ideas that introduced students to basic scientific knowledge. This knowledge would lead students to transfer learning processes to new investigations of their own in a "progression of knowledge" that built students' knowledge and understanding and yielded "an internationally benchmarked Science education" (The National Academies Press, 2013, p. xiii). Written as performance expectations, NGSS chose three categories: divisions of content within

disciplinary core ideas (DCIs), Science and engineering practices (SEPs), and cross-cutting concepts (CCs). The standards were written as performance objectives. NGSS developers wanted students to learn Science at “the intersection of practice, content, and connection” not only in the academic careers but throughout their lifetimes (NGSS Lead States, 2013, p. xvi). Transfer of skills, strategies, and practices across the curriculum is the crossroads at which NGSS and CCSS met within the classroom. Both the CCSS and NGSS required investigative research by students (Fisher, Frey, & Lapp, 2012). For teachers to prepare themselves and their students adequately for such investigative work, a plethora of texts were necessary.

### **Scholastic Publishing, Inc. and a Guide for Classroom Libraries**

Scholastic Books published an online classroom library checklist for elementary teachers to use as a guide to compile a classroom library (Scholastic, n.d.). Scholastic recommended a minimum of 10 nonfiction books per student and 10 fiction books per student. Additional recommendations by Scholastic were for a wide selection of genres, magazines, multiple copies of some texts, and with a wide diversity in cultural and linguistic texts representing students’ home cultures. Furthermore, Scholastic advised teachers to procure 40% of the classroom texts to be published during the last five to ten years. Moreover, Scholastic strongly suggested student choices for text additions to the existing library. Teachers may desire a copious classroom library; however, teachers may not have a knowledge base or skills to evaluate texts.

### **Sources for Science Trade-Books**

There are many places for teachers to locate trade-books. Many organizations annually honor authors, illustrators, and publishing companies for producing trade-books that meet specified quality criteria (Hilburn, Claes, & Griffiths, 2010). The authors of *Commonalities in Content of International Children’s Book Awards: What Does This Tell Us About Children,*

*Culture, and Reading Interests Across the Globe?* (Hilburn, Claes, & Griffiths, 2010) indicate that librarians are quite aware of award-winning books from their respective countries. What is interesting is that it is adults selecting books to receive awards for readers who are children. This has come to be understood as somewhat of a conundrum. In fact, Hilburn, Claes, & Griffiths (2010) selected 89 award-winning texts for examination by adults and children. Of those selections, 61 texts were selected by both sets of examinees as being high quality, leaving out 28 original selections by the researchers. In the literature research, Hilburn et al. (2010) noted that rarely does “child appeal” get listed as a criterion for determining high quality literature (p. 2). There are some consistent characteristics of texts that are chosen by examinees, especially adults. Those criteria are a reflection of the country of origin, childhood imagination, lessons learned themes, anthropomorphic animals, and themes that deal with serious issues that children encounter in their lives or in the lives of friends. Furthermore, although the themes of these books had overlap between the two groups of examinees, the differences lay in the absence of overlap in a majority of the book titles. This highlights the major differences between criteria of adult choices and the choices made by children when selecting trade-books that impart analogous factual information.

### **National Science Teachers Association Outstanding Science Trade-books for Students K-12**

In 1973, the NSTA, in conjunction with the Children’s Book Council (CBC), formed an award for Outstanding Trade-books for Children to recognize K-8 nonfiction texts that supported Science concepts and learning objectives. The award list has been enlarged to encompass K-12 texts and currently the award is called Outstanding Science Trade-books for Students K-12. Each year a committee reviews texts submitted by publishers and authors that meet specific criteria. During the month of March the annotated bibliography list is compiled and published by NSTA



and CBC. Criteria for the texts include relating Science information, concepts, and skills in the categories of Archaeology, Anthropology, Paleontology, Biography, Earth and Space Science, Environment and Ecology, Life Science, Physical Science, as well as, Technology and Engineering.

The OTBC emphasizes literacy criteria beyond reading, writing, and speaking. OTBC evaluates the author's stance toward Science as portrayed in the text through three criteria: the presentation of Science content area knowledge, progressively expanding investigative process skills for students to observe and explain natural phenomena, and how well the author guides students to evaluate investigative results. Furthermore, NSTA has expanded their recognition of "way of knowing" to include art, history, personal perceptions, Science, mathematics, and engineering that lead to product development and the understanding of the natural world. This reverts to earlier references of learning being embedded in language. The NSTA states that it can inspire and enrich a global society of diverse learners who will live adult life as citizen-scientists understanding their world from a responsible, informed viewpoint or as professional scientists actively engaged in responsible research investigations or developing environmentally friendly technological processes and products (<http://www.nsta.org/publications/ostb/ostb2008>). Publishers released books during a school year calendar and NSTA issued the award during March of the following year.

Since the adoption of Science, Technology, Engineering, and Math (STEM), CCSS, and NGSS standards, the NSTA consider higher-order thinking and Science-engineering practices are implemented into the investigative process model and serve as curricular criterion (<http://nstacommunities.org/blog/2011/12/11/transfer-of-energy/>). OTBC is a widely used source for Science teachers' classroom libraries providing opportunities for extended topical research.

## **National Council of Teachers of English (NCTE) Orbis Pictus Award**

Increasing emphasis on cross-curricular teaching and learning led Diane Parker to write a book titled, *Planning for Inquiry It's Not an Oxymoron!* (Parker, 2007), after she encountered the following questions from her elementary students:

1. I wonder who invented blankets?
2. I wonder if sea monsters are real?
3. If twenty-five elephants can be heavier than the Empire State Building?
4. What would we look like if we didn't have any bones?
5. Do fish get thirsty?

Parker realized that language arts activities overlapped into other content areas and vice-versa. Diane Parker is an example of how to develop a text to assist elementary teachers plan inquiry-based learning activities. Her experiences in the classroom helped her understand that the lines between content areas are not as clear-cut as she had previously thought. Parker's endeavors in inquiry-based learning revealed that it is a more fun and exciting method of teaching, as well as, an exciting environment for her students to learn in. Teachers who plan classroom research activities use nonfiction text selections that are awarded honors by organizations such as the Orbis Pictus Award.

A committee formed to represent the National Council of Teachers of English (NCTE) worked jointly with a representative committee from the International Reading Association (IRA) to establish language arts standards that could be the guide for all language arts classrooms worldwide (IRA & NCTE, 1996). Because there were no national standards related to language arts education, reading, and literacy, it was important for these two groups to set standards. The first order of business was for the two organizations to establish a definition of

literacy in a modern world that is print-driven. According to the IRA-NCTE Language Arts Standards (1996) students were to:

1. Read a wide range of print and nonprint texts to understand themselves and others, for information acquisition, to be prepared for the workplace, for personal pleasure, and the texts were to be fiction, nonfiction, classic, and contemporary.
2. Read from many time periods and genres to better understand being human.
3. Apply strategies, to understand, interpret, evaluate, and appreciate a variety of texts.
4. Adjust oral, written, and visual language according to audiences and circumstances.
5. Use diverse strategies for writing and writing processes, for the purpose of communicating with diverse situations and people.
6. Apply language structures appropriately for diverse situations adapting strategies, language conventions, techniques, and figurative language, to create critique, and discuss print and nonprint texts.
7. Generate research ideas and/or questions in order to conduct research on topics by gathering information, evaluating quality of that information, and synthesizing in order to best communicate the obtained knowledge to others.
8. Employ various sources to gain knowledge such as internet, databases, and encyclopedias, to synthesize information into one language arts product to communicate with others.
9. Respect diversity of languages, patterns, and dialects across cultural and ethnical lines, regions, and social roles.
10. Use English when they are EL2 to gain competency in English and advance in understanding content across the curriculum.

11. Participate, reflect, become knowledgeable and creative members of various literacy communities.

12. Use oral, written, and visual language to accomplish personal functions for enjoyment, learning, persuading others, and exchanging information.

Established in 1990, the NCTE award honored what is considered to be the first nonfiction text specifically planned as a publication for an audience of children: *Orbis Pictus* – *The World in Pictures* (1657) by Johannes Amos Comenius. Nonfiction categories for the NCTE Orbis Pictus Award are biography, history, Science, and the arts. Classroom teachers, like the aforementioned Diane Parker, come from a background focused on teaching and learning the structure of the English language and are frequently members of NCTE. The Council becomes the lens through which NCTE chooses trade-books for use in the classroom. These trade-books help teachers guide students to observe story structure, learn grammar, explore diverse genres, and discuss texts as interconnected fragments of the greater realm of literature rather than isolated entities.

The Orbis Pictus Award website, posted criteria for the award include factual accuracy, text organization, design, and style (<http://www.ncte.org/awards/orbispictus>). More specifically the website states that facts should be written without stereotypes, recognizing multiple viewpoints of readers, and written by an author who holds adequate qualifications. Organization of the text should be logical, sequential, and clearly relate patterns and interrelationships of concepts. The book's illustrations must be attractive and suitable for the topic with a balance of illustrations and text, in easily readable fonts. The author's writing should explore topics in an adventurous style, encouraging readers to extend learning through further research, use concepts and language appropriate for the content area, genre, and contain flawless grammar.

Books selected for this award from this Orbis Pictus Award expose primary grade-level students to the best English sentence structure, use of language, and scientific facts that have been verified by the NCTE Orbis Pictus Award selection committee. It is from this perspective that students may gain knowledge about proper American English sentences. This set of award books are strong choices for English as a Second Language students and is a primary source of texts by teachers with an English major or minor as their background. Many college professors teaching pre-service teachers use Orbis Pictus Award as one of their sources for text examples in the courses they are teaching. Thus, pre-service teachers are frequently exposed to Orbis Pictus Award as a source for trade-book selection for their classroom libraries.

### **International Reading Association: Teachers Choices Reading List**

In research conducted by Maaka and Lipka (1997), the elementary classroom that engages in collaborative learning that fostered shared ownership of learning, ownership of curriculum through self-selection, and literature-based thematic unit studies much like a cross-curricular, Critical Literacy learning environment resulted in students who felt more positive about themselves as learners, about reading to learn a wide variety of topics, and had high levels of motivation to learn in fun-filled exploratory learning activities.

The International Reading Association (IRA) established a trade-book award titled Teachers' Choices Reading List (IRA, 2009) that utilizes input from classroom teachers using trade-books in their classrooms. Due to the global nature of the membership and attendance to yearly IRA conferences the geography of the teacher's home is considered. Sometimes it is at yearly conferences that teachers attend author sessions at which they learn about new nonfiction texts.

Grade-levels of books considered for an award by Teachers Choices Reading List must be paperback kindergarten through eighth grade texts (IRA, 2009). Only books of high quality grammatical writing with excellent illustrations are considered. Books considered for an award were to be supportive of the classroom content and curriculum. Primary grade-level students must be taught criteria for recognizing quality literature. The criteria of various award-conferring organizations are taught by teachers or librarians (Stephens, 2008). In her article in *The Reading Teacher*, Stephens (2008) stated characteristics of trade-books should be evaluated by teachers and young readers. Stephens also stated that books should invite the readers into an exciting adventure with colorful, sharp pictures on the cover. According to Stephens, criteria include accuracy, high interest mysterious themes, and references for extending research online sources or other texts on the same topic. Next, illustrations and captions that should balance and complement one another, rather than competing for space on the page. As readers focus on each page, eyes should glide from topic to topic and easily from illustration to text. Finally, font style and size should not distract and interfere with the focus on creation of meaning. She wrote that reading should not be a struggle to comprehend due to differences of font styles. Notably, young children have trouble with those squirrely “a” and “g” letters that seem quite different from viewing in their own print style.

Due to the nature of teaching and learning in elementary classrooms, a major focus is on learning to read and reading to learn. The whole language teaching approach of the 1980s brought an increase in interest of parents and teachers looking to buy trade-books to support students’ interest in reading (Peterson, 2006). The surge in publication of trade-books for children has continued as parents and teachers sustained their awareness of students to read

books at home for research and pleasure. However, sometimes teachers and parents struggled to locate books on specific topics of interest for their respective students.

Many elementary classroom teachers are members of IRA and attend yearly conferences to make connections with other professionals who can impart to them how literacy is a vital link to their students' understanding of content areas (IRA, 2009). Teachers look to professional organizations for new research-based methods for teaching reading, ways to implement trade-books in content areas, methods for accommodating student reading differences, and varied topical interests (Fisher, Frey, & Lapp, 2012, p. 10).

### **Association for Library Service to Children: Robert F. Sibert Informational Book Medal**

Librarians are often tasked with the position of choosing texts for all content areas, topical research sources, and pleasure reading (Hilburn, Claes, & Griffiths, 2010). One organization that librarians join to keep them informed of current trends in literature is the Association for Library Service to Children (ALSC).

The ALSC annually recognizes authors and illustrators for outstanding nonfiction books published in the United States per criteria listed on their website

(<http://www.ala.org/alsc/awardsgrants/bookmedia/sibertmedal/sibertterms/sibertmedaltrms>). The Robert F. Sibert Informational Book Medal honors the former President of Bound to Stay Bound Books, Inc. located in Jacksonville, Illinois. The award is financially supported by Bound to Stay Bound Books, Inc. and administered by ALSC. Books must be informational children's texts that address topics of high interest to children. The book must be of high quality authorship, illustration, and layout. It must include nonfiction features such as a table of contents, index, and various graphic features for reference-type texts. The mainly English text may contain words or phrases from different languages. The book must have been published in the school year prior to

the award and authored by a resident of the U.S., its commonwealths, or territories. While many trade-books used in schools are selected by librarians for school libraries, this award is pivotal in classroom library selections as well. This is because teachers seek the direction of librarians in making book choices for their classroom libraries.

### **Fountas, Pinnell, and Curriculum-Selected Trade-Books Influence of the National Literacy Act of 1991**

The Congress of the United States passed the National Literacy Act of 1991 establishing literacy as “an individual’s ability to read, write, and speak in English and compute and solve problems at levels of proficiency necessary to function on the job and in society, to achieve one’s goals and to develop one’s knowledge and potential” (IRA & NCTE, 1996). This act led to an enormous response by book publishers to produce texts for elementary grade-level readers to support the objectives of the act. This increase in elementary grade-level books was met with appeal by teachers, school districts, parents, and children. Sales of emergent and easy reading books swelled in response and became a spiraling market place.

Publishers Weekly Online posted the top-selling children’s trade-books for 2001 and noted the huge increase of trade-books published for pre-kindergarten through eighth grade (<http://www.publishersweekly.com/pw/print/20011217/28595-all-time-bestselling-children-s-books.html>). Teachers and parents were excited about the availability of texts to support students’ reading and in 1998, Harry Potter hit the scene. The challenge at that time was limited reference material for teachers to use as a means of understanding the reading levels of texts and locating books that moved students forward with small challenges and not overwhelming jumps in difficulty from one text to another. The system Fountas and Pinnell (1986) developed became part of the Reading Recovery Program for struggling readers and *Guided Reading Good First*



*Teaching for All Children* for regular education readers. Fountas and Pinnell (1986) also decided that skipping from first grade texts to second grade texts in whole increments was too challenging for many students. Therefore, Fountas and Pinnell (1986) developed a system by which texts increased in difficulty in fractional parts of the whole school year, allowing students to be challenged a little over time; yet, students could retain control over reading the text by using reading skills and strategies to decode and problem-solve unknown words.

Fountas and Pinnell have written many books that help teachers learn how to more effectively and efficiently help struggling readers. An example is the book *Matching Books to Readers* (Fountas & Pinnell, 1999), which introduced the micro-leveled texts. Initial criteria for consideration of books for the leveled book collection are: (a) length of texts in pages, words and lines per page, (b) print style by font, size of font, and spaces between word and number of lines per page, (c) placement of phrases, sentences, pictures, consistency of this pattern throughout the book, as well as, organizational features such as chapters, headings, contents, and index, (d) punctuation, (e) illustrations in terms of quantity and interaction of text and illustrations, (f) content of information, as well as, theme complexity and sophistication of story, historical influence, and political portrayal, (g) text structure in narrative or expository form, and (h) perspective of the author and characters, structure of language, literary devices, vocabulary, and number and range of high frequency words. Earlier in chapter three of *Matching Books to Readers*, the process for discerning quality texts is: (a) watching students interact with texts, (b) attending to self-descriptions of how teachers used texts, (c) considering child development and young readers, (d) grouping books with similar characteristics and complexity, (e) assigning texts to levels according to those characteristics and complexities, (f) field testing by teachers and students by employing running records, (g) revision of levels, (h) adding new books by

repeating the same processes, and (i) adding new books in future years through the same processes.

## **Reading Recovery**

The extensive research concepts of New Zealander, Marie Clay, came to the United States in the form of *The Observation Survey* (Clay, 1994). This influx of research, evaluation methods, and teaching procedures influenced widespread change in methods of teaching reading in the primary grade-levels. As both a teacher and psychologist, Clay studied the reading behaviors of students in New Zealand schools (1994). She created intervention methods of assessing students' knowledge of texts, reading behaviors, reading comprehension, and writing. Her work resulted in the development of Reading Recovery, and the *Observation Survey of Early Literacy Achievement*, including Running Records, the informal student reading assessment. The premise of her work was that a teacher needed to understand the details of what an individual student comprehended about the work of reading and books, before being able to intervene and assist a student with acquiring further skills that lead to progressive reading improvement. Reading Recovery was developed to teach students of kindergarten and first grade.

As Reading Recovery teachers, Fountas and Pinnell (1986) understood the value of the Reading Recovery program. They appreciated the need for students and teachers to have an extensive library of books available that both challenged students, yet were easy enough to comprehend the meaning of the text. Fountas and Pinnell (1996) envisioned teaching reading, writing, and language beyond the initial teaching and learning of emergent reading. Emergent reading is the earliest forms of reading that include understanding that print holds the meaning of books not the pictures, directionality of the page, recognizing individual letters in unknown

words, recognizing two, three, and four letter words, and beginning to understand that many words work together to convey meaning.

The authors called the movement to get students beyond emergent reading Guided Reading (Fountas & Pinnell, 1996). It was developed for regular education readers. Guided Reading was a method for interacting with all readers in any grade level and any reading ability (Fountas & Pinnell, 1996). It provided structure for teaching and learning with any genre of texts. *Running Records*, developed by Clay (1984), could be used to assess any student's reading level on any text, not just the assessment texts as provided by Reading Recovery. *Running Records* assessed students' reading achievement and aided in moving students toward more challenging levels of text. It also served as a method of revealing reading behaviors that the student struggled to employ. Teachers used mini-lessons for individuals or small groups to intervene with students to fix-up difficulties. Whole group teaching introduced lessons but small groups were the focus of intervention. Small groups were also flexible as a student was not permanently assigned to the group. As reading progress was achieved, students moved into new groups that better fit their understanding of how to approach reading texts. Guided Reading meant that students remained in a structured, supportive scaffold of the learning environment while progressing through elementary and middle school (Applebee & Langer, 1983).

### **How *Leveled Booklist K-8+* Influences Most Elementary Schools**

Fountas and Pinnell wrote many books that help teachers learn to more effectively and efficiently help struggling readers (e.g. Fountas & Pinnell, 2009). Another of their books was the *Leveled Book List K-8+* (Fountas & Pinnell, 2009). Fountas and Pinnell (2009) used classroom teachers to evaluate published trade-books for assigning reading levels to individual books. The leveling had increased text difficulty listed not as a whole number grade-levels, but as small

subdivided portions of a school year, such as one point seven, one point nine, two point one. The teachers' work at leveling texts led to a long list of trade-books published in *Matching Books to Readers Using Leveled Books in Guided Reading* (Fountas & Pinnell, 1999). It was followed by the much more extensive *Leveled Booklist K-8+* (Fountas & Pinnell, 2009). *Leveled Booklist K-8+* helped in the process of introducing slightly more challenging texts. Published by Heinemann, the same publisher for the majority of Clay's books, Fountas and Pinnell made the book lists available for text selection for librarians and teachers in kindergarten through eighth grade schools. Currently, the book list is published in both hard copy and made available online. A subscription to the online version is available for a small yearly fee. Due to the ongoing nature of updating the list and its massive size, 33,000 titles in the 2010-2012 edition, the online version with search features is best for those who wish to build a classroom library in kindergarten through eighth grade-levels for reading class or in content areas, such as social studies, mathematics, and Science.

### **The Critical Ingredients of Critical Literacy**

Many theories are counter responses to difficult circumstances imposed by governments, societies and religious organizations (Johnson, 1995). Often in history it has been the financially and educationally less fortunate people of society who suffer most from oppression and suppression of freedom of choice, access to educational institutions, access to job opportunities, and subjection to domination by those with more power to limit or admit citizens into means by which they could gain personal independence and rise above subjugation and poverty.

**Critical Theory.** Critical theory follows the pattern of being a response to repression. A limited reading of Critical Theory refers to a specific group who taught and studied at the Frankfurt School in Germany (Johnson, 1995). This group of philosophers and sociologists -

Adorno, Horkheimer, Marcuse, Fromm and Benjamin - believed that humans were under subjugation to domination of social classes, industrial employers, or anything that submits them to dominance by others (Kincheloe & McLaren, 2000; Kucukaydi, 2010). This theoretical stance is the impetus behind many subsequent interest groups that lobby for declining dominance and increasing human freedoms. Since the time of the Frankfurt School group, any theory that espoused a comparable theoretical attitude is referred to as a generic type of critical theory, with lowercase letters. In religions there are orthodox, analytical, and liberal believers in the doctrine. So too in critical theory, there are various ideologies but Critical Theory, with capital letters, was developed by the Frankfurt group and is the foundation that began philosophers' interest in subsequently developing critical pedagogy, critical discourse analysis, critical inquiry, critical thinking, and Critical Literacy, though each is a separate and distinct area of study.

**Critical Discourse Analysis.** Critical discourse analysis (CDA) is one of the largest theoretical influences on critical pedagogy (Wodak & Myers, 2009). It focuses on the use of language to exert power via persuasion, inclusion and exclusion of stakeholders, as well as, the dominance of some cultural and social groups by individuals and other cultural and social groups. By critically analyzing all forms of discourse including nonprint texts, speech acts, and multimedia, proponents of CDA attempts to extend linguistics beyond grammar by engaging with nonverbal communication, such as gestures, images, films and visual arts (Bloome & Talwalker, 1997).

**Critical Pedagogy.** Critical pedagogy applies the concepts of Critical Theory in that it advocates critically thinking about all belief systems as promoted by authors (Wink, 2010). Critiquing texts while employing a democratic, classless, unbiased lens allows readers the opportunity to locate advantages and disadvantages of belief systems. Sensitivity to political,

racial, ethnical, gender-based, and other differences within media is an outcome of critical pedagogy and is termed critical media literacy (Freire, 1970; Giroux, 1994; Kellner, 2000; McLaren, 1989). Elimination of stereotypical depictions in any form of media is a goal in order to eradicate bias.

Critical pedagogy guides Critical Literacy to acknowledge the presence of underrepresented individual and group stakeholders in texts, though they are voiceless within some texts. When diverse groups work together to solve complex problems by enacting change as a response to literature, one group may create pressure toward a person or group to sanction change that leads to a more balanced viewpoint that includes perspectives of multiple stakeholders and an egalitarian solution (McLaren, 1989).

**Critical Inquiry.** Essays are often constructed in argumentative, expository, or research formats. Critical inquiry (CI) is a process of reading, reconstructing the text, and responding to it (Chute & Jagoda, 2014). Reading the text is a method of information gathering and forming a personal viewpoint on the topic. Next, students write an essay that expresses the reader's interpretation and understanding of the text-writer's stance. The final stage of CI is for the reader to expound his or her interpretation of the topic. The CI writing style is a highly valuable instrument in response to reading texts in Science and current events. (Maloch & Horsey, 2013).

**Critical Thinking.** Critical thinkers use Bloom's Taxonomy levels of analyzing, synthesizing, applying, and evaluating information collected from research conducted by observation, communication, and experience (Scriven & Paul, 1987). Using the reasoning structures of critical thinking, students read or conduct research while employing the Elements of

Reasoning which include:

1. Purpose, goal, or end in view
2. Question at issue or problem to be solved
3. Point of view or frame of reference
4. The empirical dimension of reasoning
5. Conceptual dimension of reasoning
6. Assumptions
7. Implications and consequences
8. Inferences (Paul & Elder, 1996)

The National Council for Excellence in Critical Thinking (NCECT) uses a definition constructed by Scriven and Paul (1987). Scriven, Paul, and others such as Henry Steele Commager, Edward Glaser, and Jonathan Kozol have been members of the NCECT. The NCECT basically stated that by using the high level thinking processes of Bloome's Taxonomy, having gathered personal and historical experiences that resulted in self-examination, having evaluated via various modes of thinking, having ascertained diverse perspectives on a topic that gets applied to a specific question, and having generated possible outcomes to understand consequences of those possible outcomes, the person then chooses the decision with what appears to be the best outcome. This decision is made even though it is understood that monitoring and adjustments may occur. This process is a way of taking complete control of his or her life while meeting up with challenging situations that require decisions.

### **The "Criticals" Converge**

Print and nonprint texts are appraised through intrinsic, subjective and implied social criterion perspectives in Critical Literacy classrooms rather than rigid prescriptive text-based

criteria in traditional classrooms (Vasquez, 2003). Students in Critical Literacy classrooms appraise the expertise of authors' and illustrators' professional background knowledge, especially as it relates to the subject about which they have written or illustrated that is particular to the text the students are reading. Students in Critical Literacy classrooms interact with other students in a small group setting to engage in rich discussions about multiple texts to gain understanding of diverse perspectives. Students in Critical Literacy classrooms learn to respect others' culture, ethnicity, race, and gender. The self-reflection of critical thinking, the problem-posing of critical inquiry, the self-improvement of critical pedagogy, and the truth-seeking of critical analysis converge into a Critical Literacy classroom. Students' cultural and ethnic backgrounds in addition to personal experiences serve as a springboard for observing and evaluating texts. In Critical Literacy, all texts are considered to be agenda-driven and non-neutral.

### **Increasing Awareness and Empathy through Critical Literacy**

In *Beyond "I Like the Book"* (Vasquez, 2003), students on a research trip to the school library noticed a lack of informational texts about different countries. Specifically, there were no books that would inform them about the country of origin of their newest classmate and therefore the class composed a letter to the librarian requesting purchase of books. Students and parents collaborated to generate a list of books containing ethnically diverse characters and bilingual books, which was attached to the letter. The kindergarten class had learned to position themselves in the perspective of another, the new student, and take socially appropriate action to resolve an existing problem. For students in this Critical Literacy classroom, skills and strategies learned in the classroom had real world applications and connected school with home and the world at the same time.



Critical Literacy teaching and learning is achieved through research activities, beginning with investigation of authors, their purposes for writing texts, their expertise in the topic of the text, the illustrators and their expertise, the accuracy of depictions, the settings, and the characterizations of non-stereotypical depictions in art and in texts (Comber, Thomson, & Well, 2001). In Critical Literacy, nonfiction texts are examined and compared with multiple texts to confirm accuracy of facts and to locate differing author perspectives (Heisey & Kucan, 2011).

Critical Literacy classrooms help students learn that ethnic and cultural backgrounds, as well as, personal experiences, influence the perspectives of individual and group stakeholders (Luke, 2000). Critical Literacy practice focuses on print, nonprint texts, and speech-as-text in the forms of audio, video, discussion, and oral presentations, while recognizing the biased perspective of the author, the audience, and the readers. Although some perspectives may be silent in texts, critical readers recognize these as equally valuable to their own in relation to topic-based studies. Critical pedagogy can influence critical readers to acknowledge power of authors' texts and perspectives of stakeholders to move them to action for change (Vasquez, 2003). Current Science topics for researching authors' credentials leading to rich discussions might include various reasons for climate change, reasons prior to the industrial age for various animals extinctions, and various authors' viewpoints on changes in animal development over centuries. During each research project and discussion, participants learn to employ third space giving equal respect to all viewpoints expressed by those within the group (voiced) and those outside the group (silent) who may disagree.

Using current classroom theory and pedagogy, teachers activate students' prior knowledge to aid in understanding texts (Anderson, 2004; Bransford, 2004). According to Anderson (2004), schema is an underlying organizational mental pattern that is a composite of

ethnicity, culture, home background, personal experiences, acquired knowledge from texts, and knowledge of how people interact within the world. Schemata are structures which become mental filters or viewfinders for understanding authors' texts (Anderson, 2004). In the primary grades, teachers work diligently to engage students' vast discernment of the workings of the world as they interact with texts (Hall & Piazza, 2008; Juel, 1996). Critical Literacy also includes social, ecological, and political issues. In the realm of Science, these issues can be the stewardship of the Earth. The ways in which people show respect for themselves and others by preservation of wildlife, plants, and overall habitat has consequences on the quality of life that people enjoy. Science trade-books that depict people collaborating to preserve wildlife species and keep the Earth free of litter are exhibiting overall respect for other humans because we are all dependent on the positive environment of nature. Depicting people working cooperatively together to clean up areas that have been littered provides positive reinforcement for young readers. Using their knowledge of the world and how it works helps students to clarify what is accurate and what is confused.

### **Reading or Literacy?**

Reading is such a complex task that to relegate it to one psychological model is nearly impossible. In *Models of the Reading Process* (Samuels & Kamil, 1984), the authors describe reading as a psychometric model (Holmes, 1953), an oral language recoding model (Carroll, 1964), a communication model (Ruddell, 1969), a psycholinguistic model (Goodman, 1965), a linguistic and cognitive model (LaBerge & Samuels, 1974), an interactive model (Rumelhart, 1977), and others. Each model overlaps with others and exhibits the complex nature of the reading process. Compartmentalizing reading processes into small segments with the hope that they will be smoothly assembled into coherent understanding of texts seems counter to the

portrayal given compared to what good readers do. Good readers naturally engage in specific use of thinking strategies to negotiate texts. These thinking strategies are much like self-talk that assists them in solving gaps of knowledge (Wilhelm, 2001).

### **The Influences of Gee, Freire, Macedo, Grant, and Fisher**

Illustrating the complexity of literacy in his article, *What is Literacy?*, James Paul Gee wrote that literacy is the “control of secondary uses of language” (Gee, 1989, p. xx). A complication exists between literacy versus reading. Gee (1986) defines reading as “the ability to interpret print” (p. 4) and he defines discourse as it applies to literacy as: “a socially accepted association among ways of using language, of thinking, and of acting that can be used to identify oneself as a member of a socially meaningful group or social network” (p. 6).

Reading is limited, by Gee (DATE), to print; literacy, therefore, must be an extension of reading in which people are interacting with others within a socially meaningful group while thinking, using language, acting in ways that identify them as members of the group, and networking to accomplish some predetermined goal that may or may not include interpreting print. Each bit of Gee’s literacy definition adds complexity for those acquiring emerging skills and entrance into the world of literacy (Gee, 1986). If Paulo Freire attended this group he would also engage in trying to read the people for meanings of their contextually embedded statements by attending to their facial expressions and their gestures while existing within the context of both their immediate and global world (Freire & Macedo, 1987).

The need for readers to understand various cultural backgrounds and acquire extensive vocabulary has increased exponentially to the point of overwhelming teachers and students (Grant & Fisher, 2010). Within a global world that has multiplied the use of text, graphics, illustrations, and expanded technology to project these as well, reading has been overtaken by

literacy in the classroom. Students also need to become wise consumers of information from various sources and learn methods to check the legitimacy of sources (Vasquez, 2003). The burden of teachers to prepare their students to approach texts and to impart “the right” information to their students has increased to the same degree. However, in this fast paced global and technical society, it is impossible for instructors to adequately impart all the right information (November, 2012). Teaching then becomes more a matter of creating environments structured around project learning that allows students repeated experiences of being careful consumers of information by evaluating the legitimacy of resources, drawing conclusions, writing about the information they have gleaned, citing sources, presenting information and conclusions, and discerning the appropriate actions to improve the community in relation to the information they have learned. The environment in which all these activities take place and become a natural process for learning is the project-based Critical Literacy classroom.

### **Reading as a Task**

Primary classroom teachers often lead student interactions with big books and text discussion to construct meaning about texts (Lawrence & Snow, 2011; Ruddell & Unrau, 2004). In pre-reading activities, student predictions are made, reading occurs, and verification of prediction accuracy is checked in small group and whole group discussions. Facts, personal experiences with animals, places, and things are segments of nonfiction teacher-led discussions. These conversations are opportunities for teachers to introduce students to silent stakeholders, diverse perspectives, social and political topics related to animal habitats, water and food shortages in remote countries, and challenges in their own cities, as well as, other topics important to primary students.

Teachers move students from identification of words in print to understanding those words within various contexts (Marshall, 2000). Furthermore, teachers modify response to literature activities to include discussion, drawing, words-as-captions, summaries, personal stories connected to texts, or writing stories in the same pattern as previously read texts, called mentor texts. Comparisons or contrasts of two or more texts and self-selected research topics are student knowledge-building activities in which teachers plan for differentiation of reading and learning in various ability levels (Kintsch & Hampton, 2009). Teachers in Critical Literacy classrooms plan student counter-text writings from the perspectives of silent stakeholders to increase diversity and converge understanding of textual themes. Writing campaigns in which students appeal to leaders to respond to information they discovered while conducting research about their community or student-made videos require deeper research and to express student concerns about school or local topics. One example is a student-made video dramatizing how to negotiate a bullying situation on the playground (Vasquez, 2003). This is a useful example of a student-made video because when local students create their own public-service advertisement, some local students, parents, and community leaders would recognize them and respond by helping solve the problem.

### **Cross-Curricular Text Usage in Content Area Classrooms**

Intentional use of cross-curricular texts, bridging between school and home environments or inclusion of contemporary cultural elements such as music, graphic novels, or popular movies, are further examples of teachers planning for knowledge-building (Morrell, 2000, 2010; Vasquez, 2003). Multimedia texts permit students clearer understandings of topics within context and can be resources for response to literature formats. Teachers intermingling school environment and home cultures build bridges for understanding with diverse student culture

classrooms (Goldenberg, 2004). U. S. school literacy, linguistics, and reading often reflects Western cultural perspectives, but immigrant students need to find connections in the classrooms that reflect what they know (Foster & Purves, 1986; Weber, 1986). English as a secondary language (ESL) students perform better on standardized English assessments, have better transfer of linguistic skills, and better letter-sound relationship knowledge when reading English if they have higher developed skills in their first language (Garcia, 2008). Critical Literacy, with its multiple sources, allowance for divergent perspectives, and immersion in English across content areas, as well as, bridging language barriers, serves to engage diverse student populations in reading and reading-related activities.

### **Concept-Oriented Reading Instruction**

Sometimes using known pedagogy and techniques to explain unfamiliar pedagogy and teaching methods promotes understanding. A familiar pedagogy is Concept-Oriented Reading Instruction (CORI; Guthrie, Wigfield, & Perencevich, 2011). In a research study examining the effectiveness of CORI, it was discovered that students with differing performance levels, diverse cultures, and various languages immersed in cross-curricular, Science-based language arts activities increased comprehension and overcame student at-risk factors (Guthrie et al., 2011). CORI curriculum is based on inquiry project learning that focuses on reading for the purposes of conducting research. The pedagogy of CORI incorporates content areas as the central topics of learning while integrating reading/language arts objectives of self-directed topical research, embedded strategy instruction which employs mini lessons to address reading and grammar needs of students rather than traditional long lectures and completing worksheets. In these ways, CORI coincides with pedagogy of Critical Literacy. Other commonalities of CORI and Critical Literacy are student collaboration on real world content area work, and literacy learning

experiences. Teachers who plan cross-curricular opportunities to engage in intense real world use of oral, print, and written language improve current performance and prepare students for the language of secondary, post-secondary, and adult work (Elley, 1981).

### **Comprehension: Reading to Understand Texts**

A 1944 survey of reading professionals considered to be experts in reading research revealed teachers needed to teach nine reading skills for students to become good readers (Davis, 1944). Those skills were:

1. Knowledge of word meanings,
2. Ability to select the appropriate meaning for a word or phrase in context,
3. Ability to follow text structure, identify antecedents, and references to it,
4. Identify main idea,
5. Ability to answer questions about the passage,
6. Ability to answer questions without using the exact words in the passage,
7. Draw inferences about the passage,
8. Recognition of literary devices used to create tone and mood,
9. Determine the author's purpose, intent, point of view, and to draw inferences about the author.

Allan Luke, the Deputy Director General of Education for the state of Queensland, Australia and his co-author Peter Freebody developed the Four Resources Model that contained:(a) coding competence called the code breaker, (b) semantic competence called the meaning maker, (c) pragmatic competence called the text user, and (d) critical competence called the text critic (Freebody & Luke, 1990; Muspratt, Luke, & Freebody, 1997). Freebody and Luke (1990) were the architects of the Critical Literacy curriculum adopted as the Australian model for

learning across their nation. Both the critical analysis and the literary elements must be present to satisfy Luke's Critical Literacy pedagogy written for Australia (Luke, 2000). The list of skills is not too unlike those expected by today's teachers; however, today, teachers find it challenging to set aside ample time for student reading, student engagement in learning, student practice of specific reading strategies, time for collaboration with classmates and the teacher, as well as, time for discussion with classmates and the teacher (Fielding & Pearson, 1994; NCLE, 2013). Critical Literacy, as outlined by Luke (2000), includes time for teachers to instruct students in reading language arts strategies. To Luke (2000) and Pearson and Camperell (1981), understanding text structure is of major importance in comprehending texts. Moreover, for Luke (2000), Critical Literacy that does not recognize the need to teach standard elements of literature such as text structure, setting, plot, and characters and does not qualify as literacy but only qualifies as criticism.

The Reading and Development, Corporation (RAND) study is required that reading teachers' instruction include reading fluency activities, instruction of many embedded reading strategies, self-monitoring strategies, and vocabulary instruction (Snow, 2002). RAND's study also required teachers to employ multiple genres, allow students to choose materials, plan collaborative activities with challenging reading tasks, teach with a wide-range of methods, and plan for extended student reading time. Many other reading authorities appeal for the same reading activities, as well as, real world reading and interactive reading to strengthen students comprehension abilities (Brown, Palincsar, & Armbruster, 2004; NCLE, 2013; Pearson & Camperell, 1981). All the aforementioned reading to learn activities are incorporated in Critical Literacy classroom environments.



## **Viewpoint of the Author and Questioning the Author**

Questioning the author is one of the first steps toward becoming a critical reader (Killion, 2002). Learning to pose good questions directs students toward interrogation of an author of texts (Beck, McKeown, Hamilton, & Kucan, 1997). Frequently, young students are reliant on teachers as a source of all knowledge rather than seeing themselves as investigators or detectives looking for answers to in texts (Williams, 2010). When teachers model predictions, verbalize internal thought processes, verbalize a summary of main ideas of the text, or pose questions such as “What is the difference between a wheel and a tire?” or “What is the difference between a peninsula and an island?” teachers guide students to become detailed observers of texts and better text detectives.

## **Writing as Comprehension in Response to Reading**

Teacher-planned primary grade-level reading activities embed reading in a context of collaborative learning that result in sociocultural constructed texts (Gee, 2001). Instruction and modeling of collaborative literacy centered on genres, literacy elements, and authorship of responses to literature are planned by teachers for self-contained classrooms and teachers of Critical Literacy. It has been noted that students who had writing instruction performed better on their reading assessments than students without writing instruction (Bond & Dyskstra, 1967). Other researchers argued that students who have a sense of authorship, conference with others about their writing, and have knowledge of editing are more flexible writers and possess strong critical thinking skills (Graves & Hansen, 1983). When teachers use multiple teaching methods, deconstruct texts to inform instruction, emphasize thinking strategies, encourage brainstorming, and set up a classroom environment of collaboration during the writing process, students of all

socioeconomic categories are more likely to become strong readers and writers (Applebee & Langer, 1983).

### **Reading Disability: A Struggling Student's Pathway to Comprehension**

Montgomery and Kahn (2003) suggest that Critical Literacy should incorporate teaching methods in a natural, connected flow of investigative and response processes, especially if the flow of the writing process is sequenced so that struggling readers and writers have a written check-off list of tasks to be completed. In critical Science Literacy classrooms, thematic studies using multiple grade-leveled texts is a natural method of accommodating all readers through use of Science trade-books (McLaughlin & DeVogd, 2004). Making a natural environment by differentiating for various reading levels, Critical Literacy Science classrooms provide adequate information for students to perform well on classroom and district-wide testing. As students expand their knowledge, vocabularies, and understanding of topics, they can self-select books that also increase reading challenges while they approach the texts with prior knowledge that scaffolds their own learning. Exposure to topics through multiple texts and the Critical Literacy discussion-rich environment help all students expand mental structures to add new information to schema and obtain new vocabulary to describe their newly acquired knowledge (Blachowicz & Ogle, 2001).

### **Ownership of Text Vocabulary and Meaning**

Individuals with limited prior knowledge have limited success at inferring from texts (Coté & Goldman, 2004). Opportunities to see and use vocabulary words within various contexts improve the likelihood that students will adopt words into their schema (Wessels, 2011). Teachers who introduce vocabulary through speech, by exposure to vocabulary through various texts, and then reinforce vocabulary in student written response assignments have provided

multiple opportunities to engage with new words (Allington, 1984; Sticht & James, 1984). Silent reading limits student engagement with text while robust oral reading such as Readers Theater, discussion, dialogic speech, presentations, and writing reinforce reading readiness and vocabulary adoption (Lawrence & Snow, 2011; Wilkinson & Silliman, 2000). These collaborative literacy events increase students' understanding of diverse perspective in Critical Literacy classrooms.

### **Cultivating Fully Literate Readers**

A position statement by the International Reading Association (IRA) indicates that a person who is “fully literate” is one who can negotiate the technologies of the world and can “read the world” as Freire and Macedo (1987) pointed out four decades ago (IRA, 2009). The IRA position statement equates the importance of technological literacy with “critical and culturally sensitive thinking” (IRA, 2009, p. 1).

Teachers in K-12 classrooms search for methods to motivate students, keep them engaged in the learning process, raise the rigor of content area reading, as well as, differentiate the curriculum to accommodate learning, and include cultural-ethnic perspectives of topics (Gambrell, 2011; Vasquez, 2003). Meanwhile, the pressure of standardized testing is unrelenting, the criteria for highly qualified teachers does not dissipate, and documentation of student performance remains as the CCSS steps in to challenge students to encounter complex texts while supported by teacher scaffolding of instructional activities (Fisher, Frey, & Lapp, 2012). Looking beyond the post-phonics-based reading of fiction texts to the more academic reading of nonfiction, content area-based texts lead perfectly into student-centered research projects that naturally scaffold and challenge student reading (Barnes, 2013; Schiro, 1997). Yet, the question remains of how to engage students thoroughly in actively learning skills and strategies while

applying them to the real world, as they gain deeper understanding of the existence of varying cultural and ethnical perspectives of social, scientific, ecological, and political topics across the globe through their encounters with complex texts.

Teachers' foremost duty is to teach the literacy skills and strategies that are required by curriculum standards for students to attain success in their daily work within the classroom and to be prepared for adult life in a global society (CCSS, 2010). Today, these standards come in various forms, such as CCSS, Standards for the English Language Arts (NCTE) and IRA. Each state department of education chooses the source of their standards. Most states have chosen to adopt the CCSS State Standards.

In some states, the state department of education or the local school district directs specific teaching methods be employed to meet these teaching objectives or standards. Other states or local districts allow teachers the freedom to choose their teaching methods as long as specified skills and strategies are being taught or addressed (CCSS, 2010). At this point, teaching philosophy or theory enters into the decision-making of how to teach standards and objectives.

In an academic world moving into the CCSS, assessments are not vanishing but changing form, thus, students' abilities to evaluate scenarios, problem-solve, and choose feasible answers remains (Barnes, 2013). Critical Literacy project-learning reinforces these skills and strategies through repeated opportunities at learning processes centered on solving problems in cross-curricular and intra-curricular projects that address the needs of the classroom, the school, and the local community.

The CCSS and Standards for the English Language Arts expect students to analyze texts and text structures, read and write in various genres for multiple purposes, draw inferences, understand that communication changes for different audiences, conduct research, reflect on

what they have learned, and apply or transfer skills and strategies they have learned to new situations across the curriculum (CCSS, 2010). Nonfiction texts have specific sentences structures, text, graphics, and overall book structures that set them apart from fiction books. This difference makes it imperative that teachers explicitly teach young students to recognize the different structures in order to approach reading with appropriate skills and strategies. The Common Core specifies students be familiar with non-fiction text structures such as captions, headings, glossaries, indices, and tables of contents, electronic menus, and icons, and be able to identify key information and facts. These skills are subsequently needed to perform well on yearly standardized tests.

A problem for the classroom teacher and the student is to find ways to conduct broad spectra of learning across the curriculum as they practice respect for diversity and global cultures, while maintaining high interest and motivation during what at many times seems to be a very short school day (Vasquez, 2003). The teacher of today looks for ways to compress learning much like compressing computer files in order to prepare students for an unknown future. Critical Literacy requires that each of these skills, strategies, and activities be performed to achieve the end product: conduct topical research projects to meet curriculum objectives that identify and understand the perspectives of all stakeholders whether they were voiced in the texts or silent and respond to the results of the investigation by seeking resolution to problems discovered during the research. Students move one step beyond identifying problems and into understanding the consequences of problems on people, animals, and the environment. Critical Literacy compresses learning by employing literacy skills within the content areas.

## **Standards and Objectives for Language Arts and Science**

The Common Core State Standards (2010) state relation to reading, teachers of primary grade-level students must explicitly teach:

1. Methods for asking and answering questions,
2. How to retell stories,
3. How to identify words and phrases in stories or poems that relate feelings,
4. How to explain the difference between fiction and nonfiction texts,
5. How to identify the narrator in a story,
6. How to describe characters, settings, or events,
7. How to compare and contrast concepts within the texts,
8. How to use different reading techniques for reading prose and poetry.

These are the same requirements for teaching students how to interact with fiction and historical narrative nonfiction texts from a Critical Literacy stance. Teachers of Critical Literacy also teach students to make connections to the real world by understanding which stakeholders were left out of the story, what those stakeholders might think about the same events, and what those missing stakeholders might propose as solutions to problems within the plot. In Critical Literacy, it is important for students to own skills and strategies for interactions with all texts because they are required to read multiple texts on the same subject and from multiple genres. Reading widely assists students to comprehend the in depth nature of a topic, the multiple perspectives of stakeholders, question the agenda of authors, and to form an informed opinion on a topic.

Critical Literacy students are then required to participate in discussions and ultimately respond to the topic based on their overall understanding by writing a response, writing a counter

text arguing against an author's perspective, or with a media presentation. With regard to writing, primary teachers must teach students to:

1. Write opinion papers about books,
2. Write explanatory texts on chosen topics,
3. Write with different narrative writing techniques recounting events in sequence,
4. Write responses to questions with the help of an adult,
5. Write using digital tools for the purpose of publishing with the help of an adult,
6. How to participate in shared research and writing projects,
7. How to gather information from various sources while receiving adult help (CCSS, 2010).

In Critical Literacy classrooms, students as individuals, in pairs, and in small groups engage in daily writing of responses. Critical readers write opinion papers about fiction and nonfiction texts, as well as, about various types of media. Students in Critical Literacy classrooms construct sequenced accounts of stories, responses to questions, and frequently participate in collaborative research and writing projects.

Critical Literacy engages students in natural interactions while employing all aspects of language arts. When primary teachers instruct students about speaking and listening, they must plan for students to engage in collaborative conversations with diverse partners, peers and adults in both small groups and large groups (CCSS, 2010). Primary teachers explicitly teach how to follow rules for discussion, how to respond to others, and methods for asking clarifying questions. They must also teach the appropriate ways to ask and answer questions of a speaker to obtain other information. Teachers of primary students need to model how to describe people, places, things, and events with details, ideas, and feelings. They must teach students how to

speak in complete sentences appropriate for various tasks and situations. Predictions, verifications, discussions of the texts during and after reading, collaboration to compare and contrast texts, as well as, the negotiation of self-chosen research can incorporate each of the above objectives in Critical Literacy classrooms.

### **Science Content Area and Critical Literacy**

It is clear that Science is an everyday influence in the lives of the world's citizens – Energy production through petroleum, solar, geothermal, hydraulic fracturing, wind, and water are daily topics in the news. Environmental concerns in relation to maintaining animal habitat while expanding housing, farms, and producing sources of pollution are also constant concerns of the public. Balancing the needs of humans with the needs of animal and plant environments is delicate. These are often emotional topics for students that automatically inspire interest in research (Hendricks, 1987).

The NSTA is calling for students to become critical readers as they read the Internet, newspapers, magazines, and in obtaining Science current event news from all sources (Pratt, 2013); however, typically Critical Literacy topics are associated with social studies research which focuses on looking at the deficits of social and government provisions for humans within various contexts. This strengthens the need for teachers to employ Science content texts, in the form of trade-books, magazines, Internet websites, and video, as sources of topics for use with Critical Literacy. Furthermore, Science is the perfect learning environment and content for investigation of real world complex problems, searches for explanations, various types of evaluation, collaboration, and negotiation of solutions (McLaughlin & DeVogd, 2004).

Currently, literacy-teaching is trending toward increased research experiences (Fisher, Frey, & Lapp, 2012). Teaching critical literacy is achieved through research, beginning by



investigating authors, their purposes for writing the text, their expertise the illustrators, their expertise, accuracy of depictions, as well as, investigating the setting and its use of in accurate or defamatory depictions. Nonfiction texts are examined and compared with multiple texts to confirm accuracy of facts. Writings of Mann (1837), Dewey (1899), and Rugg (1939) reference teacher struggles to inspire students to be critical readers. Nearly 100 years later, current articles by Science and social studies educators call for teachers to teach critical reading strategies to equip students not just for use in the classroom but as prepared adults ready to enter the world of political agendas with propaganda, as discriminating consumers of the Internet, texts, television, movies, symbols, and even friendships (Devick-Fry & LeSage, 2010; Henry, 2006; Morrell, 2000; Rush & Lipski, 2009; Schramm-Pate & Lussier, 2003; Wilson, 2001).

Critical Literacy cannot be static and easily standardized. Intensive preparation, practice, and readjustments for classroom guidelines and boundaries are important to negotiate diverse, conflicting viewpoints but worth the effort to equip students adequately (Vasquez, 2003). In this way, Critical Literacy strategies, when connected to content area curriculum, are remolded to be applied in flexible ways to fit the genres of fiction and fantasy, as well as expository and nonfiction texts. Any one of a diverse list of applications of Critical Literacy is available for study but this research study focused on the evaluation of Science nonfiction text to support primary grade-level classrooms. Science has a specialized discourse. There is a clear need for trade-books to support critical Science teaching multiple literacies reading, and learning. Much like math, the Science community has beliefs about a large body of complex knowledge of which students are expected to know to be considered Science proficient (Hunsader, 2004; Moje et al., 2004). Science trade-books assist teachers in extending the information offered in textbooks to provide students with opportunities to acquire complex Science knowledge.

The influences of CCSS and NGSS standards in the critical Science Literacy classrooms are guiding factors in teacher decision-making to meet standards in 44 of 50 states in the United States (CCSS, 2004; NGSS, 2013). Various educational theories converge in the critical Science Literacy classroom to strengthen the depth of skills, strategies, and knowledge acquired by students, preparing them to conduct research projects using multiple texts and increase student awareness and empathy. Critical Science Literacy uses cross-curricular texts to support students' learning.

### **Summary**

The chapter reviewed existing literature associated with Critical Literacy, Science education, and Science books. Ensuing topics comprising this chapter were the prism of multiple perspectives, curricular considerations of the study, sources for Science trade-books, Fountas, Pinnell and curriculum-selected trade-books, Reading Recovery, how *Leveled Booklist K-8+* influences most elementary schools, the critical ingredients of Critical Literacy, reading or literacy, comprehension, standards and the language arts and Science, Science content area and Critical Literacy. Common Core State Standards and the Next Generation Science Standards were curricular considerations for writing questions for the evaluation of texts to identify Critical Literacy elements and for modifying the STBER Sources for locating Science trade-books were the awards programs of four professional organizations: NSTA, IRA, ALSC, and NCTE as well as the curriculum-selected source, Booklist K-12+ (Fountas & Pinnell, 2009). Reading was identified as a complex cross-curricular task with the aim of comprehension of texts. The Critical Literacy program, *Four Resources Model* (Luke & Freebody, 1997) was explained.

### CHAPTER III: METHODOLOGY

This chapter presents a description of the methodology of the quantitative and descriptive evaluation of the critical Science Literacy trade-books using criteria of the three main subscales of the MASTER: Science, Literacy, and Critical Literacy. This chapter addresses the following topics: (a) research questions guiding the study, (b) development of the MASTER (c) an overview of the search for an existing instrument, (d) the original STBER format, (e) development of the MASTER, and (f) choosing resources for the primary grade-level Science trade.

#### **The Significance of the Study**

The researcher for this study modified an existing evaluative instrument, the STBER, for the purpose of evaluating primary grade-level Science trade-books. Changing the name of the tool reflects the modifications made to the STBER. The new name, the Modified Analytic Science Trade-Book Evaluation Rubric (MASTER), identified the presence of Critical Literacy elements of race, gender, authority, culture, socially relevant political issues. Presence of these elements leads to discussion-rich Critical Literacy environments that assist students in engaging in a communication skills process of apprenticeship. The act of apprenticing is learning and producing artifacts beneficial now and in the future.

#### **Research Design**

This study was a quantitative research study with the goal of using a modified evaluative instrument to identify Critical Literacy elements in Science trade-books and to utilize it in the analysis of data pertaining to Science trade-books. This process abided by a sequential statistical analysis of data to disregard unsatisfactory deficient information, and locate remarkable, consequential results. Nonparametric, descriptive, and frequency data were explored and

reported. The use of Shapiro-Wilkes, an exploratory factor analysis, means and standard deviations of subscales, the Kruskal-Wallis test, the Mann-Whitney U test, and the Chi-Square test of Independence were also instrumental in conveying meaningful statistical information.

### **Assumptions**

The STBER was an existing and an already effective instrument that identified quality Science trade-book literature (Atkinson et al., 2009). The assumptions for this research were that the MASTER would distinguish quality Science Literacy trade-books from lesser quality texts. It was an objective that the MASTER would identify specific Critical Literacy elements as they are distinguished in Section III on the MASTER. Therefore, it was assumed that there was an extensive body of published texts available that would provide an ample list of texts for evaluation and identification of Science-related Critical Literacy trade-books.

### **Limitations**

The limitations of this study were that the original sample size, though substantial at 321 books, might eliminate too many texts due to the failure criteria of the first three questions in the Science Literacy subscale because they did not contain adequate Science information. Elimination of texts would make it difficult to compile a generous list of Science trade-books for evaluation.

Due to the short length of primary grade-level texts, which limits the depth of Science content information that can be relayed, it was decided to use any trade-books identified by the randomized selection for the study. Similar texts with minimal Science information might be eliminated in higher grade-levels. Another limitation was the possible absence of Critical Literacy elements in each text may further eliminate texts from inclusion in the sample. Because

no existing information was located about evaluating content area texts for elements of Critical Literacy, the outcome of the quantity or quality of text evaluation was unknown.

For this study it was desired to have a large sample to evaluate with the MASTER to insure that the study was broad enough to represent the available literature in the category of primary grade-level Science trade-books. One hundred and fifty-four books evaluated were derived from four organizations' Award-Winning Trade-book (AW) booklists from 2008 through 2013. Although the booklists were collected from 2008-2013, some book publication dates lay outside that spread. Some organizations require that books be published during the previous year, while others allow publication after the booklist date. The remaining 167 books were from the Curriculum-Selected Trade-book (CS) source. An attempt was made to purchase an equal number of texts from the CS category and the AW categories. Both sets of books spanned the branch areas of Earth and Space Science, Life Science, Physical Science, Social Science, Applied Sciences, and Formal Science. Texts to be evaluated for the study were purchased online through [www.amazon.com](http://www.amazon.com). The social website [www.randomizer.com](http://www.randomizer.com) was used to randomly choose texts from the CS source. Each text was assigned a number of one through four to designate which area of Science was most suitable. These areas were:

1. Earth and Space Science,
2. Social Science,
3. Life Science,
4. Physical Science.

From the designations referenced in the CCSS (2010) and NGSS (2013) publications, these were deemed the most frequently occurring in pre-kindergarten through second grade

Science trade-books. No copyright dates or authors were listed in the CS source, which prevented any endeavor to stay within the 2008-2013 publication dates.

### **The Original Science Trade-book Evaluation Rubric (STBER) Format**

The original STBER was comprised of two categorical or subscale sections. The first subscale evaluated Science trade-books by Science Literacy criteria. The Science Literacy Subscale was divided into two subsections. The first subsection of Science Literacy evaluated trade-books to decide if there was sufficient scientific information included in the text to qualify as a Science text and contained three questions. If the trade-book did not contain sufficient scientific material, it was to be rejected from further review. The second subsection of Science Literacy evaluated the quality of the information and also contained three questions.

The second categorical subscale of the STBER, Literacy, evaluated quality of the literacy in trade-books and was comprised of only that one section containing six questions. In the Literacy Section there were no disqualification questions as had been in the Science Section.

For the purposes of this study, the STBER was modified to add a third section or subscale labeled as Critical Literacy. This subscale of the rubric evaluated trade-books for the presence of Critical Literacy elements, which were race, gender, authority, culture, socially relevant political issues, and the degree to which small group discussion could be generated from the trade-book. There were no disqualification questions as had been in the Science Literacy section. When the STBER was modified, the researcher labeled the STBER as the MASTER.

All three major sections - Science Literacy, Literacy, and Critical Literacy - were added individually and divided by the number of questions in each section in order to achieve an average score for each section. The average score was then marked in the Final Reviewer

Evaluation rubric. Space was allotted for the reviewer to write evaluator comments for each question throughout the survey as well as in the Final Reviewer rubric.

## **Development of the MASTER**

### **Overview**

Science learning and literacy are interconnected because reading is an integral part of the Science research process, which explains why immersion of collaborative Critical Literacy teaching and learning in Science primary grade-level classrooms is crucial (Grant & Fisher, 2010). The researcher conducted a search to locate an instrument for evaluating trade-books for Critical Literacy. Because it was difficult to identify quality Critical Literacy trade-books to compile an abundant resource bank of texts for primary grade-level Science classroom teachers (Atkinson et al., 2009; Fang & Wei, 2010; Guthrie & Wigfield, 1999). Prior to location of the STBER, no instrument was located to evaluate both Science and literacy on the same survey. The STBER used a five-point Likert scale to evaluate Science trade-books and identify quality texts for imparting significant scientific information to supplement classroom textbooks and as general high-quality literature. It was examined and considered to be a high quality, existing instrument. A discussion with the dissertation committee chair resulted in a decision to appeal to the authors of the STBER for permission to modify it to include Critical Literacy on the STBER. An Internet search located Terry Atkinson, PhD. of East Carolina University in the Department of Literacy Studies, English Education, and History Education. Dr. Atkinson assisted in contacting the other two authors, Lisa Huber, PhD., and Melissa Matusevich, PhD. The researcher received permission from all three authors (see Appendix A, B, C).

### **Content Area Experts Issuing Opinions on the MASTER**

The committee contributed their professional feedback to modify the STBER. Two experts, one in the field of Mathematics Education and another in the field of Science Education, were

members of the researcher's dissertation committee. These professors discussed their analysis of the STBER and questions being considered for modification of the STBER. Their opinion as experts weighed heavily in the Critical Literacy modifications made to the STBER. Committee members suggested rewording sentences and eliminating some sentences on the researcher's list of possible modifications. It was decided that Critical Literacy questions would focus on race, gender, authority, culture, social-political, and pairing with other texts would create a discussion-rich environment for primary grade-level students' consideration. After the researcher worked with the STBER as an evaluative tool, it was determined that the instrument was analytical in that it provided a systematic, methodical guide for evaluation of primary grade-level Science trade-books. As a result, the title for the STBER was renamed to reflect its transformed and analytical state to become the MASTER. The technique of using a Likert scaled rubric is a reasonable and efficient structure. Honoring the original intent of the authors was an influential consideration in retitling the STBER.

### **Choosing Resources for Primary Grade-Level Science Trade-Books**

The sources for the AW for this research study were:

1. National Council of Teachers of English Orbis Pictus for Outstanding Nonfiction for Children,
2. International Reading Association Teachers' Choices,
3. Association for Library Service to Children with support from Bound to Stay Bound Books, Inc. Robert F. Seibert Informational Book Medal,
4. National Science Teachers Association Outstanding Science Trade-books for Student K-12.

The remaining Science trade-books for this research consisted of curriculum-selected trade-books (CS) chosen from the Fountas and Pinnell (2009) *Leveled Book List K-8+*.



Librarians frequently choose texts for school libraries. For the purposes of this research, the texts from *Leveled Book List K-8+* were labeled CS. The authors of the CS promote this text as having contained 33,000 texts of various genres. The titles of the CS were appraised for titles that appeared to be Science-related. The Science-related titles were highlighted and numbered. These books underwent a randomization selection process to gather texts from Earth and Space Science, Social Science, Life Science, and Physical Science. Both the CS book titles and the AW book titles were entered into an Excel spread sheet and alphabetized to randomize the list. The Social Psychology Network ([www.socialpsychology.org](http://www.socialpsychology.org)), maintained by Steven Plous of Wesleyan University, has a free link called Research Randomizer. The researcher employed the Research Randomizer to generate the list of 453 randomized numbers that might be necessary in order to procure enough texts for the study. It was believed that out-of-print texts, or out-of-stock titles might prove to be a complication. With that in mind, it was decided to proactively choose extra titles that could be used to substitute for unavailable books. A second party was hired to assign the random numbers to the alphabetized list of book titles in order to limit the researcher's interaction and familiarization with the titles of the Science trade-books, and to conceal knowledge of whether the books were AW or CS from the researcher. This system was used to reduce researcher bias during the actual evaluation process. An annotated bibliography of the books used in the study can be found in Appendix F.

The following independent variables were used in the analysis:

1. Is the book AW or not?
2. Is the book in copyright group 1 prior to 2000?
2. Is the book in copyright group 2 (2000-2009)?
3. Is the book in copyright group 3 (2010 through 2014)?

4. In which area of Science is this book?

### **Process for Evaluation of the Texts**

The researcher was a member of the IRA, the NSTA, and the NCTE at the time of the purchase of the texts and during the period of text randomization. The researcher was not a member of the Association of Library Service to Children. Randomization allowed the instrument evaluation to occur without prejudice and reduced the influence on the researcher's evaluation of books. One MASTER packet was used for each text. A number on the Likert Scale of 1-5 was circled for each question on the MASTER. Assigning a text as a "one" designated a weak depiction of characteristics referred to in each question while "five" represented a strong portrayal of a component within each question. Researcher comments were entered for each question as needed to later use in preparing the annotated bibliography of research texts located in the appendix (See Appendix F).

### **Process of Data Collection**

The research data was analyzed to assess the instrument's ability to distinguish the differences between AW and the CS in the areas of Science criteria, literature criteria, and Critical Literacy criteria. Data were reported by descriptive statistics and factorial statistics. There were three subscales on the MASTER: Literacy, Science Literacy, and Critical Literacy. It was considered possible that meeting criteria in one category might affect the outcome in another category. Consideration of data for whether the criteria in the Literacy category (Section I of the MASTER) were met in the high range or whether the book also met criteria in Science Literacy (Section II of the MASTER) was in the high range was important. Furthermore, deliberation for the criteria in the Literacy category (Section I of the MASTER) of the high range, or did the book also meet criteria in the Critical Literacy category (Section III of the MASTER) in the high

range was a substantial matter. Finally, if the criteria in the Science category (Section II of the MASTER) was in the high range, did the book also meet criteria in the Critical Literacy category (Section III of the MASTER) in the high range? Analyzing data for these three questions resulted in a matrix.

It was expected that there may be many sets of variables due to the diversity of resources of books and the large sample size. The expected outcome was that the CS would have higher scores on the three sections (i.e. Science Criteria, Literacy Criteria, and Critical Literacy Criteria) of the MASTER due to the nature of the book selection process conducted by Fountas and Pinnell (2009) which deemed books appropriate for use as focus for reading and as supplemental to textbooks in content area teaching and learning.

### **Procedures for Data Analysis**

The methodology that was implemented employed quantitative and descriptive evaluations of the critical Science Literacy trade-books using criteria of the three main subscales of the MASTER: Science, Literacy, and Critical Literacy. Data analysis of the critical Science Literacy trade-books was generated via step-by-step process. These analyses were followed by a process of analysis which adhered to a consequential statistical analysis to evaluate data, eliminate insufficient, insignificant information, and locate noteworthy, meaningful data analysis results. Some of the analyses conducted that contributed to the quantitative and descriptive language of this study were analysis of frequencies, exploratory factor analysis, computation of means and standard deviations of subscales, the Kruskal-Wallis test, the Mann-Whitney U test, and the Chi-Square test of independence.

Data was collected and analyzed concurrently. Data was analyzed to determine relationships between the three subscales. Total scores were computed and checked for each

MASTER subscale and normality of the three total scores by the Decade Factor. The Decade Factor divided the data into three groups based on copyright dates that were recorded for pre-21<sup>st</sup> century publication date data (1986-1999), first millennial decade publication date data (2000-2009), and last millennial publication date data (2010-2014). The normality of the total scores was examined using the Shapiro-Wilk's Test of Normality and box plots. Because all three total scores were highly skewed, assumption-free nonparametric statistics were used to analyze the data.

Data was next analyzed by the Cronbach's Alpha for internal consistency and reliability for a 0.7 or greater. Exploratory factor analysis (EFA) was conducted. An EFA is an algorithm program that attempts to organize otherwise chaotic data and correlate the data to establish interrelationships between data. Other analyses were the Scree Plot, factor loading, as well as, computation of means and standard deviations, Kruskal-Wallis, Mann-Whitney U test, and cross-tabulations which helped determine if relationships existed between and among the subscales and decades. Denzin and Lincoln (2005) suggest triangulation of multiple methods as well as Lincoln & Guba (1985) in their discussion of the trustworthiness of data analyses. Using a variety of statistical procedures that test for the same results, e. g. reliability, is a method of verifying accuracy through triangulation.

The original aim of the study was to analyze a large population of texts from the copyright years of 2008-2013. Two books were listed as copyright 2013 in the award list but were marked as 2014 inside the texts. The *Booklist K-8+* source listed no copyrights and no authors. So when the randomized list required a specific number, the text was placed on the list to acquire it. The books were ordered, purchased and when the books arrived they were placed into a box. The assistant placed the randomized number inside the cover of each book. Then the

assistant handed the texts off to the researcher who discovered the copyright dates when evaluating the books which resulted in the determination that some books were outside of the target years. This is the reason that it was decided to analyze books by the Decade Factor. The Millennium Decades included the years from 2000-2014 and contained only 278 texts.

Further analysis was conducted to determine the Decade Factor. This factor considered the decade in which each book's copyright was assigned. Analysis was conducted with the Kruskal-Wallis and the Mann-Whitney U on three groups, books with copyrights: prior to the twenty-first century (1986-1999), the first decade of the new millennium (2000-2009), and the beginning of the second decade in the new millennium (2010-2014). Books were grouped and analyzed by the Decade Factor, to find patterns in the data. The scores of each subscale were added; then, analyzed with the Kruskal-Wallis test. Pairing of the decades, analysis with the Mann-Whitney U test, and adjustment with the Bonferroni correction was employed to look for statistical significance between Decade 1 and Decade 2, Decade 1 and Decade 3, and Decade 2 and Decade 3. The Kruskal-Wallis procedure disclosed significant differences among the three Decade subscales and reveal patterns.

Further analysis with the Mann-Whitney U test by pairing the decades and adjusting with the Bonferroni correction was completed. The family-wise alpha at 0.167 ( $0.05/3$ ) for all pairings was employed to reveal any significant differences where  $p < 0.167$ .

The two New Millennium decades, Decade 2 versus Decade 3, were analyzed by cross-tabulations. An expected outcome was that the Curriculum-Selected texts would score higher on the subscales because the criteria by which they are selected for placement in the *Booklist K-8+* is professed to be high so that texts can support the academic curriculum. Subscale means were analyzed. When comparing AW and CS, the means of subscales compared. The two New

Millennium decades were analyzed with the Mann-Whitney U test to distinguish differences between the AW and the CS and to note statistical significance. The Shapiro-Wilk's Test and box plots were used to reveal skew of the data.

In primary grade-level texts the concept of "Science" is broader than in the later grade-levels. In primary grade-levels "social Science" includes topics like health, mental health, families, and relationships, topics covered in health class in the later grade-levels. Due to this phenomenon, students grow to expect human relationships to be detected in Science textbooks. As a result, students in primary grade-levels would be expecting to see humans depicted in Science trade-books performing functions related to scientific processes, health, mental health, families, and relationships. Collaborative school work is a common occurrence in the lives of primary grade-level students. Collaborative professional work of scientists would then be perceived as normal to students. This study showed that as a rare occurrence in photographs or illustrations; yet, scientists do work regularly in teams and it would be beneficial to depict that type of work in primary grade-level Science trade-books.

Two additional study aims that were expected to be addressed were ecology and environmental issues. Critical Literacy considers how respectful humans are depicted in texts. It would seem fitting for Science trade-books to address in what manner people are enacting their respect for other people and themselves by preserving wildlife and habitats, as well as, keeping the environment free of litter and pollution. In some of the evaluations the researcher evaluated specific books with high scores when the author presented social, ecological, and political issues typical in the real world such as preservation of nature and antilittering messages.

## **Summary**

This chapter presents a description of the employed quantitative and descriptive methodologies used for evaluating critical Science Literacy trade-books using criteria of the three main subscales of the MASTER: Science, Literacy, and Critical Literacy. This chapter described the topics: (a) research questions guiding the study, (b) development of the MASTER, (c) choosing resources for the primary grade-level Science trade-books, and (d) the process for evaluation of the texts, and (e) summary. Much data was expected due to the large sample of texts evaluated. The data was analyzed to determine if the MASTER was able to distinguish the AW from the CS. The CS text source did not list copyright dates so, texts outside the target of 2008-2013 necessitated the development of the Decade Factor in which texts published prior to 2000 and after 2013 were eliminated. Remaining texts were divided by copyrights from 2000-2009 represented the first decade of the New Millennium and texts from 2010-2014 represented the second decade of the New Millennium. This was titled the Decade Factor for the purposes of this study.

## CHAPTER IV: RESULTS

This chapter describes the trade-book analysis with the MASTER. The chapter addresses the following topics: (a) an analysis of Science content target groups, (b) the frequencies of the Science areas, (c) factor analysis of the data, (d) direct interaction of three questions, (e) further factor analysis, (f) analysis of the Decade Factor, (g) analysis of decades on the basis of the sum scores, (h) analysis of only the new millennium decades data, (i) response to research question one, (j) response to research question two, and (k) a chapter summary.

This study was conducted in the spring, summer, and fall of 2014. The sources of award-winning primary grade-level Science trade-books (AW) were the National Science Teachers Association (NSTA) Outstanding Science Trade-books, National Council of Teachers of English (NCTE) Orbis Pictus Award, the International Reading Association (IRA) Teachers Choices Reading List, and the Association for Library Service to Children's (ALSC) Robert F. Sibert Medal. The source for the Curriculum-Selected Trade-Books (CS) was the text, *Booklist K-8+* by Fountas and Pinnell (2009). Each survey required about 45 minutes per trade-book to complete. A copy of the MASTER survey is included in Appendix B. Also, the original STBER (Atkinson et al., 2009) is included in Appendix D.

The three sources of data in this study were the Science Literacy criteria, Literacy criteria, and the Critical Literacy criteria of the MASTER and therefore, this chapter the data related to the three subscales as established by the MASTER during the evaluation of primary grade-level Science trade-books will be reviewed and interpreted.

### **Analysis of Science Content in Target Groups**

The number of AW texts that were obtained totaled 154 books, and therefore it was attempted to obtain an equal quantity of texts from the CS source. Understanding that some



books might be out of print or unavailable due to high demand of books being ordered to fulfill the needs for elementary schools, 30 extra books were attempted to be ordered for a total of 180 books. Only 167 CS texts were able to be obtained. However, the two groups AW (154) and CS (167) constituted nearly equal sets and the total population of books evaluated was 321.

### **Frequencies of Science Areas**

The frequencies of text per area of Science indicated that Life Science was the most frequently published Science area for primary grade-level texts in this study with 180 total books (see Table 1). Life Science composed more than half the total number of texts examined in the study. The second most frequently published Science was Social Science, with 68 total books, which is less than half of the number of Life Science books. In addition, Social Science was less than one fourth of the total number of books evaluated in the study. Ranking third in the Science area, Earth and Space Science was less than one fourth the number of Life Science books; however, Earth and Space Science was just greater than one tenth the total number of books evaluated with the MASTER. In last position, Physical Science was comprised of 32 total books, was one-third the total number of books published in comparison to Life Science, and one-tenth the total number of books evaluated with the MASTER. Because the books were randomly chosen from both of the sources, the subtotals of each Science area indicate uneven distribution of texts throughout the four areas of Science: Earth and Space Science, Social Science, Life Science, and Physical Science (see Table 1).

Table 1.

*Frequencies by Area of Science (N = 321)*

Item	Frequency	Percentage
Earth and Space Science	41	12.77
Social Science	68	21.18
Life Science	180	56.07
Physical Science	32	9.96

### **Factor Analysis**

A factor analysis identifies patterns, usually a linear connection between variables. In this study an exploratory factor analysis resulted in a three factor solution, per Cattell (1966), who said that the Scree plot is a display of the factors that should be kept in the eigenvalue evaluation. The Scree plot for this study showed the pattern that three of the factors (questions) were clearly well above the one on the eigenvalue side of the diagram. Eigenvalues are a numerical way of describing interrelationships.

An exploratory factor analysis was conducted to identify and compute the variability of factors underlying the MASTER data. Results were described in descriptive and factorial statistics language. The Scree Plot was generated to indicate support for the three factor solution as described by Cattell (1966) as the optimum number of factors to be extracted (see Figure 1). The factor loading matrix exhibiting the solution is shown in Table 2. Consideration was given to include a fourth factor, but it was rejected for inclusion on the subscales due to its proximity to a factor of one on the plot.

### Direct Interaction of Three Questions

The factor analysis in this study indicated a direct interaction between the three questions on the subscales. Those were:

1. Is the book's Science content presented "as an everyday endeavor" so that students can connect it with some of their own experiences or so that they can participate as "scientists in the making" (i.e., pose "I wonder" questions or explore further)?
2. Is the book's Science content personalized by putting a human face on Science practice (presenting scientific inquiry/discovery "in action" through engaging narratives showing specific inquiry skills in actions by "expert scientists")?
3. Is the book's Science content intellectually and developmentally appropriate for its audience?

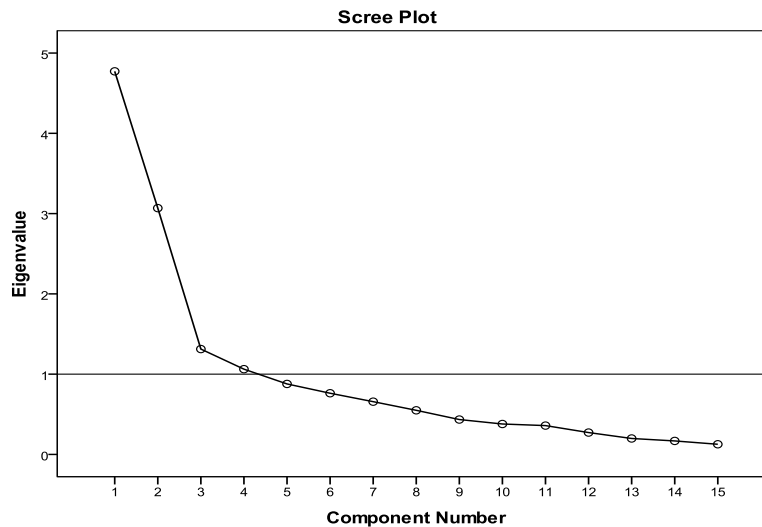


Figure 1. Scree Plot for the MASTER

Table 2.

*Factor Loadings for 15 Items from the MASTER (N = 321)*

Item	SCI	LIT	CRLIT
1. Sci 1 Is the book's Science content presented "as an everyday endeavor" so that students can connect it with some of their own experiences or so that they can participate as "scientists in the making" (i.e. pose "I wonder" questions or explore further)?	0.759	0.182	0.091
2. Sci 2 Is the book's Science content personalized by scientific inquiry/discovery "in action" through engaging narratives showing specific inquiry skills in actions by "expert scientists"?	0.693	0.221	0.219
3. Sci 3 Is the book's Science content intellectually and developmentally appropriate for its audience?	0.846	0.140	-0.039
4. Lit 1 Fiction: Does the plot exhibit good development, imagination, and continuity? Are the characters (if any) well developed? Nonfiction: Does the book's content include adequate information presented in a clearly organized and appropriate text structure?	0.328	0.743	0.065
5. Lit 2 Does the book contain a vivid and interesting writing style that actively involves the reader?	0.253	0.802	0.014
6. Lit 3 Are the book's illustrations and graphics text-relevant, appealing, and representative of a child's perspective?	0.294	0.631	0.023
7. Lit 4 Are the book's readability and interest level developmentally appropriate for its intended audience?	0.474	0.386	-0.143
8. Lit 5 Do the book's content information, style, graphics/illustrations, and story/text structure complement one another?	0.228	0.750	0.036
9. Lit 6 Do access features (table of contents, index, bibliographies, epilogues, captions, etc.) offer additional information that explains, extends, or verifies information in the book?	0.035	0.662	0.128

Item	SCI	LIT	CRLIT
10. CrLit 1 Do the text, pictures, and illustrations respect the reader by presenting positive ethical and cultural values, especially of inclusive of gender and racial representation?	0.135	0.109	0.852
11. CrLit 2 Is there a historically non-represented or underrepresented groups that are typical within the real world?	0.905	0.008	0.128
12. CrLit 3 Are characters in graphics and text representing authority figures from multiple cultures?	0.059	-0.060	0.888
13. CrLit 4 are there multiple cultures having places?	-0.008	0.027	0.835
14. CrLit 5 Are there social, ecological, or political topics present in the text that are typical of the real world?	0.026	0.454	0.454
15. CrLit 6 When paired with more culturally representative texts, would this book help reveal discussion-rich dialog for students?	0.579	0.204	0.162

*Note.* SCI = Science Literacy, LIT = Literacy, and CRLIT= Critical Literacy.

### **Further Factor Analysis**

Further reliability analysis of each of the criteria in the three subscales individually resulted an alpha level of 0.762 for the three items in the Science Category, 0.770 for the six items in the Literacy Category, and 0.831 for the six questions in the Critical Literacy Category. Means and standard deviations for the three subscales were displayed in Table 3, Table 4, and Table 5. The relationship between the three categorical subscale totals for the Decade Factor were found to be highly skewed. This study's factor analysis indicated that there is a patterned relationship between 3 of the 15 questions in the Science section, the Literacy section, and the Critical Literacy section, especially between the first three questions on the instrument.

Table 3

*Means and Standard Deviations for the Science Subscale (N=321)*

Item	<i>Mean</i>	<i>SD</i>
Sci 1 Is the book's Science content presented "as an everyday endeavor" so that students can connect it with some of their own experiences or so that they can participate as "scientists in the making" (i.e. pose "I wonder" questions or explore further)?	4.660	0.844
Sci 2 Is the book's Science content personalized by scientific inquiry/discovery "in action" through engaging narratives showing specific inquiry skills in actions by "expert scientists"?	4.349	1.056
Sci 3 Is the book's Science content intellectually and developmentally appropriate for its audience?	4.461	0.977

*Note.* Sci = Science Literacy; SD = Standard Deviation.

Table 4.

*Means and Standard Deviations for the Literacy Subscale (N=321)*

Item	<i>M</i>	<i>SD</i>
Lit 1 Fiction: Does the plot exhibit good development, imagination, and continuity? Are the characters (if any) well developed? Nonfiction: Does the book's content include adequate information presented in a clearly organized and appropriate text structure?	4.433	0.989
Lit 2 Does the book contain a vivid and interesting writing style that actively involves the reader?	4.386	0.978
Lit 3 Are the book's illustrations and graphics text-relevant, appealing, and representative of a child's perspective?	4.779	0.563
Lit 4 Are the book's readability and interest level developmentally appropriate for its intended audience?	4.302	0.961
Lit 5 Do the book's content information, style, graphics/illustrations, and story/text structure complement one another?	4.595	0.820
Lit 6 Do access features (table of contents, index, bibliographies, epilogues, captions, etc.) offer additional information that explains, extends, or verifies information in the book?	3.137	1.759

*Note.* Lit = Literacy; M = Mean; SD = Standard Deviation.

Table 5.

*Means and Standard Deviations for the Critical Literacy Subscale (N=321)*

Item	<i>M</i>	<i>SD</i>
CrLit 1 Do the text, pictures, and illustrations respect the reader by presenting positive ethical and cultural values, especially of inclusive of gender and racial representation?	2.838	1.839
CrLit 2 Is there a historically non-represented or underrepresented groups that are typical within the real world?	2.542	1.852
CrLit 3 Are characters in graphics and text representing authority figures from multiple cultures?	2.171	1.795
CrLit 4 Are there multiple cultures having places?	1.869	1.585
CrLit 5 Are there social, ecological, or political topics present in the text that are typical of the real world?	2.399	1.801
15. CrLit 6 When paired with more culturally representative texts, would this book help reveal discussion-rich dialog for students?	4.361	1.250

*Note.* CrLit = Critical Literacy; M = Mean; SD = Standard Deviation.

### **Analysis of the Decade Factor**

The relationship between the three categorical subscale totals for the Decade Factor were found to be highly skewed. This study's factor analysis indicated that there is a patterned relationship between three of the 15 questions in the Science subscale or section, the Literacy section, and the Critical Literacy section, especially between the first three questions on the instrument. Analysis with the Kruskal-Wallis test revealed no statistical significant differences among the three decades in relation to the individual questions; however, then the scores were added together into a sum. The Science sum and Literacy sum score detected statistical differences denoted at  $p = 0.05$ . This was true for the statistical significance of the Critical Literacy sum score among the three decades. So, when each of the sections of Science, Literacy,

and Critical Literacy scores were individually added, each summation was statistically significant.

### **Analysis of Decades on the Basis of the Sum Scores**

The pairing of the Decades by use of the Mann-Whitney U test and adjustment with the Bonferroni correction indicated statistical significance between Decade 1 and Decade 2, Decade 1 and Decade 3, and Decade 2 and Decade 3. Looking at the scores across time showed differences in the manner in which texts scored and when the copyright years were grouped by what was called the Decade Factor. This Decade factor revealed patterns when texts were grouped by copyrights that were in the pre-21<sup>st</sup> century group (1986-1999), the first decade of the new millennium (2000-2009), and in the first years of the second decade of the new millennium (2010-2014). After the analysis by the Mann-Whitney U test, the results were tweaked by a procedure called the Bonferroni correction. This resulted in statistical significance when comparing Decade 1 to Decade 2, Decade 1 to Decade 3, and Decade 2 to Decade 3, which made the copyright period influenced by human perspectives on how to write children's books, what topics to write about, and how to present information a factor in how the texts were perceived during the examination with the MASTER.

Further analysis of differences among the Decades on the basis of the Science sum score, Literacy sum score, and Critical Literacy sum score, was derived via the Kruskal-Wallis test. In regard to the Science sum score, no significant differences among the three decades were detected,  $\chi^2(2) = 3.051, p = 0.217$ . Pertaining to the Literacy sum score, significant differences among the three decades were detected,  $\chi^2(2) = 38.667, p < 0.001$ . Relating to the Critical Literacy sum score, significant differences among the three decades were detected,  $\chi^2(2) = 11.490, p < 0.01$ .



Follow-up analysis of the Literacy sum score by pairing decades was performed using the Mann-Whitney U test. Significance level ( $\alpha$ ) was adjusted using the Bonferroni correction. The family-wise alpha was set at .0167 (the accepted  $p$ -value divided three subscales =  $0.05/3$ ). For Decade 1 (1986-1999) versus Decade 2 (2000-2009), the difference was statistically significant,  $Z = 2.703$ ,  $p < 0.017$ . For the comparison between Decade 1 (1986-1999) and Decade 3 (2010-2014), the difference was statistically significant,  $Z = 5.374$ ,  $p < 0.017$ . For the comparison between Decade 2 (2000-2009) and Decade 3 (2010-2014), the difference was statistically significant,  $Z = 4.790$ ,  $p < 0.017$ .

Similarly, follow-up analysis of the Critical Literacy sum score was performed. When comparing Decade 1 (1986-1999) to Decade 2 (2000-2009), the difference was statistically significant,  $Z = 2.957$ ,  $p < 0.017$ . For the comparison between Decade 1 (1986-1999) and Decade 3 (2010-2014), the difference was statistically significant,  $Z = 3.465$ ,  $p < 0.017$ . For the comparison between Decade 2 (2000-2009) and Decade 3 (2010-2014), the difference was not statistically significant,  $Z = 0.336$ ,  $p = 0.737$ .

### **Analysis of Only the New Millennium Decades Data**

The original set of books were to include copyright years 2008-2013 to capture data over a six-year period because a survey of the most recent publications was desired. The CS source had no copyright years published making it impossible to eliminate any randomly chosen texts due to a copyright date outside of the desired grouping. After evaluation of the randomly chosen texts was completed, it was decided to eliminate those texts that fell outside the target copyright group. It was anticipated that the texts would depict an improvement in an inclusive attitude, chronologically and over time. Consequently, it was desired to evaluate the most recently

published text to determine if the more inclusive attitude was reflected in the texts of primary grade-level Science trade-books.

Cross-tabulation analysis of only the millennial data Decade 2 (2000-2009) versus Decade 3 (2010-2014) resulted in 278 books being analyzed. Analysis was then performed based on whether these two groups were on the award-winning lists or on the curriculum-selected lists. A higher percentage (72.2%) of the books in Decade 2 were on the curriculum-selected lists while a higher percentage (87.9%) of books from Decade 3 were on the award-winning lists. When analyzed by Chi-Square test of Independence, there was a statistically significant relationship between the Decade Factor and classification source,  $\chi^2(1) = 95.76, p < 0.001$ . Practical significance as reported by the Phi statistic was 0.587,  $p < 0.001$ , which indicates a large effect size. Frequency statistics are shown in Table 6.

### **Further Impact of the Decade Factor**

Cross-tabulation comparisons of only the two Millennial Decades revealed that in the years 2000-2009, 72.2% (117 books) were from the CS source while the years 2010-2014 indicated 87.9% (102) of the books were from the AW sources. When the books with copyright dates prior to the year 2000 were eliminated from analysis, the results were clearly influenced by the sources from which they were chosen. During the early years of the new millennium, more books were from the CS source, which was the *Booklist K-8+* by Fountas and Pinnell (2009). However, during the four years of the second decade in the new millennium, there was a high number of texts from the Award-Winning sources: the NSTA Outstanding Science Trade-books, the NCTE Orbis Pictus Award, the IRA Teachers Choices Reading List, and the ALSC Robert F. Sibert Medal. When analyzed by a Chi-Square test of Independence a statistical significance was detected between the Decade Factor and the classification sources of AW and CS along with a

practical significance by Phi. Chi-Square verified the results of Cross-tabulation in noting that the Decade Factor was an important influence on the scores of the texts.

Table 6.

*Millennial Decade Comparisons of AW versus CS Cross-tabulation by the Decade Factor (N = 278)*

		AW versus CS			
Millennial Decades		AW		CS	
		Percent	Frequency	Percent	Frequency
2000-2009		27.8	45	72.2	117
	2010-2014	87.9	102	12.1	14

*Note.* AW = Award-Winning Trade-books, CS = Curriculum-Selected Trade-books.

### **Response to Research Question One: How Accurately Can the Instrument Distinguish**

#### **AW from the CS?**

An expected outcome was that the CS would have higher scores on the three sections, Science Criteria, Literacy Criteria, and Critical Literacy Criteria, of the MASTER due to the nature of the book selection process conducted by Fountas and Pinnell (2009) as books deemed as appropriate for reading and as supplemental to textbooks in content area teaching and learning. Means and standard deviations by MASTER subscale sum scores are shown on Table 7. The total number of questions in the Science subscale was three with a possible score per question being five and a maximum score for the whole Science subscale equal to 15. The total number of questions in the Literacy and the Critical Literacy subscales was six with a possible score per question being five and a maximum score for Literacy and Critical Literacy subscales equal to 30.

Table 7.

*Descriptive Statistics of the Subscale Sum Scores (N = 321)*

Subscale	Mean	SD	Minimum Score	Maximum Score
Science Sum	13.47	2.378	3	15
Literacy Sum	25.63	4.403	6	30
Critical Literacy	16.18	7.512	6	30

*Note.* SD = Standard Deviation

Table 8.

*Descriptive Statistics of the Subscale Sum Score by Classification Source (N = 319)*

Classification Subscale	AW			CS		
	M	SD	N	M	SD	N
Science	13.63	2.43	147	13.32	2.34	172
Literacy	26.86	3.43	147	24.55	4.86	172
Critical Literacy	16.65	7.45	147	15.85	7.59	172

*Note.* 321 was reduced to 319 due to elimination of two books with copyrights outside the parameters. AW = Award-Winning; CS = Curriculum-Selected; M = Mean; SD = Standard Deviation; N = Sample Size.

Two books in the total population resided in both the AW and the CS categories. Due to this phenomenon, they were eliminated from the evaluation of descriptive statistics of the subscale sum score by source. Differences between AW and CS by subscale sum scores were examined using the Mann-Whitney U test. For the Science subscale, no statistically significant difference between the AW and CS was detected,  $Z = 1.764$ ,  $p = 0.078$ . For the Literacy subscale, a statistically significant difference between the AW and CS was detected,  $Z = 4.439$ ,  $p < 0.05$ . For the Critical Literacy subscale, no statistically significant difference between the AW and CS was identified,  $Z = 1.262$ ,  $p = 0.207$ . Consequently, the MASTER was not able to distinguish Science trade-books in the Science subscale and the Critical Literacy subscale but

was able to detect a statistical difference in the Literacy subscale. During examination of the primary grade-level Science trade-books, it was observed that illustrations and photographs were highly focused on animals, insects, plants, celestial bodies, weather conditions, and other non-human aspects in Earth and Space Science, Life Science, and Physical Science texts. Subsequently, human depictions were rare in the books. Critical Literacy deals with how respectfully humans are depicted; however, if human depictions are rare, the scores on the Likert scale are often a score of one. This makes the scores on the Critical Literacy individual question scores and on the summation scores low for most of the books. Also, the primary grade-level AW and CS classifications have very little difference in scores because of the low incidence of human depictions. This factor of low incidence of depictions seems to account for the MASTER's inability to distinguish any differences between the AW and the CS.

Looking deeper at the data to frequencies and cross-tabulation, revealed that the frequencies for the classification sources of AW and CS were distinctive. There was a statistically significant relationship between classification source and area of Science,  $\chi^2(3) = 10.890, p < 0.05$ . The practical significance as reported by the Cramer's *V* statistic was 0.185, which indicates a medium effect size. Frequency statistics are shown on Table 9.

Table 9

*Descriptive Statistics of Area of Science by Classification Source*

Classification Item	AW		CS	
	Frequency	Percentage	Frequency	Percentage
Earth and Space Science	21	51.2	20	48.8
Social Science	32	47.1	36	52.9
Life Science	88	49.4	90	50.6
Physical Science	6	18.8	26	81.3

*Note.* AW = Award-Winning; CS = Curriculum-Selected.

**Response to Research Question Two: What Critical Literacy Elements and Topics Can be Found in Primary Grade-Level Science Trade-books as Identified by the MASTER Instrument?**

In Social Science texts, more human interactions and relationships were depicted; however, this was not observed in every text. This factor leaves little opportunity to observe historically underrepresented groups, positive representations of ethnicities, cultures, genders, or races. Without people in illustrations and photographs, image portrayal of multiple cultures are not depicted nor are places of authority. Few elements of Critical Literacy were depicted. In the limited number of illustrations or photographs depicting humans, only one Native American was depicted, three people who looked Asian Indian were depicted, fewer than ten African Americans were depicted, and five Chinese were depicted caring for pandas in their native habitat. People of the Hispanic cultures were the ethnic minority most depicted in photographs and illustrations. Two people with physical challenges were depicted, one in a wheelchair. Few depictions were noted in the pre-millennial decade (1986-1999). However, there was little increase noted of depictions of cultural, ethnical, or the physically challenged in the first decade of the millennium (2000-2009). The second decade of the millennium (2010-2014) is the

copyright group that depicted Native Americans, the wheelchair bound person, and a boy with autism. These frequencies are noted on the MASTER evaluation forms in the comments areas.

### **Summary**

In summary, this chapter provided an analysis of Science content target groups, the frequencies of the Science areas, factor analysis of the data, direct interaction of three questions, further factor analysis, analysis of the Decade Factor, analysis of decades on the basis of the sum scores, analysis of only the new millennium decades data, response to research question one, response to research question two, and as summary of the chapter.

Sources of the Award-winning Science trade-books for evaluation were the Outstanding Science trade-books, the Orbis Pictus Award, the Teachers Choices Reading List, and the Robert F. Sibert Medal. The source of the curriculum-selected Science trade-books for evaluation was the *Booklist K-8+* (Fountas & Pinnell, 2009) (See Appendix B). It was determined that the books performed differently on the survey with the MASTER as related to the Decade Factor.

Quantitative statistics techniques used to evaluate the data via Statistical Package for the Social Sciences (SPSS) were Cronbach's alpha, Kruskal-Wallis, the Mann-Whitney U, and cross-tabulations. Data results were displayed in a Scree plot, a factor loadings table, an items statistics table, and a means and deviations table.

## CHAPTER V: SUMMARY AND CONCLUSIONS

This chapter presents a discussion of the findings of the study. The topics include: (a) the Common Core State Standards, (b) the Next Generation Science Standards, (c) the MASTER and Critical Literacy, (d) the MASTER and reading, (e) implications of the study, (f) the limitations of the study, and (g) the recommendations for future research. The MASTER evaluated two set of texts, the AW and the CS. The two groups of books were found to be more alike than different because they had already passed a screening process and were not truly a random sample of the whole population of available trade-books published during the period 2008-2014 for primary grade-level use.

### **MASTER and Common Core State Standards**

Under CCSS, students are expected to conduct in depth topical research across the curriculum. Critical Literacy supports in depth investigations when students research the backgrounds of authors and illustrators, read multiple texts focused on the same topic, engage in discussions that respect divers perspectives, and negotiate solutions to local and global community problems. The MASTER assists teachers in determining quality literature for use in a classroom guided by CCSS. The instrument identified the Science areas of texts. There was a direct interaction between the three questions on the Science subscale.

### **MASTER and Next Generation Science Standards**

The Next Generation Science Standards stipulates the use of processes similar to those used by professional scientists. Professional scientists embark on research by first conducting a literature review of existing published studies related to their chosen topic. Teachers using the MASTER instrument to identify quality Science trade-books on texts related to specific curricular topics will provide texts for their students to emulate the research processes of



professional scientists. The developers of NGSS designed the standards to reflect a need for students to practice Science at “the intersection of practice, content, and connection” not only in the academic careers but “throughout their lifetimes” (NGSS Lead States, 2013, p. xvi); the MASTER assists teachers in providing the needed high quality texts to meet that standard. Transfer of skills, strategies, and practices across the curriculum is the crossroads at which NGSS and CCSS met within the classroom.

### **MASTER and Critical Literacy**

It was expected that the MASTER would identify Critical Literacy elements in the Science trade-books. However, the researcher found that the MASTER detected, instead, a serious lack of critical elements, especially those related to people and diversity. This represents a missed opportunity to teach students about the role of scientists and the collaborations between scientists of diverse backgrounds. As students conduct research and evaluate authors’ and illustrator’s expertise related to specific topics, they practice a portion of Critical Literacy (Comber, Thomson, & Well, 2001; Heisey & Kucan, 2011). When teachers identify respectful texts with the MASTER and provide them for their students, students will be exposed to what being respectful looks like and be more likely to practice respectful interactions with others from various cultural backgrounds. Vasquez (2003) and Behrman (2006) indicated that practicing respectful interactions in the classrooms led to more empathy.

It is the broad choice of reading sources and the depth of complexity of texts, as well as, expectations that opinions are backed with research that help move Critical Literacy away from the simplicity of superficial reading and into the power of intense literacy (Gee, 1986, p. 6). Much like the format of CORI (Guthrie, Wigfield, & Perencevich, 2011), Critical Literacy immerses students in the vigor of integrated content area research. These networked scaffolds

across the curriculum lead to holistic thinking and transfer of skills and strategies from one content area to the next, increasing comprehension of texts and better understanding of work processes. Writing becomes an integral part of this type of classroom. Ownership of vocabulary is demonstrated in discussions and written work. Standards for classrooms, such as these, come from the Common Core State Curriculum and the Next Generation Science Standards. All the above characteristics work together to help teachers guide students to becoming fully literate readers within the Science Critical Literacy classroom. This study combined information about Critical Literacy from various sources into one location, instructing teachers how to transfer from a cross-curricular content area inquiry learning. Merging Science and Critical Literacy expands wide range reading (Fisher, Frey, & Lapp, 2012) and condenses learning.

A working definition of Critical Literacy was created to improve implementation of Critical Literacy in the classroom. Critical Literacy equips readers to examine texts for in depth information, to collaborate with classmates, and seek solutions for problems (Behrman, 2006). These activities imitate the actions of Science professionals who are engaged in research (Boydston, 2008, p. 50). It was expected that the CS would perform higher on the evaluations than the AW. That was not proven during the statistical analysis. However, it was shown that there were a higher percentage of Physical Science trade-books in the CS classification.

### **MASTER and Reading**

A connection between accommodation of diverse readability levels and the processes of Critical Literacy was made (Fisher & Frey, 2013; Johnson, 1995; Scriven & Paul, 1987; Wodak & Myers, 2009). The environment of Critical Literacy includes small group work and extensive discussion about multiple texts focused on the same topic. Rather than forcing all students to read the same text, the availability of multiple texts naturally allows for texts of varying reading

levels to be available to all students to use as research material (Montgomery & Kahn, 2003). Texts with the same topic will have reading vocabulary overlap, which assists struggling students to have a naturally occurring scaffold of learning. The extensive small group discussions scaffolds students' learning by bringing forth oral vocabulary from other members of the group that can then be applied to reading vocabulary as students decode and problem-solve unknown words. The cooperative nature and allowance of diversity within Critical Literacy groups also supports struggling readers.

The use of the MASTER enables teachers to carefully choose sources with a depth of complexity with an expectation that opinions are backed up by research. This moves discussions away from superficial reading and toward the power and vigor of cross-curricular content research (Gee, 1986, p. 6; Guthrie, Wigfield, & Perencevich, 2011). Networked scaffolds across the curriculum lead to holistic thinking and transfer of skills and strategies from one content area to the next increasing comprehension of texts and better understanding of work processes. Writing becomes an integral part of this type classroom. Ownership of vocabulary is demonstrated in discussions and written work. Standards for classrooms, such as these, come from the Common Core State Curriculum and the Next Generation Science Standards.

### **Implications of the Study**

The findings of this study expand the fields of Science, Literacy, and Critical Literacy by providing a new tool for teacher evaluation trade-books for use in classrooms to support Science research conducted by students. The findings of this study indicated the MASTER was statistically reliable. This study aids advancement in the area of Critical Literacy through providing a tool for further evaluation of texts in grade-levels above primary (K-2<sup>nd</sup> grades) to identify what Critical Literacy elements are present in those trade-books. The tool identified the

absence of human depictions within most Science texts through answering questions in the Critical Literacy subscale. This absence of human depictions was a major cause of the low scores in the Critical Literacy sum scores.

Implications of this study are that depictions of human images within primary Science trade-books are not representative of the diversity within the global community. Human depictions are somewhat absent from most of the Life Science area texts, the Physical Science area texts, and the Earth and Space Science area of texts. This absence of humans from photos and illustrations creates a gap of connection between the role of scientists and activities within these three areas of Science. Students, therefore, do not make connections between Science careers and themselves for future adult employment.

Furthermore, the frequencies of areas of Science as topics in Science trade-books need to address a broader context than Life Science topics. Because primary grade-level education includes kindergarten, first, and second grades, consideration of more areas of Science for future Science trade-books should be taken into consideration. Physical Science topics were the least attended area. Magnets, friction, electricity, and chemical change are topics that could prove to be of high interest to young developing scientists. Physical Science is an area that leads to many professional Science careers and needs to be represented as the exciting venue that it is. Research about student knowledge in the areas of Physical Science and Earth and Space Science throughout the upper grades as it correlates to lack of texts within the lower grades would be an area for study. It became clear that the value in the MASTER was in its ability to indicate what is absent from Science trade-books. It is due to the low scores on questions regarding human representations that force the conclusion that humans are generally not present in photographs or illustrations. These are lost opportunities to inform students about the important and exciting

work that scientists engage in every day. This absence of human depictions represent missing pieces of a schema puzzle that young readers mentally construct about how the world works. Scientists collaborate, they conduct research, they analyze, they synthesize, they apply gathered information, they draw conclusions, they are creative and develop new products, and they solve problems. Human depictions in literature represent real world Science professional practices. Young readers could aspire to and ultimately become scientists who engage in careers. When those Science careers are not modeled to them in Science trade-books, students are not given the opportunity to imagine themselves as a contributing part of the scientific community. Every book that does not depict professional scientist careers is a lost opportunity to gain an aspiring scientist.

### **Limitations of the Study**

One limitation of the study is that the MASTER was not presented initially to a wide panel of experts for evaluation. The construct validity of the MASTER was affirmed by content specialists on the dissertation committee. A member of the College of Science and Engineering served as an outside member of the committee. With her addition, the committee had a Science professor, a mathematics professor, and a literacy professor. The mathematics professor was familiar with the instrument developed by Hunsader (2004) to assess mathematics trade-books on which Atkinson et al. (2009) based their instrument, the STBER. She understood their interpretation of the original instrument. She gave her approval to use the modified version of the STBER. The Science professor discussed her perceptions of the Science portions of their rubric and stated that those questions seemed appropriate. The literacy professor gave suggestions for improving the suggested wording of questions and for the elimination of some questions from the list. It was decided to move forward with a specific format of the modified STBER. After

using the MASTER, the researcher determined that the instrument could use further improvement. Therefore, in the next version of the MASTER, the researcher will seek a wider range of Critical Literacy and Science experts to validate the new instrument.

### **Recommendations for Future Research**

The reliability of the MASTER was established by several statistical analyses; however, it is recommended that the next version of the MASTER be presented to a wider panel of Critical Literacy and Science experts for evaluation and validation. The researcher recommended to repeat the study under several different conditions. Second, locating book lists through different organizational award lists would be a good comparison to data in this research. Third, using only the public library, school library, or classroom libraries with the same grade-levels within one school or district would be of value. Fourth, conducting a study of texts that were all chosen by young readers, not adults, would be a good comparison study. Fifth, if the books were to be purchased, it would be interesting to compare a different online book source, getting texts through bookstores, or obtaining randomly chosen texts from a publisher's catalog. Sixth, a researcher could use a librarian source other than *Booklist K-8+* as one of the sources. Seventh, a researcher could use the same books used in this study and have three or more people evaluate the books. This could provide an additional measure of reliability. Eighth, one more measure of reliability is to survey a selection of experts in the Critical Literacy profession to gain their insight on the information evaluated on MASTER subscales. Ninth, a researcher could use the MASTER to evaluate a truly randomized set Science trade-books that have not passed some prescreening process.

The researcher recommends that authors seeking topics for their next book or for their first Science trade-book consider the manner in which many physical Science topics can be

portrayed succinctly and with simple language. There are young readers curious about the workings of the world who do not even know enough to ask questions about physical Science. If one has never been exposed to the power of magnetism by playing with a magnet, one cannot ask questions about that force. If one has not dropped a whirligig off of the stairway and watched as it twisted during the force gravity's pull, one cannot ask about gravity. The researcher further recommends reading of some of the texts listed in the annotated bibliography that showed good comments about the simple language and bridging diverse readability levels with nonfiction text structures to better understand what features contribute to good nonfiction Science trade-books.

As for the MASTER evaluation tool, the researcher plans to make further specific modifications to the instrument. First, the three screening questions from the Science subscale are separated from the other three questions. These are screening questions developed to eliminate texts based on low presence of Science information in the text. In primary grade-level, kindergarten and emergent first grade texts, there is very little Science. Employing the screening questions would have eliminated many texts from this study that are typical of early reading Science trade-books. The three screening questions are:

1. Does the book have substantial Science content (scientists at work and/or scientific information?)
2. Is the Science content (text, scale, vocabulary, and graphics) accurate?
3. Is the Science content current?

Rewording those three questions and including them in the Science subscale, as a helpful guide would improve the MASTER. The three Science questions that were included in the study were:

1. Is the book's Science content presented "as an everyday endeavor" so that students can connect it with some of their own experiences or so that they can participate as "scientists in the making" (i.e., pose "I wonder" questions or explore further)?
2. Is the book's Science content personalized by putting a human face on Science practice (presenting scientific inquiry/discovery "in action" through engaging narratives showing specific inquiry skills in actions by "expert scientists")?
3. Is the book's Science content intellectually and developmentally appropriate for its audience?

Including all six questions makes the three categorical subscales equal in number and would also assist the strength of the overall instrument. Second, rewording the Critical Literacy questions in a manner that allows respect for nature in the form of kindness to animals, responsible treatment of the environment, and service in the form of volunteerism, such as in environmental litter pickups, to become part of the Critical Literacy subscale would honor respectful behaviors in Science texts that did not have human depictions. It became clear during the study that "respect for humans" can be broader than direct interaction. Respect for humans may also include respect for the environment, which includes all aspect of wildlife and nature. If that is accurate, then some questions on the Critical Literacy subscale should address those portions of the global community.



This chapter presented a discussion of the study findings as they related to national standards, Critical Literacy, and reading. It included the limitations of the study and recommendations for further research.

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## APPENDIX A

### Permission by Author to Modify Science Trade-book Evaluation Rubric



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May 17, 2013

To Whom It May Concern:

As one of the original authors of Making Science Trade-book choices for Elementary Classrooms (Atkinson, T., Matusevich, M., & Huber, L., 2009), I give permission to Connie L. Patchett to modify the Science Trade-book Evaluations Rubric (STBER) for her dissertation work.

Should you have questions about this matter, do not hesitate to contact me.

Sincerely,

A handwritten signature in cursive script that reads "Terry S. Atkinson".

Terry S. Atkinson, Ph.D.

Associate Professor - Literacy Studies, English Education, and History Education

Graduate Director

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## APPENDIX B

### Permission by Author to Modify Science Trade-book Evaluation Rubric

On 4/1/2013 12:46 PM, Lisa Huber wrote:

Greetings,

I give my permission for the instrument used in the article that appeared in the *Reading Teacher* to be modified by Connie Patchett for the completion of her doctoral dissertation.

If I need to be more specific please let me know.

Thanks,

Lisa Huber

252-714-0930

## APPENDIX C

### Permission by Author to Modify Science Trade-book Evaluation Rubric

STATEMENT OF PERMISSION:

April 1, 2013

I give permission for Connie Patchett, doctoral student at Texas A & M, Corpus Cristi, to alter Science Trade-book Evaluation Rubric by Terry S. Atkinson, Lisa Huber, & Melissa Matusevich as outlined in Ms. Patchett's request. The rubric was published in the March 2009 journal, Reading Teacher in an article entitled "Making Science Trade-book Choices for Elementary Classrooms.

Melissa N. Matusevich  
Blacksburg, Virginia

## APPENDIX D

Science Trade-book Evaluation Rubric

Book Title		Author:				
ISBN:	Copyright Date:	Out of print ____ Yes ____ No (If out of print, carefully attend to whether Science content is current.)				
Science Content of Book: (Check all that apply.) ____ Details professional scientist(s) engaged in inquiry      ____ Fact/Concepts ____ Presents Science through an engaging/enjoyable story      ____ Details “how to” experiments						
Before reviewing the book, answer these three questions: 1. Does the book have substantial Science content (scientists at work and/or scientific information)? 2. Is the Science content (text, scale, vocabulary, and graphics) accurate? 3. Is the Science content current? If the answer to any of the above three questions is “no,” decide if this text should be used as an example of counter text.						
Science Criteria						
Is the book’s Science content presented “as an everyday endeavor” so that students can connect it with some of their own experiences or so that they can participate as “scientists in the making” (i.e., pose “I wonder” questions or explore further)?		5	4	3	2	1
		Yes	Somewhat		No	
Comments:						
Is the book’s Science content personalized by putting a human face on Science practice (presenting scientific inquiry/discovery “inaction” through engaging narratives showing specific inquiry skills in actions by “expert scientists”)?		5	4	3	2	1
		Yes	Somewhat		No	
Comments:						
Is the book’s Science content intellectually and developmentally appropriate for its audience?		5	4	3	2	1
		Yes	Somewhat		No	
Comments:						
Literacy Criteria – framed to fit fiction/nonfiction genres						
Complete either A or B.		5	4	3	2	1
<u>A. Fiction:</u> Does the plot exhibit good development, imagination, and continuity?		5	4	3	2	1
Are the characters (if any) well developed?		Yes	Somewhat		No	
<u>B. Nonfiction:</u> Does the book’s content include adequate information presented in a clearly organized and appropriate text structure?		5	4	3	2	1
		Yes	Somewhat		No	
Comments:						
Does the book contain a vivid and interesting writing style that actively involves the reader?		5	4	3	2	1
		Yes	Somewhat		No	
Comments:						
Are the book’s illustrations and graphics text-relevant, appealing, and representative of a child’s perspective?		5	4	3	2	1
		Yes	Somewhat		No	
Comments:						

Note: Rubric by Terry Atkinson, Lisa Huber, and Melissa Matusevich, adapted with permission from Hunsader, P. D. (2004). Mathematics trade-books: Establishing their value and assessing their quality. *The Reading Teacher*, 57(7), 618-629. (Continued)

Science Trade-book Evaluation Rubric

Are the book's readability and interest level developmentally appropriate for its intended audience?	5 Yes	4 Somewhat	3	2	1 No
Comments:					
Do the book's content information, style, graphics/illustrations, and story/text structure complement one another?	5 Yes	4 Somewhat	3	2	1 No
Comments:					
<u>For nonfiction only:</u> Do access features (table of contents, index, heading, sidebars, glossary, author's notes, bibliographies, epilogues, captions, etc.), offer additional information that explains, extends, or verifies information in the book?	5 Yes	4 Somewhat	3	2	1 No
Comments:					
Does the book respect the reader by presenting positive ethical and cultural values, especially inclusive of gender and racial representation? (If not, omit this item from scoring.)	5 Yes	4 Somewhat	3	2	1 No
Comments:					
<p>Final reviewer evaluation:</p> <p>1. Average the scores for this review related to Science Criteria; repeat for Literacy Criteria.</p> <p>2. Select values below based upon the average of scores from the Science Criteria and followed by the Literacy Criteria.</p> <p>Round each score to a tenth of a point.</p>					
Rating of this book from a Science perspective:	5 Superb	4 Recommended	3 Use with Caution	2 Marginal	1 Unacceptable
Rating of this book from a Literacy perspective:	5 Superb	4 Recommended	3 Use with Caution	2 Marginal	1 Unacceptable
Comments:					

Note: Rubric by Terry Atkinson, Lisa Huber, and Melissa Matusevich, adapted with permission from Hunsader, P. D. (2004). Mathematics trade-books: Establishing their value and assessing their quality. *The Reading Teacher*, 57(7), 618-629.

## APPENDIX E

### Modified Analytic Science Trade-book Evaluation Rubric

<b>Book Title</b>		<b>Author:</b>				
ISBN:	Copyright Date:	Out of print ____ Yes ____ No (If out of print, carefully attend to whether Science content is current.)				
Science Content of Book: (Check all that apply.) ____ Details professional scientist(s) engaged in inquiry      ____ Fact/Concepts ____ Presents Science through an engaging/enjoyable story      ____ Details “how to” experiments						
Before reviewing the book, answer these three questions: 1. Does the book have substantial Science content (scientists at work and/or scientific information)? 2. Is the Science content (text, scale, vocabulary, and graphics) accurate? 3. Is the Science content current? If the answer to any of the above three questions is “no,” decide if this text should be used as an example of counter text.						
<b>Science Criteria</b>						
Is the book’s Science content presented “as an everyday endeavor” so that students can connect it with some of their own experiences or so that they can participate as “scientists in the making” (i.e., pose “I wonder” questions or explore further)?		5	4	3	2	1
Yes		Somewhat		No		
Comments:						
Is the book’s Science content personalized by putting a human face on Science practice (presenting scientific inquiry/discovery “inaction” through engaging narratives showing specific inquiry skills in actions by “expert scientists”)?		5	4	3	2	1
Yes		Somewhat		No		
Comments:						
Is the book’s Science content intellectually and developmentally appropriate for its audience?		5	4	3	2	1
Yes		Somewhat		No		
Comments:						
<b>Literacy Criteria – framed to fit fiction/nonfiction genres</b>						
Complete either A or B.		5	4	3	2	1
<u>A. Fiction:</u> Does the plot exhibit good development, imagination, and continuity? Are the characters (if any) well developed?		Yes	Somewhat		No	
<u>B. Nonfiction:</u> Does the book’s content include adequate information presented in a clearly organized and appropriate text structure?		5	4	3	2	1
Yes		Somewhat		No		
Comments:						
Does the book contain a vivid and interesting writing style that actively involves the reader?		5	4	3	2	1
Yes		Somewhat		No		
Comments:						
Are the book’s illustrations and graphics text-relevant, appealing, and representative of a child’s perspective?		5	4	3	2	1
Yes		Somewhat		No		
Comments:						

Note: Rubric by Connie L. Patchett adapted with permission from Atkinson, T.S., Matusevich, M.N., & Huber, L. (2009). Making Science trade-book choices for elementary classrooms. *The Reading Teacher*, 62(6), 484-497. (Continued)

Modified Analytic Science Trade-book Evaluation Rubric

Are the book's readability and interest level developmentally appropriate for its intended audience?	5 Yes	4	3 Somewhat	2	1 No
Comments:					
Do the book's content information, style, graphics/illustrations, and story/text structure complement one another?	5 Yes	4	3 Somewhat	2	1 No
Comments:					
Do the book's content information, style, graphics/illustrations, and story/text structure complement one another?	5 Yes	4	3 Somewhat	2	1 No
Comments:					
<u>For nonfiction only:</u> Do access features (table of contents, index, heading, sidebars, glossary, author's notes, bibliographies, epilogues, captions, etc.), offer additional information that explains, extends, or verifies information in the book?	5 Yes	4	3 Somewhat	2	1 No
Comments:					
<b>Critical Literacy Criteria</b>					
In order for students to learn to observe stereotypes, author agendas, social topics, cultural topics, ecological topics, inaccuracies, lack of multiple perspectives, & etc. students must read books that contain those challenges and books that are more respectful. Thus, Critical Literacy research projects expose students to various types of texts for the purpose of rich discussion amongst students with the teacher facilitation. This next section assists with providing broad-based book selection.					
Do the text, pictures, and illustrations respect the reader by presenting positive ethical and cultural values, especially inclusive of gender and racial representation?	5 Yes	4	3 Somewhat	2	1 No
Comments:					
Is there a presence of historically non-represented or underrepresented groups that are typical within the real world?	5 Yes	4	3 Somewhat	2	1 No
Comments:					
Are there two or more cultures represented in the texts that are typical within the real world?	5 Yes	4	3 Somewhat	2	1 No
Comments:					
Are there multiple cultures having places of authority in the text?	5 Yes	4	3 Somewhat	2	1 No
Comments:					

Note: Rubric by Connie L. Patchett adapted with permission from Atkinson, T.S., Matusevich, M.N., & Huber, L. (2009). Making Science trade-book choices for elementary classrooms. *The Reading Teacher*, 62(6), 484-497. (Continued)

Modified Analytic Science Trade-book Evaluation Rubric

Are there social, ecological, or political topics present in the text that are typical of the real world?	5 Yes	4 Somewhat	3	2	1 No
Comments:					
When paired with more culturally representative texts, would this book help reveal discussion-rich dialogue for students?	5 Yes	4 Somewhat	3	2	1 No
Comments:					
<b>Final reviewer evaluation:</b> 1. Average the scores for this review related to Science Criteria; repeat for Literacy Criteria; repeat for the Critical Literacy Criteria. 2. Select values below based upon the average of scores from the Science Criteria, the Literacy Criteria, and the Critical Literacy Criteria. Round each score to a tenth of a point.					
Rating of this book from a Science perspective:	5 Superb	4 Recommended	3 Use with Caution	2 Marginal	1 Unacceptable
Rating of this book from a Literacy perspective:	5 Superb	4 Recommended	3 Use with Caution	2 Marginal	1 Unacceptable
Rating of this book from a Critical Literacy perspective:	5 Superb	4 Recommended	3 Use with Caution	2 Marginal	1 Unacceptable
Comments:					

Note: Rubric by Connie L. Patchett adapted with permission from Atkinson, T.S., Matusevich, M.N., & Huber, L. (2009). Making Science trade-book choices for elementary classrooms. *The Reading Teacher*, 62(6), 484-497.



## APPENDIX F

### Annotated Bibliography of Science Trade-books

Abdul-Jabar, K. & Obstfeld, R. (2012) *What color is my world? Lost history of African American inventors*. Readers get a behind the lens view of African American inventors in the narrative of the text and on the sidebars. The main character, Mr. Mital relates information about famous inventors who all became real scientists. The kids who hear the stories don't know if the people are real or fictional. Excellent source of biographical information and a list of inventors for students to use for conducting biographical research. Wonderfully planned and executed with vivid language. Illustrations are great. The readability is 2<sup>nd</sup> GT and higher. Others would have to get a read aloud. Text refers to the historic struggles of people of color and females. Social and political topics are equality, recognition for achievements, and working hard to accomplish things for which there may not be recognition. A variety of technology was developed by the inventors. (Social Science and Physical Science).

Adamson, T. (2008). *Pluto a dwarf planet*. Mankato, MN: Capstone Press. Readers wondering about space and planets learn about a dwarf planet: Pluto. This behind the lens view of space, Earth, Pluto, and Pluto's moons clearly describe in text the dwarf planet. Beautiful color photos impart details about Pluto's surface. This book is an easy 1<sup>st</sup> grade text and can be a wonderful read aloud for Pre-K and K. the book includes a diagram of orbits of the planets, an internet site list, a glossary, table of contents captions, an index, headings, and a bibliography. (Earth & Space Science).

Aldrin, B. (2009). *Look to the stars*. New York, NY: G.P. Putnam's Sons. Quotes of famous scientists, explorers, teachers, technology developers, are on every page of the book. The concept of becoming an expert scientist is on every page as well. The reading level is very high at 3<sup>rd</sup> and above but it is well worth the read aloud experience to find out much of this information. The word choices are vivid and interesting. This would be great as part of a text set in which older children read with younger children or the text has been read onto an audio tape. Many nonfiction structures including a website list, a timeline of exploration and other extensions. (Earth and Space; Life Science; Social Science).

Alexandros, S. (2004). *Chickens (life cycles)*. Boston, MA: Houghton Mifflin. The behind the lens view of the lifecycle of chicks beginning with hatching. This book shows lifecycle and that is a primary grade-level Science concept. Very nicely portrayed in color photos and inside the egg view. Could better bridge diverse readability with side bars, and information in the back of the book. (Life Science).

Allen, F. (2010). *The sun*. Boston, MA: Houghton Mifflin. Shows people out experiencing activities in the sun. Many people can observe effects of sun in their lives. Heat, dark, light, shade, and shadow are things that are shown. No new information beyond what we already experience daily, No information about sun spots, Earth orbiting around the sun, or sun flares. Bland language. (Earth and Space; Life Science; Social Science).

Anderson, S. (2008). *Coasts*. Behind the lens of a camera readers will explore the coast line of the ocean. The Science information engages the reader and text is from the viewpoint of a child. The reader wants to join in the beach fun and exploration. The text is simple and allows the photos of textures be the center of attention. An African American father is playing with his daughter. (Earth and Space Science; Social Science).

Armstrong, B. (1997). *The sea wall*. There is not very much Science in this book. In some illustrations all the people's heads are tilted at a very odd angle. The sentences are flowing and not staccato. The pages are numbered. Adults are supportive of the children in the story and are working together as a community to solve problems. The people look like Caribbean Islanders. They all work together to make the sea wall. (Social Science; Earth and Space Science).

Arnosky, J. (2009). *Crocodile safari*. New York, NY: Scholastic Publishing, Inc. This book is set up as if it is a scientist's journal, logging time of day, weather, and tide. It is perfect modeling for observation of animals in their natural habitat. The author and his wife safari to south Florida went out in the water in a 12 foot boat, took photos and made notes about their adventure. As a well-known naturalist, Arnosky even wrote author's notes, had headings, extensions and a DVD accompanies the book! The DVD makes the high-level vocabulary workable for primary readers because it adds to the oral vocabulary before approaching the written/reading vocabulary. As part of a text set, this is a great beginning to discussion about endangered species. Text and photos are wonderfully matched. (Life Science).

Arnosky, J. (2010). *Slow down for manatees*. New York, NY: Penguin Young Readers Group. Written in simple, common language. There is a large amount of Science in this book and even more in the author's notes in the back. It is a very interesting story in which young readers will be moved to seeing the need to rescue the animals. Illustrations are hazy, like a lagoon or shallow Florida waterway might be on the high humidity day. Text and illustrations work together to tell the story. (Life Science; Earth and Space Science).

Arnosky, J. (2011). *At this very moment*. New York, Penguin Group. The author excels at writing readable texts that impart scientific thinking. Behind the lens of a scientist's camera readers will observe animals in a manner that they could complete a scientist's journal as a post reading task. Notes are in the back of the book to extend learning. The author invites readers to use their imagination and creativity to imagine what animals all over the globe are engaged in doing. Because animals are residing in different climates around the globe students have to switch from one climate to another. Climatology is a good career to research and discuss as a post reading activity. (Life Science; Earth and Space Science).

Arnold, C. (2012). *A warmer world*. Biologists are studying animals in the wild and the text is their observations. Scientists' notes are on a simulated piece of notebook paper, looking as if it was ripped out of a journal. This book could be read in daily readings one journal entry at a time. Post reading activity could be the students make a journal by sharing what they remember from the reading (without looking until all ideas are exhausted). An older child from another grade-level classroom could do the reading and charting what the students dictate. Intensely detailed information and better than most books. Well-planned presentation of information. There are

many nonfiction structures in the book, the website list and numbers pages may be especially useful. (Life Science).

Aston, D. H. (2007). *A seed is sleepy*. San Francisco, CA: Chronicle Books, LLC. This wonderfully illustrated book relates the dormancy stage of seed growth as “sleepy”. There is much to learn from the well-written text but anthropomorphic terms like sleepy, impart a human quality to young learners who might be confused. Furthermore, the main story text is in a cursive font limiting access for many readers. (Life Science).

Bardhan-Quallen, S. (2009). *Flying eagle*. Watertown, MA: Charlesbridge. The behind the lens of binoculars observation is a poem about a father eagle trying to find food for her baby eagle. The author describe the landscape, the animals it sees, escaping a poacher’s arrow, his failures at hunting and his success. Then tomorrow, it will be the same: hunting again. There are references to Serengeti Plains animals and flora. Extension in the back further impart information about the different eagles in the area and the plain itself. There is a map of the Serengeti National Park and an inset of its location in Africa. The Illustrations are beautifully done in sunset’s magnificent colors. (Life Science; Earth and Space Science).

Barretta, G. (2011). *Zoola palooza, a book homographs*. New York, NY: Henry Holt, & Company. This book is a total fiction book with animals talking in homographs such as, “The dog said bow wow,” while wearing a bow tie. It was cute but nothing to do with Science. (Social Science).

Barton, C. (2009). *The day-glo brothers*. Watertown, MA: Charlesbridge. It’s easy to imagine that brothers might work together to solve problems or invent something important but these two brother went beyond just being helpful to one another. Joe and Bob conducted scientific experiments to develop new products, to improve existing products, and created something many young readers enjoy: day-glo paint. This is written brilliantly! The use of black and white images juxtaposed to the fluorescent colors intensifies the effect. This book is easy to read for 2<sup>nd</sup> grade and 3<sup>rd</sup> grade readers but K-1 will have to listen to a read aloud. The author wrote notes in the back about related subjects that readers will want to know. Here’s the joy of the story: Joe and Bob were growing up during the Great Depression. They did not have much money to buy food, but they managed to invent some things that are very useful. This story can encourage classroom students to keep working hard on an idea until it become a reality. (Social Science; Physical Science).

Basel, R. (2006). *From corn to cereal*. Mankato, MN: Capstone Press. Eating cereal is an everyday event to many students. Production of cereal is also an everyday event to some people. Preparing the soil, planting, caring for soil, harvesting, and moving corn to the manufacturing plant for production of cereal are depicted in this book. Challenge words would put this text into second grade. Language is matter of fact not vivid or exciting. Young readers will recognize environmental print of the Kellogg’s brand. This book has sidebars, a glossary, a table of contents, an index, headings, a bibliography, an internet site list as well as a recipe for making a snack with cereal. (Social Science; Life Science).

Baxton, J. (1997). *Hay for Ambrosia*. Huntington Beach, CA: Pacific Learning. A mother and child move the hay and men cut, rake and bale the hay. Questions that arise are: How do donkeys, mules, and horse get food during the winter months? What seasons are good for making hay? What kind of weather is needed to grow hay? That leads to a nonprint discussion of when does hay get planted, what weather is necessary to sprout the hay seeds. Do humans eat hay? Why or why not? There are great color photos in this book. Text is readable for 1<sup>st</sup> grade but boring. What was remarkable about the book was showing women working on the farm which breaks the stereotype. (Life Science; Earth and Space Science).

Berkes, M. (2007). *Over in the jungle*. Because this looks like a fantasy, a child may not be sure it's about something "real". This book would need to be preceded and/or followed with photos of real animals that were represented in the book. Very interesting verse presentation. The graphics and illustrations are appealing to readers and the text is also interesting. It includes nonfiction structures and a song in the back of the book. It has instructions on how to create textures as seen on the animals in the illustrations of the book. (Life Science).

Berne, J. (2008). *Manfish: A story of Jacques Cousteau*. Snorkeling and SCUBA diving were developed by Jacques Cousteau. The illustrations are magnificent, the writing is wonderful. The information is perfectly what readers would want to discover, and the theme is respect for wildlife. Jacques Cousteau wanted to go deeper into the water to explore so he developed the SCUBA, which is an acronym. Read the book to find out what those letters stand for. (Earth and Space Science; Life Science).

Biddulph, Fred & Biddulph, Jeanne. (1992). *Spiders and their webs*. Bothell, WA: The Wright Group. Since young readers have many opportunities to observe spider behaviors at home and in school, spiders are a curious animals. Because of the photos and text, the reader feels as if they are "inside" the book observing the subject. Missed the opportunity to impart the importance of spiders in the ecosystem. (Life Science).

Biddulph, Fred & Biddulph, Jeanne. (1992). *Spiders are special animals*. Bothell, WA: The Wright Group. The book uses illustrations and photos in comparison of daddy longlegs and spiders is an important event in this text as the book works to clear up readers' conflicting ideas about arachnids, insects, and animals. Limited text reduces the opportunities to impart more information to readers but this is a solid beginning introductory text. (Life Science).

Biddulph, Fred & Biddulph, Jeanne. (1993). *Clouds, rain, and fog*. Bothell, WA: The Wright Group. Behind the lens observation of clouds as they change into clouds full of rain. This is a good beginning to precipitation, fog, and weather changes. This is a high interest topic for young readers and the diagram about clouds is a high interest display. It introduces them to the idea of graphic displays in books. Discussion could morph into climate of various places around the world, which ones have rain, which ones get a great deal of rain, and which ones don't. A study of weather words would be appropriate: monsoons, hurricanes, water spouts, tornadoes, and drought) (Earth and Space Science).

Bishop, N. (2008). *Frogs*. New York, NY: Scholastic Nonfiction. Frogs, toads, and lizards live in many locations where readers could go observe them after this book. Nic Bishop, photographer and author, always tells his readers about his methods and location for getting the photos for the book. It is inspirational for readers to believe that they, too, could compile a book about something just like Nic Bishop. Easy flowing sentences. Some action photos show frogs jumping from trees. It has nonfiction structures of index, headings, sidebars, glossary, author notes, and captions. Shows South American habitat. (Life Science; Earth and Space Science).

Bishop, N. (2009). *Marsupials*. New York, NY: Scholastic, Inc. Walking or riding on safari in the Australian Outback, students get a behind the lens of binoculars view of marsupials. In the author's notes, Nic Bishop shares information about his adventures in the Outback. Vocabulary is challenging for K-1 and acceptable for grade 2. Beautiful color photos of the animals. This book contains some nonfiction text structures such as index, glossary, and captions. (Life Science and Earth and Space Science).

Bishop, N. (2010). *Lizards*. New York, NY: Scholastic Publishing Company. Nic Bishop's picture is in the book as he poses with a lizard. The readability independent level is 2<sup>nd</sup> and 3<sup>rd</sup> grade while this book is a read aloud for K-1. There are different sized fonts on each page so that younger, less adept readers can read the larger print. More adept readers can read the smaller fonts, this accommodates diverse readability levels. Nonfiction structures in this book are an index, a glossary, author's notes bibliography, and captions. (Life Science).

Bishop, N. (2012). *Spiders*. Spiders can be found nearly everywhere, are very interesting, and can be readily observed at home or in public places. Photo shows Nic Bishop taking photos of spiders. The reading is 2<sup>nd</sup> grade. The texts uses adjectives such as: stronger than steel and super stretchy. The photos give enough context to let the reader observe the environment and habitat, also. (Life Science).

Bishop, Nic. (2012). *Snakes*. This is a typically great work of photography by Nic Bishop. Behind his lens readers can see the details of the animals and habitat. There are three font sizes to bridge diverse readability levels. The language is detailed and highly descriptive. Color photos are intriguing. The author's notes tell how he was able to get some very difficult pictures. Nonfiction structures are an index, a glossary, author's notes, and a bibliography. (Life Science).

Blackaby, S. (2003). *Fish for you*. Minneapolis, MN: Picture Window Books. This is a nonfiction look at how to care for a pet fish. The good information about the maintenance of fish tanks. Instructions are extremely details, yet the language is easy to read. The illustrations are Cute, childlike, and draw readers into the with the on-grade-level approach to a generally boring subject. Highly recommend reading this book before buying a pet fish for the classroom or home because it opens the mind to the demands of caring for pet fish. The ASPCA and the Goldfish Society are listed in the book. (Life Science).

Blake, M. (1990). *The sea otter*. Bothell, WA: the Wright Group. This book gives descriptions of the sounds and behaviors of the sea otter. Otters like to lie on their backs and crack open shells to get the sea creatures out for their food. There is a nice balance between the illustrations and the photos. Some challenge words for 2<sup>nd</sup> grade. There is a map in the back of the book and captions

for the pictures. Books about hunting otters for their coats, and protected species information would make a nice text set. (Life Science; Earth and Space Science).

Blaxland, W. (1998). *Working on water*. Crystal Lake, IL: Rigby. A second semester 1<sup>st</sup> grade text with many details about jobs related to water. This is a great text for introducing the idea of having a career with some amazing technology associated with them. This text has a table of contents, a glossary, and a formal introduction. It shows a female navigator and a female charter boat captain. (Social Science).

Bleiman, A. & Eastland, C. (2012). *ABC zooborns*. New York, NY: Simon and Schuster Beach Lane Books. Fantastic use of animals in a trade-book. Also, shows familiar and unfamiliar species and raises the bar on ABC books. Some of these species are rarely depicted in texts. Simple, yet exciting text with a zany story. Vivid language that engages even the most bored learner! Main text is second semester 1<sup>st</sup> grade while back of the book extensions are smaller print and more like 2<sup>nd</sup> and 3<sup>rd</sup> grade. Definitions of five levels of endangered species accompany details on every animal depicted in the book. (Life Science).

Bodach, V. K. (2007). *Stems*. Mankato, MN: *Stems*. Mankato, MN: Capstone Press. This is a well-written easy reader text. Color photos are back far enough to give context to where the plant is growing. This 1<sup>st</sup> grade text is very nicely done and accessible for most readers. Many nonfiction structures throughout the book. No humans are depicted. (Life Science).

Bolton, D. (2001). *Eek! Look at this!* Crystal Lake, IL: Rigby. It does not tell enough information about the creatures in the book. It is actually boring. It is only skimming the surface. It would need to be part of a text set on the same topic. Color photos are mostly good, although some are so close-up that it gives no context for the habitat. The readability is so low that it is difficult to read with smoothness and enthusiasm. (Life Science).

Brimmer, L. D. (1999). *Raindrops*. New York: NY: Children's Press. Rain happens most places around the world which makes it a common activity for humans to observe. The book shows the progression of how rain begins, how it gathers in creeks, streams, rivers, and lakes. This book evokes the notion that young readers can construct their own nonfiction book. It would be a good activity for post-reading. The text is good for emergent readers. (Earth and Space Science).

Browne, M. (2005). *When they were little*. Boston, MA: Houghton Mifflin. The storyline is interesting but too much information is left out due to trying to keep the sentences short. Because of the lack of information concepts about the real world are not clearly explained. (Life Science).

Buckley, Marvin. (2003). *From the skyscraper*. Washington, DC: National Geographic School Publishing. Behind the lens view from the Sears tower in Chicago this is a great introductory text for stimulating interest in engineering topics, careers, and other STEM topics. The book misses opportunities to address "how" and "why" questions of the inquisitive young reader because there are no extensions to increase information acquisition or to bridge readability diversity. (Physical Science).

Budgell, G. & Lumb, S. (2006). *We like fruit*. London, UK: Harper Collins. Nutrition is the topic of this book, especially focusing on the value of fruit. Color photos promote the beauty of fruit. This book could have bridged diverse readability and interest levels with sidebars. Nonfiction text structures in this book were page numbers, table of contents, index, headings, glossary, and bibliography. It also contains recipes and menus that use fruit as ingredients. (Life Science and Social Science).

Burleigh, R. (2009). *One giant leap*. New York, NY: Philomel Books. The paintings used for illustrating this book are so real that they nearly look like photos. In 1969 Buzz Aldrin and Neil Armstrong landed and walked on the moon. It was a big day in technology's achievements and remains so in technology's history. This book imparts every important step of this adventure. (Earth and Space Science; Social Science).

Burns, L. (2012). *Citizen scientists*. New York, NY: Henry Holt & Company. Depicts family members in the act of bird watching and making notations of all wildlife like butterflies, frogs, ladybugs, and birds. Many photos of people acting as citizen scientists by membership in various organizations. This is a lengthy book with second semester 2<sup>nd</sup> grade text. Well organized and detailed information about watching and recording nature. Even as a read aloud, the length of this book could be overwhelming to young listeners. Portrays Asians, African Americans, Hispanics as children and adults. (Life Science and Social Science).

Butler, A. (2000). *Recycling dump*. Glenview, IL: Scott Foresman & Company. Recycling is the major focus of this book. However, it does not tell where recycled materials go after being collected at a curbside pickup or what recycled materials become when they are recycled. This book does nothing to bridge diversity of readability in extra nonfiction structures such as sidebars or captions. (Earth and Space; Social Science).

Butterworth, C. (2011). *How did that get in my lunchbox?* The story of food. Somerville, MA: Candlewick Press. Shows a variety of cultures helping process plants into foods that children commonly eat. Young readers need to better understand from where their come. Teacher will need to support and scaffold reading for many students. Author included very much vivid language that keeps the reader interested. The style of illustration is both child-like and active-looking to impart a "moving along" sense to the food production. Readers will notice that many cultures and both genders are represented. Only a few nonfiction structures. (Social Science; Life Science; Earth and Space Science).

Byrd, R. (2012). *Electric Ben*. A timeline shows development of technology of Benjamin Franklin's time period. Readers will be able to grasp that he lived at a very different time. They will also begin to understand why he and others were driven to experiment. It is clear that many of his experiments could be duplicated today. The language is simple but descriptive. Language is simple but the length of the book is extensive for most primary students to read independently and would tire them. Shared reading would be good. The busyness of the pictures portray the busyness of Mr. Franklin. Native Americans depicted in native costume dress. Text refers to Mr. Franklin's admiration of the Native Americans. (Social Science and Physical Science).

Canizares, S. & Moreton, D. (1998). *Who lives in a tree?* New York, NY: Scholastic, Inc. Although it is a behind the lens look at animals it does not give details about what type of butterfly? What kind of fox? This is a lost opportunity to say more about each animal in various nonfiction structures. There is only one sentence per page. There are color photos and illustrations in the epilogue. Text does not adequately support the photos.

Canizares, S. & Reid, M. (1998). *Nests, nests, nests*. New York, NY: Scholastic, Inc. Nests are in the big cities and in the country. Nests can be seen by almost anyone who is intently looking to find them. Binoculars help people see the nests. The reading level is the very beginning of emergent reading. There is more information in the back of the book and can be accessed by second semester 1<sup>st</sup> grade with help. (Life Science).

Catala, E. (2003). *Ways we communicate*. Mankato, MN: Capstone Press. This is from a mental health perspective as the text discusses signs, sign language, people of various medical health professions, and family members. A discussion of internet, notes, letters, and talking are included. Computers in photos are very dated from 1980s. There is an activity in which students play telephone in the back of the book. The population in this text is very diverse. (Life Science and Social Science).

Campbell, F. (2002). *A trip to the dentist*. New York, NY: The Rosen Publishing Group, Inc. The reader takes a vicarious trip to the dentist to have teeth cleaned and checked. Photos depict the female Hispanic, the Hispanic male, and the African America female at the dentist's office. Because going to the dentist is not available to all economic groups, showing students what happens at the dentist's office is important. Nonfiction structures are numbered pages.

Cerullo, M. & Roper, C. (2012). *Giant squid*. Mankato, MN: Capstone Press. On page 17 the text gives details about how scientist study and conduct experiments. The text is very exciting throughout the book. The color photos are good and the readability of the text is exciting 2<sup>nd</sup> grade and 3<sup>rd</sup> grade words. The book is structured with many nonfiction features such as table of contents, index, heading, glossary, bibliography, and epilogue. "The Hunt Continues" is a guide to further research about giant squids. (Life Science).

Cernak, L. (2006). *Heat all around*. Boston, MA: Houghton Mifflin. Text is short and choppy, which makes reading difficult, and nearly boring. Photos are cropped so close that context or habitat is not discernable. Bridging readability levels are not bridged in this text. A white man is playing on the beach with children while a Hispanic is in her housecoat baking cookies while her daughter is in pajamas helping bake. This looks sexist. (Social Science).

Chan, H. (2003). *Heat changes things*. Washington, DC: National Geographic Society. Melting ice cream and ironing shirts are two of the things that are featured in this book as changing due to application of heat. Sometimes, it is not explained to readers how the heat gets applied to objects. That would need to be a post reading discussion. There are beautiful color photos that show objects but the text only addresses a small reading level niche which limits usefulness of the book. This book shows an African American dad helping his daughter, which is a not very often depicted family structure. (Physical Science).



Chapman, J. (2001). *Ocean facts*. New York, NY: The Rosen Publishing Group, Inc. This behind the lens observation could have taken place in a large aquarium. Photos are cropped so closely there is very little context for the habitat of the animals and plants. This book lacks sidebars and other nonfiction text structures that assist readers in grasping information. Sadly deficit of vivid language to describe the photos and they don't always identify what is in the photos. This book really needs better explanation. An activity for readers could be learning to use adjectives of colors, textures, sizes, and shapes to better describe the photos and write the text in small or large groups. (Life Science).

Chin, J. (2009). *Redwoods*. New York, NY: Roaring Brook Press. The author-illustrator relates the redwoods to everyday object that many readers already are familiar with: the Statue of Liberty, skyscrapers in large cities, and getting lost. The boy in the story is name Boy Jason and he climbs a redwood tree to look at the entire forest and the habitat that the redwoods make for many animals. The author uses common words to explain redwood and gives a definition of them uses it in a sentence: reiterated trunks. He did this beautifully! The whole book is nicely done. He includes many context clues in the text and in the art for readers to use to solve unknown words. Illustrations invite the reader to join in the adventure of Science inquiry and discovery. Text is late 1<sup>st</sup> grade. The ending is splendid! The text and art are consistently supporting each other. An epilogue explains the danger that is befalling the redwoods and there is a redwood diagram. (Life Science and Earth and Space Science).

Chin, J. (2011). *Coral reefs*. New York, NY: Roaring Book Press. A behind the lens voyage to the bottom of the sea. A blonde female citizen scientist is looking at a voyage portrayed in a book and we get to journey along as she uses her imagination. This is a second grade independent reading level. The book is very detailed, in vividly portrayed, and has many extensions in the back. The text and illustrations fit nicely together to tell the story. Inside the front and back covers of the book, are line drawings of sea animals, facts about coral reefs, symbiotic relationships of sea animals, and threats to coral reefs. (Earth Science; Life Science).

Chin, J. (2012). *Island: A story of the Galapagos*. New York, NY: Roaring Book Press. Explains animal and plant adaptations in a clear fashion. Allows readers to visually experience this adaptation in an "over time" manner. Illustrations and text detail the behind the lens view of island growth and death due to volcanoes and sinking. The book deals with topics in a chronological pattern. The language uses 2<sup>nd</sup> and 3<sup>rd</sup> grade adjectives with some other challenge words sprinkled in. The author-illustrator works hard to show that changes happen over time so that 1<sup>st</sup> and 2<sup>nd</sup> grade readers can understand this concept. The author leaves the text font large to support early readers. There is a photo of the author at Galapagos Island. Many nonfiction structures are included. (Life Science).

Christensen, B. (2012). *I, Galileo*. New York, NY: Alfred A. Knopf. Readers observe Galileo growing up in Italy, being educated, having possession of some very fancy instruments, and some inventions. Yet, he was not being rewarded for his inventions rather he was having some difficulties in his life. He was punished for his intelligence. Young readers can relate to wanting to look at the stars and planets. They can also understand that there are people who do not like them or want then to succeed. They further understand that people make up bad things to get someone in trouble. There is an abundance of information in this book. The text is very

interesting. The structure of the book includes a glossary, a bibliography, an epilogue, a preface, a website list, a chronology, an afterword, and maps. (Earth & Space Science, Social Science).

Chowcher, H. (2011). *Desert elephants*. This is one of the best books showing human interactions with elephants. The language is vivid and engaging. The illustrations are beautiful. This book is late 2<sup>nd</sup> grade independent reading but well worth the energy to put it on tape for a re-reading center activity. The text and illustrations very much complement one another. Nonfiction structures are websites, author's notes, and a map of elephant migration path. Three African peoples are depicted: Dogon, Fulani, and Tuareg. Working together to solve problems is a major theme of this book and can be used to help establish a collaborative classroom atmosphere at the beginning of the school year. (Life Science).

Cohen, J. (2003). *Dump trucks*. London, UK: Lerner Publishing Group. The physics of dump trucks is a high interest topic for many young readers. Dump trucks are big, noisy, have great technology and due to this attract a great deal of attention. This book is well written and has many facts in the back of the book about dump trucks and the parts of a dump truck. Nonfiction structures are the index, headings, and the extensions in the back. It also is available in the Spanish version: Volquetes form Libros Para Avanzar-Potencia En Movimeinto. (Physical Science).

Collard, Sneed. B. (2012). *Sneed B. Collard's most fun book of lizards*. Waterloo, MA: Charlesbridge Publishing, Inc. Lizards are fun animals to observe because they have so many odd, humorous behaviors. Young readers from Texas to California can observe lizards every day in their own yard or the school grounds. The photos are clear and the descriptions are detailed. Both close up and distance photos still show the context of the lizard's habitat. The text is very folksy and personally addresses the reader. Readability could challenge even 2<sup>nd</sup> grade readers but the book contains many nonfiction structures like table of contents, index, sidebars, glossary and a website list. (Life Science).

Collins, M. (1995). *Dinosaurs*. Plant fossils are depicted in rocks and fields. Smooth sentence structure. Dinosaurs are all labeled with some rare specimens. Depicts scientists locating and preservation of fossils. Includes a timeline of different dinosaur periods. (Earth Science).

Connal, J. (1996). *Astronauts*. The book explains that astronauts are usually scientists and pilots who learn how to go into outer space. Illustration show all the training that is a daily effort. Text has smooth, intelligent sentences. This is a great study of careers books. The language is so nicely done. Very nice work on anti-gravity explanation. There are women in space shown in this book. (Life Science).

Coughlan, C. (1999). *Fireflies*. Mankato, MN: Capstone Press. Young readers could easily examine in person or a behind the lens observation of fireflies. A high interest topic for readers of many ages but this book lacks information about habitat, region, food source, predators, and what makes the lantern glow. The language is bland with no adjectives. The color photos are so up-close that no context for their habitat or ecosystem is visible. Nonfiction structures are a glossary, index, captions, a bibliography, and internet sites. (Life Science).

Coughlan, C. (1999). *Ladybugs*. Mankato, MN: Capstone Press. Behind the lens your young scientists will be observing wildlife and identifying anatomical parts with the help of captions. Extensions for this book is to chart observations in small groups. Statements of fact with not adjectives to make language vivid; however, it is an interesting book concept. Nonfiction structures are a glossary, a table of contents, an index, a bibliography and internet sites list. (Life Science).

Craig, J. (1982). *What's under the ocean?* Mahwah, NJ: Troll Associates Communications. The ocean is an everyday experience when readers live near the ocean; however, many people do not live near the ocean and do not understand the different lifestyle that the ocean brings. A character in the book snorkels to explore what is below the surface of the ocean waters. A baby and mother dolphin are depicted in the picture. Some animal names are difficult for 1<sup>st</sup> grade students to problem-solve. The right whale is shown with huge shark-like teeth. There is no racial diversity depicted in this book. The one nonfiction structure is an index. (Life Science).

Curtis, J. K. (2012). *Sea horses*. New York, NY: Henry Holt and Company. As the scientists behind the lens, readers stare at the amazing underwater view of the sea horse life cycle. Written in simple words, the text conveys the mesmerizing sea horse world below the ocean surface. Great descriptions of sea horse activities are vivid and interesting. Sea horses are fascinating creatures of high interest to young readers. The book does a great job of giving the very information that readers want to know. Nonfiction structures were located the front of the book, which was a great idea to acquaint readers with tidbits that informed their reading of the main text. This way they had looked at vocabulary before approaching the main text. (Life Science; Earth and Space Science).

Cusik, D. (2012). *Get the scoop on animal poop*. Watertown, MA: Imagine Publishing by Charlesbridge. Of course! Everyone understand that organisms eliminate waste but this behind the microscope lens journey views different animal feces. This is a book that can leave the reader over informed! However, it is quite interesting. Text and photos are clustered like little piles of fecal material found along a woodland path. This book has challenging readability. Teachers must watch their language because this book opens the door to a great deal of subjects however, the book gives the correct words for things that children have previously only known colloquially. There are Poop Detectives, a Poo Interview, and other extensions. (Life Science).

Cutting, B. & Cutting, J. (1988). *Wheels*. Bothell, WA: The Wright Group. This very short book Is listed as a K-1 book. It repeats the word “wheels” 11 times yet the text includes fantastic and machine. The text is not at all descriptive with adjectives. (Physical Science).

Cutting, B. & Cutting, J. (1992). *Clouds*. The characters discuss the day by day activities of watching the sky. Parents and child discuss what colors are in the sky at different times of day and what those colors mean. The developmental level of this text is appropriate. The sentences are smooth and seem like real conversation rather than contrived text. The manner in which the text and the illustrations work together is very well coordinated. (Earth and Space Science).

Cutting, B. & Cutting, J. (1996). *Are you a ladybug?* Bothell, WA: The Wright Group. As a behind the lens view of ladybugs, the author poses questions to lead the reader in establishing criteria for scientific investigation of beetles. Sentence structure and word choice are emergent. Colorful pictures and text shows respect for wildlife, and compares and contrasts ladybugs with life forms. It would have been better by bridging diverse readability levels with sidebars and extensions. (Life Science)

Cyrus, K. (2011). *The voyage of turtle rex*. A behind the periscope look at prehistoric reptilians and other creatures, including Archelon. Text is written in 2<sup>nd</sup> grade words. The journey in this book is as if a submarine submerged into a prehistoric sea to observe the animals from long ago. The vocabulary is active as if flowing from one creature to another. Illustrations are amazingly detailed showing barnacle on the turtle's shell and the moonlight shining on the sea. The text and pictures are highly supportive of one another. Author's notes tell of modern-day challenges for sea turtle life via commercial fishing and human encroachment on their habitat. (Life Science).

Dahl, M. (2004). *Do frogs have fur?* Minneapolis, MN: Picture Window Books. This is one time the cartoonish humor of illustrations works well in a nonfiction topic. In fact it is the strength of the book. An observation of wildlife while checking out their coverings. It is very well executed with a continual compare and contrast exercise opportunity throughout the book. Using this book to its utmost sets up young readers for inquiry thinking and inquiry reading for future excursions into the habitat of wildlife. This book pairs well with other texts that really get into the details of habitat of specific animals. It has nonfiction structures such as index, glossary, and a bibliography. There is an animal coats and coverings table in the back along with an internet site list. (Life Science).

Davies, N. (2011). *Dolphin baby*. Behind the periscope view as if inside of a submarine this underwater safari on an interesting trip to view dolphins in action. This high interest topic might inspire a struggling reader to take on a challenge or two with some dolphin-related words. The illustrations are excellent and seamlessly fit together with the text. The afterword sections are full of information. Articles or books about commercial fishing, overfishing, food sources of fish, predators of fish and dolphins would be a nice text set. (Life Science; Earth and Space Science).

Doeden, Matt. (2005). *Fighter planes*. Mankato, MN: Capstone Press. Aerial photos are spectacular views of flights. Fighter plane technology overviewed but not detailed in this early primary grade-level book. One sentence per page and no sidebars limit opportunity to bridge readability variations known to exist in kindergarten and first grade. (Earth and Space Science; Physical Science).

Doeden, M. (2007). *Tugboats*. Mankato, MN: Capstone Press. Every day tugboat drivers perform the hard task of moving large, heavy objects from one place to the next at harbors all over the world. This skilled trade gets little press but the intelligence of tugboat captains and their knowledge of technology is extremely high. The sentences of this text are very action-oriented. The photos are wonderful showing tugboats in context with one another as well as with other boats and sea-going barges and ships. This is a great conversation starter for introverted students who might like information about all aspects of the ocean. (Physical Science).

Doeden, M. (2008). *Thunderstorms*. London, UK: Lerner Publications. Eventually, nearly everyone sees a thunderstorm. Photos show meteorologists monitoring storms on computer screens. Shows a father and son covering ear from the noise due to the clapping thunder. They use a coin to measure the size of hail, then the tornado siren sounds. The diagram of water in clouds shows water drops moving up and down to form bigger water droplets and then hail. There is a thunderstorm table and many nonfiction structures included in the book, including a website list. (Earth and Space Science).

Deedrick, T. (1998). *Astronauts*. Mankato, MN: Capstone Press. Readers will understand the idea that astronauts live in space every day. Astronauts are portrayed as scientists conducting experiments in space. This book can be read by late first grade. It has interesting photos and an interesting writing style with simple text. Internet sites and an experiment is in the back of the book. Photos depict varied cultural heritages in the people. It would be good paired with a book about solving problems like disease through space experiments. (Earth and Space Science).

Deem, J. M. (2008). *Bodies from the ice: Melting glaciers and the recovery of the past*. Boston, MA: Houghton Mifflin. This book is far too graphic to have in kindergarten and perhaps even 1st grade classrooms. As a parent, they might have time to talk with the student enough for them to accept this topic. However, 2<sup>nd</sup> grade students in small groups might be able to talk through the thoughts and feelings about the gruesome expedition to recover frozen bodies. It was fascinating reading. (Earth and Space Science; Life Science).

Deem, J. M. (2012). *Faces of the past*. Boston, MA: Houghton Mifflin Books for Children. Reconstructing faces by using real skulls, gray clay, and the yellow brown clay. Extremely interesting text but the text is 4<sup>th</sup> grade and above. There are nonfiction structures such as table of contents, index, bibliography, introduction, a list of museums, and a websites list. (Life Science and Social Science).

Degezelle, Terri. (2006). *Taking care of my hair*. Mankato, MN: Capstone Press. Personal hygiene issues such as cleanliness, feeling positive about self, and a nurse looking for lice are hot topics for young readers. Websites for further study are listed. Four ethnicities of children are depicted so this is a book respecting diversity and imparting important information. (Social Science).

Dolbear, E. (2001). *Pandas have cubs*. Minneapolis, MN: Compass Point Books. Behind the lens scientific observation of panda cubs growing up from newborn to adult. Readers learn distinctive characteristics and behaviors of pandas. PreK-K read aloud book but early 1<sup>st</sup> grade could read this with support in a partner read or small group. Photos depict actual activities of pandas. This nonfiction text employs captions, glossary, epilogues, an index, author's notes, and a website list. This book could pair with a text discussing the encroachment on panda habitat and food supply. (Life Science).

Duffy, J. (2006). *Grow a bean plant*. Boston, MA: Houghton Mifflin. This book has good Science information about growing a bean plant. The pictures show root growth which is an interesting concept to young readers who perhaps have never grown a plant. The information and

style of graphics do complement one another and illustrate the plant growth. People depicted are an African American, a Hispanic, and a senior citizen. That is good to show multigenerational people working together. There are no captions, sidebars, bibliography, or websites list in this book. (Life Science).

Dunphy, M. (2010). *At home with the gopher tortoise*. Berkeley CA: Web of Life Children's Books. This behind the lens observation of the gopher tortoise and many other animals that find shelter below ground. This is a 2<sup>nd</sup> grade reading level. Amazingly detailed and vivid account of the dwelling of animals. Beautiful illustrations. Sometimes the text is difficult to read when it is over the top of the illustrations. There are an epilogue and captions for nonfiction structures.

Durney, R. (2003). *Weedy sea dragons*. Elizabethtown, PA: Continental Press. Behind the lens view from a periscope to watch weedy sea dragon behaviors. Systematic inquiry in great text with only 106 words! Photos are wonderful and match well to text. Would have been better if it would have bridged diverse readability levels with sidebars, epilogues, and other nonfiction structures. Nicely paired to Rachel Carson and Jacques Cousteau books. (Life Science and Earth and Space Science).

Ecton, A. M. (1998). *Saguaro*. New York, NY: Richard C. Owen Publishers. Readers see the Sonoran Desert from behind the lens as the Saguaro story unfolds. The story does not relate the total height the saguaros can reach, how it replicates, the animals that depend on it for their habitat. Those are topics for post reading research. Statements of fact are not necessarily imagination catchers. This text could have used some adjectives to spice up the text because the illustrations are very interesting. If the pages had been bigger so that captions and sidebars would bridge diverse readability levels that would have been great. Animal names are listed in an index; however, this was a lost opportunity to use the names in an epilogue to expand learning. (Life Science; Earth and Space Science).

Eggleton, J. (2002). *Swim, climb, and fly*. Auckland, New Zealand: JJ Education. Observing frogs and lizards can be an everyday event in some areas of the world. Although there are no scientists depicted in the book conducting observations, students in pairs or small groups could complete observation charts as if they are scientists during a second reading of the text. Readers could brainstorm other information they wish the book had told them. Then, they could conduct research to find that information. To bridge the diversity of readability levels sidebars and back of the book extensions could be constructed by students and placed in a display around the book to enhance the knowledge of all students. (Life Science).

Elliot, J. (1996). *The armadillo*. Bothell, WA: The Wright Group. Observation of the armadillo is easy to do because they are rather slow, most of the time. However, it does require being in his or her habitat. The armadillo is a high interest topic because of their outer covering. The language in this book is a little faster paced than the armadillo. Photos are good but the line-drawing looks boring and uninteresting. Text is second semester 1<sup>st</sup> grade. Nonfiction structures are table of contents, index, headings, glossary, and captions. (Life Science).

Emmett, J. (2005). *Robots*. London, UK: Harper Collins Publishers. This book doesn't show humans building robots or using them in an everyday life situation. The book imparts human desires to the robots when it says the robot wants to win a competition, work hard, and have fun. No adjectives that make the book have vivid language. Does not explain that robots are substitutes for human employment. (Physical Science).

Evans, L. (2010). *Big cats*. New York, NY: Scholastic, Inc. A behind the lens detailed safari-observation of Big Cats. Can serve as a prequel to a zoo field trip. Color photos are vivid accompanied by action-based language in text. Easy read-aloud for early grades. Comparison chart of the five biggest cats in the world. (Life Science).

Fawcett, V. (2004). *When I was a baby*. Crystal Lake, IL: Rigby. When young readers are growing up, they are very interested in babies and the growing up process of humans. This book has a limited vocabulary that limits the interest in what would have been a high interest book. This book could be in a text set with many other texts discussing facts about babies and the maturing process. (Life Science).

Fear, S. (2001). *Who laid these eggs?* Parsippany, NY: Pearson Learning Group. Using investigative and inquiry skills readers can work to eliminate the incorrect guesses about which animal laid the eggs. The repetitious sentence gets a bit weary but discussion should be coming from the large or small group using discussion to work through problem-solving. The sentences are explanatory but not vivid. This book would be great with other books about eggs and readers can learn to chart comparisons and contrasts in a small group setting. (Life Science).

Feeny, K. (2008). *Caring for your snake*. Mankato, MN: Capstone Press. Color photos depict images of caring for a pet snake. This is a read aloud for K but independent reading for 1<sup>st</sup> and 2<sup>nd</sup> grades. Nonfiction structures in this book are a table of contents, an index, a glossary, a bibliography, internet websites, sidebars, and a snake cartoon, with speech bubble! (Life Science and Social Science).

Fern, T. (2012). *Barnum's bones*. Giroux, NY: Margaret Ferguson's Books. The high-interest topic of dinosaurs attracts readers to participate vicariously on the highly-detailed retelling of Barnum Brown's excursions to locate the first T-rex skeleton. Vivid illustrations are excellent. (Earth-Space Science).

Firestone, M. (2005). *Clay*. Mankato, MN: Capstone Press. Clay is a common ingredient in many everyday objects. This book is excellent in imparting much information in simple sentences that use adjectives to describe and make clay sound interesting. Color photos are excellent examples of mining clay and products made from clay. Text is mostly second semester 1st grade words, decodable words, and solvable with help. Pictures are close up but still leaving in the context clues. Many nonfiction structures and internet site list. A text set could have 1-2 books about the problems of mining. (Earth and Space Science; Physical Science).

Flora, B. (2007). *Lightship*. New York, NY: Athenaeum Books for Young Readers. The technology on the ship is quite amazing. Careers connected with the ocean are portrayed in this book. The employees and their job responsibilities is very detailed. This behind the lens view is intriguing and sparks readers' imaginations with ideas of living on the ocean. The diagram of the

ship's sections is also detailed. The theme of taking care of others through an employed position is a good topic of discussion after the reading. Research of former sailors on the Lightship might be an interesting group follow-up activity. (Earth and Space Science; Physical Science; Social Science).

Flora, B. (2009). *Moonshot: The flight of Apollo 11*. New York, NY: Simon & Schuster Children's Publishing. Behind the lens journey during preparation, lift-off, flight, and landing of spacecraft to the Moon. Author's effort to make text accessible to young readers is evident. Lengthy story but could be read over 2-4 sessions by strong 1<sup>st</sup> – 2<sup>nd</sup> grade reader. Back of book extensions are 3<sup>rd</sup> -4<sup>th</sup> grade level text. Front of book diagrams of spacecraft. (Earth & Space Science; Social Science).

Florian, D. (2010). *Poetrees*. New York, NY: Simon and Schuster Publishing Division. Readers get a behind the lens view of trees, some of which have quite unusual characteristics. Illustration show people and give reader perspective on size, shape, and characteristics. The book is 2<sup>nd</sup> and 3<sup>rd</sup> grade independent reading. Good poetry and use of "play on words" techniques. Very nicely done. This book will challenge readers' sense of humor and understanding of homophones. Words disobey printing rules and go where they wish on the page which adds to the whimsy of the book. There are many nonfiction structures and the book includes a diverse human population (Life Science).

Frost, H. (2001). *Feeling angry*. Mankato: MN: Capstone Press. Controlling anger is an everyday challenge for young readers who are dealing with a variety of new experiences that growing up provides. This book conveys ways to change reactions to irritating circumstances which are depicted in the photos. (Social Science).

Frost, H. (2001). *Walkingsticks*. Mankato: MN: Pebble Press and Capstone Press. Readers take a vicarious excursion to look for walkingsticks and other creatures that they may see. Challenging vocabulary in the text but it introduces proper scientific words for insect, twig, camouflage, predators, and antennas. The sentences are nice, not choppy. Photos depict the variations that can be observed in walkingsticks. Overall this is a nicely completed book. A topic of ecology that should be in this book is the concern for a shortage of walkingsticks because of human encroachment on habitat. Websites are listed, a glossary, table of contents, captions, index, and extensions that explain the topic.

Frost, H. (2007). *Snowy owls*. Mankato, MN: Capstone Press. There are not humans in the book only the snowy owls, which is quite all right! Snowy owls are amazing animals that are very difficult to see in the northern regions due to their camouflage. The text and photos support one another well. There are many nonfiction structures, including a website list. (Life Science)

Francis, S. (2009). *A snowy day*. Boston, MA: Houghton Mifflin. Readers participate from remembering their own experience, if they have any experience with snow. There is much text about the day but not much about the process of snowflakes forming or what constitutes a snow storm. The text is 2<sup>nd</sup> grade. This book has less than optimal information about the Science of snow, which young readers would like to know and could have understood. It has captions and numbered pages. (Earth and Space Science and Social Science).



Francis, S. (2009). *All about boats*. Portsmouth, NH: Fountas and Pinnell Leveled Literacy Heinemann. This behind the lens observation of boats is very interesting. When it comes to boats, small does not mean lacking power because the tug boat looks small but it has great power to push large barges and ships in the harbor. The technology of boat and the jobs that boats perform are depicted in black and white which reduces the interest for young readers. This is a good career book: boat captain. (Social Science; Physical Science).

Freeman, M. (1999). *Fire engines*. Mankato, MN: Capstone Press. Photos and text are about Firefighters and firefighting. A good book to pair with this would be one that presents the technology of firefighting. Nonfiction text structures for this book were table of contents, index, bibliography, internet sites list, a note to teachers and parents about fire safety information. (Social Science).

Frost, H. (2000). *Seeing*. Mankato, MN: Capstone Books. As one of our five senses, seeing is considered very important. In an effort to keep the standards of words per page and a specific number of total pages per book, the text does not tell much about seeing. Nonfiction structures present in the book are a table of contents, an index, a bibliography, and extensions. (Life Science; Social Science).

Frost, H. (2001). *Feeling angry*. Mankato, MN: Capstone Press. Controlling anger is an everyday challenge for young readers who are dealing with a variety of new experiences that growing up provides. This book conveys ways to change reactions to irritating circumstances which are depicted in the photos. (Social Science).

Frost, H. (2007). *Puffins*. Mankato, MN: Capstone Press. This journey requires both behind the camera lens and behind the periscope because readers follow the puffins below the surface of the water to discover what they do when they are swimming. The language and sentence structure is very good. The use of simple text is amazingly descriptive. The color photos are fantastic. There is a map and a key for the map, as well as website lists. (Life Science; and Earth and Space Science).

Frost, H. & Gore, L. (2008). *Monarch and milkweed*. New York, NY: Atheneum Books for Young Readers. Monarch butterflies are fascinating creatures. They are beautiful in color and form, they are beautiful as they fly, they make an amazing migration, and they have survived some very challenging events that have nearly wiped them out. Behind the lens readers learn the proper methods for observing the life cycle of the monarch. The text is very detailed but done with second semester 1<sup>st</sup> grade language for GT, and 2<sup>nd</sup> and 3<sup>rd</sup> grade language. Illustrations properly portray the beauty of the monarch. There is a website list, a map in the front of the book and inside the back cover as well. (Life Science; Earth and Space Science).

Frydenborg, K. (2012). *Wild horse scientist*. Boston, MA: Houghton Mifflin. Readers monitor wild horse behaviors from behind the lens of binoculars, as scientists recording observations. Jay and Alison show readers how to observe wildlife and record facts in the records. This book is interesting and very detailed. It would be good used in a text set with other horse books that detail physical and behavior characteristics then compare and contrast the information. There are many nonfiction structures. (Life Science).

Galbraith, K. O. (2011). *Planting the wild*. Atlanta, GA: Peachtree Publishing. Behind the lens observation of seed planting, dispersion, root growth, and plant growth. At times the text representations of animal sounds are included in the text. The text sometimes sways up and down on the page to imitate movement as if blown by the wind. Beautiful illustrations and graphics, yet, they do not over power the page. Traditional style illustrations and traditional style font minimize the novelty and keep readers grounded to the task of reading. (Life Science).

George, Jean Craighead. (2008). *The wolves are back*. New York, NY: Dutton Children's Books. Observing wildlife is somewhat of a challenge but this behind the lens view of the wolves returning is a wonderful event. This is a 2<sup>nd</sup> grade independent book. The text has nice details and interesting language. The artwork is stunning. It depicts the symbiotic relationship of wolves and other wildlife with the habitat. (Life Science).

George, Jean Craighead. (2010). *The buffalo are back*. New York, NY: Penguin Group, Inc. A book relating the discovery of buffalo grass by a child prompts an entire community to become citizen scientists improving care of the plains on which buffalo graze. Early primary readers would understand concepts when book is used as a read aloud while strong second and third grade readers could read in a supported small group environment. (Life Science).

Gerber, C. (2008). *Winter trees*. Watertown, MA: Charlesbridge. This poem tells about a child who notices each tree and the tree's specific characteristics. It is nicely done and very interesting. Pictures gives distinct, detailed look at each tree's leaves, bark, and overall shape. Identifying trees diagram is included with more text in the back of the book. This is a great book to introduce the career of urban and wild forestry. Southern Illinois University has information about that career. The main character looks Asian and is shown enjoying the seasons. (Life Science; Earth and Space Science).

Gibbons, G. (2008). *Elephants of Africa*. Bronx, NY: Holiday House. Behind the lens of binoculars while on an African safari to learn a great deal about rarely discussed information about African elephants. All very nicely done. This book has a map of where the elephants live and "elephant tracks" extra information in the back of the book. Sidebars, headings, and captions are also in the structure. A text about poaching, human encroachment, nature preserves, and respect for wildlife habitat would strengthen this book. (Life Science).

Gibson, B. (2006). *Spy Tools*. Austin, TX: Harcourt Achieve. This book exposes the tools spies use to obtain information and accomplish secret mission. Writing inspires readers to engage imagination and creativity. Instructions on how readers can construct their own spy tools with adult assistance. (Physical Science).

Gibbons, G. (2012). *Ladybugs*. New York, NY: Holiday House. Observing bugs from behind the lens sees everything "Ladybug", except the bug. This book is very nicely on target with grade primary grade-level text, various text sizes bridge diverse readability to support and challenge readers. Inset illustration shows actual size of top view, side view of beetle, the lifecycle stages of development, predators of ladybug, and websites list. Nonfiction structures are headings and captions. (Life Science).

Gibson, B. (2006). *Thrills on the water*. Austin, TX: Sails Literacy Series. Watersports safety is a part of a health education program and this book helps complete that part of the curriculum. It shows people engaged in water sports and water exercise. Readers will have seen these sports on television but will not have a grasp of the dangers these sport possess. This book will enlighten them. Amazing amount of information in such a short book. Color photos will catch the eye of readers looking at great action scenes. For 2<sup>nd</sup> grade this will be an independent reading. It could be paired with other safety books or other sports books. An activity for the text set is to present this book after having read the other sports books. Then go back and re-read them so that now they discuss and chart safety rules for those sports. (Life Science; Social Science).

Giles, J. (1998). *Our baby*. Boston, MA: Nelson Cengage Learning. As a new baby enters a family, the well-being of the baby, the parents, and the older siblings becomes a concern. There are color photos depict older brothers helping to care for a new baby sister as father gives the baby her bath. The father is very active in the lives of his children. Showing an extended family in the photos would have been a positive concept. This book would have been better with nonfiction structures such as a website, bibliography, and sidebars to bridge readability levels. (Life Science and Social Science).

Gillespe, K. (2003). *What goes up?* Many objects are described as “going up” in this book. Directionality activities like, Simon Says, “Put your right hand up,” would support this book. The text has limited language of six words per page. Each object is in a position but then reaches even great height when it is going up. This is a great K level book and the Simon Says activity could reinforce left and right as it is practiced in conjunction with this book. (Physical Science; Social Science).

Gonzalez-Jensen, M. (2008). *Our gift to the beach*. Austin, TX: Rigby Harcourt Achieve. Readers can draw conclusions throughout this book such as: litter can be avoided by putting trash in a waste can. Mother and daughter perform ecology clean-up of beach on their day out. Readers decide which part of ecology and the habitat are what is litter. Pairing this text with other texts on volunteering to help clean the environment would enhance this text. (Social Science).

Gose, M. (2010). *The sounds all around us*. New York, NY: The Rosen Publishing Group, Inc. Reviews the sounds many people hear every day. Make scientific observations as every day occurrences create sound. The author could have written text for the sounds such as: tick, tick, tick. For the most part the illustrations and graphics are text-relevant. Various ethnicities are represented in pictures. (Physical Science; Social Science).

Gown, B. (2012). *D is for desert*. Ann Arbor, MI: Sleeping Bear Press. An alphabet book always encourages readers to compile their own alphabet book. Two size of fonts helps to bridge diverse readability levels. Scientists are shown gathering specimens. Everything is described in four lines of poetry per page. This is a book filled with new and interesting vocabulary that could be used on a vocabulary word list and pulled out in conversations. Dinosaur vocabulary lovers will be amazed and scoop up these new words. Extensions of this book ae very well executed. The

Taureg people, Persians, Mongolians, as in in photos while the Anangu people of Australia are referred to in the text. (Social Science, Life Science, and Earth and Space Science).

Green, R. & Scarffe, B. (1994). *Black and white*. New York, NY: MacMillen McGraw Hill. Aily observation of animals reveal black and white animals all around us. This book focuses on animals that are black, white, or black and white. The illustrations are very nicely done. One sentence per page is not enough information. Using nonfiction structures to extend information dissemination

Green, S. (1992). *In the woods*. Carlsbad, CA: Dominie Press, Inc. Although children do not fly, they will wish they had physically joined the flying child tour guide of this fiction book. Viewing the woodland wildlife and documenting the musical-instrument-playing ants will excite readers about the possibilities held in this imaginary journey. Separating fact from fiction will be a challenge for a discussion-rich post reading activity. The text has a particular rhythm that is somewhat challenging to keep doing. (Life Science).

Guiberson, B. Z. (2009). *Life in the Boreal*. New York, NY: Henry Holt and Company, LLC. An excursion of the Boreal Forest to observe animals and habitat from behind the lens. Illustrations very beautiful but the text is disorganized by mentioning animals on one page but not showing them until many pages later. (Life Science).

Guiberson, B. (2010). *Earth feeling the heat*. New York, NY: Henry Holt & Company. The behind the lens view does not give great detail about the habitat and what is causing the climate change until the afterword. It says particles are causing the change. But does not say which particles or how and why that changes the climate. The text repeatedly asks who can help but with no humans depicted in the book, there is not result to humans and no idea of what humans could do to help. The photos are appealing and the text is easy for more primary with help. (Earth Science).

Giullieri, A. (2006). *The rainbow*, (U.S. Edition). Austin, TX: Harcourt Achieve. This book introduces emergent readers to color words and words related to painting. It would be a great book to combine with books focused on the Science of rain, clouds, the water cycle, evaporation, and the formation of rainbows. (Earth Science).

Giullieri, A. (2006). *The snail*, Austin, TX: Harcourt Achieve. This kindergarten level text describes the behaviors of snails. Because the reading level is emergent, it does not relate very much information about snails. There are no nonfiction structures featured in this book. (Life Science).

Hague, B. (2012). *Alien deep*. Washington, DC: National Geographic Society. Scientist Tim Shank and his crew take readers on an underwater tour to observe hydrothermal vents and the wildlife that live there. The text is independent at 3<sup>rd</sup> or 4<sup>th</sup> grade but interesting enough for a read aloud for younger readers. This book is full of good maps, explanations of vocabulary words, and photos of technology such as the ROV. The text compares scientific knowledge of the deep ocean to that of Mars. Extensive sidebar use about deep water technology, deep water habitat, and deep water wildlife. (Earth and Space Science; Life Science).

Halfmann, J. (2011). *Star of the sea*. New York, NY: Henry Holt and Company. The author does a very thorough job explaining the habits of the sea star, the method for finding prey, and the characteristics of the sea star. Overall a very nicely done book. Some pictures require two pages, there are insets of other ocean creatures, and great view of habitat. The text bridges diverse readability levels with insets, captions, and extensions. (Life Science).

Hall, M. (2005). *Ladybugs*. Mankato, MN: Capstone Press. Behind the lens view of ladybugs. Readers are unaware that photographers are also behind that lens. It might be nice to have that discussion as a career in Science. The book is very nicely executed. There are many nonfiction structures, including a website list. (Life Science).

Hall, M. (2006). *Beetles*. Mankato, MN: Capstone Press. Beetles are easily explored in an everyday environment because they exist all over the Earth. In this book the reader becomes the expert behind the lens. The author seems intent on meeting a words per page quota which limits the information in the book that could have better explained important things like how beetles provide benefits to the earth. The photos are cropped so close that no context is available for readers to understand habitat. This text does have many nonfiction structures and one of those is a list of internet sites. (Life Science).

Hall, P. (2010). *Whose ears are these?* Mankato, MN: Capstone Publishing. Ears are an interesting concept to young readers and this book takes a high interest topic and turns it into a question-answer format in which readers can actively respond during small or large group readings. The format helps readers engage as primary grade-level investigators. The follow-up activities to this book are fantastic: hearing and ears of other animals like snakes, frogs, and pachyderms, the five senses, animals of all kinds. The language is vivid for so few words per page. These are words for a long-term vocabulary list. (Life Science).

Ham, C. (2013). *Open wide!* Waynesville, NC: Early Light Books. This poem shows a dramatic behind the lens observation of the mouths of animals. The text is very detailed and uses vivid language that can be just a little bit scary with some animals' mouths! It is a rare treat to look inside the mouths of some of these animals and is a high interest topic of young readers. The font styles are unique. Some 1<sup>st</sup> grade students could read this independently and it would make a great book for paired reading in a center after the read aloud to small groups or whole class. It has an index, headings, and captions. (Life Science).

Hammonds, H. (2003). *Caring for the outdoors*. Austin, TX: Harcourt Achieve. On an excursion to local places people view the urban outdoors as animal habitats. The book introduces "Science as literacy" connecting Science vocabulary to literacy in the text. Behind the lens readers are watching real children during an inquiry research activity. The children are being citizen scientists as they conduct observations. The text overviews places where urban animal habitats exist but does not specify what animals live there. K-1<sup>st</sup> will require much discussion to understand the vocabulary but 2<sup>nd</sup> will be independent. This is a great book to have in a multiple text set of conducting observations. The characters in the photos are Hispanic, African American, and Caucasian. The Latino dad is fishing in one photo.

Hammonds, H. (2004). *Growing peas*. Austin, TX: Harcourt Achieve. This book relates the active, daily observation of the lifecycle of pea plants from planting the seeds to tending the plants and picking the pods. The language is very detailed and has a great many directive statements that give instructions to accomplish tasks. It makes a nice how-to text. Could be even better if it bridged diverse readability levels. (Life Science).

Hammonds, Heather. (2003). *Caring for the outdoors*. Austin, TX: Harcourt Achieve. Readers get a behind the lens tour of local places and discover everyday locations are habitats for wildlife of the plant, animal, and insect variety. This book introduces “Science as literacy”. Photos show real kids as “citizen scientists”. Introduces scientific vocabulary but does not give detailed descriptions of habitats or what is found there. Challenging text for early primary grade-levels. (Physical Science).

Hamsa, B. (2012). *Animal babies*. New York, NY: Scholastic Children’s Press. The intense curiosity about animal babies by young readers makes this a high-interest topic. This book provides the name of each animal baby in poetic form. Great opportunities for comparing and contrasting animals, babies, mothers, and habitats. This text could be memorized by Pre-K and K readers for reciting as an entertainment for parents’ night as photo are exhibited on screen. There could be a where’s my mom quiz, a celebration of spring, matching mothers and babies, a maize, counting animals, counting words, and a word list. It would be a great book to use in a text set with human parents and their babies. (Life Science)

Harvey, D. (2012). *Smithsonian super nature encyclopedia*. Smithsonian-Doerling Kindersly. Behind the lens observation comparing and contrasting Science of what readers already know to new Science concepts. X-rays in this book compare and contrast various animals’ skeletal structures. Introduces new life forms without becoming weary of the constant change to new concepts. Text is very descriptive. Photos are beautiful color depictions. There are so many font sizes throughout this book that every reading level is accommodated. It is amazing to find that one naturally follows the size font that one is comfortable with. A reader could go back and reread again and again to learn new such as table of contents, index, headings, sidebars, glossary and captions. (Life Science).

Hatkoff, J. & Hatkoff, I. (2008). *Looking for Miza*. Scholastic Press. Patrol rangers protect the mountain gorillas from poaching. Readers ride along with them behind the lens and take note of the peril to the gorillas. Actual patrol rangers and a veterinarian are depicted in photos. This is a Pre-K and K read aloud. Extensions are included in the back of the book. Readers are engaged by the jungle terrain. The mission of the patrol to keep the gorillas safe and healthy from threats to their lives, their habitat, the lives of the patrol rangers. The value of protecting the gorillas and their habitat are explained in the book. With only 700 mountain gorillas is clearly stated in the book. (Life Science).

Hatkoff, J., Hatkoff, I., & Hatkoff, C. (2009). *Winter’s tale*. New York, NY: Scholastic, Inc. Scientists rescue and care for animals. This behind the lens observation of Winter’s rescue and rehabilitation is unique. Reading level is a bit high for second semester 1<sup>st</sup> grade but it makes a nice read aloud. K-early 1<sup>st</sup> might need a modified version (shortened) of the text for a read aloud. Color photos are nice. Text has different font styles. Caring for the injured, whether

human or animal is an important theme. Nonfiction structures are a map, a website to find out more about Winter, and general dolphin information, further information is available about Winter's prosthesis tail. (Life Science).

Hawes, Judy. (1991). *Fireflies in the night*. New York: HarperCollins Publishers. Young readers are intrigued by fireflies and this book helps them understand how fireflies make light. Even shows the slight glow of larvae. An experiment is included in the text that readers will want to complete. Only shortcoming is lack of extensions or website list. (Life Science).

Hayden, J. (2005). *Working with plants*. Austin, TX: Harcourt Achieve. This book relates instruction on how to work with plants to keep them healthy. This book has headings for section and subtitle headings as well. The author has a good idea of how to keep plants from meeting an untimely demise. (Life Science).

Hayden, J. (2006). *Feeling*. South Melbourne, Victoria, Australia: Nelson Cengage Learning. Photo depicts a dog lying on its back being petted but text says the boy feels the dog moving. This book has a table of contents, headings, and glossary. Contains Hispanic and Caucasian parents interacting with children. (Social Science).

Hayden, K. (2000). *Astronaut living in space*. New York, NY: DK Publishing. Illustrations show a female astronaut repairing technology equipment. The text refers to the many tests "Linda" has to take to become an astronaut; however, the inset photo that depicts the tests show a man being tested by a man and a woman sitting down taking notes. Later there is one woman in a photo with her space suit on. Many photos are interspersed with the illustrations. A photo of the bathroom in space is included for those who wonder about that. (Earth and Space Science; Physical Science).

Holmes, A. (2006). *Facts about magnets*. Boston, MA: Houghton Mifflin. The book depicts students engaged in scientific experiments. It does a good job explaining North Pole and South Pole characteristics of magnets. Inspires reader to conduct his or her own experiments. Independent readers would have to be GT first grade or later. It would have been better if it included the instructions for conducting an experiment. It would be good in a text set with other books that gave instructions for experiments or internet sites for experiments. (Physical Science).

Hooker, K. (1999). *Look! Bugs...* Elizabethtown, PA: Continental Press, Inc. Kids are using magnifying lenses to explore bugs' bodies. It could have been better with more context of the habitat, lifecycles, and food. The text is stunted sentences of 4-5 words long. Some photos are so close that it is hard to get the context of habitat. This book could have bridged diverse readability by having sidebars, bibliographies, internet sites, and a glossary. It would be good paired with a book about bug habitat. (Life Science).

Howard, F. (2005). *Butterflies*. Mankato, MN: Capstone Press. This butterfly book follows butterflies through the day of locating flowers, getting food, and is portrayed in a manner as if a scientist is recording places and activities for a scientific research log. This author can say a great deal of information in only one sentence per page! Very colorful photos accompanied by descriptive text makes this book a first grade winner! Included are a table of contents, glossary,

index, headings, and a website list for further research. It would be great to have a scientist research log enlarged and have small or large groups dictate what to record on the log for each page. (Life Science).

Hughes, C. (2010). *First big book of animals*. Washington, DC: National Geographic Society. The behind the lens observation of many animals with a great many facts about where animals live and photos of their respective habitats. Font size and text are very accessible to first grade readers. The whole book is nicely done with vivid, yet easy language and large font. The book has many nonfiction text structures but also contains a map and tips for parents about how to further extend their child's research experience. (Life Science).

Hughes, M. (2003). *Water, water*. Bothell, WA: Water, water. The many ways in which water is used is the theme. Only one sentence per page make for a difficult attempt at imparting all the information that should be conveyed about water. Illustrations are well done and deserves more words, even if on a sidebar or in the back of the book to really do justice to the pictures. This book includes characters of African American and Asian heritage. Furthermore, it includes a child with a physical mobility challenge. This different uses of water could be charted by students in a small group or rug time as a post-reading activity. (Life Science).

Howard, F. (2005). *Parrots*. Mankato, MN: Capstone Press. Color photos depicting parrots are Good. Text is second semester 1<sup>st</sup> grade-GT or higher. This book contains a table of contents, sidebars, glossary, captions, internet site list, page numbers, and a hands-on activity of how parrots crack nuts. Photos contain a Filipino or Malaysian person. (Life Science).

Hoyo, M. (2009). *Horse feathers*. Austin, TX: Steck-Vaughn. This book about many different types of horses helps to dispel a stereotype of horses. That could lead to a discussion about dispelling the stereotype of humans. All of the horses in this book are beautiful in their unique ways in just the same manner that all humans are beautiful in their unique ways. This book would be great in a text set about diversity, and with books that have photos of animals, people, and things to be compared and contrasted for their attributes that are unique and beautiful in their own manners. (Life Science; Social Science).

Huxley, G. (2007). *How does water change?* Bothell, WA: Rigby Star. Depicts water in solid, liquid, and gas. Challenging text is well-supported by photos and prior knowledge. Depicts water in river, lake, geyser, and iceberg. Text ends abruptly when prescribed number of words is maxed out. Using everyday scenes helps reader relate. Includes table of contents, index, heading, and captions. Water preservation could be presented with this topic. (Physical Science).

Iverson, S. (1993). *Pollution*. Text discusses smoke emitting from an industrial stack but it is an emission of steam not smoke. Depictions photos should be accurate. Staged litter on p. 2. Book contains poetry. Unidentifiable brown-skinned children wading in terribly littered beach to find objects to sell. Book contains social, ecological, and political issues. (Earth Science).

Jacobs, D. (1990). *What does it do?* Milwaukee, WI: Raintree Publishers. This black and white book has copies of etchings from the 1880s as the illustrations. The photos are from the 1990s. Narrative is not engaging. Technology is out-of-date. Limited sentences cannot impart very



much information. The language is not vivid or interesting. The paper is so old it smells of mildew. It does have a high variability in ethnically diverse people in the photos. (Physical Science).

Jakab, C. (2005). *My caterpillar report*. Crystal Lake, IL: Rigby. A great book, showing through pictures, the reader how to study wildlife and how to record data. The amount of Science included in this small book is great! Simple language but flowing sentences. This is an even nicer book when part of a text set that looks at moths, butterflies, larvae, and making observational charts. (Life Science).

Jenkins, M. (2011). *Can we save the tiger?* New York, NY: Walker and Company. This book relates the plight of the tiger, as people encroach further and further into their realm. Some people believe that tigers are magical healers and so they kill them to get that magic. Some people will pay a great deal of money to purchase their pelts/fur, so there are people who kill the tiger to get the money. This book has extremely detailed side bars. The illustrations are amazing with details also. It also has different sized fonts to bridge diverse readability levels. Be respectful of wildlife is a theme of the book.(Life Science).

Jenkins, S. & Page, R. (2008). *How many ways can you catch a fly?* Boston, MA: Houghton-Mifflin, Co. the problem of catching food is solved repeatedly throughout this book by many species. This book creates a desire to find out more about the species, the food, and the habitat of each species. Information in this book is extensive. The text is 3<sup>rd</sup> grade but would make a great read aloud with availability for browsing for all. Extensions in the back of the book are so small, they would be 4<sup>th</sup> or 5<sup>th</sup> grade reading and would be great for students to interact with older student partners. Text and pictures are vivid and engaging. The back of the book contains more illustrations and information on animal behaviors. (Life Science).

Jenkins, S. & Page, R. (2010). *How to clean a hippopotamus*. Boston, MA: Houghton-Mifflin Harcourt. The symbiotic relationship of animals that clean other animals is portrayed in this book. A behind the lens safari sometimes shows human hands help and caring for other animals. Audience is most likely 4<sup>th</sup> grade readers but could be a small group or large group read aloud for younger audiences or an older student with a younger reader as partners. Information in this book is extensive and extremely interesting. Sidebars and captions are included in the main pages of the text. Illustrations and text are small. The extensions in the back of the book include pictures, more information about symbiotic relationships, author's notes, a bibliography, and an epilogue. (Life Science).

Jenkins, S. & Page, R. (2011). *Time for a bath*. Boston, MA: Houghton Mifflin. Looking at how various creatures bathe and clean themselves from behind the camera lens. Each animal is unique and some of these animals are not that often used as subjects in books. This high interest textures in an Eric Carlesque manner making a 3-D effect. The type font is interesting and while space offsets the color choices to simplify graphics. Respecting wildlife themed books could be readily paired with this fine text. (Life Science).

Jenkins, S. (2012). *The beetle book*. Boston, MA: Houghton Mifflin. Beetles are ¼ of all of the living things on earth, including plants and the animals. So, they can be a daily observation

outside this book. As citizens, readers learn about the size, shape, color, food, and habitat of the beetles. Read aloud for most of primary students. The whole book is extremely attractive. Font is excessively small to account for 100 beetle being identified with captions. Every beetle in the book is clearly identified. (Life Science).

Jenkins, S. & Page, R. (2013). *My first day: What animals do on day one*. Boston, MA: Houghton Mifflin. Behind the lens view of some unusual wildlife that do not often get covered in highlighted in books. Extended information in the back of the book but print is very small your young readers. It would make a great book for a young reader to be partnered with an older child to have a pair and share reading. Repetitious language that remains interesting because of the high interest subject. Did not get stale. It is a very well executed book. Intriguing illustrations keep reader focused. It has nonfiction structure of epilogue includes further information about every animal in the book and captions throughout. (Life Science).

Jennings, T. C. (2012). *Gopher to the rescue! A volcano recovery story*. A volcano eruption on wildlife and habitat causes quite a problem for the wild animals and shows the gopher's position in the habitat to assist with recovery. Behind the lens look at gopher underground burrows and their impact on other animals. This book is very nicely done and so understandable for young readers to be interested in this topic, although they would need discussion throughout to really grasp the totality of this topic. The impact of the need for flight from the lava is dramatic. Fantastic text information in the back of book to extend learning. Has a "For Creative Minds: What and Where are Volcanos?" section in the back. Natural Disasters and Habitat Changes; Hands-on: Pressure and Melting experiments, and Tectonic Plates are more follow-up lessons. (Life Science; Earth and Space Science; Physical Science).

Johns, Edwin. (2010). *Lizzie's lizard*. Berkshire, England: McGraw-Hill Publishing Company. A child working in the garden with her grandmother, becomes a true citizen scientist using a hand lens to observe a lizard. This text extends learning about other lizards to online opportunities. Photos depicting real people and lizards would be better because photos show young readers that things in books are "real". (Life Science).

Johnson, B. (2009). *At the zoo*. West Berlin, NJ: Townsend Press, Inc. All the children and the teacher are engage in observation at the zoo. This book has very little information about the zoo. In fact, it focuses more on being part of the buddy system for the humans and the animals. The language is bland. This is not a very interesting book. (Social Science).

Johnson, N. & Chin, J. (2010). *The falling raindrop*. Berkeley, CA: Tricycle Press. This fantasy story is based in facts but could confuse readers about fact and fiction. Anthropomorphism of a raindrop flying to Earth. This book is cute and appealing. It would require much discussion. It could be paired with a book about how wildfires are started and the difficulties of quenching wildfires. (Earth & Space Science).

Kelly, I. (2009). *Even an ostrich need a nest*. New York, NY: Holiday House. Reader will tiptoe through the trees to remain quiet and not disturb the birds as they nest. Each bird has their own way of making a nest and their own type of materials to construct it. The information is very detailed and uses some interesting phrases: "teases the ends with her beak". This is much better

than some of the other boring language in books. Some struggling readers may find the wavy text to be disturbing. There is a world map in the back and locates the birds mentioned in this book. (Life Science; Earth and Space Science).

Kelly, I. (2011). *Even an octopus needs a home*. New York, NY: Holiday House, Inc. behind the lens view of wildlife in their homes. It is as if we are peering through binoculars. The text on every page is wavy and distracting to some readers. The text is 2<sup>nd</sup> grade or higher. There is a great deal of text on every page. That might overwhelm some struggling readers. However, the text is very interesting and descriptive. The coordination of the pictures and text is well done.

Koontz, R. (2010). *What's the difference between a butterfly and a moth?* Minneapolis, MN: Capstone Publishers. The reader views all the butterflies and moths in a garden or woods from behind the lens. The detailed and very specific language describes parts, and behaviors. There is a solid language comparison and contrast of the moth to the butterfly. Illustrations are excellent as are the sidebars. The print is large and clear for the youngest

Kottke, J. (2000). *From pumpkin seed to pumpkin*. Danbury, CN: Welcome Books Children's Press. Definitely a first grade text. Could be a stronger source by having captions, and sidebars to bridge diverse readability levels. The information is well organized. This book contains a table of contents, an index, glossary, author's notes, a bibliography, and an internet site list. (Life Science).

Krueger, C. (2004). *The hummingbird*. Barrington, IL: Rigby. The narrative is dry and nearly boring which is a sad state because hummingbirds are a high interest topic and are quite exciting little birds to learn about and watch. The bee hummingbird looks like a bumblebee and is about the same size. Hummingbirds are nectarvores. The color photos are quite beautiful. The text could have mentioned that they flap their wings and that would have been short and easy to read. The book has a ruler of 2 inches to show the size of these hummingbirds. (Life Science).

Laínez, R. (2010). *The Tooth Fairy meets El Raton Pérez*. An American fictional character, The Tooth Fairy, meets the Hispanic fictional character, El Raton Perez. The book includes various Spanish terms in print for English-only students to learn. The readability level is second semester first grade for high achieving readers. (Life Science and Social Science).

Lanucglane, P. (2010). *Wild animals atlas*. Washington, DC. National Geographic Society. This behind the lens experience is visually inviting. It gives such details about animals that it is the perfect guide on how to chart animal observations. Students could do the charting in pairs at a learning center or on a computer screen. The text is a challenge but the charting could be a post-reading activity. There is a variety of font sizes for bridging diverse readability. Color photos are far enough out from the animals that habitat can be readily observed. It does some hopping around from place to place. There is a map of the world in the front locating all the animals in the book. It mentions endangered species and designated them on graphic displays in the book. (Life Science).

Larson, K. & Nethery, M. (2008). *Two Bobbies*. New York, NY: Bloomsbury Walker Kids Books for Kids. A storm becomes a hurricane and separates animals from their owners but

humans can rescue them and help the animals. Two animals, a dog named Bobbi, and a cat named Bob Cat, are friends and help one another survive the aftermath of the hurricane. Caring for animals, understanding that some animals have medical issues in the same way humans do. This book is a great opening reading for a unit on mammals, careers that work with animals, and being kind. (Life Science and Social Science).

Lawlor, L. (2012). *Rachel Carson*. New York, NY: Holiday House, Inc. Rachel learned to practice scientific observation when she was a child. She grew up to be a professional scientist. The language of this book is 3<sup>rd</sup> grade independent reading level. The language is very descriptive and depicts her specific time period, the prejudice against women, how she overcame that prejudice to become the scientist she wanted to be. Books that focus on prejudice, pollution, legislation to regulate pollution and what still needs to be done. (Life Science).

Leslie, K. (1999). *A nest full of eggs*. Austin, TX: Steck-Vaughn. Behind the lens observation of frogs, birds, turtles, snakes, and fish that lay eggs. This is mostly a Pre-K and K text with sentences constructed of only four words. Sidebars naming animals, describing their habitat, and other information would have improved this book. The color photos are great and deserve more text explanation. This poorly planned book needs to maximize the publisher's cost to produce and print a text. (Life Science).

Levine, E. (2012). *Sea baby*. New York, NY: Walker Publishing, Company. An otter is orphaned and people care for it however, humans are not seen touching or interacting with the baby otter because they want to limit interactions with the otter. This is important to let it go back to the wild. This book is well done and very appealing. 1<sup>st</sup> grade can read independently but K would need a read aloud. This book has nonfiction structures of author's notes, bibliography, epilogue, and a website list. Rescuing and caring for wildlife is a major theme and important to teach young readers. (Life Science).

Lindeen, C. K. (2004). *Life in a forest*. Mankato, MN: Capstone Press. This text is nicely written. It could have used sidebars, but if students conduct further research, they can write sidebars with the information they gather and display it next to the book somewhere in the classroom. Color photos are nice. The language of the text is right on level. Nonfiction structures are many including internet sites and maps. (Earth and Science; Life Science).

Lindeen, C. R. (2008). *Water basics*. Mankato, MN: Capstone Press. This book depicts all the everyday uses of water and describes the water cycle. The author has very nicely completed this book, even with the matter of fact language, well-formed sentences and paragraphs. Nonfiction text structures are table of contents, index, glossary, bibliography, and internet website list. (Earth and Space Science).

Loewen, N. (2004). *Spotted beetles*. Minneapolis, MN: Picture Window Books. A girl is observing beetles; magnifying lens. The book has vivid language. Cute illustrations, especially of the larvae. It has fantastic readability and developmentally appropriate language. Nonfiction structures are the page numbers, anatomy diagram, a poem/rhyme is in the back, websites list, and a magnifying lens that acts as a sidebar. (Life Science).

Lourie, Peter. (2012). *The polar bear scientist*. New York, NY: Houghton Mifflin Harcourt Publishing Company. Readers will instantly want to become polar bear scientists with this engaging text and will enjoy the many extensions included in the book. A great read aloud for any age but it can be an independent text for second grade GT and above. Page 31 is magnificent! Needs more human ethnic diversity. (Life Science).

Lunde, D. (2011). *After the kill*. This behind the lens experience as a mammologist is unique, exciting, and a little uncomfortable for some people. The text is detailed just as a scientist would write in his or her journal. Although there is much text, the words are mostly easy reading and easy to decode when using the context of the pictures, letter sounds, and life experiences of watching wild animal videos. The medium of soft watercolor paintings helps with the difficulty of the subject and helps to blur a bloody kill by the lions. It assists in approaching what some readers would believe to be a cruel subject, but it is a natural act by lions. This book shelters the readers by the approach that is taken. (Life Science).

Lyon, G. & Tillotson, K. (2011). *All the water in the world*. New York, NY: Atheneum Books for Young Readers. Behind the lens look at the water cycle and the need for all living things to have water. Some fonts are quite small and difficult for young eyes to read. Uses a vocabulary that many 1<sup>st</sup> grade students don't yet know like "meandered" and "cascaded" that add vivid meaning when teacher explains it. Good for introducing concept of water conservation. (Earth and Space Science; Life Science).

McElroy, J. (2010). *It's harvest time*. New York, NY: Simon & Schuster Children's Publishing Division. This behind the lens observation of seeds sprouting and producing plants for food is a great book to lead to a classroom or school-wide garden for the school community. This book could be paired with other books, some about nutrition to increase student understanding about food. Overall, it contains interesting language, has high appeal, and is a developmentally appropriate text. The human population of the illustrations are diverse. (Life Science; Earth and Space).

McGillvray, Jennifer. (2006). *Chickens on the farm*. Boston, MA: Houghton Mifflin Company. Chicken photos are so closely cropped that readers do not get a context for chicken habitat. Readability level is too high/mature for independent reading but the presentation is for very young readers with boring, lifeless word choices. (Life Science).

McNamara, M. (2007). *How many seeds in a pumpkin?* New York, NY: Schwartz & Wade. This is an absolutely wonderful example of experimentation on, prediction, and data collection! Although the characters are illustrated, the characters seem real and believable. This is definitely a small group or whole group reading experience. This is a wonderful story and language encounter for readers. The pictures illustrate just how messy pumpkin cleaning is. There were various methods of counting in different manners, by 2s, by 5s, by 10s, and estimating. The classmates are from very diverse cultural and ethnic backgrounds. There is a male teacher. The author and illustrator work hard to portray personality characteristics of the characters. (Life Science and Formal Science (Math)).

McPherson, J. & Birchall, B. (1992). *A boat that floats*. Bothell, WA: Wright Group. Cartoon illustration depict children engaging in this experiment. The illustrations impart an imaginary element not a real life element to the experiment. Overall, this is a nicely executed text and a good approach to a first attempt at conducting experiments. Step by step approach instruction and matter-of-fact language. If paired with books about scientist from diverse ethnic backgrounds. (Social Science; Physical Science).

McPherson, J. (2002). *How does my bike work?* Washington, DC: National Geographic Society. Readers will be observing the actions of a bicycle not as a child but as a scientist. This can be done on most given days for many children. The text is very detailed and even explains the action of pedaling. Sometimes, like in this book, the photos are too close to get the context of where a part on an object is really located. An inset indicating the location would have helped a great deal. The nonfiction structures of the book are a glossary and pages numbers. (Physical Science; Social Science).

McReynolds, L. (2012). *Eight days gone*. Watertown, MA: Charlesbridge. Written in poetic form, this book limits what could be said about astronauts and outer space but it makes for interesting reading. It would be a stretch to say that young readers connect their own journey experiences to those of astronauts but perhaps a compare and contrast activity could be made. During the space flight astronauts conduct scientific experiments. Illustrations are quite attractive. K-1<sup>st</sup> grade readers would need a read aloud but 2<sup>nd</sup> would be able to read it independently. The book contains a website list in the back. (Earth and Space Science).

Malone, P. (2001). *Desert rain*. Washington, DC: National Geographic Society. The scientific information is well done. The language is nicely descriptive. This book imparts a general respect for nature and wildlife. The illustrations are very colorful. (Life Science).

Malone, P. (2007). *Close to the wind*. New York, NY: The Penguin Group. The diary entries record the Beaufort scale number of the wind embedded in a story of 18<sup>th</sup> century sailing on the ocean. Sailors were the ocean scientists of the day in previous centuries. They kept detailed journals of every fish or sea animal they caught or saw as well as daily weather records. This book is a read aloud for primary but 3<sup>rd</sup> grade students could read it independently. The text and illustrations are very appealing. It has nonfiction structures of sidebars, glossary, author's note, epilogues, a map of the Atlantic Ocean, and a letter written by the main character, as well as a biography of Francis Beaufort the developer of the Beaufort Wind Scale. (Earth and Space Science).

Manos, John. *How to make paper*. (2004). Barrington, IL: Rigby. This behind the lens view of conducting a how-to project offers readers a great opportunity to follow directions and better understanding of paper production with hands-on engagement. No environmental information about the pollution, tree depopulation, and energy issues of paper production. (Physical Science).

Markle, S. (2009). *How many baby pandas*. Behind the lens view of pandas. Small groups or partners could record all the things they observe in the photos just as if they were scientists observing the pandas in real life. Then when observation charts were posted, a differing observations could be noted for future scientific observations. (Life Science).

Markle, S. (2010). *Hip-pocket papa*. Watertown, MA: Charlesbridge Publishing. Behind the magnifying lens excursion to Australia as a citizen scientist into the rain forest observation of hip-pocket frogs. An interesting read aloud for K-1 readers. Vivid, vibrant language inviting illustrations engage the reader in supportive, yet challenging text. Great story for any age. This book has nonfiction structure of table of contents, glossary, epilogue, and website list. (Life Science).

Markle, S. (2011). *Butterfly tree*. Atlanta, GA: Peachtree Publishers. Noticing can lead to observing and that could happen any day with butterflies. The mother knew enough about Science and butterfly migration that the pattern of monarchs were something she wanted to share with her daughter. This wonderful book makes a nice starter for a unit on lifecycles, moths versus butterflies, and all type of larvae. This book engages the reader from beginning to end. The reading level is later 1<sup>st</sup> grade and beyond for independent reading but it is engaging for younger readers to have as a read-aloud. Mapping migration and comparing and contrasting migration patterns of other wildlife would be interesting follow-up activities. (Life Science).

Markle, S. (2012). *Waiting for ice*. Watertown, MA: Charlesbridge. Through the eyes of Dr. Ovsyanikov, the scientist who studied Wrangel Island there for 17 years, the reader observes polar bear life and behaviors. The journal records are translated by Ms. Markle, the author, into developmentally appropriate language. The epilogue continues the story after Dr. Ovsyanikov stopped his journal. The text and illustrations portray the stark landscape of the island's polar bear region and the lack of food. The artistic style of the illustration help cover the gruesomeness of the male polar bear's kill of the walrus. Nonfiction structures of author's notes and epilogue, extends learning as does the website <http://Science.howstuffworks.com/global-warming.htm>. (Life Science; Earth and Space Science).

Marzello, J. (2010). *Pierre Penguin*. Ann Arbor, MI: Sleeping Bear Press. Readers begin a visual tour of birds and their habitat in various neighborhoods, expand to a comparison to African Penguins then, specifically to Pierre and his plight. Pierre's situation is a springboard to readers' personal feelings of shyness, rejection, feeling socially different due to looking different. Language is detailed poetry. Illustrations are life-like. Early readers can be actively engaged to finish the sentences of the poetry. Back-of-the-book extensions include questions and answers about Pierre. (Life Science).

Mason, M. (2008). *Inside all*. Readers have an opportunity to experience the night sky every 24 hours. The concepts of the night sky, rotation of Earth and revolving around the sun are concepts that the book does not explain well. Not enough information is related to readers for them to have a real context for the scientific information. Readers can relate to lying in bed, perhaps even looking out the window at the night sky for those who do not have prior knowledge of the planet locations or constellations. The illustrations are just amazing! The back of the book lists other books in the Nature awareness Series. Kindergarteners would have to have this as a read aloud but strong 1<sup>st</sup> and 2<sup>nd</sup> grade students could mostly read this without help. This could be paired with a better space text or a book about pollution and how the night sky looks with pollution in front of it. (Earth and Space Science).

Mayer, L. (2010). *Newton and me*. Mt. Pleasant, SC: Sylvan Dell Publishing. Gravity, motion, friction are all every day experiences. Pictures show use of a magnifying lens, doing scientific work, and relating that work to force and motion. Written in poetic form, the language is very exciting. The poetic format helps readers problem-solve unknown words. The book has “For Creative Minds” in the back, a Force and Motion section, Matching Forces activity, Who Was Newton, and a list of Newton’s Laws of Motion. (Social Science; Physical Science).

Messner, K. (2011). *Over and under the snow*. Behind the lens scientific observation of animals during the winter months. Patterned text is great for interactive reading with emergent readers. Contrasts human life above the snow with animal life before the snow. Depicts family togetherness, respect of nature, and wildlife. Co2 pollution issue is included. (Life Science).

Michaels, E. (2009). *All about bugs*. Portsmouth, NH: Fountas and Pinnell Leveled Literacy Heinemann. This book has a boy holding a magnifying lens in order to look more closely at a butterfly. This book is one of the better 16 page books. It has three sentences per page. Color photos give context of the habitat. The only nonfiction structure is page numbers. This book would be well paired with books about moths, bugs, insects, and ecological interests in preserving and planting habitat that attracts butterflies, and hummingbirds. (Life Science).

Michaels, E. (2009). *All about sled dogs*. Portsmouth, NH: Fountas and Pinnell Leveled Literacy Heinemann. Training dogs every day and observing dogs every day can be part of some human’s work or personal life, Sled dogs are a high interest topic. The author does not explain that there are specific breeds of dogs that are used for sled dogs like the Chinook dogs. The text tells about the Iditarod race: the origin, the length of the race, and who won the first race. The Iditarod race commemorates a very important historical event that saved the lives of many people. Also, one of the dogs in the traces has a very important job. The photos and text are very action oriented. (Social Science and Life Science).

Miche, M. (2012). *Nature’s patchwork quilt: Understanding habits*. Nevada City, CA: Dawn Publications. Exploring all habitats for wildlife and understanding the food chain through a Science perspective and with Science vocabulary. Environmentalist shown at the end of the book and encourage readers to join with them. The book is very nicely done. It has much detail in a succinct, easily readable text. Primary students can adopt the vocabulary in the book into their oral vocabulary. This book is an example of how Science trade-books should be completed. (Life Science; Earth and Space Science).

Miller, D. S. (2012). *Survival at 120 above*. New York, NY: Walker Publishing Company, Inc. Traveling across the Simpson Desert National Park and Regional Reserve in Australia. The author traveled and participated in weighing, measuring desert animals. K-1<sup>st</sup> is a read aloud book while 2<sup>nd</sup> and above could read independently. The book is detailed and organized. The reader will feel as if they are traveling in a Hummer across the desert while viewing animals and landscape are encountered. It’s a great day to wear all Khaki-colored clothing and an outback hat! The animals of Australia are very unusual. The manner in which the artist captured movement and detail in a still illustration is fascinating for anyone interested in art techniques. Some nonfiction structures are included. (Earth and Space Science; Life Science).



Miller, H. (2000). *My pigs*. New York, NY: Children's Press. Rearing pigs is the theme and an introduction for city readers to be involved in a domesticated animal study. For such a short book, this is pretty good at conveying the subject and doing it well. Color photos will intrigue readers not accustomed to looking at pigs. This book includes page numbers! It also has an index, a glossary, author's notes, a bibliography, and a website list for extended study. After reading discussion could focus on the ease of rearing pigs versus other farm animals. A discussion of the proper names for animals such as swine (pigs), bovines (cows), and others that they bring forth for discussion. Don't know the words? They could learn to use an online dictionary to look them up as an activity on the smart board or overhead. (Life Science).

Mitchell, C. (1998). Bothell, MA: The Wright Group, Inc. Tasting different foods and experiencing different flavors can be an adventure. Experimentation in the kitchen to taste different is depicted in the book. Showing the places on the tongue that sense different flavors would have strengthened this book. Using extensions in the back of the book to bridge diverse readability levels would have seriously strengthened this text. Showing 2-3 friends sharing the experience of tasting new ethnic foods would have contributed to an opportunity to make this book a multicultural experience. (Social Science; Life Science).

Mitchell, Susan K. (2007). *The rainforest grew all around*. Mt. Pleasant, SC: Sylvan Dell Publishing. Information and pictures present a sense of wonderment and as if the reader were living in the rainforest. Although it is probably a read aloud, the concepts are easily understood by young learners who could "see" themselves as scientists engaged in observation. (Life Science).

Mohr, C. (2009). *The cupcake*. West Berlin, NY: Townsend Press. Using deductive reasoning, students solve the mystery of who ate the cupcake. This is cute story of a primary grade-level class who leaves the room for a short time and returns to find that some of one birthday cupcake has been eaten. The teacher assists students in deducing what might have happened to the partially eaten cupcake. Clearly shows that brainstorming a list of questions and then trying to answer each question in a systematic manner, can lead to an answer to a problem. (Social Science and Life Science).

Momatiuk, Y. & Eastcott, J. (2009). *Face to face with penguins*. Washington, DC: National Geographic. The everyday experience of observation of birds is clearly exhibited in this book. The authors encourage readers to extend their learning online by watching video feed of penguins from computer online displays. Information is extremely detailed just like the scientists' observation logs are displayed in the text. Students will read the very interesting things birds do in these logs. Photos are dramatic color up close views of the birds but still delivering context in which the birds can be seen. Map is on page 29. Ideas for extending learning activities are in the back. (Life Science).

Montgomery, S. (2010). *Kakapo, rescue: Saving the worlds' strangest parrot*. Boston, MA: Houghton Mifflin Books for Children. Trip to New Zealand's Codfish Island to research Kakapo parrots for 10 days. Behind the lens look at Nic Bishop's magnificent photography. All aspects of the remote Science research location are documented in text and photos. This book contains very high text level with vivid language and abundant information about the parrots. Readability

level is about 4<sup>th</sup> grade with small print and complex words. Some large print is in small sections. Address for the Kakapo Recovery Program is in the book and the web address as well. Readers can check the website and observe Kakapo every day and chart their observations. (Life Science).

Morlock, L. (2012). *Track that scat*. Ann Arbor, MI: Sleeping Bear Press. This cute book has large font for the main text and smaller font for sidebar information. Diagrams of animal scat and their corresponding foot prints are included. This is a very interesting concept about how to relay the size of an animal to young readers through text and diagrams. (Life Science).

Morrison, Y. (2001). *Zoom in!* New York, NY: McGraw Hill Education. A reporter is interviewing a scientist for a historical overview of Science information. People have questions and this reporter asked many of the questions about which people are curious. The book is good for small groups and pairs to help each other solve unknown words. Nonfiction structures in the book are the table of contents, an index, headings, page numbers, and sidebars. Photo depicted a female scientist. (Life Science; Physical Science; Social Science).

Mortenson, G. & Roth, S. L. (2009). *Listen to the wind*. New York, NY: Dial books for Young Readers. Readers explore the culture and technology of the rural Middle East, in Pakistan, as they try to build a bridge across a crevasse so that they can transport building materials to build schools. Readers see the cable and the new bridge in photos in the back of the book. This is more of a social studies oriented book. The art in this book is fantastic! Reading levels are in 1<sup>st</sup> grade with help. Artist's notes are in the back of the book along with many nonfiction structures to help convey the message. Dr. Greg and his institute work to help Pakistanis improve their villages by building a school. This is a great story about how western culture people and eastern culture people work together to make the world a better place. Dr. Greg has a motto: We are more alike than we are different, we need to help others. (Social Science; Physical Science).

Mortenson, L. (2009). *In the trees, honey bees*. Nevada City, CA: Dawn Publishing. Behind the lens observation of the life patterns of honey bees in contrast to humans and animals. Shows the need for humans to work with the honey bees to help them produce honey. The text has two different fonts to bridge diverse readability levels of emergent and easy reading. The text in vivid and interesting poetry for emergent reader and descriptive nonfiction text for easy readers. There are author's notes, a bibliography, website list and a list of books about bugs and insects. Clearly a book to promote respect for wildlife. (Life Science).

Nargi, L. and Booker, K. (2011). *The honeybee man*. New York, NY: Schwartz and Wade Books. The late 1<sup>st</sup> grade independent book is a blend of nonfiction and fiction with a cute story. It uses the story to be very explanatory about the honeybee man. Inside the front cover are diagrams of information about bees and beekeeping. (Life Science).

Neal, J., Kelly, P., Shook, R., & Poe, M. (2002). *The desert*. A Hispanic boy, with a stick to defend himself, walks through the desert habitat. There are two sentences per page but was an opportunity to really bridge diverse readability levels to support maturing readers ready to take up a challenge in a high interest text. The pictures are stark and without many context clues of other plants and wildlife. (Earth and Space Science; Life Science).

Nelson, R. (2004). *Gravity*. London, UK: Lerner books. Text and photos encourage reader to experiment with gravity on their own. This would be a great activity to use the Loose in the Lab (2009) Science lab series by B. K. Hixson ([www.looseinthelab.com](http://www.looseinthelab.com)). Photos show various people experimenting with gravity. It is also a good introduction to the physical Science of force. It's difficult to find anything but good things to say about this book, especially when it is used as one book within a multiple text set. Many facts about gravity and Galileo are included. (Physical Science).

Nelson, R. (2005). *Windy*. London, UK: Lerner books. Characters are flying kites and watching flags in the wind. Photos depict an African American, a Hispanic, and a Caucasian adults interacting with children. Good for use in a multicultural classroom. (Earth and Space Science).

Newquist, H. P. (2012). *The book of blood*. The book mentions Hippocrates, has highly varied ethnic population. However, the topic is not for primary readers and is a junior high school vocabulary.

Newman, M. (2011). *Polar bears*. New York, NY: Henry Holt and Company. Readers become the scientists making observations from behind the lens. Extensive information is imparted in a simple, easy-to-read text, yet it contains vivid descriptions. Color photos are sometimes quite exciting in this book. Second semester 2<sup>nd</sup> grade text. The book is overall well-coordinated. It has many nonfiction structures some of which are website listings and bear conservancies. (Life Science).

Newton, T. (2010). *Day and night*. San Francisco, CA: Chronicle Books, This book sounds like it is about day and night, but it is about two enemies who became friends. There is no Earth and Space Science anywhere in this book. (Social Science).

Nivola, C. A. (2008). *Planting the trees of Kenya: The story of Wangari Maathai*. New York, NY: Farrar, Straus, and Giroux. The common every day person could see the harm to the land of Kenya; however, it was Wangari who responded to the problem with a wise solution, This book shows how all the people come forth to heal the land together. Even young readers can understand the story. It is a read aloud for K-1<sup>st</sup> but independent reading for 2<sup>nd</sup> and 3<sup>rd</sup>. the writing style relates some of the speech pattern of the Kenya people. The illustrations are highly appealing with vibrant colored clothes and textured landscapes. The text and illustrations work beautifully together. It was the women of Africa who came forth in strength at the beginning of the planting the seedlings. (Life Science; Social Science).

Nivola, C. A. (2013). *Life in the ocean: The story of oceanographer Sylvia Earle*. Giroux, NY: Farrar Strauss. This books explains the live of Sylvia Earle, her early life exploring wildlife on her parents' far and later after they all move to the Gulf of Mexico, where she explored the ocean. This book shows all the exciting possibilities of careers of scientists to be involved in work near and in the ocean. This is one of the best books written. The author writes of the Sylvia' encounter with whales: Sylvia says that hearing their haunting beautiful songs in the sea is like being inside the heart of an orchestra", (Nivola, 2013, p. 15). It is absolutely an amazing encounter with language, scientific vocabulary, and hope for females to pursue their desired

career despite traditional pushback. This is an introduction to women in Science, NOAA, National Geographic Society, as well as entrepreneurship. (Life Science; Social Science; Physical Science).

Nowicki, D. (2007). *Shadows*. Boston, MA: Houghton Mifflin. Children are making shadows using a flashlight and in scientific experimentation. The sentences are nicely formed for reading in 1<sup>st</sup> and 2<sup>nd</sup> grade. Photos colors are interesting when thinking about the colors of shadows. This book is not culturally diverse. (Physical Science).

Otten, J. (2001). *Sports training: Soccer*. Rigby. The author makes a connection between muscles and exercise by playing soccer. What is not clear is if this is actually a Science book because of the manner in which it's written. This would have to be pointed out by the teacher. It would be best paired with other texts that cover more clearly the Science portion of soccer. It is a text full of facts not eliciting action or agreement by the reader. The book opens with an introduction and has page numbers table of contents, index, glossary, bibliography, and captions. This could be paired with books about Title Nine and funding of sports programs in schools. (Life Science and Social Science).

Patrick, S. (1996). *Engines*. Bothell, WA: The Wright Group. Behind the lens observation of engines in racing cars, rockets, trains, and wheelchairs. Depictions of humans working on engines, generation of power through different technologies, and speed. Shows buses, jets, and lawn mowers. Could be a nice text as a part of a text set. (Physical Science).

Patrick, S. (2001). *Cars*. Bothell, WA: The Wright Group. The reading level of this book is 1<sup>st</sup> grade. It could give much more information and use adjectives to describe the cars. Just like "It is a small car. It has no top." That would have been on grade level but more descriptive. It is just boring text. It could have one more sentence per page and be more interesting.

Pattison, D. (2012). *Desert baths*. Mt. Pleasant, SC: Sylvan Dell Publishing. Did you ever wonder how desert animals take a bath without water? This book answers that question in many ways, depending on the animal. The video camera lens takes reader to the desert to observe various bathing habits. There is much more information in the back of the book: How to tell time by the sun's position, Bath time: True or False quiz, Deserts in north America, Desert Adaptations, For Creative Minds, Desert Habitat and Fun Facts, as well as website lists. (Life Science; Earth and Space Science).

Peete, H. R. & Peete, R. E. (2010). *My brother Charlie*. New York, NY: Scholastic Press. Many students wonder about how to interact with classmates who have autism. This book explains what it is like for a twin sister to interact with her brother, who has autism. It is a great guide for families and for teachers to use with students. Second semester 1<sup>st</sup> grade might be able to read this independently. It educates and enlightens people that one child with autism is not like another child with autism. The language used is appropriate for young readers. The illustrations are very nicely done. There are websites listed and a bibliography list in the back for more information and support. (Social Science).

Peterson, B. (2012). *Leopard and Silkie*. New York, NY: Henry Holt and company. Children are involved in baby sitting with seal pups and keeping people away, like other animals and dogs. Second semester 1<sup>st</sup> reading level. The text is nicely detailed and very interesting. Color photos of the baby seals are cute and show their habitat. Nonfiction structures are author's notes and bibliographies. (Life Science).

Peterson, C., & Lundquist, L. (2010). *Seed, sun, soil*. Honesdale, PA: Boyds Mills Press. Readers will be viewing information about seeds in foods, picking, corn sprouts, and photos of the root system. Farmer and his daughter seen with corn seeds, cows eating seeds, on the farm and a field of corn. Rain filters down to the buried corn seed. Photo shows girl standing on a ladder I corn is still above her head. 1<sup>st</sup> grade second semester Photos examples of microbes are very interesting. Other texts used with this one could discuss crop rotation, soil conservation, and the possibility of providing food for all people everywhere by teaching agricultural standards of caring for the Earth. (Earth and Space Science; Life Science; Social Science).

Pinkerton, D. (2009). *Living and working in space*. Boston, MA: Houghton Mifflin. Going to space is portray as something that is as achievable as going on a weekend vacation. It's easy for some and more challenging for others. There are many photos of people related to the space adventure. Text is at the late 1<sup>st</sup> grade level. There are a diverse population of four women and one man portrayed in the photos. (Earth and Space; Social Science).

Pittay, B. & Pittau, F. (2012). *Birds of a feather*. San Francisco, CA: Chronicle Books, LLC. This book's extreme superiority to other books is difficult to relate. This avian journey is eye-popping with excitement and engages the reader in physical action opening all the pop-ups and pop-outs. Pre-K and K will need supervision to keep from tearing the pop-ups. Vivid art and extraordinary text. Second and third grade could read independently. There's so much going on in this book there is no room for nonfiction texts structures and extensions. Authors and publisher need to address other topics with as much enthusiasm as this book. (Life Science).

Pokrovskya, L. (2012). *Saving Yasha the incredible true story of an adopted moon bear*. Washington, DC: National Geographic Society. Scientists rehabilitate baby moon bears in a manner that the moon bears can return to the wild when they are grown. Behind the lens view as a citizen scientist, readers become very engaged in this story. Pre-K and K would be a read aloud text. Very detailed, vivid descriptions with great color photos impart the story of these scientists in action. A map of locations of moon bear forests in Asia and where moon bears are on display in the U. S. is included. Post reading activities could be respect for wildlife, habitat, poaching, as well as wildlife preservation, and rehabilitation careers. Research could be what students need to do to prepare to be in a scientist career. (Life Science).

Posada, M. (2007). *Guess what is growing inside this egg*. Behind the lens observation and analysis of animals in their habitat and scientific documentation of the observation. Readers can observe the illustrations to "match" their mental vision with the read aloud text or independent reading. Young readers will be able to understand so that they can compare and contrast what they already know about animals to what they learn in this book. This could be an introduction to more in depth learning on the computer or internet about animal. Vivid language in that they

“use their long tails as paddles”. Illustrations are child-like but not cartoony. The text has 3 font sizes to diverse bridge readability levels. There is an inside the egg diagram. (Life Science).

Price, C. (1997). *Bats, bats, bats*. Austin, TX: Steck Vaughn. Readers will observe bats in varying habitats, ecosystems, and times of day. Sidebars and captions could have greatly extending learning as well as bridged diverse readability levels. Younger readers are very curious about bats. Text is written more like a caption for the photo than an informative sentence. The color photos are awesome! Nonfiction structures are in the form of numbered pages. (Life Science).

Pringle, L. (2012). *Frogs strange and wonderful*. Honesdale, PA: Boyds Mills Press. This book has text that is independent for 3<sup>rd</sup> grade and above. Nonfiction structures of the book are website list, wildlife organization list. It would be good to pair this text with books that discuss the preservation of the habitat, preservation of the food chain, the common good that frogs do for the habitat and the world. (Life Science).

Probst, B. D. (2006). *Things that melt*. Boston, MA: Houghton Mifflin. Depictions are of children freezing and melting liquid as an experiment. The language in the text is interesting and inviting. Bridging readability could have been better approached. The experiments are interactive with a parent or guardian at home. There is an experiment for readers to do in the back of the book. Follow-up questions for post-reading discussion are also in the back of the book. (Physical Science).

Prosek, J. (2009). *Bird, butterfly, and eel*. Simon & Schuster Children’s Publishing Division. This vicarious adventure occurs as if the reader is wandering through wildlife habitats and observing wildlife during migration season. This is a good book to introduce an entrance into discovery mode. There are many appropriate adjectives to describe creatures, places, and objects. The illustrations are intensely inviting although the language choices are challenging to many early 1<sup>st</sup> grade students. There is an extension of learning in the back of the book. (Life Science).

Purdy, F. (2003). *Hands at work*. Many professionals are seen completing work: a doctor, a horticulturalist, and a dentist for a few. The photos show that these people have acquired skills by going to school to get training in their respective areas of expertise. Only 50 words in this book limits what can be said. The photos are nice and colorful. This book could have bridged diverse readability levels with sidebars and back-of-the book extensions.

Pyres, G. (2001). *Animal feet*. Barrington, IL: Rigby. Scientists are behind the lens of this up close look at animals and their feet. The text could use one explaining sentence and one or two more words per sentence. The alternative is captions or sidebars because this book did not tell much information, like; “This is an ape.” In the main text but in the sidebar it would say: It uses its feet to climb. Its feet are a lot like human hands.” That would work. The book has a good concept but it is not bridging diverse readability levels and it is not interesting. (Life Science).

Pyres, G. (2003). *Eggs*. Barrington, IL: Rigby. Not everything you ever wanted to know about eggs is in this book, but some things are. There is a table of how to record information about the eggs, the life inside the eggs. It’s a great example of how to conduct scientific observations. It

has matter-of fact language that makes the book a little less approachable for your readers. However, this book has nonfiction structures of page numbers, a table in the back, a table of contents, and an index. A good introductory book to expository texts. (Life Science).

Raatma, L. (2000). *Fire fighters*. Minneapolis, MN: Compass Point Books. A fire fighter's necessary training, arson investigation, daily schedule, life-saving, and personal characteristics necessary for being a fire fighter. (Social Science).

Raatma, L. (2002). *Politeness*. Mankato, MN: Bridgestone of Capstone Press. Politeness is a part of everyday mental health behaviors. This book shows children practicing politeness. The language is not vivid but is action oriented to give a feeling of being in the middle of a polite environment. Color photos accompany well written text. Nonfiction structures are table of contents, index, headings, bibliography, captions, internet website list, and hands-on instruction for making introductions. (Social Science).

Ramos, G. (2009). *Bubbles*. Portsmouth, NH: Heinemann. The Science of bubbles is a high interest topic with children and adults. This book describes how the bubbles form, what causes them, what causes them to pop. This book could appeal to a broader audience if the author had used text structures to bridge diverse readability levels such as side bars, captions, a glossary, and epilogues. (Physical Science).

Randell, B. (1999). *Walking in the winter*. Crystal Lake, IL: Rigby. Changing of seasons is an everyday adventure but this book illustrates the very specific changes of nature from autumn to winter through the eyes of a boy. Challenge words are deciduous, evergreen, hibernate, and hedgehogs. Most text is on point with first grade. This is a great introduction to seasons, weather, and climate changes. (Earth and Space Science and Life Science).

Rechnet, A. (2004). *Out and about at the aquarium*. Mankato, MN: Picture Window Books. This book begins with a list of questions about which a child wonders in relation to an aquarium. This book is an excellent behind the lens observation of an aquarium and the animals it contains. Some sharks are looking at the reader so straight on that it is unnervingly as if they might have you for lunch! What an extraordinary beginning to further research about sharks and a discussion about sharks. Everything about this book is nicely done. It contains a glossary, bibliographies for further research, an index, diverse population of human characters. This book leads to a discussion of littering, protection of plants and animals in the wild, and further research on every living organism in this book. (Life Science).

Reeves, B. (2003). *Pets: Lost and found*. Barrington, IL: Rigby. This book gives instructions on how to find a pet if it is lost. It says that instead of having someone come to the home to return a lost pet, meet in a public place like a park, or near a well-known restaurant. This is good guidance. The language is somewhat interesting. It has odd shading and shadowing of faces. Cartoonish houses line the street with cartoonish people and pets. Nonfiction structures are a prologue and page numbers. (Social Science).

Rice, H. (2004). *In the forest*. Huntington Beach, CA: Teacher Created Materials. The book is a behind the lens with a scientist's view. Text refers to a lynx one page but there is no photo of the lynx until several pages later. The graphics are very interesting. Readability is independent at 1<sup>st</sup> and 2<sup>nd</sup> grades. Kindergarten would have to have a read aloud. Nonfiction structures are table of contents, headings, sidebars, glossary, captions, and a map with a map key. (Life Science).

Rice, D. (2011). *Animal mothers and babies*. Huntington Beach, CA: Teacher Created Materials. This behind the lens look at animal mothers and babies is a high interest topic of young readers. Could have done better with bridging diverse readability if they had included other nonfiction structures that had different reading levels or size of font. Not much information is in the text of the book. It is not vivid or engaging language. Color photos are good. (Life Science).

Rice, D. H. (2012). *A butterfly life*. Huntington Beach, CA: Teacher Created Materials. Behind the lens view of monarch butterflies with a limited word review of the life of monarchs. Color photos but mundane language. Nonfiction structures of this book are a glossary, a wordlist, lifecycle diagram, and page numbers. Could be paired with books discussing preservation of wildlife and habitat, pollution issues, insecticides, and species endangerment. (Life Science).

Rice, D. H. (2012). *Water*. Huntington Beach, CA: Teacher Created Materials. Color photos depict various places where water is found. Water, though simple, is an intriguing resource for children and adults. (Earth and Space Science).

Ring, S. (2006). *Good dog!* Bloomington, IN: Red Brick Learning. Readers become acquainted with the concept of working dogs: a seeing-eye dog, an assistive dog, a herding dog, a rescue dog, and others. People are pictured with the dogs as the dog engages in work. The behind the lens observation relates the importance of working dogs. This is a great book from which adults can learn, also! Well organized, matter-of-fact language with a high-interest topic makes this a topnotch text. Color photos assist a motivated 1<sup>st</sup> grade student to problem-solve unknown words. However, the font size is so small, many first grade students would struggle to read it. Hearing impaired, physically impaired, and wheelchair bound humans are portrayed in the book. Projecting the book up on screen would help young readers participate in reading the text. The concept that it is important to help others and to assist people with operating their lives as independently as possible could be a discussion-rich topic. (Social Science).

Rogers, R. (2000). *Good vibrations: Experimenting with sound*. Great experiments that the students can conduct with assistance are included in the book. The experiments are great for adult guidance at a learning center as well as recreating at home for Home and School connections. Photos are out of date but still interesting. Depicts sharing and working as a team. Text discussed air pollution. Includes table of contents and headings. (Physical Science).

Rogers, J. (2006). *Animals nearby*. Boston, MA: Houghton Mifflin. Shows and describes how wildlife survive in urban areas. Though text is interesting, readability is not bridged and is at 2<sup>nd</sup> grade level. Photos are in black and white which limits the appeal for some readers. Nonfiction text structures are table of contents, headings, and captions. (Life Science).



Rotner, S. & White, D. A. (2012). *Body actions*. New York, NY: Holiday House. Children are actively moving their bodies for fun and exercise. The Science has a personal face on it everywhere in this book. The content, text, and photos are all excellent. The writing is vivid and readers will want to join in. There is an overlay drawing. The text is a little challenging but with support from a reading partner a struggling reader will be able to figure it out. This book has red heads, blondes, African Americans, Hispanics, and Asians for a major diversity look at being fit. (Life Science; Social Science).

Ruddell, D. (2009). *A whiff of pine, a hint of skunk: A forest of poems*. Simon & Schuster Children's Publishing Division. Readers look at the text descriptions of animal behaviors and their characteristics. Clearly understandable descriptions for K-2 readers or listeners. Each poem makes an introduction to a species that can be verified or extended in other text research. The language is interesting and vivid. Although they are sometimes cartoonish representations and impart anthropomorphic qualities to the animal (reading and writing) a solid discussion of real animals as a post-reading activity can bring students back to reality. Nonfiction structures are table of contents which lists the names of the poems. (Life Science).

Rusch, E. (2012). *The mighty mars rover: the incredible adventures of spirit and opportunity*. Boston, MA: Houghton Mifflin. The first page of the book is presented as the first page of a scientist's journal. The book includes quotes of "Leader Steve Squyres". It looks like 4<sup>th</sup> and above could read this independently. Perhaps a bit of overload for young readers but because it's so thrilling and full of things to look at, they may have motivation to stay focused for that long. The text is mentally capturing and over a story of an eight-year-old telescope junkie S transformation into a robotic engineer for NASA's Mars Rover program. The total number of photos, diagrams, and information is overwhelming but this book can keep a space junkie reader occupied for days! Story and photos complement one another. Nonfiction structures match the book: overwhelming. It's great to see a book for young readers that are above average in interest in technology. (Physical Science; Earth and Space Science).

Saunders-Smith, G. (1998). *Lightning*. Lightning is well-described in this behind the lens observation of a weather phenomenon. The reader as citizen scientist uses inquiry skills to best understand information in this text. Clear, detailed explanations of characteristics of lightning, chain lightning, and ground lightning. Vibrant photos provides context paired with detailed language impart diverse levels of readability. Contains table of contents, glossary, bibliography, index, and internet sites that extend learning. (Earth-Space Science).

Sayre, A. & Sayre, J. (2003). *One is a snail ten is a crab*. Somerville, MA: Candlewick Press. A cute counting book. Also a cute Science book in that it is a behind the lens observation of the number of feet each creature has. Sidebars with more information about each animal would have been nice. The language is vivid and the concept is interesting. Very-child-like drawings help readers imagine that they, too, could draw the animals. (Life Science).

Sayre, A. & Pulley, A. (2010). *Turtle, turtle, watch out!* This books shows readers how to connect to groups that are actively engaged in respectful actions to preserve wildlife and habitat. From behind the lens, students observe humans engaged in technology design and protective measures to assist turtle survival. The book is organized through the story progression of turtle

development. The art is mentally engaging and appropriate for primary readers. Children like being rescuers of animals and this book encourages that natural tendency. The illustrations are soft and inviting while the text encourages participation. There are many nonfiction structures and one is a website list. Children of various backgrounds are included in the illustrations. (Life Science; Earth and Space Science).

Schaefer, L. (2010). *Just one bite*. San Francisco, CA: Chronicle Books, LLC. Behind the lens scientific observation of the size of bite for various living specimens: bacteria, worms, sperm whales, and other species. Readability bridges in the form of back-of-the books extensions, large main text and smaller explanatory texts. Miniscule versus gigantic word choices help portray species sizes. Species diets in the back of book. (Life Science).

Scholastic, Inc. (2012). *Scholastic: Discover the elements*. New York, NY: Scholastic, Inc. The shows everyday items that readers would recognize and looks at these items with a new perspective of the naturally occurring element sources from which things are made. A behind the lens view of smelting metals and exploding fireworks. Readers could look and ponder these photos for days and not read a word because it is so packed with interesting things to see. The text is second semester 1<sup>st</sup> for some parts but more on level with 2<sup>nd</sup> grade and beyond for other portions of text. It has abundant information. There are diagrams of Science information, photos of Science experiments in actions, and almost every young reader's dream: disassembly of common items to see what is inside! So fantastic that it will be a challenge to get readers back to work. A Van Gogh painting illustrates pigments. Teaming an older reader with a younger reader would help. Photo shows women scientists who made historical medical or technological discoveries. (Physical Science).

Schaefer, L. M. (2001). *Amphibians*. Mankato, MN: Capstone Press. Readers would be using inquiry learning to locate answers to the questions posed in the text. The author took the time to use 5-7 words per sentence that helped explain information. Readers would also be motivated to have post reading research online to find more information. Comparing and contrasting attributes of various amphibians could be a small group chart activity. Nicely written sentences. The nonfiction structures of this book are very helpful. The internet sites for this book worked! (Life Science; Earth and Space Science).

Schaefer, L. H. (2008). *Sisters*. Mankato, MN: Capstone Press. Sisters are a part of many families and they can make great playmates and friends. This books works hard at explaining familial relationships, working together, playing together, disagreeing, and working it out. The book also explains that sometimes sisters look very much alike. It has color photos, internet websites, and numbered pages, (Social Science; Life Science).

Scholz, C. (2006). *A farm for wild animals*. Boston, MA Houghton Mifflin Company. Shows scientists or medical people helping hurt wild animals. Very interesting text for only 161 words! Shows readers how to help injured animals. Could be better with captions, sidebars, epilogues, and internet sites for further research. (Life Science).

Schulz, K. (2012). *Always be safe*. Danbury, CN: Scholastic Publishing. Safety is an every day practice in a Science lab or at home. This book imparts many safety and health rules. There is no explanation of why the rule is a good rule or what could happen if the rule isn't followed. The book could be better if there were sidebars that looked like safety posters that could be hung on the classroom wall or at home. There is a "Keep Our Self Safe" song and a Scissors Safety Count game in the back of the book. (Social Science).

Schuette, S. (2005). *I am tolerant*. Mankato, MN: Capstone Press. The intellectual level of this book is developmentally appropriate. The readability of the text is 1<sup>st</sup> grade. The language is simple but direct and retains an interesting sound. The nonfiction structures of this book are abundant and include page numbers and internet sites list. The diversity of people in the pictures includes Jewish, Hispanic, Little People, Asians, African American, Tall children, and short children. (Social Science).

Schwartz, D. M. (2000). *Horse*. Huntington Beach, CA: Creative Teaching Press. Behind the lens observation of the life and lifecycle of horses. This book is high in Science content about horses. Descriptive text accompanies great photos of a high interest topic. Text is mostly independent for 2<sup>nd</sup> grade. There is a lifecycle quiz at the end of the book, photos in the back, and a list of other books in the Lifecycle Book Series. Other books for a text set would be ones about wild horses in China, wild mustangs in the Western region of the US and on an island on the east coast of the US. (Life Science).

Schwartz, D. M. (2007). *Where in the wild*. Berkeley, CA: Tricycle Press. A scientist/photographer takes the readers on a tour of animals who sport camouflage. Young readers are highly interested in this topic. The collaboration of artist and author really make this fantastic book a major success. The artistry is what pushes the comprehension of text over the top. Poetry focuses the mind to comprehend as well. This is a 2<sup>nd</sup> grade independent book. This is a book for which there should be over abundance of planning ahead. All the students should where camouflage, the teacher should where camouflage, the room should be draped in camouflage, and everyone should eat Baskin Robbins camouflage ice cream. Picture of animals with camouflage should be drawn and posted in the hallway. Everyone should be counted as absent because they cannot be found to take attendance. Well, maybe drop that last activity. (Life Science).

Schwartz, S. (2002). *Sea shells*. Parsippany, NY: Dominie Press of Pearson Education, Inc. No more visions of empty sea shells with this look at living mollusks in their ocean habitat. Ocean scientists photo species in habitat and let surrounding context assist reader with understanding size and location. Marvelous books that supports and challenges readers' word knowledge, problem-solving skills, and knowledge of sea life. Book supports and challenges readers with bridging diverse readability levels. Words like gigantic, tentacles, camouflage are in context enough to help readers solve meaning. (Life Science).

Serafini, R. (2008). *Looking closely along the shore*. Toronto, ON: Kids Can Press. Behind the periscope, microscope, and the binoculars readers can observe life in the ocean. A repetitious text pattern sparks the readers' curiosity and then explains in detail the answer to each riddle that is presented. The repetitious riddle format reduces the decoding stress by some younger readers.

It also allows for reading by diverse readability levels rather than just one level. The text format increases the possible used for this book: homophones, using it as a mentor text to write one's own riddles and use different animals. The riddle introduces an air of mystery and wonder which increases the interest to approach an otherwise challenging text. Because the text alternates between an easy and challenging text, it opens the opportunity for low, middle, and upper level readers to participate. The pictures which show a minute portion that is unrecognizable works with the riddle to create mystery, (Life Science).

Serafini, F. (2010). *Looking closely at the rain forest*. Toronto, ON: Kids Can Press. Behind the lens observation of rainforest wildlife, habitat, and ecosystem in riddle format. Immediate engagement in comparisons and contrasts of familiar objects. Requires scientific and inquiry thinking to successfully engage in this book. Great as an intro to a rainforest unit. Vocabulary uses descriptive language with colors, shapes, sizes, and sounds. Stark black and white print area is juxtaposed to vibrant color photos on a journey into the dark realms of the deep forest. Side bars and extensions could have enhanced the bridging of diverse reader text. (Life Science).

Seymour, M. (2009). *Ladybugs*. Boston, MA: Houghton, Mifflin for Children Books. The behind the lens view of the methodical scientific observation of the ladybug: its lifecycle and activities. It is a 1<sup>st</sup> grade, well-constructed text trade-book; however, it only has two sentences per page. The book tells the importance of ladybugs in the garden. A discussion could ensue about the negative effects on the ladybug population and a comparison of ladybugs and praying mantis activities. Would be a great book when in a text set. (Life Science).

Sharp, K. (2003). *A dictionary of science*. Boston, MA: Houghton Mifflin Rigby. Readers can observe the moon, sun, and stars but the behind the telescope lens view of Earth, other planets, the Moon, and stars in this book look spectacular. One problem is that it shows planets but never names them. The color photos are very nice. This high interest book could have been so much more with side bars or back-of-the-book extension to give the ultra-curious child a chance to have further reading. (Earth and Space Science).

Sheldon, D. (2009). *Into the deep: the life of naturalist and explorer William Beebe*. Watertown, MA: Charlesbridge. Scientific thinking and behavior is an everyday event for scientists. Passage through the life of William Beebe is by way of a young boy writing in his Science journal. It models scientific behavior as a way of life, outside the venue of school, and watching animals on his own. Second semester 2<sup>nd</sup> grade could read this book independently. It is very detailed so readers can emulate his behaviors. He wrote, "To be a scientist is better than to be a king." (December 31, 1983). This book is an encouragement to young readers to be themselves and not conform to what others are doing. (Social Science; Life Science).

Sidman, J. (2010). *Dark emperor and other poems of the night*. Boston, MA: Houghton Mifflin Books for Children. From behind the lens exploration of nocturnal insects and wildlife. Written in poetic format with sidebars that describe each animal in detail. Some 2<sup>nd</sup> grade GT students could easily read this text, otherwise it is a read aloud book. It has the nonfiction structures of table of contents, headings, sidebars, and a glossary. (Life Science).

Sidman, J. (2010). *Ubiquitous*. New York, NY: Houghton Mifflin Harcourt Publishing. Readers can observe ubiquitous wildlife, creatures, and plants nearly every day around their homes, schools, and in other public places. This book is full of opportunity for inquiry-discovery experiences as citizen scientists. The poems have larger font size while the book bridges diverse readability levels with smaller font in the sidebars for more advance readers. Information is very detailed. Text and illustrations work to support one another. There are many nonfiction structures but the diagram of the earth's development of life forms beginning with bacteria through humans is amazing. Other topics that could be paired with this book are over population of some animals, endangerments of other animals, and human encroachment. (Earth and Space Science; Life Science)

Sidman, J. (2011). *Swirl by swirl*. Boston, MA: Houghton, Mifflin for Children Books. Full of opportunities to compare and contrast various animals, plants, shells, and waves. Behind the lens tour of natural things that spiral. Extremely large print in main text with smaller print in extension in back of book providing bridging of diverse reading levels. Fibonnaci spiral in the back of book. This book would be great to pair with other texts giving more detailed information about all the things illustrated in this book. (Life Science).

Sill, C. (2011). *About hummingbirds*. Atlanta, GA: Peachtree Publishers. Behind the lens observation of hummingbirds engaged in flight and eating. Large main text is simplified while afterword extension is more challenging. Beautiful illustrations, website list, and is one of many in a series of texts listed in the back. Preservation of humming bird text and construction of a hummingbird-friendly garden could be an extension. (Life Science).

Sill, C. (2011). *Grasslands*. Atlanta, GA: Peachtree Publishers. On a photographic safari, readers view from behind the lens the grasslands of summer and again in winter it is the same grasslands. The author and illustrator went the extra mile and put "plates" in the back of the book with more information. Illustrations are inviting. Although text in the main part of the book is limited, colorful and descriptive words were chosen to describe this beautiful place. This author really knows how to craft text for beginning readers and make it interesting. The afterword is fantastic!

Sill, C. (2012). *Oceans*. Behind the lens observation of ocean life. Book captions and back of the book extensions bridge the diverse readability levels. There are three size of fonts! This is mostly about ocean animals in their habitat and the food chain that exists there. Language is exciting and the graphics in this book are amazing. Nicely detailed descriptions. Nonfiction structures are a map of the world, an afterword or epilogue has extended info on each creature that is featured in the book. Other wildlife books are listed in the back of this book as well as other habitat books. (Life Science).

Silver, A. (2012). *The plant hunters*. Readers will learn to think like botanist going into dangerous areas to discover, sketch document and gather plant specimens. Illustrations and text related the experiences of botanists in remote areas locating plants and animal specimens in South America and other jungle and mountainous places. This reading level is too high for primary. It is more like 4<sup>th</sup> -6<sup>th</sup> grade. It is also a dangerous and scary story. The text is very detailed. It has a timeline, illustration credits, other notes on the back. (Life Science).

Simon, S. (2012). *Butterflies*. New York, NY: Harper Collins Publishers. This book is well done from the sentence structure, to the pictures, to the organization. It is 2<sup>nd</sup> grade reading with a glossary, index, captions, and a website list. (Life Science).

Simon, S. (2012). *Seymour Simon's Extreme Earth records*. San Francisco, CA: Chronicle Books. At a location 621 miles from the South Pole, scientist conduct experiments about previous climate changes. Ice cores are drilled, moved, and stored for later study. There are challenging words in the text but if there has been previous discussion of the topic with introduction to vocabulary, a second semester first grade student might be able to read it independently. Great photos paired with challenging text that has high interest. So, some readers might stretch to achieve the reading. This book could be used to help students understand that natural disasters are human equalizers: we cannot escape them and we need to help others in Hawaii, Chile, and other areas that are prone to natural disasters. (Earth & Space Science).

Singer, M. (2011). *Caterpillars*. Waynesville, NC: Early Light Books. Behind the lens observation of caterpillar lifecycle: eating, molting, and entering the metamorphosis stage. Reader observes stages of development of larvae for moths and butterflies. The text mentions the gypsy moth on page 11 but gives no picture of it until page 25 then it only shows the larvae stage. It never shows the moth stage. This book should be part of a text set for a butterfly unit and students can have a rich discussion about the gypsy moth problem. (Life Science).

Sky, J. *7 uses for air*. Boston, MA: Houghton, Mifflin for Children Books Air is used to blow instruments, balloons, balls, leaves, tires, and candles. Helps readers look at common everyday events from a scientific point of view. When paired with other texts, this book could be part of a text set. Could lead to a discussion of the chemical structure of air: oxygen, hydrogen, nitrogen, etc. Includes color photos of air in action. (Physical Science).

Skalansky, A. E. (2012). *Out of this world*. Observing the night sky for constellations and planets. Picture shows a silhouette against the night sky. Text is written in 2<sup>nd</sup> grade language. K\_1<sup>st</sup> is a read aloud book. This book is packed with information. The poem is the main text but sidebars are full of high-interest information. The manner in which the illustrations are so spectacular is amazing. (Earth and Space Science).

Sloan, P. & Sloan, S. (1994). *Animal homes*. Littleton, MA: Sundance Publishing. Color photos depict animals' homes. However, the text is so limited while it should be bridging diverse readability levels for these beginning readers. Imparts a limited idea of animal homes and does not embellish in the limited text. (Life Science).

Sloan, P. & Sloan, S. (1995). *Washing the dog*. Northborough, MA: Sundance Publishing. Care of pets is a serious and difficult subject for families to work out. This book shows humans performing skills while bathing the family pets. The text is directive and instructional. Color photos support the text in demonstrating how to perform the pet bathing. (Social Science and Life Science).

Spinner, s. (2012). *Alex the parrot*. New York, NY: Random House Children's Books. Irene Pepperberg worked with Alex the parrot every day and kept detailed notes. These experiments are put into primary reader language and passed on in this book. Alex was able to accomplish more than any parrot before him had learned. He was amazing. (Life Science).

Stewart, M. (2009). *Under the snow*. Atlanta, GA: Peachtree Publishers. This book answers the questions of early primary students about what happens to animals during a snowy, frozen winter. Illustrations of underground habitat and behaviors of various types of wildlife. Book could be better with the support structures of nonfiction such as table of contents, index, headings, and captions to bridge readability variations of primary readers. (Life Science).

Stewart, M. (2012). *Animal grossapedia*. New York, NY: Scholastic Publishing Company. The author portrays a behind the lens inquiry of things that are really repulsive to most people. There are very good quality color pictures. For K-1 this is a read aloud, while for grade 2 and above, the book is independent reading. The nonfiction structures of the book are table of contents, heading, glossary, and bibliography. (Life Science).

Stockdale, S. (2008). *Fabulous fishes*. Atlanta, GA: Peachtree Publishers. One child snorkeled in the ocean. As a result, the reader participates in a behind the lens (goggles) adventure seeing a tremendous number of fish, including deep sea fish that could not have been seen by snorkeling. The book switches back and forth between saltwater and freshwater fish. The book's main text is a simple and limited poem. The back of the book experience is a 3<sup>rd</sup> and 4<sup>th</sup> grade detailed, prolific description. Illustrations are bright colors and appealing. This book would be good in a text set that contained one book that depicted various ethnic people enjoying water, fish, and the ocean. Another pairing could be one that presented preservation of ocean wildlife, habitat, and good stewardship of beaches. (Earth Science; Life Science).

Stone, J. (2009). *Once small step: Celebrating the first man on the moon*. New York, NY: Roaring Book Press. The 4<sup>th</sup> grade level book is interesting as it relates information about the trip to the moon. It is written from the viewpoint of a child who assembled the story from mementos that belongs to relatives of the space mission support team and astronauts. This book has flaps, and folding inserts as if it was a scrap book made by a space junkie. There are all men depicted because it was the 1960s when women and people of color did not yet have equal opportunities to education and employment. That is a good topic for post reading discussion and for thinking about other books for use in a text set. (Earth and Space Science).

Stone, L. (2002). *Giant pandas*. Minneapolis, MN: Lerner Publications, Company. The lifecycle and habitat is shown in color photos and described in text, as well as panda hotels and panda zoos. Photo show Chinese scientist engaged in various acts of research. Contains very detailed descriptions of efforts to preserve pandas. Large font and extensive text but many second semester first grade students would be able to interact with the main text. Smaller text is in captions and in the back of book extensions. Included is a map, instructions on how to be a word detective, and instructions on how adults can share text with young readers. (Life Science).

Stone, T.L. (2009). *Almost astronauts: 13 women who dared to dream*. Somerville, MA: Candlewick Press. Testing students is stressful and they can relate from that point of view to the women who endured much testing as they tried to qualify for space travel. Doctors, scientists, and pilots are all viewed from behind the lens as readers make their way through the texts. These are all Science career people testing Science career people. The text level is far above 3<sup>rd</sup> grade or above text but it's a read aloud opportunity. There is abundant information with extremely detailed descriptions. There are many nonfiction structures including an appendix and an internet website list. (Earth and Space, Life Science; Physical Science).

Sweet, M. (2011). *Balloons over Broadway*. New York, NY: Houghton Mifflin Books for Children. This book relates the process of trial and error that led to the production of large balloons that are flown during the Macy's Thanksgiving Day Parade. Tony Sarg refined and refined his technology until the balloons were controllable. Texts and pictures work together to inform the reader about how to do puppets, marionettes, and hot air balloons. Old-style playbill or newspaper style print. Cultures of the early 19<sup>th</sup>, 20<sup>th</sup>, and 21<sup>st</sup> centuries are depicted in illustrations. Immigrants to the U. S. during the late 19<sup>th</sup> century went to see the parade. Nonfiction structures include extended information on the inside cover of the book in front and back. (Social Science; Physical Science).

Taus-Bolstad, X. (2003). *From clay to bricks*. Minneapolis, MN: Lerner Publication, Co. Behind the lens observation of mining clay and brick manufacture. Depicts and describes the clay, the mold, kiln, and factory. A great book for discussions of occupations. This book has table of contents, headings, and a glossary. When paired with another text environmental issues of mining, quarrying, and effects on wildlife, habitat, and environment could be topics of discussion. (Earth-Space Science; Social Science).

Temple, Annie. (2006). *A worm's home*. Boston, MA: Houghton Mifflin Company. Dirt is an everyday endeavor but this text introduces the scientific term "soil" and what it offers as a habitat for an important animal for humans: the earthworm. Second semester first grade readers can probably read this short, simple, well-written text that imparts an extensive amount of information. A weakness is there are no extensions such as captions or index. (Life Science).

Tull, M. (2005). *The land around us*. This text takes the reader on a journey into various cultures. Behind the lens view of people of the world in their native lands with numerous terrains, climates, clothing styles, and diverse cultures and ethnicities. This is a high school level book developed by the United Nations to assist Chinese-speaking people learn English. Photos are typical of those in National Geographic Society's magazine. Many maps, diagrams, and Chinese characters are throughout. (Social Science).

Trumbauer, L. (2003). *The life cycle of a kangaroo*. Mankato, MN: Capstone Press. The life of a kangaroo is intrigue to all ages. The manner in which they, hop, give birth, nurse and care for their young, and fight with their feet is all amazing. Furthermore, the fact that they are native to Australia, an enthralling location adds to the excitement. The color photos are both outside and inside the kangaroo's pouch. Outdoor pictures are blurry because they were blown up too much. There are many nonfiction structures, including a website list. (Life Science).



Van Steenwyk, E. (2008). *First dog Fala*. Atlanta, GA: Peachtree Publishing, Ltd. Behind the lens view of the importance of pets for mental health. Citizen scientist readers learn about polio and that impaired people can become successful people like the President of the United States. Readers learn that physical impairment does not mean mentally impaired. Readers will also deal with the death and burial of Fala, the dog. Illustrations show a wheelchair-bound person and implied idea of accepting people who look different, and may feel different. (Social Science).

Wadsworth, G. (2009). *Up, up and away*. Watertown, MA: Charlesbridge. In this text students become citizen scientists who record information about the garden, especially about spiders. The language in this book is very appealing and action oriented. It has a great deal of information recorded about the spiders, (Life Science).

Walker, C. (1992). *Plants and seeds*. Bothell, WA: The Wright Group. Readers can observe the seeds, seedlings, and adult plants during the lifecycle photos. The behind the lens comparisons and contrasts of various types of seeds and plants as they develop is something that could be charted by different small groups. There is plenty of scientific information included in this text. A photo depicts an adult bean plant that has produced seed pods so that the lifecycle can begin again. There is only one sentence per page. Inset photo on each page shows the enlargement of the seed that matches the adult plant. (Life Science).

Walker, P. (2002). *Plane rides*. New York, NY: Scholastic. Readers discover, from behind the lens, what happens while on a commercial flight from one major city to another. Readers see color photos of the food, the pilot, the format of passengers' seats. A good book to use for discussing Science related careers. This book includes a glossary, bibliographies, an index, information about the author, a website list, and page numbers. (Social Science).

Watson, S. (1997). *Humpback whales*. Austin, TX: Steck-Vaughn. This book contains many opportunities for comparing and contrasting animals, mothers, babies, habitat. Readers' first look at the magnificence of whales in amazing color photos. Hard to get more vivid descriptions in a one sentence per page book. Readability could have been bridged with extensions and side bars but they didn't go that direction. (Life Science).

Weber, R. (2002). *Weather wise*. South Africa: Spyglass Books. Excellent job explaining colloquial sayings about weather and weather changes. The language choices are wonderful. Color photos are high quality. Nonfiction structures are many but some of the internet sites did not work. (Earth and Space Science).

Wells, E. (2006). *Trouble on a trip to the moon*. Boston, MA: Houghton Mifflin. Students may be able relate to having car trouble with the engine, a flat tire, or an automobile accident. Their experience might be a way to introduce the story of this book. Engineers and the space team solved the technology problems of this space flight. Text is too challenging for most first semester 1<sup>st</sup> grade students. Many second semester 1<sup>st</sup> grade students and above could read the text of this book. It would be nice to use it in a text set of other books about the same subject as well as space flights of any type and planets. Discussion could focus for a time on working together to save lives as in this story. (Earth and Space Science).

Wilbur, H. (2010). *Lily's victory garden*. Ann Arbor, MI: Sleeping Bear Press. Readers will observe how to plan, prepare the soil, plant, care for, and harvest a garden. Lily worked in her garden every day. By relating the story in fictionalized history, readers understand the steps for vegetable gardening. Scientific information is couched in a social studies story about World War II. However, the principles can be applied to a urban community, a rooftop garden, or family garden. (Social Science; Life Science; Earth and Space Science)

Windsor, J. (1999). *Animal coats*. Austin, TX: Rigby. This book would be a great part of a text set about animals' coats. This book discusses the coats of pets. The text is written in kindergarten language. It has one nonfiction structure and that is an index. (Life Science).

Windsor, J. (2003). *Birds' feet*. Austin, TX: Rigby Harcourt Achieve. Many urban readers can look at urban birds' feet to compare and contrast what they see in this book. This behind the lens look at only seven types of birds' feet. This book could bridge diverse readability levels with sidebars and extensions, a bibliography, and a glossary in the back of the book. There could be more said about birds' feet such as type of prey and type of feet are needed for what raptors eat. This book could be further improved with information about ecology, preserving habitats, and not littering. All these improvements could be covered in other books of a text set. (Life Science).

Windsor, J. (2003). *A stomach full of stones*. Austin, TX: Achieve Publishing. Readers are not hiding behind stones to keep safe from tyrannosaurus rex. Readers are coroners looking at stomach contents. The author never explains why the dinosaurs had stone in their stomachs, what the dinosaurs names were, and the narrator looks like Dino the Dinosaur from Fred Flintstones cartoon show. Needs better organization. The length of sentence is first grade but the word choices are second and third grade. Illustrations of dinosaur teeth are described as being different but they almost look the same. Young readers will struggle with that. This book has page numbers, a word bank with drawings, a chart for leading discussion, and an illustrated table of contents. (Life Science).

Williams, R. (1990). *Underground*. Bothell, WA: The Wright Group. This behind the lens observation stimulates readers' own imagination and inquiry behaviors. With only one sentence per page, it is difficult to write much. The text could have been extended with sidebars, and other nonfiction text structures. The lack of text seems inadequate for the curiosity levels of most young readers. However, that opens an opportunity for including this text as part of a text set that fills the gaps left by this book. (Life Science).

Winter, J. (2008). *Wangari's trees of peace: A true story from Africa*. San Diego, CA: Harcourt Publishers. We all can plant tree seedlings to replenish the Earth, where ever we live! Her "face" in the book can become our own face by following her example to fight deforestation. Even small children can understand these concepts. The story is chronological in nature. It relates not only her deeds but her culture, the meaning of tress, and the loyalty of her gender. The text and pictures work together to impart the depth of the meaning of this story. The epilogue was very helpful. The book is distinctly respectful of culture, the environment, and future generations. Historically, African women are strong in spirit but ignored as leaders. In this story, that is not true. (Life Science; Social Science; Earth Science).

Winter, J. (2011). *The watcher*. New York, NY: Schwartz & Wade Books. Watching animals in their own homes is the theme of this book. The drawings are of a style that is achievable by a highly artistic child and appealing for that reason. Most of the text simple, or decodable in context with the drawings. Simple font lets the pictures dominate just like a jungle would do. The African in the pictures have guns. (Life Science; Social Science).

Winter, N. (2006). *A rainy day solution*. Boston, MA: Houghton Mifflin. The text of this book is really about 3<sup>rd</sup> grade for independent reading. There are seven children trying to find something to do on a rainy day. The population of children is somewhat diverse. (Social Science).

Wittlock, J. (2013). *Tarantulas*. Mankato, MN: Pebble Plus. A detailed behind the lens research discovery of tarantulas' structure. Close up photos are highly engaging. Contains text structure of nonfiction books such as table of contents, index, heading, and captions. Lacks description of importance of spiders in the global ecosystem. (Life Science).

Wood, L. (2010) *Bats*. This book is very nicely completed with color photos and smoothly reading text. It is a pleasure to read a short text book with such flowing sentences. It has a glossary but no other nonfiction text structures. Text discusses miles per hour speed of wind, Reading is challenging to some 1<sup>st</sup> grade readers but find for 2<sup>nd</sup> grade. (Life Science).

Woodhouse, A. (2009). *Wind*. Boston, MA: Houghton Mifflin. The concept of this book is to demonstrate the effects of air movement. Readers vicariously participate in experimentation by children to observe the effects of "wind". As scientists, readers will observed blowing bubbles, flying kites, trees blown down form storms, and windmills that produce electricity. (Physical Science).

Workman, R. (1993). *My computer*. Auckland, New Zealand: Lands' End Publishing. This book was extremely out of date in computer style, clothing, style, and hair style. Computers are not at all like this one and thus is not the best choice for use. However, it would be a good compare and contrast item in a text set. (Physical Science).

Yezerksi, T. E. (2011). *The meadowlands: a wetlands survival story*. New York, NY: Farrar Straus Giroux. In the early years of the United States, people moved here from countries in Europe. These people moved into the swampy wetlands of what is now New Jersey and New York, because this land reminded them of where they had lived before. This book details all the changes that happened to the wetlands since people moved there. All the poor decisions, bad behaviors toward the land, littering, and other things that could have totally destroyed the ecosystem and nearly did. Wildlife in that area is described and depicted in this book. Each page is frames with illustrations that need to be attended to so that the reader can grasp the entire story. It's a good small group book that is then placed in a learning center for long-term perusal. (Earth and Space Science; Life Science).

Yoshizawa, L. (2005). *7 ways to get energy*. Boston, MA: Houghton Mifflin. Animals and humans eat plants and animals as part of the food chain. One example of the food chain is sun gives energy to corn which gives energy to chickens which give energy to people. Explanatory

statements but not vivid language. No nonfiction structures in this text. The people depicted in the pictures are African America boy and girl and a Hispanic girl and boy. (Life Science).