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Science Informational Trade Books: An Exploration of Text-based Practices and Interactions in a First-grade Classroom

Virginia Anne Schreier
University of South Florida, vschreie@mail.usf.edu

Science Informational Trade Books:

An Exploration of Text-based Practices and Interactions in a First-grade Classroom

by

Virginia A. Schreier

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Department of Childhood Education and Literacy Studies
College of Education
University of South Florida

Co-Major Professor: Jenifer J. Schneider, Ph.D.
Co-Major Professor: Sherry Kragler, Ph.D.
Jolyn M. Blank, Ph.D.
Danielle Dennis, Ph.D.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

Although scholars have long advocated the use of informational texts in the primary grades, gaps and inconsistencies in research have produced conflicting reports on how teachers used these texts in the primary curriculum, and how primary students dealt with them during instruction and on their own (e.g., Saul & Dieckman, 2005). Thus, to add to research on informational texts in the primary grades, the purpose of this study was to examine: (a) a first-grade teacher's use of science informational trade books (SITBs) in her classroom, (b) the ways students responded to her instruction, and (c) how students interacted with these texts. My study was guided by a sociocultural perspective (e.g., Bakhtin, 1981; Vygotsky, 1978), providing me a lens to examine participants during naturally occurring social practices in the classroom, mediated by language and other symbolic tools. Data were collected by means of 28 observations, 6 semi-structured interviews, 21 unstructured interviews, and 26 documents over the course of 10 weeks.

Three themes generated from the data to provide insight into the teacher's and students' practices and interactions with SITBs. First, the first-grade teacher used SITBs as teaching tools during guided conversations around the text to scaffold students' understanding of specialized vocabulary, science concepts, and text features. Her instruction with SITBs included shared reading lessons, interactive read-alouds and learning activities during two literacy/science units. However, there was limited use of SITBs during the rest of her reading program, in which she demonstrated a preference for narrative. Second, students responded to instruction by participating in guided conversations around the text, in which they used prior knowledge,

shared ideas, and visual representations (e.g., illustrations, diagrams, labels, and captions) to actively make meaning of the text. Third, students interacted with SITBs on their own to make sense of science, in which they demonstrated their interest in reading the texts, formed connections to science, used reading strategies, and adjusted to the text type and variations of text complexity.

The findings indicate the teacher's practices with SITBs were supportive of literacy and science learning for students at various levels of reading development. However, her inexperience with informational books and her preference for narrative demonstrates a need for training to assist her in providing guided and individualized reading instruction with SITBs, as well as provide students with full access to these texts in the classroom. Further, the teacher's overgeneralizations for science during instruction with SITBs indicates the need for training to strengthen her knowledge of science that would better prepare her to convey information and critically read information presented in these texts. Finally, the students' engagement with SITBs and their use of strategies to make sense of these texts on their own, indicates the first graders were motivated and capable readers of informational books.

CHAPTER ONE:

INTRODUCTION

Today's children must prepare to be savvy consumers of the vast informational texts they will encounter during their academic years and throughout their adult lives (Duke & Bennett-Armistead, 2003; Kletzien & Dreher, 2004). By the time students reach sixth grade it is estimated that they will spend more than 75% of their time reading nonfiction genres (Moss, 2005). Further, students in the intermediate and middle grades will encounter more complex expository texts that contain academic language related to important content areas such as science. Additionally, the amount of informational text increases throughout the higher grades and into adulthood, as individuals read information on the internet, at job sites, in magazines, newspapers, and elsewhere (Hall & Sabey, 2007; Smith, 2000).

Investigating how children deal with intermediate-grade texts, Chall and Jacobs (2003) followed 30 students in grades two, four, and six for two years to examine their reading progress during their transition from primary grades (K-3) to intermediate/middle grades (4-8). A significant finding was that participants' reading scores began to decelerate around grade four, and scores overall declined for academic vocabulary and reading comprehension of texts used in the intermediate and upper elementary grades. Chall and Jacobs' research provides evidence of the possible challenges students face with expository texts during their transition from primary to intermediate grades.

Further, the implementation of the Common Core State Standards (Common Core State Standards Initiative, 2010) is forthcoming, requiring students to read and write more

informational texts (Maloch & Bomer, 2013b). Primary teachers will need to find more ways to include informational texts in their literacy and content area instruction to fulfill state and school curricular demands, as well as prepare students for emerging state assessments emphasizing nonfiction (Maloch & Bomer, 2013a, 2013b). Moreover, primary teachers are faced with finding appropriate nonfiction books for their instruction that students not only learn from, but can connect to and engage in, as they make this transition to more expository types of reading and writing tasks.

In order to prepare our youth as readers, experts have called for an increase in the amount of informational text represented in primary classrooms, claiming that it will facilitate understanding of important content areas (Atkinson, Matusevich, Huber, 2009; Maloch & Bomer, 2013a, 2013b; Morrow, Pressley, Smith, & Smith, 1997), advance scientific language (Honig, 2010; Santoro, Chard, Howard, & Baker, 2008; Varelas & Pappas, 2006), provide experience with expository text structures (Duke, Caughlan, Juzwik, & Martin, 2012; Duke & Kays, 1998; Pappas, 1993, 2006), and boost interest in reading and writing (Dreher, 2003; Moss, 2003; Ness, 2011; Pappas & Varelas, 2009).

Although research has produced evidence of the benefits for exposing primary children to informational text (Maloch, 2008; Maloch & Bomer, 2013a, 2013b; Morrow et al., 1997; Pappas, 2006; Saul & Dieckman, 2005), there is also evidence of its scarcity in primary classrooms and that primary teachers struggle with effective ways to incorporate it into their literacy/science curricula (Duke, 2000; Jacobs, Morrison, & Swinyard, 2000; Jeong, Gaffney, & Choi, 2010; Palmer & Stewart, 2003; Yopp & Yopp, 2006, 2012).

Background of the Study

Informational Books

Various researchers have defined informational texts (e.g., informational books). For instance, Duke (2000) defined informational texts as texts that serve to "communicate information about the natural or social world, typically from one presumed to be more knowledgeable on the subject to one presumed to be less so," and having the features and structures of such texts, e.g., "factual content," "timeless verb constructions," "technical vocabulary," "classificatory and definitional material," "topical theme," and "graphical elements" (p. 205). Whereas, Galda, Cullinan, and Sipe (2010) defined informational books as, "nonfiction books of information and fact about any topic" (p. 304), in which the main purpose of the book is to present factual information, and storytelling is secondary.

Further, Maloch and Bomer (2013b) noted the complexity of informational books, claiming that as fiction contains various genres (e.g., realistic fiction, science fiction, fantasy, etc.), you also find informational books containing various genres, with both narrative (e.g., biography and historical narrative) and expository structures (e.g., historical accounts and scientific reports) to present information. In particular, researchers (e.g., Donovan and Smolkin, 2002; Dreher & Voelker, 2004; Duke et al., 2012; and Kletezien & Dreher, 2004; Moss, 2003) have addressed the diversity of informational books, by placing these texts in categories to distinguish the multiplicity of their purposes, features, and structures. The salient point is within informational books there is a range of genres with very different features and structures that could fit into the primary grade curriculum for a variety of instructional and recreational purposes.

The progression of informational books. Over the past decade, there has been a surge of informational books from publishers that addresses the diverse interests of young readers (Gill, 2009; Moss, 2003; Rearden & Broemmel, 2008). Moss (2003) stated, "More children's nonfiction trade books are published each year than books in any other genre; some 2,500 of the 5,000 books published each year are nonfiction" (p. 36). Further, The Library of Congress noted that the divide between fiction and nonfiction has shifted from 50-50 in the 1990s to 60 percent in favor of nonfiction in 2002 (Hepler, 2003). Also noting this upward trend, Rearden and Broemmel (2008) found a sharp increase in informational books in their analysis of genres and content areas of science-based Teachers' Choices books between 1988 and 2004 (e.g., a 44% increase of narrative informational books, and a 50% increase of non-narrative informational books between the two periods measured).

Additionally, children's informational books have undergone some major transformations over the past decade (Moss, 2003). According to Moss, "There is no genre of children's literature that has changed as radically in recent years as nonfiction" (p. 10). Today's nonfiction includes developmentally appropriate informational books on various instructional and independent reading levels for both the primary and intermediate grades (Duke & Bennett-Armistead, 2003; Moss, 2003). In addition, these texts focus on a range of fascinating topics from sea turtles to space travel and are versatile enough to fit into the existing school curricula. Moreover, informational trade books have tremendous kid-appeal with interesting formats, text arrangement, descriptive language, and intriguing illustrations (Galda et al., 2010; Kiefer, 2010; Moss, 2005). Different types of informational trade books include concept books, nonfiction picture books, life-cycle books, photographic essays, identification books, nature books,

experiment and activity books, documents and journals, survey books, and informational storybooks (Kiefer, 2010).

Science informational trade books (SITBs). Recently, there has been an emphasis in research on the use of informational books in the primary grade literacy and science curriculum (Moss, 2003; Saul & Dieckman, 2005). This research has drawn attention to s*cience informational trade books* (SITBs) as a prominent genre of informational books included in elementary-grade literacy and science curricula in varying degrees (Donovan & Smolkin, 2001; Pappas, 2006). In addition, researchers such as Donovan and Smolkin (2002) and Dreher and Voelker (2004) have analyzed SITBs in order to categorize them into sub-genres or categories that demonstrate their structural variations and diverse textual features. For instance, after extensive research of the SITB genre, Donovan and Smolkin distinguished the categories of SITBs as: *non-narrative, narrative, storybooks, and dual-purpose* (e.g., Donovan & Smolkin, 2001, 2002, 2006; Smolkin & Donovan, 2001, 2003, 2004). Adding to this research, Dreher and Voelker's (2004) in-depth analysis of guidelines for selecting SITBs in the primary grades led them to discover that existing guidelines were not comprehensive enough to cover the full-range of categories in the SITB genre. To account for this gap, Dreher and Voelker also developed categories for SITBs (i.e., *expository, narrative-informational, and mixed texts*) to explain the diversity of features and structures in these texts.

The Role of SITBs in Primary Classrooms

Although experts recommend primary teachers include nonfiction in their literacy and content area curriculum, there is considerable evidence young children have little exposure to informational books in primary grade classrooms (Duke, 2000; Jacobs et al., 2000; Yopp & Yopp, 2006). For instance, over a decade ago in her landmark study, Duke (2000) reported that

few informational texts were found in primary classrooms and only an average of 3.6 minutes per day were spent with informational texts during language arts activities. During the same year, Jacobs et al.'s (2000) survey of elementary teachers revealed that informational books were seldom chosen by teachers as read alouds for elementary students. More recently, Yopp and Yopp (2006) found young children had much less exposure to informational books than narrative books, both at school and at home. Further, Jeong et al.'s (2010) descriptive investigation of second-, third-, and fourth-grade classrooms demonstrated a much larger proportion of narrative texts compared to informational texts, with an average of one minute of instructional time with informational texts in second grade classrooms, and an average of 16 minutes in grades three and four within four hours of instruction. However, Jeong et al. also found a slight growth of informational texts in language arts instruction and activities between grades two, three, and four.

Primary teachers' perceptions and attitudes. Researchers have suggested primary teachers have formed perceptions and attitudes for SITBs that may influence how they choose and use these texts in their literacy/science curricula (Donovan & Smolkin, 2001; Ness, 2011; Palmer & Stewart, 2003). For instance, a number of studies revealed primary teachers have chosen inappropriately leveled SITBs, have attitudes that SITBs are too difficult for primary students (Donovan & Smolkin, 2001; Ness, 2011; Palmer & Stewart, 2003), have attitudes that science is boring (Donovan & Smolkin, 2001), and have made assumptions that storybooks are more suitable than nonfiction in the primary grades (Duke, 2000; Donovan & Smolkin, 2001; Pappas, 1993).

Aligned with this research, Donovan and Smolkin's (2001) descriptive study investigated the types of texts 10 elementary teachers used during science instruction and the teachers'

assumptions about SITBs at a half-day workshop. Donovan and Smolkin found the teachers repeatedly stated science was boring and "unfun" (p. 435) and SITBs were too difficult to read aloud. They also found teachers did not attend to the features and structures of SITBs during book selections and mostly chose SITBs that added excitement to science, such as informational storybooks and dual purpose SITBs. Further, Palmer and Stewart (2003) provided evidence of a librarian's, primary teachers', and primary students' assumptions and practices for nonfiction in their qualitative investigation of a school library and 11 classrooms. Their study demonstrated primary teachers and the school librarian chose inappropriately leveled informational books with heavy concept loads, and acted as information-brokers to interpret difficult information during read-alouds. Based on their findings, Donovan and Smolkin, along with Palmer and Stewart, suggested primary teachers need training for how to select and use nonfiction effectively in their literacy/science instruction.

Recently, Ness' (2011) survey of 318 K-5 teachers added insight to research for teachers' perceptions and attitudes toward informational trade books. Teachers self-reported that the technical vocabulary, complex text features, and students' lack of background knowledge made it difficult for students to comprehend SITBs. One teacher commented that the challenging vocabulary in informational trade books, "almost ensured that my students wouldn't comprehend" (p. 42). Besides reporting the challenges, teachers also reported benefits for informational books, such as new knowledge, increased literacy skills, and increased motivation to read nonfiction. Ness' findings led her to suggest teacher training is necessary to equip teachers with instructional practices for the challenging vocabulary, text structures, and general comprehension problems posed by informational trade books.

Primary teachers' use of SITBs. A number of studies have investigated teachers' use of interactive read-alouds of SITBs to scaffold student's understanding of science concepts, scientific language, text structures, visual representations, and informational compositions (e.g., Bradley & Donovan, 2010; Coleman, Bradley, & Donovan, 2012; Smolkin & Donovan, 2001, 2003; Varelas & Pappas, 2006). For example, in a qualitative interpretive study, Varelas and Pappas' (2006) examined teachers and students as they engaged in dialogically-oriented read-alouds of SITBs during a literacy/science unit on the states of matter. During the read-alouds, teachers encouraged dialogic talk, provided opportunities for intertextual connections, and modeled comprehension skills. Further, Varelas and Pappas' study revealed teachers facilitated first- and second-graders' use of scientific language and their construction of scientific knowledge as they participated in discussions during the read alouds. Likewise, Smolkin and Donovan's (2001) two-year case study demonstrated how a first-grade teacher modeled comprehension strategies during interactive read-alouds of SITBs. Smolkin and Donovan found that first-grade students and the teacher interacted together to co-construct scientific ideas, use scientific language, and share personal experiences related to the text.

Additionally, Santoro et al.'s (2008) qualitative study of first graders' comprehension development and vocabulary growth demonstrated how teachers used interactive read-alouds of SITBs during science units (i.e., units for mammals, reptiles, and insects) to model text structures and comprehension strategies (e.g., retelling and summarizing). Santoro et al. found students who participated in the read-alouds had improved comprehension and enhanced use of vocabulary demonstrated by longer, more elaborate retellings. Further, Pappas and Varelas' (2009) investigation of six urban primary grade children (grades 1-3) also demonstrated teachers' use of interactive read-alouds of SITBs during a science/literacy unit. During the read-alouds,

teachers used SITBs as teaching devices where she and her students "co-constructed scientific ideas" (p. 203) as they read, shared ideas, and interacted with the text. At the end of the unit, students composed their own information books that incorporated scientific information, expository text features, scientific language, and visual representations. Overall, research has shown teachers used interactive read-alouds of SITBs as thinking devices and models of expository texts to teach comprehensions skills, text features, scientific language, informational compositions, and to make intertextual connections (Bradley & Donovan, 2010; Coleman et. al, 2012; Pappas & Varelas, 2009; Smolkin & Donovan, 2001, 2003; Varelas & Pappas, 2006). Furthermore, teachers encouraged intertextual connections as students participated in various other activities during science/literacy units (e.g., hands-on-explorations, writing and drawing in a journal, and writing and illustrating an information book).

Students' engagement and retellings with SITBs. Research has also provided evidence young children are capable of understanding informational books and are interested in reading them when they are available (Donovan, Smolkin, & Lomax, 2000; Duke & Kays, 1998; Pappas, 1993). For instance, Pappas' (1993) and Duke and Kay's (1998) seminal qualitative studies drew significant attention to kindergarteners' attitudes and abilities to deal with informational books. In Pappas' study, she reported kindergartners were just as competent in distinguishing lexical features and structures in their pretend readings of informational books as they were in narrative books. Another strong finding was kindergarteners consistently chose informational trade books over storybooks during observation sessions. Similarly, Duke and Kays found kindergartners developed knowledge of information book language and used it in their pretend readings following read-alouds. Moreover, they found kindergarteners quickly became familiar with expository texts, interacted with them, found these texts to be very engaging, and expressed

enjoyment during read-alouds. Furthermore, Donovan et al.'s (2000) descriptive study of first graders' self-selection of books from the classroom library demonstrated children actively selected SITBs on topics that interested them for recreational reading.

Summary of the Study's Background

Scholars call for an increase of informational texts in the primary grades proclaiming its advantages for young children, such as vocabulary growth (Santoro et al., 2008; Varelas & Pappas, 2006), enhanced content area knowledge (Atkinson et al., 2009; Morrow et al., 1997), awareness of expository text structures (Duke & Kays, 1998; Pappas, 1993, 2006), and improved motivation to read and write (Dreher, 2003; Moss, 2003; Pappas & Varelas, 2009). Other research indicates children need exposure to expository texts in the primary grades to prepare them for the surge of informational text they will encounter in higher grades and in real-world settings later in their lives (Chall & Jacobs, 2003; Duke & Bennett-Armistead, 2003; Moss, 2005; Hall & Sabey, 2007). Furthermore, a new school curriculum implementing the Common Core State Standards (Common Core State Standards Initiative, 2010) is mandating an increased use of informational texts in the literacy and content area curricula in schools nationwide (Maloch & Bomer, 2013b).

Over the past decade, informational books have transformed into attractive books that appeal to young children with high-interest topics, kid-appealing formats, descriptive language, and vivid illustrations (Galda et al., 2010, Kiefer, 2010; Moss, 2005; Smolkin, McTigue, Donovan, & Coleman, 2009). Further, SITBs have emerged as a key genre of informational books and have been recognized by researchers for their diverse categories (e.g., *non-narrative, narrative, storybooks, and dual-purpose*) that serve different instructional purposes (Donovan & Smolkin, 2002; Dreher & Voelker, 2004). Despite the surge of attractive and developmentally

appropriate informational books available from the publishers for primary students (Gill, 2009; Moss, 2003; Rearden & Broemmel, 2008), there remains evidence primary students have little exposure to these texts in their classrooms (Duke, 2000; Jacobs et al., 2000; Jeong et al., 2010; Yopp & Yopp, 2006). Some researchers contribute this to primary teachers' assumptions that informational texts are too difficult and that fiction is more suitable for primary grade students (Donovan & Smolkin, 2001; Ness, 2011; Palmer & Stewart, 2003; Pappas, 1993).

Conversely, research also provided evidence young children enjoy reading informational books and have successfully used expository text features in retellings and pretend readings (Duke & Kays, 1998; Pappas, 1993; Santoro et al., 2008). Further, research indicates teachers have chosen SITBs for various integrated science units and used them as thinking tools in interactive read-alouds to model comprehension strategies, text features, and scientific language, as well as provide opportunities for intertextual connections (e.g., Bradley & Donovan, 2010; Smolkin & Donovan, 2001, 2003, Varelas & Pappas, 2006) . In addition, a number of studies have shown primary students demonstrated their understanding and use of science concepts, scientific language, visual representations, and text features, as they participated in interactive read-alouds and composed their own information books (e.g., Coleman et al., 2012; Pappas and Varelas, 2009).

Overall, the gaps and inconsistencies in research done thus far requires more investigation into the current role of SITBs in primary classrooms. For example, some researchers reported that primary teachers viewed SITBs as too difficult for primary students and that primary teachers lacked expertise for selecting and using appropriate SITBs (e.g., Donovan & Smolkin, 2001; Ness, 2011; Palmer & Stewart, 2003). On the other hand, researchers reported primary teachers have chosen and used SITBs effectively during interactive read-alouds to model

comprehension strategies, explore expository text features, and teach scientific language (e.g., Smolkin & Donovan, 2001; Varellas & Pappas, 2006). Additionally, some studies indicate primary students have dealt well with informational books during interactive read-alouds, pretend readings, retellings, and in their informational compositions (e.g., Bradley & Donovan, 2010; Coleman et al., 2012; Duke & Kays, 1998; Pappas, 1993, Pappas & Varelas, 2009). These inconsistencies incite further investigation into the ways primary teachers use SITBs in their literacy/science curricula, and how first-grade students respond to instruction and interact with these texts in the classroom.

Additionally, the majority of research thus far investigating primary teachers' and students' practices and interactions with SITBs has used qualitative methods or mixed methods. Although insightful, these studies have posed particular strengths and limitations. For example, Duke's (2000) descriptive study of 20 first-grade classrooms was strengthened by its longevity (one school year) and large sample size; however, its credibility was affected by the researcher's lack of access to all the texts students utilized in the classrooms. Further, it took place over a decade ago, and the findings may not apply to contemporary schools. In addition, Donovan and Smolkin's (2001) descriptive study of 10 teachers' choices of SITBs at a half-day workshop provided thick descriptive data and researcher reflexivity; however, it was limited by its small sample size, brief duration, and short questionnaires. Moreover, Ness' (2011) study using mixed methods and open-ended questionnaires provided insight into 318 K-5 teachers' perceptions and practices for SITBs; however, it was limited by self-reporting bias and non-responder bias. Additionally, Morrow et al.'s experimental study of 128 third-grade students' science instruction is quite dated (i.e., 1997), and represents the paucity of quantitative research that has investigated the use of SITBs for science instruction. This study provided a statistical analysis of students'

literacy and science learning gains associated with three methods of science instruction (e.g., with/without SITBs); however, it was limited by its intact classrooms and teacher awareness of the different treatments, compromising the study's internal validity.

All in all, research investigating primary teachers' use of SITBs in the literacy/science curricula, as well as primary students' responses during instruction to these texts, and their interactions with them in the classroom, is represented by a limited number of studies with a narrow range of study methods and inconsistencies in their findings. Moreover, the findings for outdated studies addressing these issues may not be relevant to contemporary classrooms (e.g., Duke, 2000; Morrow et al., 1997).

Therefore, to add to the body of research and learn how the role of SITBs has evolved in primary classrooms, it is important to further examine primary teachers' use of SITBs in their literacy/science curricula, as well as how primary students respond to instruction and interact with these texts. Thus, the focus of my study is on a first-grade teacher's use of SITBs, as well as first-grade students' responses to her instruction and their interactions with these texts.

Theoretical Framework

Given the focus of my study is on a first-grade teacher's and students' use of SITBs in a classroom setting, my primary form of data gathering is based on interactions with and around texts. As such, sociocultural theories provided an overarching framework to view the participants as they engaged in routine social events in the classroom revolving around the text (i.e., SITBs), providing opportunities to learn science through their conversations of the text and their social interactions (Bakhtin, 1986; Vygotsky, 1978, 1986; Wertsch, 1991). Within this framework, Vygotsky's (1978) notion of apprenticeship provided a lens to observe the first-grade teacher in

the position of expert to scaffold students' understanding of science and their acquisition of the academic language of science (Gee, 2004a; Cope & Kalantzis, 1993).

Sociocultural Theories

Sociocultural theories emphasize that social interactions are central to the learning process and are also mediated by language and other symbolic systems (Bakhtin, 1986; Vygotsky, 1978, 1986; Wertsch, 1991). As children participate in recurrent social activities of their daily lives, mediated by the language they encounter and the actions of others, they are actively making sense of their social roles and responsibilities within their classrooms. Further, Bakhtin (1986) suggested children learn oral and written discourse as they encounter and respond to their social worlds to build symbolic associations. According to Bakhtin, discourse consists of "utterances" that are bound by a beginning and ending. Further, Bakhtin referred to the expressive aspects of utterances as "voice," which he described as, "the speaking personality, the speaking consciousness" (1981, p. 434). As teachers and children participate in discourse, they construct meaning from their social interactions within their classrooms, and express their *voices* during conversations around the text. Bakhtin further contended through "addressivity," which he defined as "the quality of turning to someone" (1986, p. 99), students partake in dialogue, where they share symbolic tools to build knowledge of content areas and acquire academic language.

Further, Vygotsky (1978) suggested children use their semiotic tools (e.g., language, pictures, texts) during social experiences, in which more knowledgeable others (e.g., teacher, more advanced peers) move them along within the "zone of proximal development" (1978, p. 86) to new levels of understandings and skills with information to be used for later application. During my study, informational books served as semiotic tools (Wells, 1999) during teacher-

guided conversations with and around the text to help students develop understandings of scientific language and science concepts. In the following section, I discuss how through apprenticeship, students gain access to new ways of thinking about information within the zone of proximal development.

Apprenticeship. According to Vygotsky (1978, 1986), children learn from their experiences and interactions with others. For instance, Vygotsky proposed children first learn and develop on an interpsychological plane by more knowledgeable others, i.e., teachers and peers, who scaffold their learning and demonstrate cultural ways of thinking. Vygotsky (1978) referred to the phase where children have knowledge of the task, but have not quite mastered it, the zone of proximal development. Vygotsky argued that children learn most effectively within their zone of proximal development where the more knowledgeable teacher or peer scaffolds the child to the next level of learning, repeating the process toward mastery learning. Through apprenticeship, children gradually internalize their learning experiences in a process Vygotsky (1978) refers to as "internalization" (p. 56), moving from an "interpsychological plane" to an "intrapersonal plane", where inner thought or inner speech takes place (p. 57). Sociocultural theorists contend that as the novice engages and interacts with texts within cultural activities, they are apprenticed into textual practices consistent with such texts (Vygotsky, 1978; Wertsch, 1991). As children internalize what they learn, they master it in order to use it for future application. Rogoff (1990) expanded on Vygotsky's developmental theory by characterizing it as a process of guided participation where children actively participate in their own development.

In the primary classroom, children have opportunities to learn from more knowledgeable others, such as the teacher and peer mentors within cultural activities. For example, when teachers engage children in interactive read-alouds of SITBs (Smolkin & Donovan, 2001, 2003;

Varelas & Pappas, 2006), they have opportunities to scaffold children's understandings of such texts (e.g., asking questions, elaborating on student comments, providing opportunities for intertextual connections, and pointing out text structures). Through participation in these cultural activities, children learn particular textual practices associated with informational texts, as the teacher guides their learning within their zone of proximal development toward mastery of important concepts and language development (Vygotsky, 1978; Wertsch, 1991).

Social acquisition of academic language. Gee (2004a) added to Vytotsky's (1978) notion of apprenticeship, suggesting children learn academic language during their social interactions and conversations with more advanced users of such language. As the first-grade teacher in my study engaged students in conversations with and around the text (i.e., SITBs), the text served as tools to model the use of academic language, providing opportunities for the teacher to share her interpretations of these terms and make them relevant to the students' experiences and the real world. During such conversations, the first-grade students also had opportunities to discuss these terms and imitate their use for their own purposes.

Moreover, Gee (2004b) stressed that the acquisition of academic language builds a symbolic repertoire and has important implications for children's literacy and content area learning. He used the academic language of science as a prime example of vital academic language that children need to be successful in school and in science-oriented conditions outside of school. Gee contended school success is contingent on how well the learner copes with academic language and his/her willingness to participate in learning it. Gee claimed in order to acquire academic language, students will need to give up some of their "lifeworld" language (p. 16). For example in science, academic language, such as *exhibits* and *variation* may need to replace more lifeworld terms, such as *show* and *different*.

Cope and Kalantzis (1993) also emphasized the need for explicit instruction of important academic genres, such as genres in the science domain. To facilitate "genre literacy" (Cope & Kalantzis, 1993, p.1) in key content areas, these researchers contended teachers take on the role of expert to scaffold students in the acquisition of discourse that is important to school success. They suggested academic language needs to be taught and teachers should provide opportunities for children to practice it with their peers during social interactions. Further, Cope and Kalantzis argued students' need to successfully master genre literacy during their schooling, in order to be prepared for a technical and science-driven workforce they will ultimately enter as adults.

Summary of Theoretical Framework

Sociocultural theories (Bakhtin, 1981, 1986; Vygotsky, 1978, 1986; Wertsch, 1991) provided a framework for my study suggesting children learn through their participation in the recurring social activities of their daily lives, mediated by the language they encounter and the actions of others. Thus, during my study, I took a sociocultural stance during observations of the first-grade teacher and students participating in the routine social activities in the classroom (e.g., interactive read-alouds with SITBs routinely used in the first-grade teacher's instruction), in which participants engaged in conversations around the text to learn science and acquire academic language.

Further, my study was guided by Vygotsky's (1978, 1986) notion of *apprenticeship* through which novice users of texts (e.g., first-grade children) gradually internalize their learning experiences through the scaffolding of more knowledgeable others (e.g., the teacher and peer-mentors) within their zone of proximal development toward mastery learning of concepts and their development of language. Through this lens, I observed the first-grade teacher in the role of expert, where she was positioned to apprentice or scaffold first-grade students as they

participated in routine social practices within the first-grade classroom, where learning took place around texts (e.g., SITBs).

Moreover, Gee (2004b) pointed out as children learn academic language within important content area domains, such as science, they develop a symbolic repertoire that helps them gain knowledge of literacy and content areas. During my study, the first-grade teacher guided students to actively make meaning of scientific concepts and specialized vocabulary as they interacted with each other and the text (e.g., SITBs). These literacy events provided me with opportunities to observe how primary students acquire the academic language of science under the guidance of the first-grade teacher. Further, Cope and Kalantzis (1993) supported Vygotsky's (1978, 1986) notion of apprenticeship, arguing teachers must take on the role of expert to scaffold students in the acquisition of discourse important to school success and prepare them for the technical and science-driven workforce they will eventually enter as adults.

Significance of Study

Over a decade ago, Duke (2000) and Jacobs' et al. (2000) found children in primary grades spent little time reading or listening to informational texts. Recent research has shown narrative texts continue to predominate primary classrooms (Jeong et al., 2010; Yopp & Yopp, 2006). Further, there are gaps and inconsistencies with research addressing the role of science informational trade books in primary classrooms. For example, on one hand, researchers reported teachers perceived SITBs too difficult for primary students and lack expertise for selecting and using them appropriately (e.g., Donovan & Smolkin, 2001; Ness, 2011; Palmer & Stewart, 2003). On the other hand, researchers reported primary teachers have effectively used SITBs for science instruction during interactive read-alouds (e.g., Maloch & Beutel, 2010; Smolkin & Donovan, 2001; Varelas & Pappas, 2006), and that primary students have dealt with them well

during their retellings and their informational compositions (e.g., Bradley & Donovan, 2010; Coleman et al., 2012; Duke & Kays, 1998; Pappas & Varelas, 2009).

Overall, research investigating primary teachers' use of SITBs, as well as how primary students respond to instruction and interact with these texts, is represented by a limited number of studies with a narrow range of study methods and inconsistencies in their findings. Therefore, to add to the body of research and learn how the role of SITBs has evolved in primary classrooms, my study focused on a first-grade teacher's use of SITBs, first-grade students' responds to instruction with these texts, and how two first-grade students interacted with these texts.

Purpose for Study

The purpose of this study was to examine the ways a first-grade teacher utilized SITBs in her literacy/science curricula and to understand how two first-grade students responded to her instruction and interacted with these texts. Through a basic qualitative study (Merriam, 2009), my aim was to provide a descriptive account of the interactions around the use of science informational trade books within the primary literacy and science curricula.

Research Questions

The following research questions were addressed:

1. In what ways does a first-grade teacher use science informational trade books?
2. In what ways do first-grade students respond to the first-grade teacher's instruction with science informational trade books?
3. How do two first-grade students interact with science informational trade books?

Definition of Key Terms

Informational trade books: "nonfiction books of information and fact about any topic," (Galda et al., 2010, p. 304)

Interactive read-alouds: teacher read-alouds of informational books, in which during the read-aloud, the teacher guides and scaffolds students' understanding of the text, as she prompts students to discuss the text, ask questions, share ideas, interact with the text, construct meaning of the text, share personal experiences, and make connections to their lives and the real world (Smolkin & Donovan, 2001; 2003; Varelas & Pappas, 2006). Note: I mainly used the term interactive read-aloud during my study to describe such a read-aloud. However, I also referred the following corresponding terms used by researchers at times, when discussing or referring to their work, e.g., "Interactive Information Book Read-aloud" (Smolkin & Donovan, 2003) and "Dialogically-oriented Read Aloud" (Pappas & Varelas, 2004).

Intertextuality: "making sense of the texts from other contexts that children and teachers bring to, and instantiate in, the read-aloud sessions of the unit, as they juxtapose these meanings with the meanings from the current texts" (Varelas & Pappas, 2006, p. 215). Texts can refer to other books, discourse, photographs, songs, poems, media such as television or movies, etc. (Pappas & Varelas, 2004).

Literature Rich Environment: a classroom environment in which students are immersed in high-quality literature that fits their interests and needs during reading instruction and recreational reading (e.g., extensive use and access to children's literature during shared reading lessons, interactive read-alouds, book talks, book displays, on the computer, and in the classroom library).

Nonfiction: "informational books that explain a subject or concept using facts about the real world." (Galda et al., 2010, p.12).

Reading Level (RL): a number value assigned by the school system with the purpose to demonstrate students' ability to read books considered by the school and school district to be appropriate reading material for a particular grade level. At my study site, first-grade reading levels ranged from RL 0 (non-reader) to RL 18 (proficient reader), in which first-grade on-level reading levels were considered by the school system to be within the range of RL 16 to 18.

Science informational trade books (SITBs): science nonfiction books in the form of non-narrative, narrative, storybooks, and dual-purpose books (Donovan & Smolkin, 2002).

Specialized vocabulary: "technical words that are specific to a particular topic, field, or discipline," (Nation, 2001, p. 198).

Technical vocabulary: technical terms or words that belong to a particular subject area (Chung & Nation, 2004).

CHAPTER TWO:

REVIEW OF THE LITERATURE

> The basic purpose of nonfiction is to inform, to instruct, hopefully to enlighten. But that's not enough. An effective nonfiction book must animate its subject, infuse it with life. It must create a vivid and believable world that the reader will enter willingly and leave only with great reluctance. A good nonfiction book should be a pleasure to read. It should be just as compelling as a good story.
>
> -- Freedman (1992, p. 3)

To prepare primary children for the vast amount of informational texts they will encounter during their academic careers and adult lives, experts have called for an increase in informational texts represented in primary classrooms, claiming that it will advance learning in the content areas (Atkinson et al., 2009; Maloch & Bomer, 2013a, 2013b; Morrow et al., 1997), facilitate academic language (Honig, 2010; Maloch, 2008; Santoro et al., 2008; Varelas & Pappas, 2006), provide experience with expository text structures (Duke et al., 2012; Duke & Kays, 1998; Pappas, 1993, 2006), and promote interest in reading and writing (Dreher, 2003; Moss, 2003; Ness, 2011; Pappas & Varelas, 2009).

Over the past decade, the body of research addressing the inclusion of informational texts in the primary grades has extensively focused on the use of informational books in the primary grade literacy and science curricula (Moss, 2003; Saul & Dieckman, 2005). Furthermore, s*cience informational trade books* (SITBs) have emerged as a prominent genre of informational books and are available for primary grade literacy and science instruction (Donovan & Smolkin, 2002; Gill, 2009; Moss, 2005; Reardon & Broemmel, 2008). Although there has been an influx of developmentally appropriate SITBs available for primary-grade science instruction, these books

are currently used in varying degrees by primary teachers (Duke, 2000; Jeong et al., 2010; Moss, 2008; Yopp & Yopp, 2006, 2012).

Over a decade ago, Duke (2000) and Jacobs et al. (2000) found children in primary grades spent little time reading or listening to informational texts. Recent research, although sparse, has shown narrative texts continue to predominate primary classrooms (Jeong et al., 2010; Yopp & Yopp, 2006, 2012); however, this comes with reports that informational texts are slowing increasing in primary instruction (Jeong et at., 2010). Further, there are gaps and inconsistencies with research addressing the role of informational books in primary classrooms and school libraries. For example, on one hand, researchers reported teachers and librarians view SITBs too difficult for primary students and that teachers lack expertise for selecting and using them appropriately (e.g., Donovan & Smolkin, 2001; Ness, 2011; Palmer & Stewart, 2003). On the other hand, researchers reported primary teachers have avidly used SITBs for science instruction during interactive read-alouds (e.g., Smolkin & Donovan, 2001; Varelas & Pappas, 2006), and primary students have dealt with them well during their retellings and their informational compositions (e.g., Bradley & Donovan, 2010; Coleman et al., 2012; Duke & Kays, 1998; Pappas, 1993). Overall, research investigating primary teachers' use of SITBs, and how primary students respond to instruction and interact with these texts is represented by a limited number of studies with a narrow range of study methods and inconsistencies in their findings.

Furthermore, my study was guided by a sociocultural perspective, in which I recognized social interactions are central to the learning process and mediated by language and other symbolic systems (e.g., Bakhtin, 1986; Vygotsky, 1978, 1986; Gee, 2004a; Wertsch, 1991). Through this lens, I sought to understand a first-grade teacher's practices with SITBs and the

ways first-grade students responded to instruction and interacted with these texts in order to make sense of them in the context of school (Merriam, 2009).

Purpose for Study

The purpose of this study was to examine the ways a first-grade teacher utilized SITBs in her literacy/science curricula and to understand how two first-grade students responded to her instruction and interacted with these texts. Through a basic qualitative study (Merriam, 2009), my aim was to provide a descriptive account of the interactions around the use of science informational trade books within the primary literacy and science curricula.

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1. In what ways does a first-grade teacher use science informational trade books?
2. In what ways do first-grade students respond to the first-grade teacher's instruction with science informational trade books?
3. How do two first-grade students interact with science informational trade books?

Literature Review Process

Literature Review Purpose

In this analysis of the literature, I investigated a primary teacher's use of SITBs in the literacy/science curricula, as well the ways primary students respond to instruction and interact with these texts. Below, I provide a detailed account of my literature review process that includes my search process, database usage, inclusion criteria, etc. Further, I provide a critique and synthesis of the literature related to my research focus.

Inclusion Criteria

In this review, I included studies, practitioner articles, and books that have a focus on the inclusion of SITBs in a literacy/science curriculum in the primary grades. When considering the inclusion of research for this article, detailed below, I determined three crucial criteria that needed to be met in order for the research to be considered: a study's publication status, a focus on science informational trade books in literacy and science instruction, and age or grade level of participants.

Publication Status

All of the studies, practitioner articles, and books included in this review were available in English in the United States, and a majority were published from 1992 to 2013. I chose this timeframe for the following reason. Although the U.S. National Science Education Standards (NSES) were published by the National Research Council (NRC) in 1996, the debate over the standards began four years earlier in 1992 (Yager, 2004). During the four year debate, a team of 100 professionals wrote several drafts based on relevant studies to produce the NSES. Furthermore, NRC's focus for writing the NSES was scientific literacy, which was the first term they defined in the Standards. Therefore, I chose the publication date 1992 in order to include a comprehensive set of relevant studies that began at the onset of what NRC termed "scientific literacy."

In addition, I selected several relevant studies and reviews prior to 1992 that were frequently cited in research, such as Anderson, Hiebert, Scott, and Wilkinson's (1985) study, *Becoming a Nation of Readers: The report of the Commission on Reading*. Additionally, the research articles in my review were restricted to published research, since these studies are more accessible to educators and scholars and have been scrutinized by the publishing journals for

statistically significant and/or credible findings as part of meeting the standards for publication required by these professional journals. Furthermore, I excluded articles that were not full-text because they provided partial information for relevant topics in my study.

Participants

I selected research focused on teachers and students primarily in grades K-3. However, I occasionally included some studies with upper elementary grade children and middle grade students because they added key insight to the issues being discussed in the review. Additionally, the studies in this review included both general education students in regular classrooms, as well as students with learning disabilities and/or other special needs.

Culling the Relevant Literature

Key Words. I conducted a broad search of multiple databases in order to investigate the use of science informational trade books in the primary literacy/science curricula. The databases were: ERIC, JSTOR, Google Scholar, Education-Sage Full-Text, Elsevier Springer Link, EBSCO Host Academic Search Premier, ProQuest Dissertations, Web of Science, and Wilson-Web. I used the following keywords in my search: primary grade literacy, scientific literacy, science informational trade books, nonfiction, expository texts, trade books, information books, informational literature, informational texts, content area instruction, science, science instruction, science curriculum, science inquiry, read alouds, interactive read-alouds, dialogical-oriented read-alouds, shared reading, literature-based instruction, children's literature, primary grade teachers, primary grade students, first-grade classrooms, intertextual connections, scientific language, and reading motivation.

Journal Sources. As pertinent articles were identified during my search, I carefully read and scrutinized them to gather information related to my study. Furthermore, I examined the

reference lists in relevant articles for additional resources. In the effort to conduct a broad search of the research literature, I reviewed multiple journals that included empirical studies that addressed my research interest. A sample of the journals reviewed: *Reading Research Quarterly*, *Reading & Writing Quarterly*, *Reading Psychology*, *Childhood Education*, *Early Childhood Research Quarterly*, *Early Childhood Education Journal*, *Journal of Science, Journal of Research in Science Teaching, Journal of Elementary Science Education, Language Arts, The Reading Teacher, Research in the Teaching of English, Review of Educational Research, Educational Psychologist, The Elementary School Journal, The Journal of Educational Psychology,* and *Journal of Reading Behavior.*

Book Sources. Additionally, I searched numerous books for relevant studies, research articles, and expert recommended practices for informational literature in literacy and science instruction. A sample of the books reviewed were: *Bring Words to Life, Robust Vocabulary Instruction* (Beck, McKeown, & Kucan, 2013), *Crossing Borders in Literacy and Science Instruction: Perspectives on theory and practice* (Saul, 2004), *Exploring the Literature of Fact, Children's Nonfiction Trade Books in the Elementary Classroom* (Moss, 2003), *Informational Text in K-3 Classrooms, Helping Children Read and Write* (Kletzien & Dreher, 2004), *Linking Science & Literacy in the K-8 Classroom* (Douglas, Klentschy, & Worth, 2006), *Literature and the Child* (Galda et al., 2010), *Nonfiction in Focus: A Comprehensive Framework for Helping Students Become Independent Readers and Writers of Nonfiction, K-6* (Kristo & Bamford, 2004), *Reading and Writing Genre with Purpose in K-8 Classrooms* (Duke, et al., 2012), *Reading and Writing Informational Text in the Primary Grades, Research-Based Practices* (Duke & Bennett-Armistead, 2003), *Using Literature to Enhance Content Area Instruction, A Guide for K-5 Teachers* (Olness, 2007).

Relevant Literature. To help situate my review, I identified over 98 empirical studies, practitioner articles, reviews, and 28 books that spanned a diverse range of topics dealing with informational texts and library curriculum and reform. From this literature, I identified 52 empirical studies, practitioner articles, reviews, and 19 books that related to the research questions and met the criteria for my study as described above.

Status of the Field

I organized the literature review findings into two sections, the first section is titled *Describing, Defining, Categorizing, and Evaluating SITBs.* In this section, I reviewed research studies, books, and scholarly articles for the following topics: (a) informational books that provided a definition and/or descriptions of informational books; (b) science informational trade books (SITBs) that provided a description of SITBs, distinguishing these texts as a genre of informational books; (c) the categories of SITBs that provided a description of the categories of SITBs with examples of books that fit into each category, and (d) evaluation of informational books that provided criteria for selecting SITBs generated by researchers who analyzed and evaluated SITBs for the primary literacy/science curricula.

The second section of the review entitled *The Role of SITBs in the Primary Classroom* highlights important research studies relevant to the role of SITBs in the primary classroom. This section has been organized in two sections: (a) teachers' practices for SITBs, for studies investigating teachers' book choices, the degree of informational text included in primary instruction and classrooms, teachers' perceptions and attitudes for using SITBs in the literacy/science curriculum, as well as how primary teachers share and use SITBs in their literacy/science curricula; and (b) students' practices and interactions with SITBs, for studies examining primary students' engagement, interactions, use, and abilities for SITBs in the primary

literacy/science curricula in the primary classroom.

Describing, Defining, Categorizing, and Evaluating SITBs

Informational books. A major challenge educators and researchers face is to determine a consistent definition for nonfiction or informational books (Saul & Dieckman, 2005; Williams, 2009). For example, the term "information book" has been defined in *The Literacy Dictionary* (Harris & Hodges, 1995) as a nonfiction book of facts and concepts about a subject or subjects. Similarly, Kristo and Bamford (2004) defined nonfiction as the "literature of fact," or "the product of an author's inquiry, research, and writing" (p. 12). Further, Duke (2000) defined informational text as having "a function to communicate information about the natural or social world," with supporting text features (p.205).

Maloch and Bomer (2013b) point out, "When we lump all nonfiction together and treat the very different texts as if they aren't different at all, we're likely to confuse our students" (p. 207). Researchers have addressed the diversity in informational books by identifying various types of texts that fall under the informational book genre that are distinguished by their diverse purposes, structures, and features (Donovan & Smolkin, 2002; Dreher & Voelker, 2004; Duke et al., 2012; Pappas, 2006). For example, Donovan and Smolkin (2002) and Dreher and Voelker (2004) consider informational books to be narrative, expository, or a combination of the two with a purpose to inform and sometimes entertain. Due to this inconsistency in definitions of nonfiction, care must be exerted by practitioners and researchers in generalizing from one study to another (Saul & Dieckman, 2005). According to Williams (2009), "The lack of clarity and consistency about what is and is not nonfiction is more than superficial and presents a practical challenge to the field. For classroom teachers, reading specialists, and librarians, understanding the wide variety and dimensions of nonfiction texts is important to ensure they are utilized

effectively" (p. 247).

According to Galda et al. (2010), the term *nonfiction* is synonymous with *informational books*. These scholars state:

> The term nonfiction describes books of information and fact about any topic. Nonfiction, or informational books are distinguished from fiction by their emphasis. Although both may tell a story, and both may include fact, in nonfiction, the facts and concepts are uppermost, with storytelling perhaps used as an expressive technique. In fiction, the story is uppermost, with facts sometimes used to support it (p. 304).

For the purposes of my study, I define informational books according to Galda et al. (2010), "nonfiction books of information and fact about any topic" (p. 304).

Within the informational book genre, there is a range of texts with very different features and structures that fit into its genres or categories (Dreher & Voelker, 2004; Moss, 2003; Donovan & Smolkin, 2002). Researchers have compared informational books to fiction, explaining that as fiction contains various genres with diverse structures and features, such as realistic fiction, science fiction, and fantasy, so does informational books require genres to account for the different types of books that fall beneath its umbrella (Dreher & Voelker, 2004; Maloch & Bomer, 2013b).

Science informational trade books (SITBs). SITBs have emerged as a prominent category or genre of informational books (Donovan & Smolkin, 2002; Dreher & Voelker, 2004; Maloch & Bomer, 2013b; Moss, 2005). Over the past decade, there has been a surge of SITBs from publishers that addresses the diverse interests of young readers (Gill, 2009; Moss, 2003; Rearden & Broemmel, 2008). Moss (2003) stated, "More children's nonfiction trade books are published each year than books in any other genre; some 2,500 of the 5,000 books published each year are nonfiction" (p. 36). Noting this upward trend, Rearden and Broemmel's (2008) study analyzed genres and content areas of science-based Teachers' Choices books from 1988

through 2004, and found that the storybook genre decreased while SITBs increased, especially SITBs classified as non-narrative informational books (Donovan & Smolkin, 2002). Rearden and Broemmel's study demonstrated evidence that teachers are becoming aware of the numerous SITBs available for use in primary classrooms.

Moss (2003) described informational trade books, as "books that explain or inform children about a topic or concept" (p. 13). Moss goes on to explain informational trade books don't just provide information, but "take facts and weave them into interesting forms that engage readers" (p. 13). Researchers have analyzed the unique forms, text features, and structures in SITBs in order to make clear their distinctions (Donovan & Smolkin, 2002; Duke et al., 2012; Duke & Bennett-Armistead, 2003; Kletzien & Dreher, 2004; Pappas, 1993, 2006). For instance, Donovan and Smolkin (2002) described SITBs as science nonfiction books in the form of non-narrative, narrative, storybooks, and dual purpose books. These are categories or subgenres Donovan and Smolkin developed to explain the unique textual and structural features in SITBs.

Pappas' (1993, 2006) seminal work described the global patterns of SITBs. Her work has greatly impacted research for the SITB genre. Other researchers have consistently referenced Pappas' work and refer to her obligatory and optional features, as well as her linguistic characteristics of SITBs, in their own work as a basis for understanding the text features and structures in SITBs (e.g., Bradley & Donovan, 2010; Donovan & Smolkin, 2001, 2002; McTigue & Flowers, 2011, Smolkin & Donovan, 2005).

According to Pappas (2006):

> The major aim in identifying a genre is to specify the properties of the genre; it entails determining what set of characteristics a text must possess to be seen as an instance of that genre. However, because texts that are unalike might still be counted as members of a genre, the goal is to create a scheme that captures both variant as well as invariant properties in texts belonging to the same genre. (p. 230)

In Pappas' work (2006), she noted the distinctive features and structures in these texts and discussed their role in science instruction for primary grade children. In her analysis, Pappas depicted SITB has having four obligatory elements of structure: (1) topic presentation, i.e., an introduction of the topic; (2) description of attributes, i.e., depiction of the characteristics of the topic; (3) characteristic events, i.e., a description of typical behaviors and events associated with the topic; and (4) final summary, i.e., a summary of the main ideas and information on the topic. According to Pappas, a text is required to have these obligatory elements of structure to be a member of the SITB genre.

Besides the four required obligatory global elements of SITBs, Pappas also described eight optional features: the prelude, category comparison, historical vignette, experimental idea, afterword, addendum, recapitulation, and illustration extension. Additionally, there are linguistic characteristics of SITBs, which include: technical vocabulary, timeless present-tense verbs, generic nouns/pronouns, and genre specific syntax. Moreover, other typical characteristics of SITBs include captions, photographs, pictures, diagrams, labels, table of contents, index, and glossaries.

Categories of SITBs. Dreher and Voelker (2004) and Donovan and Smolkin (2002) have analyzed SITBs and categorized them into subgenres or categories to demonstrate their structural variations and diverse text features. For example, Dreher and Voelker's (2004) in-depth analysis of recent guidelines for selecting SITBs in the primary grades led this research team to discover that existing guidelines were not comprehensive enough to cover the full-range of categories in the SITB genre. Therefore, Dreher and Voelker developed categories (i.e., expository, narrative-informational, and mixed texts) to explain the diverse features and structures in these texts.

Further, Donovan and Smolkin (2002) conducted an analysis of SITBs in order to alert teachers to text type distinctions among categories in this genre. After exhaustive research examining SITBs' purposes, features, and structures, and how these texts are used in primary classrooms (Coleman et al., 2012; Donovan & Smolkin, 2001, 2002, 2006; Maloch & Bomer, 2013a, 2013b; Smolkin & Donovan, 2001, 2004, 2005; Smolkin et al., 2009), Donovan and Smolkin identified four categories associated with science-based informational trade books, which are: *non-narrative informational, narrative informational, storybooks, and dual purpose*.

In Table 1, *Donovan and Smolkin's SITB Categories*, I provided a description and examples of books for each of Donovan and Smolkin's (2002) categories for SITBs.

Table 1. Donovan and Smolkin's SITB Categories.

Categories	**Non-narrative Informational**	**Narrative Informational**	**Storybooks**	**Dual-Purpose**
Description	-expository structures -hierarchy of topics and subtopics rather than sequenced events -no storyline, plot, or characters -use of timeless or present tense verbs	-narrative delivery of information -sequenced factual events -occurrences over time	-includes stories with typical story elements -setting & characters -identifiable plots -scientific information conveyed in a story	-provides mix of narrative & expository structures -features a story along with factual information displayed in sidebars or visual displays (e.g., labels, charts, lists, etc.)
Major Purpose	-to provide information	-to provide information	-for enjoyment & entertainment, with connections to science	-to present facts, as well as provide a story
Book Examples	*Pythons* (Rake, 2008) *Earthworms* (Llewellyn & Watts, 2002)	*Life Cycles Pumpkins* (Nelson, 1991) *Life Cycle of a Kangaroo* (Royston, 2009)	*Baby Whale's Journey* (London, 1999) *Snowflake Bentley* (Martin, 1998)	*The Quicksand Book* (dePaola, 1999) *The Magic School Bus On the Ocean Floor* (Cole, 1992)

In Table 1, Donovan and Smolkin (2002) described *non-narrative informational* books as containing a hierarchically of topics and subtopics. An example of a non-narrative book is *Pythons* (Rake, 2008) that focused on the topic of pythons and provided subtopics, such as the python's habitat, appearance, ability to climb trees, food source, and life cycle, to address the

many facets of the python's life. This book included a world map to show where pythons are located, full-page photographs, realistic drawings, glossary, index, and resource guide for pythons, information in sidebars, glossary and index. Further, Donovan and Smolkin described *narrative informational* books as having a narrative delivery of factual information that sequenced events over time with a primary purpose to deliver information. For example, *Life Cycles Pumpkins* (Nelson, 2009) is a narrative account of the life cycle of pumpkins, explaining that pumpkins begin as seeds, then over time, roots, shoots, leaves, vines, buds, and yellow flowers grow until the new pumpkins finally develop. This book contained simple text, large font, full-page photographs, pumpkin facts, glossary, and an index. The *storybooks* category differs from the other categories, in that its primary purpose is for enjoyment and entertainment with scientific information embedded in its story. For instance, in *Baby Whale's Journey* (London, 2007), scientific information was conveyed in the story of a mother sperm whale and her baby as they traveled from the coast of Mexico towards Alaska with their pod. During their trip, the sperm whales fought off killer whales, communicated with sounds, and had a giant squid for dinner. This was an entertaining story, but also provided information about the sperm whale's life cycle, habitat, diet, predators, and more. Finally, Donovan and Smolkin described *dual-purpose* books as having a mix of narrative and expository features and structures, with factual information displayed in sidebars, charts, lists, diagrams, and labels that can be accessed whether or not the story in the book is read. The foremost purpose of dual-purpose books is to present a story, as well as factual information. For instance, *The Quicksand Book* (dePaola, 1977) is a dual-purpose book, providing a humorous story of a little girl sinking in quicksand in the jungle, while a boy stood nearby explaining quicksand facts and a monkey provided charts, diagrams, and lists of information on this topic. The characters' talk was captured in speech bubbles with

simple text, and colorful illustrations, which provided an interesting context for the story.

Evaluation of SITBs. Recently, there has been an influx of attractive, beautifully illustrated, and interesting SITBs from the publishers designed for children in the primary grades (Dreher & Voelker, 2004, Moss, 2003). But how do teachers know if they are selecting quality informational books that are appropriate for literacy and science instruction in the primary grades? Several researchers have consistently noted three salient concerns as worthy of attention when selecting SITBs for the primary literacy/science curricula: content, writing, and design (Donovan & Smolkin, 2002; Dreher & Voelker, 2004; Moss, 2003; Pappas, 2006; Saul & Dieckman, 2005).

Content. To evaluate the content of SITBs, three important areas must be examined: accuracy, authority, and appropriateness. (Donovan & Smolkin, 2002; Dreher & Voelker, 2004; Galda et al., 2010; Gill, 2009; Moss, 2003; Saul & Dieckman, 2005).

When addressing accuracy, the information presented in SITBs should be carefully checked as being correct, valid, and up to date (Atkinson et al., 2009; Galda et al., 2010; Gill, 2009; Moss, 2003). Moss (2003) advised comparing text information with that in an encyclopedia or consulting with local experts. Other important issues related to accuracy include assessing for the amount of stereotyping or bias presented in the informational book in terms of race, class, and gender (Dreher & Voelker, 2004; Saul & Dieckmen, 2005). Additionally, accuracy of illustrations are carefully analyzed for realistic pictures in natural settings and appropriate to actual size in relation to known items (Dreher & Voelker, 2004; Gill, 2009).

In order to establish authorial credibility, how the authors established the facts they present in their books needs to be determined (Donovan & Smolkin, 2002; Dreher & Voelker, 2004; Galda et al., 2010; Gill, 2009; Moss, 2003). Methods for doing this include analyzing

quotes made in the text and determining reliable sources for the information presented. Science concepts are scrutinized and the credibility of the author is attempted to be validated by expertise, authorities consulted, book awards, etc. Additionally, book covers are analyzed for evidence of a credentialed author or illustrator (Dreher & Voelker, 2004). Moss (2003) suggested teachers need to evaluate the expertise of the author, and, if possible, the extent of research done by the author for their subjects. For example, authors sometimes give credit to the experts they consulted in the preliminary pages of the book.

When selecting SITBs that are appropriate for primary students, teachers need to attend to the book's complexity, technical vocabulary, and purpose (Donovan & Smolkin, 2002; Gill, 2009; Moss, 2003; Sudol & King, 1996). Donovan and Smolkin (2002) conducted a systematic analysis of SITBs, during which they evaluated their complexity and readability. As a result of this analysis, they determined that linguistically oriented concepts (e.g., the depth and breadth of ideas, explicit or implicit ideas, and readability) had an impact on the complexity of SITBs. Further, they found explicit and implicit informational ideas influence the depth of information presented. For example, Donovan and Smolkin noted the sentence, "After a few months the snow has melted. It is really spring," from the book, *The Tiny Seed* by Eric Carle (1987), had implicit information that snow usually melts in spring. Further, they explained the number of implicit ideas in a SITB adds to its complexity. Thus, how many implicit ideas in a SITB is an important consideration when choosing appropriate SITBs for instruction or for children to read on their own. Furthermore, teachers will need to take time to make explicit the implicit ideas that their students are unfamiliar with in SITBs used in their literacy and science curricula.

Donovan and Smolkin (2002) also explained that readability is another important consideration of the complexity of SITBs and involves more than syllables and sentences.

Important factors for readability include a reader's motivation, background knowledge, and familiarity with related technical vocabulary. For example, children who have experiences with SITBs for a particular subject, such as bees, would most likely be able to pick up a SITB on bees and understand the implicit ideas and terms found within this book more so than a students without these experiences. Overall, Donovan and Smolkin advised teachers to use caution when choosing SITBs, in order to avoid books that have heavy concept loads and unsuitable readability levels. Primary grade children can become frustrated and inattentive with SITBs that are too complex and above their readability level (Palmer & Stewart, 2003).

When selecting SITBs for their literacy/science curricula, teachers also need to be concerned with how technical vocabulary is presented and supported by the text, illustrations, or other multimodal features (Donovan & Smolkin, 2002; Hall & Sabey, 2007; Ness, 2011; Smolkin & Donovan, 2005; Sudol & King, 1996). For example, researchers recommended teachers examine SITBs for: (a) technical vocabulary introduced and defined in the main text; (b) technical vocabulary depicted in photographs, illustrations, graphs, or diagrams; (c) technical vocabulary defined or described with captions, labels, tables, or sidebars; and (d) technical vocabulary defined in a glossary (Smolkin & Donovan, 2005; Sudol & King, 1996). Further, it's recommended that teachers examine SITBs before selecting them to identify technical vocabulary that students may struggle with and determine appropriate ways to present technical vocabulary within the context of the book (Beck et al., 2013; Hall & Sabey, 2007). Smolkin and Donovan (2003) pointed out that frequently SITBs present technical vocabulary in more depth than content area textbooks. Further, they noted teachers have opportunities to expand on and clarify it more using examples from the book. Teachers should consider SITBs that provide ample support for technical vocabulary through its various text features and structures.

In their analysis of SITBs, Donovan and Smolkin (2002) recommended teachers choose specific categories (i.e., non-narrative informational, narrative informational, storybooks, and dual purpose) of SITBs for particular instructional purposes. For example, teachers could appropriately choose non-narrative SITBs (e.g., *Whales,* Simon, 2006) that are typically structured with topics/subtopics, generic nouns, timeless present-tense verbs, and technical vocabulary to focus on particular science concepts, scientific language, and text features during instruction. Furthermore, narrative SITBs that demonstrate factual events over a period of time, would be an appropriate selection to teach a science concept such as the life cycle of a plant (e.g., *From Seed to Plant*, Gibbons, 1991). Or a dual-purpose book (e.g., *Magic School Bus, Inside the Human Body,* Cole, 1989) with a storyline, as well as information displayed in sidebars, would be appropriate to engage reluctant readers in an entertaining story to introduce or reinforce pertinent science information. Furthermore, Donovan and Smolkin recommended selecting informational storybooks to add interest and relate to children's lives when introducing or elaborating on a scientific topic, such as introducing a thematic unit on butterflies with Carle's, *The Very Hungry Caterpillar* (1969).

Writing. When examining SITBs, the craft of writing is an important consideration (Donovan & Smolkin, 2002; Dreher & Voelker, 2004; Gill, 2009; Moss, 2003; Saul & Dieckman). For instance, the author's commitment to the topic can often be revealed in his or her passionate writing of it. Moss (2003) contends that well-crafted books use voice and literacy devices, such as artistry, to engage the reader, bring the book to life, and create believable and vivid worlds that children want to enter. Examples of these devices include: (a) allowing readers to hear the voice of the author behind the information; (b) using a combination of narrative and expository techniques, such as prose or poetry; (c) using figurative language, such as metaphors

and similes to create comparisons; and (d) creating hooks to draw in the reader at the beginning of a book or chapter (Moss, 2003). Writing is also examined for language usage, such as appropriate vocabulary for the level of the reader (Dreher & Voelker, 2004).

Another consideration is unity and coherence, which are vital to the quality of writing in SITBs (Sudol & King, 1996). Sudol and King explain that cohesive text ideas require presentation in a unified and logically ordered manner both within the paragraph and the text as a whole. Moreover, sentences have a logical connection to each other and irrelevant details are avoided.

Design. To evaluate the design of SITBs, two important areas must be examined: attractiveness and visual representations (Dreher & Voelker, 2004; Gill, 2009; Moss, 2003; Ness, 2011; Saul & Dieckman, 2005; Sudol & King, 1996).

Moss evaluated the design of SITBs by their attractiveness or "kid-appeal" (2003, p. 41). She explained that attractiveness is affected by how the author creates an interesting appearance that gets the attention of young readers. For example, text layouts of information on the pages, along with font style and size, influence children's responses to SITBs (Dreher & Voelker, 2004; Gill, 2009; Moss, 2003). Additionally, researchers recommended SITBs are examined for reasonable chapter or segment lengths, page numbers, and clearly identified terms (Dreher & Voelker, 2004; Gill, 2009). Further, the added text (i.e., pages before and after the book's main text) is examined for its endpapers, table of contents, index, glossary, etc. Researchers also suggested to examine SITBs for a predominant organization pattern or structure, such as comparison/contrast, problem/solution, time order, enumeration/description, or cause and effect that is often incorporated in various categories of SITBs to enhance its organization (Ness, 2011; Moss, 2003; Sudol & King, 1996).

Furthermore, the design of important visual representations should be examined for visual organization and integration of text and illustration (Galda et al., 2010; Gill, 2009; Saul & Dieckman, 2005). For instance, Dreher and Voelker advised that illustrations have clear captions and labels to inform the reader of important information that requires attention. Furthermore, researchers recommended graphics are examined (e.g., as charts, tables, figures, and maps) to ensure they can be easily referenced and understood (Gill, 2009; Dreher & Voelker, 2004). Moreover, graphics should also have a clear purpose and relate to the text (e.g., explain, extend, or emphasize important scientific information in the text).

Atypical and typical SITBs. Primary teachers need to consider the diversity of SITBs when using the above criteria for appropriateness, writing, and design to evaluate and choose SITBs for their literacy/science curricula (Atkinson et al., 2009; Donovan & Smolkin, 2002; Pappas, 2006). For instance, Pappas (2006) described two types of SITBs, i.e., "typical" and "atypical," (p. 233, 240), that are distinguished by their text features, structures, and organization. Typical SITBs have an expository design with four obligatory elements: topic presentation, descriptive attributes, characteristic events, and a final summary. In typical SITBs, you would also expect to find generic nouns/pronouns, timeless present-tense verbs, technical vocabulary, diagrams, labels, table of contents, index, glossaries, etc. Furthermore, in typical SITBs you would find factual information in topics and subtopics with organization patterns, such as comparison/contrast, problem/solution, time order, enumeration/description, or cause and effect (Ness, 2011; Moss, 2003; Sudol & King, 1996). Therefore, it is important teachers choose and evaluate typical SITBs with an understanding of their expository features, structures, and organization and consider how appropriately they fit their instructional purposes.

However, in atypical SITBs, you find a mix or hybrid of expository and narrative structures that contains information along with linguistic features, such as a storyline or poetic language (Donovan & Smolkin, 2002; Pappas, 2006). Therefore, with atypical SITBs, you would evaluate the narrative aspects of the book (e.g., story development, figurative language, creative writing style, cohesiveness), as well as the expository features (e.g., sidebars of information, scientific language, organizational patterns) and how well they work together to present scientific information (Atkinson et al., 2009; Gill, 2009; Moss, 2003).

Pappas (2006) pointed out a caveat for teachers' selection of SITBs for literacy/science instruction. Pappas argued that although atypical SITBs are useful and engaging, teachers should not exclusively choose them over typical SITBs. According to Pappas (2006) "Children cannot truly learn science unless they also learn the distinctive language of science, and using only stories or hybrid books will not accomplish such a goal" (p. 246). Overall, primary teachers need to make informed choices for SITBs that best serve their instructional purposes, attend to their students' needs, and meet the criteria for appropriateness, writing, and design.

The Role of SITBs in the Primary Classroom

This section highlights important research studies relevant to how SITBs are used in the primary literacy and science curricula. It is organized in two sections: (a) primary teachers' practices with SITBs, in which I discuss studies examining primary teachers' book choices, perceptions for practices with SITBs, and their instruction with SITBs; and (b) primary students' practices and interactions with SITBs, in which I discuss studies examining primary students' engagement, interactions, response to instruction, and students' informational compositions for SITBs in the primary literacy/science curricula in the primary classroom.

Primary teachers' practices with SITBs. With the boom of high-quality nonfiction available for primary students (Moss, 2003; Rearden and Broemmel, 2008), research suggests primary teachers have formed perceptions about SITBs that may have influenced their selection and use of these texts in the primary literacy/science curricula (Donovan & Smolkin, 2001; Duke, 2000; Fisher & Hiebert, 1990; Jacobs et al., 2000; Jeong et al., 2010; Ness, 2011; Palmer & Stewart, 2003; Yopp & Yopp, 2006; 2012). In this section, I discuss studies that have suggested primary teachers' book choices and teaching practice are related to their perceptions and lack of experience with informational texts. I also discuss studies that demonstrated teachers using SITBs with interactive read-alouds during literacy/science units of studies, as methods for scaffolding primary students' understanding of science, and to develop their awareness of text features and structures within informational books (Bradley & Donovan, 2010; Donovan & Smolkin, 2001; Maloch & Beutel, 2010; Pappas & Varelas, 2009; Pappas & Varelas, 2004; Smolkin & Donovan, 2003; Varelas & Pappas, 2006).

Primary teachers' book choices. A number of studies have demonstrated considerable evidence teachers prefer storybooks over informational books for their reading instruction (Duke, 2000; Fisher & Hiebert, 1990; Jacobs et al., 2000; Jeong et al., 2010; Ness, 2011; Palmer & Stewart, 2003; Yopp & Yopp, 2006; 2012). For instance, during Fisher and Hiebert's (1990) qualitative investigation of literacy instruction in eight second-grade and sixth-grade classrooms, they found almost all instruction and materials read or written by students involved stories and there was little interaction with expository texts. Furthermore, in a descriptive study, Duke (2000) examined 20 first-grade classrooms four times over the course of a year for the types of reading materials in classroom libraries, on classroom walls, with attention to the length of time spent with informational text during language activities. Overall, Duke found "a scarcity of

informational text" (p. 203) in classroom print environments and the language arts curriculum, with a mean of only 3.6 minutes per day spent on written language activities that involved informational text. Moreover, Jacobs et al.'s (2000) survey using quantitative design investigated 1,874 elementary teachers' (K-6) read-aloud practices and the types of books they read aloud over the past 10 days. Jacobs and colleagues reported a consistent finding that few teachers in primary grades read-aloud informational books to their students, and informational books were used only three out of the 10 days that were investigated.

More recently, Yopp and Yopp (2006) conducted two simultaneous descriptive studies using quantitative methods to investigate: (a) 1,144 primary teachers' read-aloud choices during a one-day workshop through a simple survey on index cards; and (b) the types of books kindergarteners read at home according to their monthly reading-logs. In study one, the findings indicated that informational text made up a small proportion of read-alouds in the primary classrooms in comparison to narrative texts. Furthermore, in study two, Yopp and Yopp found the kindergarten students mostly read fiction at home with little exposure to informational trade books. Moreover, Yopp and Yopp (2012) did a follow-up study that examined the teachers' read-aloud choices of informational books in the previous study (Yopp & Yopp, 2006). Yopp and Yopp's (2012) analysis revealed 75% of the informational books teachers had chosen to read aloud in the previous study were SITBs that were about topics in life science, and 16% were about topics in earth and space science.

Similar to Duke's (2000) descriptive study methods, Jeong et al. (2010) examined informational text in 15 second-, third-, and fourth-grade classrooms' libraries, displays, and during instruction with attention to time spent with informational text during language activities. Jeong et al. visited each classroom one to two times to inventory texts and spent approximately

four hours total observing participants during language activities and instruction. Overall, Jeong et al. found a larger proportion of narrative books than informational books included in the environmental print and classroom libraries in all 15 classrooms. In addition, instructional time with informational text averaged one minute in second grade, and an average of 16 minutes in grades three and four. Although there was a higher proportion of narrative texts across grade levels, Jeong et al. found a slight move toward informational text used in instruction between grades two, three, and four, irrespective of their lack of availability. Although encouraging, this averaged to just 15 minutes of instruction with informational text during a school day.

Furthermore, certain limitations must be recognized for the limited studies that examined teachers' inclusion of informational books in primary classrooms (Duke, 2000; Fisher & Hiebert, 1990; Jacobs et al., 2000; Jeong et al., 2010; Yopp & Yopp, 2006; 2012). For instance, Fisher and Hiebert's (1990) qualitative study of literacy instruction in two classrooms provided insight into teachers' text choices through interviews, field notes, and student products. However, their study was limited by its short duration (i.e., one-week) and lacked descriptive data for the participants and setting. Moreover, Duke's (2000) descriptive study examined primary classrooms for informational text on the walls, in the classroom libraries, and during language arts instruction. Although Duke used a large study sample (20 classrooms) and controlled for high and low SES effects, the credibility was compromised because she didn't have access to all texts students were utilizing in the classroom. Furthermore, Jeong et al.'s (2010) descriptive study of 15 classrooms (i.e., grades 2, 3, & 4) replicated Duke's data collection methods and used interrater and interobserver agreement to strengthen their study. Although Jeong et al.'s study provided insight into the current status of informational text in primary classrooms, caution should be used to interpret the findings given that the sample was not randomly selected. Further,

Jacobs et al.'s (2000) survey provided evidence that few K-6 primary teachers introduced or read aloud informational books. The study's strengths were its rigorous sampling procedures using random sampling; however, its limitations were self-reporting bias (i.e., teachers self-reported on questionnaires) and non-responder bias (i.e., received 1,882 useable responses out of 3,600 teachers surveyed).

Yopp and Yopp's (2006) survey of primary teachers' read-aloud choices demonstrated informational texts make up a small proportion of read-alouds in primary-grade classrooms. However, the study was compromised because it took place on a single day at a teacher workshop using index cards to take a simple survey that had not been piloted. Furthermore, Yopp and Yopp's (2006) second study provided insight into the types of books kindergarteners read at home with their parents through an examination of reading logs filled in by the parents. However, this study was compounded by unclear data collection and oversimplified directions for how to fill in the reading logs. Additionally, Yopp and Yopp's (2012) analysis of primary teachers' book choices used data from their previous survey described above (Yopp & Yopp, 2006), showing teachers primarily chose SITBs in the life sciences when reading aloud SITBs to their students.

Overall, few studies have been conducted since Duke's (2000) landmark study to provide a more contemporary understanding of the extent of informational text included in primary classrooms and in primary literacy/science instruction. Jeong et al.'s (2010) and Yopp & Yopp's (2006, 2012) recent work suggested narrative text continues to predominate over informational text in primary classroom libraries, environmental print, and instruction. However, Jeong et al.'s (2010) descriptive study also provided some evidence that there may be a slow increase of teachers' use of informational text in language arts instruction between grades two, three, and

four, irrespective of their lack of availability. Moreover, Jeong et al.'s study represents the paucity of recent research that has evaluated the extent of informational text in primary teachers' instruction and classrooms. More research is needed for an understanding of the extent and use of informational text in today's primary classrooms.

Primary teachers' perceptions for practices with SITBs. A number of researchers have investigated the perceptions primary teachers developed for informational books (e.g., SITBs) and how these may have influenced their teaching practices with these texts during instruction (Donovan & Smolkin, 2001; Palmer & Stewart, 2003; Pappas, 1993; Ness, 2011). These studies revealed primary teachers lacked the expertise to use informational books effectively in instruction and developed assumptions informational books were too difficult for their students.

For instance, Donovan and Smolkin's (2001) descriptive study investigating 10 elementary teachers' perceptions for using SITBs in their science curriculum, revealed teachers had formed assumptions that science was boring and SITBs were too difficult for their students. Further, they found teachers chose informational storybooks and dual purpose SITBs (e.g., Cole's Magic School Bus book series) over other types of SITBs with more expository structures and features (e.g., non-narrative SITBs) in order to make science more exciting. Moreover, Donovan and Smolkin found teachers in their study did not attend to the features and structures in SITBs, but chose books mainly to add feeling to science. These findings led Donovan and Smolkin to suggest teachers need training that helps them become aware of SITB's categories, purposes, and textual distinctions to prepare them to choose from a fuller range of SITBs.

In addition, Palmer and Stewart's (2003) qualitative study of one school's librarian, 11 primary teachers, and 31 students demonstrated the primary teachers perceived SITBs as too difficult for their students. The three themes that emerged were: (a) inappropriately leveled

informational trade books, (b) teachers served as an information broker and read aloud difficult informational trade books to interpret their meaning, and (c) the inclusion of informational trade books that contained heavy concept loads. One teacher commented, "I have to read to my students. Most nonfiction books are too hard for them" (p.42). Palmer and Stewart concluded that teachers need training for how to select and use informational trade books effectively in the primary literacy and content area curricula.

More recently, Ness' (2011) survey of 318 K-5 teachers brought fresh insights for teachers' perceptions and practices with SITBs. Ness found teachers' perceived their biggest challenges for informational trade books were technical vocabulary, complex text features, students' lack of background knowledge, time restraints, and lack of book resources. For example, one first grade teacher self-reported that the challenging vocabulary of SITBs, "almost ensured that my students wouldn't comprehend" (p. 42). Besides reporting challenges with informational trade books, teachers also reported benefits, such as new knowledge, increased literacy skills, and increased motivation to read nonfiction. Ness concluded her findings indicated teacher training is needed to equip teachers with instructional practices for the challenging vocabulary, text structures, and general comprehension problems posed by informational trade books.

In sum, research indicated teachers perceived nonfiction as too difficult for primary students and have primarily chosen narrative texts for reading instruction (Duke, 2000; Jacobs et al., 2000; Jeong et al., 2010; Yopp & Yopp, 2006). Further, in an attempt to add feeling to science, teachers in Donovan and Smolkin's (2001) study selected informational storybooks and dual-purpose books rather than embrace the full range of SITBs available. Moreover, the teachers in Palmer and Stewart's study chose nonfiction above students' reading levels with

heavy concept loads; and they took on the role of "information broker" to read aloud SITBs and interpret them for their students (p. 42). However, Ness (2011) found evidence that although teachers perceived certain challenges with SITBs (e.g., technical vocabulary, complex text features, lack of background knowledge, time restraints, and lack of book resources), they also recognized some benefits for SITBs (e.g., new knowledge, increased literacy skills, and increased motivation to read nonfiction).

This examination of research demonstrated serious limitations in what can be concluded from the few studies conducted on teachers' practices for SITBs. For instance, Donovan and Smolkin's (2001) descriptive study of 10 elementary teachers' choices of SITBs at a half-day workshop included rich descriptive data and researcher reflexivity; however, it was limited by its small sample size, brief duration, and use of short questionnaires. Further, the participants chose books from pre-determined text-sets that limited their choices of books and could have influenced their perceptions and comments during the study. Additionally, Palmer and Stewart's (2003) qualitative study provided insight into the perspectives and practices of one school's librarian, 11 primary teachers, and 31 students for informational trade books. Although the study was strengthened by its longevity (i.e., over the course of a year); triangulation of data (i.e., observations, interviews, and artifacts); and direct quotes from the participants, it cannot be assumed that the participants' perceptions and practices are represented by other librarians, teachers, and students in other settings. Furthermore, Ness' (2011) survey using mixed methods and open-ended questionnaires provided fresh insights into 318 K-5 teachers' perceptions and attitudes regarding SITBs; however, it's limitations were self-reporting bias and non-responder bias. For instance, teachers may have self-reported what they thought were "correct" responses. Moreover, it is difficult to know if the participants' responses represent the perspectives and

attitudes of other K-5 teachers at large.

In general, there is a scarcity of research examining primary teachers' perceptions and practices with SITBs. Further, research conducted thus far addressing these issues, is limited by its inconsistencies and questionable study methods. Further, research much consider an emerging school curriculum being adopted nationwide, which places informational texts in an important position in literacy instruction (Common Core State Standards Initiative, 2010). As the role of SITBs evolves in today's primary classrooms, more research is necessary to understand how primary teachers reconsider informational texts (e.g., SITBs) in their literacy/science curricula.

Primary teachers' instruction with SITBs. As previously noted, research indicated primary teachers have chosen storybooks or narrative texts for literacy instruction over informational texts in general (Duke, 2000; Jeong, 2010; Pappas, 1993; Yopp & Yopp, 2006). However, research further suggested exposing young children to informational texts provides them with early access to expository text structures, scientific language, and important subject-area concepts that will prepare them for higher grades and later in life (Duke, 2000; Hall & Sabey, 2007; Moss, 2005; Smolkin & Donovan, 2003). In this section, I presented a number of studies that described and examined interactive read-alouds as methods for sharing SITBs with primary students and using these texts in the primary literacy/science instruction (Bradley & Donovan, 2010; Donovan & Smolkin, 2001; Maloch & Beutel, 2010; Pappas & Varelas, 2009; Pappas & Varelas, 2004; Smolkin & Donovan, 2003; Varelas & Pappas, 2006).

Interactive read-alouds. Two common terms used in the literature in reference to reading aloud SITBs are "interactive information book read-alouds" (Smolkin & Donovan, 2003, p. 27) and "dialogically-oriented read alouds" (Varelas & Pappas, 2004, p. 164). Both terms refer to a read-aloud method for SITBs with the same purposes and procedures. The difference between

these two terms is the different language used to describe the interactive read-aloud by different researchers. For the purposes of my study, I mostly refer to both terms as "interactive read-alouds," with the exception of instances I reference studies (e.g., Smolkin & Donovan, 2003; Varelas & Pappas, 2004), in which researchers refer to these specific terms in their work. To further clarify, I provided the researchers' description for each term below.

Smolkin and Donovan (2003) described "interactive information book read-alouds" (p. 27) as read-alouds, in which the teacher "shares, not abandons, authority with the children during the reading of the book" (p. 28). For example, during information book read-alouds, the teacher reads aloud the text while allowing students to ask questions; interact with the text and each other; share personal experiences related to the text; make connections to their lives and the real world, and partake in conversations to co-construct meaning of the text. According to Smolkin and Donovan, "interactive read-alouds not only support co-construction of meaning, but also provide teachers with the opportunity to model expert meaning-making, reasoning, and comprehension processes" (p. 28). Further, Smolkin and Donovan (2003) gave emphasis to SITBs as the impetus for primary children's "spontaneous questions, reflections, and connections, as well as teachers' decisions to model, scaffold, or direct attention to certain aspects, information, or connections" (p. 29). Moreover, Smolkin and Donovan stressed four key elements that are essential to the interactive information book read-aloud, which are: "interaction, information books, teacher awareness of text features, and time for in-depth readings" (Smolkin & Donovan, 2003, p. 25).

Another term closely related to Smolkin and Donovan's interactive information book read-alouds is "dialogically-oriented read-alouds" (Pappas & Varelas, 2004, p. 164). During dialogically-oriented read-alouds, SITBs are "shared in dialogic ways" where both the teacher's

and children's voices are heard (Varelas & Pappas, 2006, p. 212). For instance, children have freedom during the read-aloud to present their comments, ideas, and questions. Further, teachers scaffold their understandings by asking for clarification, expanding on partial responses, helping with incorrect responses, and encouraging dialogic talk for co-construction of meaning. Thus, both the teacher and students have important roles for questioning, discussing, debating, and interacting with the text and each other to develop understandings of scientific language and concepts. Furthermore, students are encouraged to share personal experiences and make intertextual connections (i.e., where students or the teacher refer to another text as they engage with a text during a read-aloud). In these instances, other texts could refer to prior lessons, other books, instances in the real-world, television, photographs, etc. (Varelas & Pappas, 2006). In the following section, I reviewed studies that have examined how teachers share and use SITBs during interactive read-alouds for their primary literacy/science instruction.

Teaching tools for comprehension. Smolkin and Donovan (2001) conducted a two-year case study that examined a first-grade teacher interactively reading aloud six SITBs and six storybooks for two consecutive years in two different first-grade classrooms. In both classrooms, the researchers found interactive information book read-alouds of SITBs prompted more responses to comprehension than read-alouds of storybooks. For example, during the first-grade teacher's interactive information book read-aloud of SITB, *The Popcorn Book* (dePaola, 1978), a child began a discussion by asking the question, "What's a kernel?" (p. 109). The first-grade teacher responded, "excellent question" and then used this question to model a comprehension strategy, "Let's read and we'll see if this (book) answers that question," and provided an alternative, "and if not, we'll talk about it at the end" (p. 109).

Overall, Smolkin and Donovan's (2001) case study demonstrated a first-grade teacher

modeling numerous acts of comprehension during interactive information book read-alouds of SITBs, such as rereading, rephrasing, and summarizing the text. Further, she scaffolded students' meaning-making efforts through her questioning, mental imagery, and analogies. Additionally, as questions arose during read alouds, the first-grade teacher created hypotheses that required students to continue reading to see if they were correct. Moreover, the interactions between the first-grade teacher and students were unplanned and arose in response to students' questions and responses to the text during the read-alouds.

Smolkin and Donovan (2003) further suggested interactive information book read-alouds of SITBs provided both nonreaders and nonfluent readers support during a "comprehension acquisition" phase, defined as "an instructional period that precedes actual comprehension strategy instruction" (p. 26). For instance, Smolkin and Donovan argued interactive information book read-alouds of informational books benefited nonreaders and nonfluent readers by building their inferential and reasoning skills, as well as adding to their background knowledge and understanding of the text. Thus, they suggested interactive information book read-alouds of SITBs could provide a foundation for nonreaders and nonfluent readers' meaning-making processes, as well as provide students with access to information and ideas beyond their reading abilities. Further, interactive read-alouds have the potential to provide students access to complex text structures that supports primary students' comprehension by providing a framework or schema for predicting organizational patterns or types of structures for how the information will be presented (e.g., Pappas, 2006; Pearson, Roehler, Dole, & Duffy, 1992). Therefore, an awareness of text structure is an important comprehension strategy when reading various types of texts (Smolkin & Donovan, 2003).

Several other studies demonstrated how teachers used interactive read-alouds to model comprehension strategies, text structures, and technical vocabulary, as well as model informational composition (Bradley & Donovan, 2010; Coleman et al., 2012). For instance, Santoro et al.'s (2008) qualitative study of comprehension development and vocabulary growth examined first graders engaged in interactive read-alouds of both informational and narrative books. Teachers read aloud SITBs associated with science units to teach comprehension strategies (i.e., retelling and summarizing), model text structures, discuss vocabulary, and encourage dialogic interactions with the texts. Overall students that partook in the interactive read-aloud sessions demonstrated longer retellings with more elaboration. Further, during Bradley and Donovan's descriptive study (2010) of second graders' informational compositions, Bradley served as a visiting science and writing teacher for three weeks in a second grade classroom. During the study, Bradley used SITBs as writing models during interactive read-alouds, in which second graders discussed, explored, and interacted with text features in SITBs during a weather unit. The second graders then composed their own information books using the knowledge they gained about text features during the read alouds (Coleman et al., 2012). Bradley and Donovan found students patterned and organized their own compositions of information books after the books read aloud, as well as included several of the text features displayed in these texts that included scientific information.

Intertextuality. Several studies examined how primary teachers used "dialogically-oriented read-alouds" (Pappas & Varelas, 2004, p. 164) in their literacy/science instruction to model comprehension skills and help students make intertextual connections to the text through their discussions of personal experiences. Varelas and Pappas (2006) defined intertextuality as, "making sense of the texts from other contexts that children and teachers bring to, and instantiate

in, the read-aloud sessions of the unit, as they juxtapose these meanings with the meanings from the current texts" (p. 215). Varelas and Pappas' (2006) qualitative, interpretive study examining intertextuality during dialogically-oriented read-alouds of SITBs, demonstrated teachers modeled comprehension strategies, rephrased ideas, and encouraged intertextual connections using mental imagery. For example, one teacher used the mental image of leaves moving through the air to help students visualize the force of wind. Overall, Varelas and Pappas' (2006) findings led them to conclude that it is necessary "to create spaces for children to use both narrative and scientific language to make sense and talk science" (p. 252).

Further, in another descriptive study, Pappas and Varelas (2009) observed a first-grade teacher create opportunities for her students to make intertextual connections and co-construct scientific ideas during a dialogically-oriented read-aloud of the SITB *Earthworms* (Llewellyn, 2000). During the read-aloud, the first-grade teacher pointed to illustrations, read captions, and paused to allow students opportunities to imitate the text and share personal experiences. Moreover, the first-grade teacher used the SITB as a teaching devise during the read-aloud and encouraged "dialogic nature of talk" (p. 203), where she and her students "co-constructed scientific ideas" (p. 203). For example, when the teacher read the heading "Finding Earthworms," she again paused, which encouraged first graders to share personal experiences about where they found earthworms, such as in their backyard and garden. The teacher extended dialogue by confirming students' remarks, repeating a portion of their comments, and asking questions. This and other dialogically-oriented read alouds were part of an integrated forest science unit that offered multiple ways for first graders to make intertextual connections (e.g., hands-on explorations, science/literacy journal, and students' compositions of information books).

Teaching tools for graphical and pictorial representations. Another layer of research has investigated how teachers and students make meaning of graphical and pictorial representations (e.g., pictures, charts, diagrams, graphs) in informational books during instruction (Coleman et al., 2012; McTigue & Flowers, 2011; Ness, 2011). For instance, Ness (2011) found in their survey of 388 K-5 teachers that although teachers used graphics during science instruction, they often did not explicitly teach students how to interpret and communicate the information in them. Furthermore, this survey revealed the most common practice for teaching graphics in SITBs was simply pointing to or making references to graphical representations in SITBs. Moreover, McTigue and Flowers' (2011) exploratory study of 30 students' (in grades 2, 4, and 6-8) perceptions and ratings of graphic representations in science textbooks led them to discover that young children frequently misinterpret science diagrams and that their interpretation skills for such graphic representations are not intuitive. Thus, based on their findings, McTigue and Flowers recommended that instruction for graphics be included in reading comprehension instruction for SITBs, and that teachers needed training for this.

Adding to this research, Coleman et al. (2012) examined a science/literacy teacher provide instruction for visual representations (e.g., pictures, diagrams, maps) in five SITBs during a weather unit that lasted three weeks in a second-grade classroom. Coleman et al. found the teacher's skillful modeling of her interpretive processes for the graphical and pictorial representations during interactive read-alouds facilitated students' ability to appropriately use and explain similar graphic and pictorial representations in their own compositions of science information books. Moreover, their findings led them to conclude, "Simply pointing to graphical representations in text is not the level of scaffolding needed for children to understand and use them effectively" (Coleman et al., 2012, p. 35). Overall, research underscores the importance of

explicit instruction where primary teachers model and scaffold students' ability to interpret and communicate visual representations in SITBs (Coleman et al., 2012; McTigue & Flowers, 2011).

Summary for primary teachers' instruction with SITBs. Numerous studies described interactive read-alouds, as a method for the teacher to read aloud SITBs, in which he or she prompts students to shared ideas during conversations of the text, interact with the text, connect the text to their lives, and co-construct knowledge of science (Malock & Beutel, 2010; Smolkin & Donovin, 2001, 2003; Pappas & Varelas, 2004, 2009). Furthermore, teachers used SITBs during interactive read-alouds, as models for comprehension strategies, text features, informational composition, scientific language, and visual representation (Coleman et al., 2012; Pappas & Varelas, 2009; Smolkin & Donovan, 2001; Varelas & Pappas, 2006). Overall, Donovan and Smolkin (2003) describe the four key elements for interactive types of read-alouds with SITBs as "interaction, information books, teacher awareness of text features, and time for in-depth readings" (p. 25).

In addition, interactive read-alouds of SITBs were used as part of integrated literacy/science units (e.g., Bradley & Donovan, 2010; Coleman et al., 2012; Pappas and Varelas, 2009) to provide primary students with various activities involving reading, thinking, drawing, writing, and hands-on activities for sharing and learning science. In particular, this research showed teachers used SITBs during interactive read-alouds as models for students' own compositions of science information books (Bradley & Donovan, 2010; Coleman et al., 2012; Pappas & Varelas, 2009). Furthermore, these studies demonstrated primary students' ability to compose information books that included scientific language, visual representations, important science information, expository organization, and text features.

Certain limitations must be acknowledged for the few studies conducted for primary

teachers' use of SITBs during interactive read-alouds (Smolkin & Donovan, 2001, 2003;Varelas & Pappas, 2006, Pappas & Varelas, 2009) in the literacy/science curricula. For instance, Smolkin & Donovan's (2001) case study examined a single teacher for two consecutive years in two different first-grade classrooms. Although insight was gained into the teachers' methods for conducting interactive information book read-alouds with SITBs and the students' responses, the findings may not necessarily be represented by other primary teachers and students in different settings. Further, Pappas and Varelas' (2009) descriptive study of primary teachers' use of SITBs during an interactive science/literacy unit on forests provided a close examination of a first-grade teacher's dialogically-oriented read-alouds with SITBs. The study's strength was its description of the participants and the study context; however, the study did not describe rigorous data collection methods. Moreover, Santoro et al.'s (2008) exploratory study of first graders' comprehension development and vocabulary growth provided a descriptive account of first-grade teachers' methods for interactive read-alouds of informational trade books; however, there was little description of the participants, setting, or data collection methods. Additionally, Varelas and Pappas' (2006) qualitative, interpretive study examined intertextuality in dialogically-oriented read-alouds of SITBs in a particular setting (i.e., two primary-grade classrooms) with purposeful selection of SITBs to encourage children's exploration of scientific ideas. However, the researchers acknowledged they could not ascertain how other participants in different settings with different SITBs would make intertextual connections during dialogically-oriented read-alouds.

Overall, more research is warranted that provides qualitative methods over longer periods of time, with in-depth interviews and first-hand observations to better understand teachers' use of SITBs in the literacy/science curricula. Further, more quantitative research through experimental

design offering a comparison of read-aloud methods, comprehension instruction strategies, and the inclusion of SITBs in the primary literacy/science curricula could provide evidence of the effectiveness of teaching methods and strategies, such as the interactive read aloud (Smolkin & Donovan, 2001, 2003; Varelas & Pappas, 2006).

Primary students' perceptions and practices for SITBs. Several researchers have probed into primary students' perceptions and practices for SITBs. Most of these studies have used qualitative methods to observe primary students interacting with the teacher, other students, and the text during read-alouds of SITBs (Bradley & Donovan, 2010; Smolkin & Donovan, 2001; 2003; Varelas & Pappas, 2006; Pappas & Varelas, 2009). However, I also reviewed Morrow et al.'s (1997) experimental study of third-graders' learning gains in a science-literacy program, as representational of the paucity of quantitative research examining the role of informational texts in primary science and literacy instruction. In particular, Morrow et al. examined how students responded to three different teaching methods that included or excluded science informational books. In the following section, I review studies examining primary students' engagement, interactions, practices, and abilities with SITBs.

Engagement and interactions with SITBs. A number of qualitative studies examined primary students' interactions with SITBs and the perceptions and attitudes they developed toward them (e.g., Duke & Kays, 1998; Pappas, 1993; Pappas & Varelas, 2004; Varelas & Pappas, 2006, 2009). For example, Pappas' (1993) landmark study challenged popular belief that children learn best with narrative texts, when she demonstrated young children's ability to use and interact with the features and structures of informational texts. In her qualitative analysis of 20 kindergarteners' pretend readings of two informational trade books and two stories after read-alouds, Pappas found kindergarteners were just as capable of distinguishing lexical features and

structures in their pretend readings of information books as they were in narrative books. Another strong finding was that kindergarteners consistently chose informational trade books over storybooks when asked to choose which book they liked better during data collection sessions (i.e., 13 out of 20 preferred information books in session one, and 15 out of 20 preferred information books in session two). Further, Duke and Kays' (1998) seminal study with 20 kindergarteners gained attention among scholars, providing evidence that young children engaged in informational texts, preferred them, and were capable of developing and using information book language in their pretend readings following read-alouds.

Moreover, Donovan et al.'s (2000) descriptive qualitative study of first graders during recreational reading provided insight into young children's engagement and preferences for informational trade books. Donovan et al. examined first graders during recreational reading and found students self-selected SITBs on topics that interested them when given this option. The study spanned two consecutive years in two first-grade classrooms that contained extensive classroom libraries. Recreational reading was included routinely in the classrooms and children were allowed to explore books without association to grades or rewards. Rigorous data collection methods were employed during the study, and the study was strengthened by its length. However, the researchers reported they lost some relevant data during buddy-reading and some of the literacy activities.

Response to instruction with SITBs. Researchers largely examined students' responses and interactions with SITBs during instruction in the context of interactive read-alouds, in which teachers modeled comprehension strategies; provided opportunities for intertextual connections, and encouraged dialogic talk (Smolkin & Donovan, 2001, 2003; Pappas & Varelas, 2004; Varelas & Pappas, 2006). For instance, Smoklin and Donovan's (2001) two-year case study of a

first-grade teacher's comprehension instruction showed first-grade students interacted with SITBs during interactive read-alouds (e.g., shared personal experiences, asked questions, discussed technical vocabulary, analyzed pictorial and graphic representations, discussed textual features, made intertextual connections); as the teacher modeled comprehension strategies (e.g., questioning, mental imagery, analogies, rereading, rephrasing, and summarizing). During their study, Smoklin and Donovan found students made more responses to comprehension instruction for SITBs than comprehension instruction for storybooks (i.e., students made 395 comprehension-coded moves during read-alouds for SITBs, and 170 comprehension-coded moves for storybooks).

In addition, Varelas and Pappas (2006) used qualitative discourse analysis in their interpretive study of first- and second-grade teachers' and students' dialogue during dialogically-oriented read-alouds of SITBs. Varelas and Pappas' study demonstrated: (a) students used both narrative and scientific language that evolved toward more scientific language, (b) students explored and struggled with scientific ideas associated with text during read-alouds, and (c) students validated personal meanings and made connections to scientific concepts in texts. Furthermore, teachers interacted with students (e.g., modeled comprehension skills, rephrased ideas, used mental imagery, and encouraged students to share personal experiences) during the read-alouds. Moreover, Santoro et al.'s (2008) qualitative study also examined first-grade students' interactions during interactive read-alouds of SITBs and narrative books during comprehension instruction. Teachers chose SITBs to read aloud during three science units on animals (i.e., mammals, reptiles, and insects), each lasting three weeks. During read-alouds, teachers encouraged students to participate in text-based discussions of vocabulary, text structures, and comprehension strategies (i.e., retelling and summarizing). Santoro et al. found

students who participated in the interactive-read aloud sessions had improved comprehension and vocabulary growth, with longer retellings with more elaboration and text-based examples.

Adding to the body of research on primary grade students' practices with SITBs, Morrow et al. (1997) conducted an experimental study with 128 third-graders in six classrooms, investigating the impact of a literacy/science program that integrated SITBs into science instruction. Morrow et al. found that the literature-science group scored significantly higher on literacy and science measures than the other comparison groups. They also found that students in the literature-science group elected to read science on their own and stated that science was interesting. Whereas, the literature-only group and the control group expressed little enthusiasm for science and reported that science instruction was boring in general. The limitations for this study included the use of intact classrooms with teachers who were aware of the different treatments which compromised the study's internal validity. The authors of the study commented that teachers' enthusiasm for the new program could have altered the children's' attitudes causing a novelty effect on the participants.

Informational compositions. Furthermore, Pappas and Varelas' (2009) qualitative investigation of primary students (grades 1-3) during an integrated forest unit demonstrated students co-constructed scientific ideas, made intertextual connections, explored text features, and developed scientific language during dialogically-oriented read-alouds and other shared activities. Further, as a culminating activity, the primary children constructed a multi-modal informational books on a science topic of their choice, where they successfully incorporated scientific information and nonfiction linguistic details. Their books contained accurate scientific information and nonfiction text features, such as table of contents, topics and sub-topics, illustrations, diagrams, scientific language, generic nouns, present-tense verbs, and speech

bubbles, etc. Moreover, Bradley and Donovan's (2010) descriptive study of second graders' informational compositions, demonstrated that after the teacher used SITBs as writing models during interactive information book read-alouds, students composed information books that were organized similar to the SITBs read during instruction. Moreover, their books included various information book elements and features (e.g., table of contents, labeled pictures, topic presentations, descriptive attributes, timeless present tense, and characteristic events). Adding to this, Coleman et. al.'s (2012) examination of a second grade science/literacy teacher model visual representations (e.g., pictures, diagrams, maps) during interactive read-alouds of SITBs during a weather unit, demonstrated students used similar graphical and pictorial representations in the composition of their own science information books. Students labeled their pictorial representations and used captions to identify and explain important weather-related items. For example, one student drew five types of storms in his information book (i.e., twisters, tornadoes, hurricanes, thunderstorms, and cyclones).

Summary of students' perceptions and practices with SITBs. Overall, research indicates primary students displayed high levels of engagement with informational books, and included their lexical features and structures during their retellings and pretend readings of these texts (Duke & Kays, 1998; Pappas, 1993). Further, research demonstrates primary students constructed scientific knowledge, used scientific language, made intertextual connections, and developed an understanding of textual features during interactive read-alouds (Pappas, 2006; Santoro et al., 2008; Smolkin & Donovan, 2001, 2003). Studies have also show primary students composed multimodal informational books demonstrating their knowledge of science, their use of scientific language, and their understanding of text features and visual representations, after teachers used SITBs as models of these features and to explore science during interactive read-

alouds (Bradley & Donovan, 2010; Varelas & Pappas, 2006, 2008; Pappas & Varelas, 2009). Additionally, Morrow et al.'s (1997) experimental study demonstrated third-grade students receiving integrated literacy/science instruction that included SITBs scored significantly higher on literacy and science measures than the other comparison groups and had developed positive attitudes towards science.

Notably, research investigating primary students' practices with SITBs instruction with SITBs mainly used qualitative methods. For example, Pappas (1993) and Duke and Kays (1998) used qualitative methods (e.g., observations and tape-recordings of students' pretend readings) to analyze kindergarteners' engagement with information trade books during read-alouds and to learn how they dealt with these books during pretend readings. Further, Donovan et al.'s (2000) descriptive qualitative study examined first-grade students' book choices from the classroom library in one classroom over two consecutive years.

Adding to this, Smolkin and Donovan's (2001) two-year case study used qualitative methods (e.g., observations and recordings of read-aloud sessions) to study primary students explore and grapple with scientific ideas and scientific language during interactive read-alouds of SITBs. Moreover, Varelas and Pappas' (2006) qualitative, interpretive study used both qualitative and quantitative analyses; however, the core of the study was their qualitative exploration of intertextuality during read-aloud sessions. Furthermore, Bradley and Donovan (2010), Coleman et al. (2012), and Pappas and Varelas' (2009) used qualitative methods (e.g., observations, field notes, research journal) to analyze primary students' dialogic talk during interactive read-alouds of SITBs, as well as qualitatively analyze students' compositions of multimodal informational books at the end of integrated science/literacy units.

Although qualitative studies have provided insight into these issues through first-hand

observations in naturalist settings, they have certain limitations (e.g., small sample size, self-reported data, short duration, loss of data, etc.), which I discussed in previous sections. More qualitative research in needed to learn primary students' contemporary perceptions, attitudes, and practices for SITBs. Moreover, qualitative studies done thus far warrant repetition in new settings with improved methods to bring fresh insights for this phenomenon to the field of literacy and science studies.

Further, I have noted a scarcity of quantitative research addressing primary teachers' use of SITBs and primary students interactions and responses to instruction with these texts. Whereas Morrow et al.'s (1997) experimental study, although quite dated, has provided insight into primary students' learning gains related to the inclusion of SITBs in science-literacy instruction. Overall, Morrow et al.'s study is representational of the paucity of quantitative research that has investigated primary students' perceptions, attitudes, and practices for SITBs. Furthermore, more quantitative research is needed to investigate these issues within the context of contemporary primary classrooms. For instance, further experimental studies could provide a statistical analysis of learning gains and a comparison of the effects of teaching methods currently used in literacy and science instruction on primary students' achievement in science and literacy (e.g., teaching methods including and excluding SITBs).

Summary

Scholars stress the importance of preparing young children for the surge of informational texts they will encounter during their academic careers and adult lives (Hall & Sabey, 2007; Smith, 2000; Duke & Bennett-Armistead, 2003; Moss, 2005). Further, research suggests informational texts need to be represented in the primary classrooms to provide young children experience with expository text structures that will become more prevalent in the higher grades

and throughout their lives (Chall & Jacobs, 2003; Moss, 2005). However, Duke (2000), in her landmark study, along with others, such as Jacobs et al. (2000), Jeong et al.(2010), and Yopp & Yopp, (2006), have found children have spent little time reading or listening to informational texts in primary classrooms.

Over the past decade, the body of research has extensively focused on the use of informational books in the primary grade literacy and science curriculum (Moss, 2003; Saul & Dieckman, 2005; Rearden & Broemmel, 2008). Further, s*cience informational trade books* (SITBs) have emerged as a prominent genre of informational books and are available for primary grade literacy and science instruction. Although there has been an influx of developmentally appropriate SITBs for use in the primary grade science instruction, these books are currently used in varying degrees by primary teachers (Ness, 2011; Palmer & Stewart, 2003; Donovan & Smolkin, 2002).

Moreover, there is evidence primary students learn literacy and science during interactive read-alouds of SITBs (Pappas & Varelas, 2009; Smolkin & Donovan, 2001, 2003; Varelas & Pappas, 2006), in which the teacher engages them in conversations with the text to share ideas, ask questions, connect to their experiences, and to co-construct meaning of science. Varelas and Pappas (2006) noted both teachers and students have important roles during interactive read-alouds of SITBs for questioning, discussing, debating, and interacting with the text in order to co-construct scientific ideas. Their work and others has demonstrated teachers' use of SITBs as thinking devices to model comprehension strategies, text structures, and scientific language during interactive read-alouds to scaffold students' understanding of science and help them form intertextual connections (Pappas & Varelas, 2004; Smolkin & Donovan, 2001, 2003; Varelas & Pappas, 2006). Research also indicates teachers promote literacy and science learning during

integrated literacy/science units that include a range of interactive activities for sharing and learning science, such as interactive read-alouds, science investigations, and compositions of information books and other forms of visual representations of science information (Bradley & Donovan, 2010; Coleman et al., 2012; Pappas & Varelas, 2009).

In sum, there is substantial evidence that narrative texts predominate over informational texts in primary classrooms (Duke, 2000; Jacobs et al., 2000; Jeong et al., 2010; Yopp & Yopp, 2006). Moreover, some researchers claim primary teachers lack expertise and resources for locating and using science informational trade books effectively in the primary grade curriculum (Donovan & Smolkin, 2001; Ness, 2011; Palmer & Stewart, 2003). On the other hand, research indicates primary teachers have engaged students in interactive read-alouds of SITBs that facilitated their understanding of science, use of scientific language, and knowledge of text-type distinctions in nonfiction (e.g., Bradley & Donovan, 2010; Duke & Kays, 1998; Pappas, 1993; Pappas & Varelas, 2009; Santoro et al., 2008; Smolkin & Donovan, 2001, Varelas & Pappas, 2006). These inconsistencies signify gaps in the research addressing the current role of SITBs in the primary classrooms. Therefore, in order to understand a contemporary role of SITBs in primary classrooms, more investigations are needed to examine the primary teacher's use of SITBs, and how primary students' interact and respond to instruction in the primary literacy/science curricula.

CHAPTER THREE:

METHODOLOGY

Although experts recommend primary teachers include nonfiction in their literacy and content area curriculum, there is considerable evidence young children have little exposure to these texts in primary grade classrooms (Duke, 2000; Jacobs et al., 2000; Jeong et al., 2010; Maloch & Bomer, 2013a, 2013b; Yopp & Yopp, 2006). For instance, Duke (2000) reported few informational texts were found in primary classrooms and only an average of 3.6 minutes per day were spent with informational texts during language arts activities. More recently, Yopp and Yopp (2006) found young children had much less exposure to informational books than narrative books, both at school and at home. Further, Jeong et al.'s (2010) descriptive investigation of second-, third-, and fourth-grade classrooms demonstrated a much larger proportion of narrative texts compared to informational texts, with an average of one minute of instructional time with informational texts in second grade classrooms. However, Jeong et al. also found a slight growth of informational texts in language arts instruction and activities between grades two, three, and four.

Research addressing informational texts in primary classrooms has extensively focused on the use of informational books in the primary literacy and science curriculum (Gill, 2009; Moss, 2003; Saul & Dieckman, 2005). Further, s*cience informational trade books* (SITBs) have emerged as a prominent genre of informational books and are available for primary grade literacy and science instruction (Coleman et al., 2012; Donovan & Smolkin, 2002; Moss, 2005; Reardon & Broemmel, 2008; Yopp & Yopp, 2012). Although there has been an influx of

developmentally appropriate SITBs available for primary-grade science instruction, these books are currently used in varying degrees by primary teachers (Duke, 2000; Jeong et al., 2010; Moss 2008; Yopp & Yopp, 2006).

Further, there are gaps and inconsistencies with research addressing the role of informational books in primary classrooms that require further investigation. For instance, some researchers reported teachers view SITBs too difficult for primary students, and teachers lack expertise for selecting and using them appropriately (e.g., Donovan & Smolkin 2001; Ness, 2011; Palmer & Stewart, 2003). Yet, others noted primary teachers effectively use SITBs for science instruction during interactive read-alouds (e.g., Smolkin & Donovan, 2001; Varelas & Pappas, 2006), and primary students have dealt with them well during retellings and informational compositions (e.g., Bradley & Donovan, 2010; Coleman et al., 2012; Duke & Kays, 1998; Pappas, 1993). Overall, research investigating primary teachers' use of SITBs and how primary students interact and respond to instruction with these texts is represented by a limited number of studies with a narrow range of study methods and inconsistencies in their findings.

Purpose for Study

The purpose of this study was to examine the ways a first-grade teacher utilized SITBs in her literacy/science curricula and to understand how two first-grade students responded to her instruction and interacted with these texts. Through a basic qualitative study (Merriam, 2009), my aim was to provide a descriptive account of the interactions around the use of science informational trade books within the primary literacy and science curricula.

Research Questions

The following research questions guided this study:

1. In what ways does a first-grade teacher use science informational trade books?
2. In what ways do first-grade students respond to the first-grade teacher's instruction with science informational trade books?
3. How do two first-grade students interact with science informational trade books?

Research Design

This basic qualitative study (Merriam, 2009) was designed to provide a rich description of a first-grade teacher's use of SITBs in her literacy/science curriculum and two first-grade students' response to her instruction and interactions with these texts. My study was guided by a sociocultural perspective (Bakhtin, 1981, 1986; Vygotsky, 1978; Wertsch, 1991), providing me with a lens to examine the participants during naturally occurring social interactions, mediated by language and other symbolic systems within their classroom. As first-grade students in my study interacted with each other and the text (e.g., SITBs) during recurring social activities in the classroom (e.g., shared reading lessons, interactive read-alouds, and hands-on learning activities), I observed the primary teacher in the position of more knowledgeable other, providing a space for the use of both "primary speech genres" (i.e., simple talk) and "secondary speech genres" (i.e., more complex scientific language) in order to make sense of science and develop the academic language of science (Bakhtin, 1986, pp. 61-62).

Through systematic observations, interviews, and relevant artifacts, I provided a detailed description of how a primary teacher and two first-grade students shared and used SITBs, which revealed their abilities to use nonfiction texts and the challenges they encountered with these texts in the primary literacy/science curricula. Using qualitative design for this investigation, I

made first-hand observations of the participants as they participated in routine activities within the classroom and school where they communicated for both social and academic purposes (Bakhtin, 1986; Gee, 2001, Vygotsky, 1978). This was a naturalistic study where my observations took place in a real-world setting where participants went about their normal day (Merriam, 2009). Further, during my study, I did not intentionally control or manipulate the participants' behaviors, actions, or environment. For example, I did not encourage the teacher to alter her instruction. As a qualitative researcher, I established a rapport with the primary teacher, the two first-grade student participants, and other primary students in the classroom. I became an accepted member of the learning community at the school in general and felt comfortable in my position as researcher. I learned the primary classroom routines and the participants' cultural habits (e.g., ways of acting, ways of doing school, ways of interacting with books, etc.), in order to gain their trust and respect (Merriam, 2009). My overall purpose was to understand the participants' practices regarding SITBs and how they made sense of them in the context of school (Merriam, 2009).

Purposeful Sampling

I purposefully selected a primary classroom at Belt Elementary (pseudonym) for my study site (Creswell, 2007; Patton, 2002). Below I describe my criteria and rationale for choosing this site and the participants for my study.

Site selection. I chose a primary classroom at Belt Elementary as an information-rich study site (Merriam, 2009) for several reasons. As a graduate student and field supervisor at a large university, I supervised interns at Belt Elementary for two school years. During my visits to Belt Elementary, I developed a rapport with the school staff and entered the study site comfortable in my role as a researcher. Belt Elementary was a small urban, Title-One school

(Pre-K to gr. 5) located a few miles from the university. The student population consisted of 54% African American, 31% Hispanic, 9% White, and 6% other, with 95% on free or reduced lunch. Further, Belt Elementary had a low student to teacher ratio (e.g., approximately 12 to 1) and provided tutoring and after school programs to assist students academically, such as the English Language Program (ELP) and Academic Intervention Services (AIS).

Further, the overall tone of the school indicated teachers had a voice in how they planned and delivered instruction. Although many teachers typically followed the basal readers, I noticed some teachers planned units of studies with trade books. Further, teachers met at regular intervals in grade-level meetings to plan instruction together and share teaching strategies. I also found teachers, interns, the librarian, and students using SITBs during literacy and science instruction. In particular, I noted the school library had a collection of SITBs on the bookshelves, as well as thematically displayed for teachers and students to easily access. I additionally observed primary teachers and students checking out SITBs when I periodically passed through the library.

Mrs. Bryan's first-grade classroom contained 15 students (i.e., 8 female and 7 male students), ranging in age from six to nine, and consisting of 11 African American students, two Caucasian students, one Hispanic student and one Haitian students. Four students were previously retained and seven would possibly be retained next year. Mrs. Bryan explained the decision to retain students was based on several factors related to students' reading progress (e.g., making adequate progress toward on-level reading during the current school year and in the following summer reading program). Further, retention was determined by the Developmental Reading Assessment (DRA) that provided independent performance levels for students' oral reading fluency and comprehension. In order to pass to the next grade, students were required to read approximately on-level for their current grade (i.e., first grade's on-level reading levels

ranged 16-18). To support reading instruction, Mrs. Bryan was provided an ELP tutor several times a week to provide assistance for students she determined to be making average or high-level progress during independent work. During these tutoring sessions with students making adequate progress in reading, Mrs. Bryan worked with the seven students individually, who she determined were making slower progress in reading during independent work. Further, she provided shared reading lessons to provide emergent readers, as well as more proficient readers, more access to the text and opportunities to build vocabulary and background knowledge.

First-grade teacher. Mrs. Bryan was a 30-year-old, African American female who had eight years of experience as a school teacher. She taught first grade her entire teaching career. I purposefully chose Mrs. Bryan (pseudonym) to be in my study based on several criteria. First, as a school visitor, I incidentally observed Mrs. Bryan in her first-grade classroom on a number of occasions and noted that she provided a literature-rich environment with carpeted area for read-alouds and shared reading lessons, numerous trade books on display, classroom library, stacks of books in big-book format, displays of informational magazines, large charts for reading lessons, along with basal readers. Further, in a brief unstructured interview, Mrs. Bryan explained that she used a variety of texts in her curriculum, including informational books. Additionally, she discussed ways she openly sought to improve her teaching skills related to children's literature and thoughtfully spent the summers taking on different teaching areas to develop. Last summer she developed reading lessons that included questioning strategies she learned through professional development provided by the school district. Moreover, she expressed her enthusiasm for participating in research that advanced literacy learning and provided a signed consent for the study.

First-grade students. I purposefully chose two first-grade students for my study after I observed all 14 students in the first-grade classroom for first two and a half weeks. I also conversed with Mrs. Bryan to find out students' reading abilities (e.g., reading strengths and weaknesses, reading progress this school year, general level of reading proficiency for first grade), book interests, communication skills, and history of interactions with a variety of texts, in particular SITBs. I solely relied on Mrs. Bryan's input for students' reading abilities, but added to her input with my own observations of how students interacted during lessons, their communication skills, showed interest in science, and displayed some familiarity with SITBs.

Before I selected student participants, I visited the first-grade classroom and orally described my study to the primary students in the classrooms and answered questions. I also sent a parental consent form home to the parents of primary students with a detailed letter describing the study and a list of data that would be collected. Further, I requested parents to return the letter with their written consent for their child to be in the study.

Next, I considered students' reading ranges in the current school year to better understand how students who are average readers in first grade utilized these texts for academic or recreational reading (Merriam, 2009). As I previously mentioned, Mrs. Bryan's class contained a high rate of students who were being considered for retention (i.e., six students at the beginning of my study and seven at the end) or who were previously retained the prior school year (i.e., four students). Therefore, I concentrated on students' reading ability in the current school year, rather than previous years, since several students under consideration had been retained. Reading levels were associated with the DRA levels and the MacMillan's readers for each grade level currently being utilized in the school reading program. The school district considered on-level first-grade reading levels to be 16-18. However, I chose an approximate on-level range for my

study criteria (i.e., reading level range 14-18) to include students who were reading close to first-grade level books and making good progress in reading as reported by the primary teacher.

Five students from the primary classroom met the minimum criteria for purposeful sampling. However, based on my observations of the students in the classroom and Mrs. Bryan's input for students, I selected two students out of the five, who stood out from the others as good communicators (rather than adequate), interacted more often with the teacher and their peers during lessons (i.e., more actively involved in lessons), and interacted more often with trade books (e.g., SITBs). Thus, Jerrick and Leesha were selected as information-rich subjects (Patton, 2002) for my study. Below, I describe the two student participants for this study.

Leesha. Leesha was a seven-year-old African American female. Mrs. Bryan reported Leesha was retained last year in first grade due to her lack of progress in reading. However, Mrs. Bryan further reported Leesha made large gains this year in reading and she had progressed to reading and comprehending first-grade reading materials. I chose Leesha for my study because she enjoyed reading all kinds of books, including SITBs. Further, she was open, easy to talk to and very social. Leesha expressed enthusiasm for being in my research, and she had parental permission to be in this study.

Jerrick. Jerrick was an eight-year-old African American male, who participated well in the classroom. Mrs. Bryan explained Jerrick was retained last year in first grade due to his lack of progress in reading. Yet, she also explained Jerrick made tremendous gains this year in reading and read close to on-level reading materials in class. Jerrick was a confident student who expressed himself well during class discussions and interviews. Jerrick was very friendly and social. Finally, Jerrick expressed enthusiasm for participating in my research, and he had parental permission to be in this study.

Confidentiality of Participants

The identities of the subjects (i.e., first-grade teacher and students) in the study were kept confidential during my collection, analysis, and reporting of the data. For instance, the teacher's and students' comments, actions, documents, and artifacts were recorded and reported anonymously by assigning pseudonyms. In addition the school site for the study was kept anonymous and assigned a pseudonym.

Token of Appreciation

The primary teacher was given a small gift card ($ 50 to Walmart) to show appreciation for her participation in the study at the end of the study. Additionally at the end of the study, each first-grade student participant was treated to popcorn as a token of appreciation for participating in the study.

Data Collection

Data from a range of sources were collected during the 10 weeks (April 5 -June 8) primarily in the first-grade classroom and on a few occasions in the school library (See Appendix A). Overall, there were 28 observations totaling 74 hours and 10 minutes, 6 semi-structured interviews, 21 unstructured interviews, and 26 documents. As the researcher, I was the primary instrument for gathering data during the study and used my skills and intuition to collect data that answered the research questions (Merriam, 2009). According to Janesick (2004), the researcher uses intuition, or informed hunches, to plan and undergo an investigation, and to develop ways of seeing data as it manifests during the process. In the following sections, I described each of the methods I used to collect data during my study.

Observations. The majority of my observation sessions lasted between two and four hours. In the first three weeks of my study, I observed for longer sessions (i.e., between three

and five hours) to help situate myself within the primary-classroom setting and learn the participants' cultural practices (e.g.., ways of learning and acting in school) and learn their routines and schedules. Moreover, I varied my schedule of observation times to capture participants involved in various activities with SITBs. For example, reading instruction in the primary classroom was scheduled from 8:30-9:55 a.m., writing instruction 10:30-11:15 a.m., and science instruction 11:15 a.m.-12:15 p.m. However, during my study, Mrs. Bryan taught several literacy/science units that encompassed reading, writing, and science; therefore, her schedule was kept flexible and spontaneous. Frequently, I asked Mrs. Bryan about her schedule for the week and adjusted my schedule accordingly for optimum times to observe lessons and activities involving SITBs. Another consideration was state and school testing that occurred during my study, which required careful planning for observations in the primary classroom.

I took on the role of participant-observer during my observations. My goal as participant-observer was to establish meaningful identity for myself in the classroom and library without losing my identity as a researcher (Gall, Gall, & Borg, 2007). To accomplish this, I chose a location to observe participants that provided a good view but was unobtrusive and quiet (Rubin & Rubin, 2012). When I entered the study site, I greeted participants with a brief friendly hello, but was careful not to stop the flow of instruction or other activities taking place. At times, I purposefully sat near the participants and others (e.g., other primary students and teachers at the study site) to hear their conversations as they chatted among each other about lessons and activities.

Occasionally, primary students in the classroom wanted to show me their work and explain what they were doing. In response, I listened intently to their comments and sometimes responded back with questions and comments of my own. Overall, primary students did not

depend on me to assist them in the classroom or library, but accepted my presence with smiles and friendly waves across the room.

Interviews. Patton (2002) explained that the purpose of interviewing is to enter into others' perspectives. Further, Merriam (2009) suggested that interviewing is necessary when behaviors, feelings, or perceptions cannot be observed, and it informs the researcher of important events that were missed during observations. Merriam also advised that semi-structured interviewers use open-ended questions related to the research questions to be explored during the interview (Merriam, 2009).

According to Rubin & Rubin (2012), in semi-structured interviews the researcher explores a specific topic by preparing a limited number of questions in advance, but plans to spontaneously ask follow-up questions as the interview proceeds. This type of responsive interviewing style allowed me the flexibility to adjust my questions in response to what I learned during the interview. During my study, I conducted two semi-structured interviews with each of the participants (i.e., the first-grade teacher and two first-grade students), in which I used open-ended questions that aligned with my research questions (see Appendix B). During my semi-structured interviews, I employed a responsive interviewing style that allowed me flexibility to adjust my questions in my response to what I learned during the interview (Rubin & Rubin, 2012). The primary teacher, and two first-grade students provided extensive responses to interview questions. Thus, I allowed participants additional time for their responses as needed. All semi-structured interviews were video-recorded and transcribed verbatim. Below, I describe the semi-structured interview process for each of the participants.

Primary teacher's semi-structured interviews. I conducted two semi-structured interviews with Mrs. Bryan, the primary teacher (i.e., first during week 4, second during week

10). Both semi-structured interviews took place in the classroom at the end of the school day when the students had left to go home. During interviews, I followed the semi-structured interview questions, as previously described. Mrs. Bryan was very relaxed, open, and candid during the interviews. She answered interview questions extensively and showed me examples of books and teaching materials that she used in her literacy/science curricula during both semi-structured interviews.

First-grade students semi-structured interviews. I conducted two semi-structured interviews for each of my study participants, Jerrick and Leesha (i.e., first one during week 5 for both students, second during week 9 for Jerrick and week 10 for Leesha). The first semi-structured interview with the student participants took place in the classroom during a break in the schedule. The second semi-structured interviews for student participants began in the school library and were completed in a workroom adjacent to the classroom.

Jerrick and Leesha were interviewed separately; however my procedures for each of their semi-structured interviews were identical. For the first semi-structured interview, Jerrick and Leesha self-selected books (i.e., both narrative and informational books) from the classroom (e.g., their book bags and classroom library), as well as from a set of books I brought to the interview (see Appendix C). During the second interview, Jerrick and Leesha selected books from the school library and brought them a workroom adjacent to the primary classroom to examine and discuss during the interview. Jerrick chose to examine only books he had selected from the library. Whereas, Leesha chose to examine books she selected from the library and some of the books I brought to the interview. Further, I asked both student participants interview questions (see Appendix B) and observed them as they examined and reacted to these books. Jerrick and Leesha were very engaged during both semi-structured interviews, e.g., they

enthusiastically selected books for each of the interviews, and they spent extensive time discussing and interacting with the texts. Overall, their individual reactions and responses to the books and interview questions were insightful and pertinent to the research questions in my study.

Unstructured interviews. During breaks in the schedule or other convenient times in the primary classroom or library, I conducted naturally occurring unstructured interviews with the participants, i.e., 11 unstructured interviews with the primary teacher and 5 with each student for a total of 10 unstructured interviews with primary students, (see Appendix A). The unstructured interviews were spontaneous and provided me with missing information and clarification of my data. Further, the unstructured interviews provided information pertinent to my research questions. I either recorded field notes or video-taped during unstructured interviews, which were transcribed shortly after the interview.

Documents. Throughout the study, I took photographs that depicted the primary classroom setting and arrangement, student-made artifacts, student work, SITBs used for various instructional purposes, SITBs on displays, SITBs selected by study participants, SITBs referenced by participants, activities associated with SITBs, etc. The photographs provided me opportunities to remember details of observations that might be otherwise overlooked during data analysis (Bogdan & Biklen, 2007, Merriam, 2009). Further, I grouped these photographs in collage arrangements to show various aspects of instruction, book sharing, activities, and artifacts and included this in my documents for this study. The documents I collected provided descriptive information, advanced emerging categories, and/or provided insight into the participants' perceptions, attitudes, or practices with SITBs. For each document I collected, I wrote a narrative that described and reflected on the information the documented provided

relevant to my research questions. The document narratives were typed and labeled with identifying information that included date, time, place, one or two word descriptors, and the pseudonym for the participants associated with the document.

Data Analysis

My data analysis was guided by Glaser and Strauss' (1967) constant comparative method to analyze data and inductively code and categorize it. I began my analysis of data collection in the field as I collected and analyzed data simultaneously during observations, interviews, and with documents. As I collected data, I formed educated guesses and noted them in researcher memos, field notes, and by adding comments to video-recordings (Merriam, 2009). Further, I transcribed and narrated my field notes and video-recordings as soon as possible after observations and interviews, making notes and comments in the margins of my transcriptions. Further, I reflected on the data I collected in order to make sense of it. In the following section, I describe how I systematically analyzed the data according to Glaser and Strauss' constant comparative method. My goal during data analysis was to construct categories that captured recurring patterns that cut across my data based on my research questions (Merriam, 2009).

Open coding. According to Corbin and Strauss (2008), "Open coding is breaking apart and delineating concepts to stand for blocks of raw data" (p. 195). Merriam (2009) further explained open coding as initial notations next to bits of data that strike you as interesting or important to your study. Moreover, Merriam (2009) suggested, "In the beginning of analysis you can be as expansive as you want in identifying any segment of the data that might be useful," (p. 178). I began the process of open coding by identifying segments or units of information in my data that linked to my research questions. As I read through my field notes, transcriptions, and document analyses, I made notations and comments in the margins to identify bits of data that

struck me as potentially relevant to my research questions. My codes for open coding consisted of short phrases, comments, or brief notes describing what I saw in the data relating to my research questions. I provided a list of open codes and how they were analyzed in the following table, *Data Analysis: Refinement of Codes and Categories* (see Table 2, p. 84).

Tracking. During data analysis, I reviewed transcripts of field notes and interviews, as well as narrative analyses of documents to track open codes to determine if they were represented in multiple observations and/or interviews and documents. To track open codes, I listed open codes and noted those consistently repeated or represented (i.e., open codes noted multiple times in transcriptions of observations, interviews, and document analyses) in the data and discarded those that were not consistently represented or confirmed by the data. For example, under research question one in Table 2 under Discarded Open Codes, p. 85, the open code " teacher's use of Power Points to teach vocabulary & concepts in SITBs" was discarded because it was only represented twice in my data. Further, under research question three in Table 2, under Discarded Open Codes, p. 89, I was not able to confirm in my data whether students actually read SITBs at home; therefore, the open code "students reading self-selected SITBs at home" was discarded.

Criteria. To be sufficiently represented in the data, open codes were represented and confirmed throughout my data analysis of transcriptions for field notes, interviews, and document analyses. Overall, initial open codes (i.e., brief notes and comments related to research questions) were tracked in this manner at the beginning of my study before they were grouped together to form categories and subcategories. Later in my study, open codes often fit into existing categories or subcategories. In the following section, I explained how open codes were grouped into categories with similar associations to my research questions.

Axial coding. Merriam (2009) described axial coding as a process of grouping your initial open codes (i.e., brief notes and comments) into groups that go together. Further, Creswell (2007) described axial coding as putting data, "back together in new ways by making connections between a category and its subcategories" (p. 290). According to Corbin and Strauss (2008):

> Open coding and axial coding go hand in hand. The distinctions made between the two types of coding are "artificial" and for explanatory purposes. To indicate to readers that though we break data apart, and identify concepts to stand for the data, we also have to put it back together again by relating those concepts. (p. 198)

Grouping. As my study progressed, I employed axial coding to group initial open codes into groups with similar associations related to my research questions. These groups became categories that I revised and refined through-out data analysis. In Table 2, p. 84, under Listing & Grouping Open Codes, I demonstrated how initial open codes were listed and placed into early categories aligning with each of my three research questions. For example, under research question one, in Table 2, p. 84, Listing & Grouping Open Codes, I grouped the open codes "modeled thinking for terms to describe the layers of the rain forest in sentences" and "thinking aloud about vocabulary to describe trees in the fall when leaves fall off" into the category "Thinking Aloud About Vocabulary." Further, as my study progressed and categories were formed, I found open codes frequently fit into existing categories. For instance, under research question one, Table 2, Listing & Grouping Open Codes, p. 85, the open code "asking why do plants need space?" was placed into the existing category "Questioning to Facilitate Understanding," along with other open codes for the teacher's questioning strategies (e.g., asking "How do you Know?" questions). Additionally, under research question two, Table 2, Listing & Grouping Open Codes, p. 87, "summarizing which rain forest animals live on different layers of

the rain forest with a partner" and "describing rain forest layers and their attributes in own words" were placed into the category "Summarizing Information from Text." In sum, I used axial coding to group initial codes with similar associations to my research questions.

Comparing. Throughout data analysis, I employed Glaser and Strauss' (1967) constant comparative method to analyze, inductively code, and categorize data. Corbin and Strauss (2008) explained comparative analysis, "Comparative analysis is comparing incident against incident for similarities and differences. Incidents that are found to be conceptually similar to previously coded incidents are given the same conceptual label and put under the same code" (p. 195). For instance, I compared units of data to identify incidents and behaviors similar to previously coded incidents and placed them in more overarching categories.

Reduction. As my study progressed, early categories were combined and refined to reduce redundancy and develop categories that demonstrated more abstract thinking about my findings for the research questions. For instance, under research question two, Table 2, Refinement of Categories, p. 87, I refined an earlier category, "Restating Information in Response to Teacher's Questioning," by adding it as a subcategory to a more encompassing category, "Restating Information from Text." Moreover, under research question three, Table 2, Refinement of Categories, p. 89, I refined an earlier category "Self-selecting SITBs with Familiar Topics" by adding it as a subcategory to the category "Forming Connections to Science." Overall, the more refined categories provided a more abstract way to think about how my findings related to the research questions.

As I analyzed data, I also compared incidents and behaviors in order to identify inconsistencies in the data related to my research questions. For instance, I repeatedly checked to see if categories formed earlier in my analysis "held up" consistently (i.e., represented in

numerous observations and/or interviews and documents) as meaningful to my study (Merriam, 2009, p. 183). In Table 2 under Discarded Categories, I listed categories that did not hold up in my study due to inconsistencies or lack of evidence in my data and were discarded. For instance, under research question two, Table 2, Discarded Category, p. 88, I discarded the category "Students' Responses to One-on-One Instruction for SITBs" because the first-grade teacher primarily used SITBs in whole group instruction, except to provide brief one-on-one assistance for recalling information from these texts during shared learning activities.

Table 2. Data Analysis: Refinement of Codes and Categories.

Research Question #1. In what ways does a first-grade teacher use science informational trade books (SITBs)? **Listing & Grouping Open Codes:**	
Listing open codes:	**Placing open codes in following categories:**
repeated read-alouds of SITBs to share ideas & information whole class	Sharing Ideas & Information During Interactive Read-alouds of SITBs in units
use of big-book format during shared reading	Student Access to Text During Shared Reading
seated on carpet in close proximity to text	Student Access to Text During Shared Reading
using pointer to direct attention to text	Student Access to Text During Shared Reading
using various SITBs to discuss and share ideas about plant parts, & functions during a plant unit	Sharing Ideas & Information During Interactive Read-alouds of SITBs in units
repeating student's comment about the function of roots	Repeating Students' Comments During Lessons
asking students to share ideas for how the wheat plant is used	Asking Questions to Prompt Discussion
growing peanuts in context of peanut farm	Connections to Real World Context
wheat plant usage in context of pasta factory	Connections to Real World Context
recalling conversations in prior lesson	Making Connections to Prior Lessons
explicit talk of specialized vocabulary as encountered in main text during shared reading	Explicitly Discussing Specialized Vocabulary in Text
explicitly discussing information in text for specialized vocabulary for plants during interactive read-aloud	Explicitly Discussing Specialized Vocabulary in Text
modeled thinking for terms to describe the layers of the rain forest in sentences	Thinking Aloud About Vocabulary
thinking aloud about vocabulary to describe trees in the fall when leaves fall off	Thinking Aloud About Vocabulary
thinking aloud about how to use specialized vocabulary for growing & harvesting peanuts	Thinking Aloud About Vocabulary
using bold print to emphasize & discuss specialized vocabulary in the context of the text	Using Text Features to Support Understanding of Vocabulary
class discussion of illustrations with labels that depict vocabulary	Using Text Features to Support Understanding of Vocabulary

Table 2. (Continued) Data Analysis: Refinement of Codes and Categories

explicit talk of diagrams that visually support vocabulary with labels for clarification	Using Text Features to Support Understanding of Vocabulary
reading and discussing a specialized vocabulary definition in glossary, as well as how it was used in context of the book	Using Text Features to Support Understanding of Vocabulary
reading and discussing captions that define and describe vocabulary	Using Text Features to Support Understanding of Vocabulary
comparing texts with/without table of contents	Demonstrating Diversity of Text Features
comparing texts with/without captions	Demonstrating Diversity of Text Features
modeling use of table of contents to locate topics of interest to read and discuss	Modeling Use & Purpose of Text Features
modeling use of bold print by highlighting important vocabulary with highlight tape & discussing	Modeling Use & Purpose of Text Features
identifying captions during read-alouds	Identifying Text Features
identifying bold print during read-alouds	Identifying Text Features
identifying title, table of contents, glossary, and index during read-alouds	Identifying Text Features
asking "How do you know?" questions	Questioning to Facilitate Understanding
asking... why do plants need space?	Questioning to Facilitate Understanding
rereading main text to understand how peanuts are gathered	Rereading Text to Check Understanding
reviewing how peanuts are grown and made into peanut butter	Reviewing & Summarizing Information
thinking aloud about how plants make food	Modeling Thinking About Text
rephrasing student's comment about the rain forest layers	Rephrasing Statements or Information
expanding on book's description of "pegs"	Explaining & Clarifying Information
providing examples for how plants differ	Explaining & Clarifying Information
Discarded Open Codes:	
teacher's use of Power Points to teach vocabulary & concepts in SITBs	
use of SITBs for guided reading	
use of SITBs for Writer's Workshop	
teacher's use of SITBs with dual-purpose structures in instruction	
teacher's use of Power Points to teach vocabulary & concepts in SITBs	
Refinement of Categories:	
Earlier Categories:	**Refined Categories:**
Repeating Students' Comments During Lessons	Prompting Discussion of Text
Asking Questions to Prompt Discussion	Prompting Discussion of Text
Pausing During Read-Aloud for Student Response	Prompting Discussion of Text
Confirming Students' Comments	Prompting Discussion of Text
Scaffolding Student's Understanding of the Layers of the Rain Forest	Scaffolding Students' Understanding of the Text
Scaffolding Student's Understanding of Photosynthesis	Scaffolding Students' Understanding of the Text
Scaffolding Student's Understanding of Plant Life Cycle	Scaffolding Students' Understanding of the Text
Student Access to Text During Shared Reading	Access to Text During Shared Reading
Interactive Read-Alouds of SITBs	Sharing Ideas & Information During Interactive Read-Alouds & Learning Activities
Connecting Text to Students' Experiences & Interests	Facilitating Intertextual Connections

Table 2. (Continued) Data Analysis: Refinement of Codes and Categories

Connecting Text to Real World Contexts	Facilitating Intertextual Connections
Connecting Text to Prior Lessons & Conversations	Facilitating Intertextual Connections
Connecting Text to Related Books in Previous lessons	Facilitating Intertextual Connections
Explicitly Discussing Specialized Vocabulary in Text	Teaching Tools for Vocabulary
Thinking Aloud About Vocabulary	Modeling Thinking About Vocabulary
Using Text Features to Support Understanding of Vocabulary (e.g., diagrams, illustrations, labels, captions, etc.)	Teaching Tools for Vocabulary
Identifying Text Features	Teaching Tools for Text Features
Modeling Use & Purpose of Text Features	Teaching Tools for Text Features
Demonstrating Diversity of Text Features	Teaching Tools for Text Features
Questioning to Facilitate Understanding	Teaching Tools for Comprehension Strategies
Rereading Text to Check Understanding	Teaching Tools for Comprehension Strategies
Reviewing & Summarizing Information	Teaching Tools for Comprehension Strategies
Modeling Thinking About Text	Teaching Tools for Comprehension Strategies
Rephrasing Statements or Information	Teaching Tools for Comprehension Strategies
Explaining & Clarifying Information	Teaching Tools for Comprehension Strategies
Discarded Category:	
Teachers' Individualized Instruction for SITBs	
Research Question #2. In what ways do first-grade students respond to the first-grade teacher's instruction with SITBs? **Listing & Grouping Open Codes:**	
Listing open codes:	**Placing open codes in following categories:**
spontaneously sharing observations related to information during interactive read-alouds	Sharing Ideas & Observations of Information in Text
sharing ideas about rain forest animals being in danger of losing their homes	Sharing Ideas & Observations of Information in Text
sharing prior knowledge during class conversations about specialized vocabulary	Using Prior Knowledge in Response to Teacher's Questions & Prompts
sharing what knows about the basic needs of plants to respond to teacher's questioning	Using Prior Knowledge in Response to Teacher's Questions & Prompts
class shares ways to eat peanut butter at home	Connecting Text to Experiences in Own Lives
student explains wheat plant is used to make bread	Connecting Text to Real World Contexts
discussing prior lesson about bees spreading pollen among flowering plants	Connecting Text to Prior Lessons & Conversations
discussing book read in previous lesson that described similar concepts	Connecting Text to Related Books from Previous Lessons
class rereading main text with descriptions of important vocabulary to check understanding	Shared Rereading of Text to Check Understanding
choral re-reading captions to illustrations to clarify information	Shared Rereading of Text to Check Understanding
students reread passage on plants needing space, as teacher points to words	Shared Rereading of Text to Check Understanding
using highlighting tape to focus on & discuss meaning of specialized vocabulary in the context of the book, similar to bold print	Using Text Features to Visually Support Information
discussion of plant diagrams to visually see plant parts and discuss their functions	Using Text Features to Visually Support Information

Table 2. (Continued) Data Analysis: Refinement of Codes and Categories

examining illustrations with labels and captions to provide visuals that support understanding of information presented in text	Using Text Features to Visually Support Information
using table of contents to enter the text and locate information on topics	Using Text Features to Navigate the Text
using index to locate information	Using Text Features to Navigate the Text
recalling information from the text to answer teacher's questions	Restating Information in Response to Teacher's Questioning
restating information from the text to add to class conversation about pollination & answer teacher's questions	Restating Information in Response to Teacher's Questioning
describing rain forest layers and their attributes in own words	Summarizing Information from Text
summarizing which rain forest animals live on different layers of the rain forest with a partner	Summarizing Information from Text
restating the plants' basic needs during an interactive read-aloud	Summarizing Information from Text
writing captions for illustrations with sticky notes	Restating Information from Text During Learning Activities
restating plants' basic needs during science investigation of the radish plant	Restating Information from Text During Learning Activities
student recalls and names the parts of the peanut plant during learning activity	Restating Information from Text During Learning Activities
restating plant life cycle during class play	Restating Information from Text During Learning Activities
Discarded Open Codes:	
students' use of science logs for science investigations related to SITBs	
Students' use of SITBs for creative writing	
Refinement of Categories:	
Earlier Categories:	**Refined Categories:**
Sharing Ideas & Observations of Information in Text	Participation in Guided Conversations Around the Text
Using Prior Knowledge in Response to Teacher's Questions & Prompts	Participation in Guided Conversations Around the Text
Connecting Text to Experiences in Own Lives	Participation in Guided Conversations Around the Text
Connecting Text to Real World Contexts	Participation in Guided Conversations Around the Text
Connecting Text to Prior Lessons & Conversations	Participation in Guided Conversations Around the Text
Connecting Text to Related Books from Previous Lessons	Participation in Guided Conversations Around the Text
Shared Rereading of Text to Check Understanding	Participation in Guided Conversations Around the Text
Using Text Features to Visually Support Information	Participation in Guided Conversations Around the Text
Using Text Features to Navigate the Text	Participation in Guided Conversations Around the Text
Restating Information in Response to Teacher's Questioning	Restating Information from Text
Summarizing Information From Text	Restating Information from Text
Restating Information From Text During Learning Activities	Restating Information from Text

Table 2. (Continued) Data Analysis: Refinement of Codes and Categories

Discarded Category:	
Students' responses to One-on-One Instruction for SITBs	
Research Question #3. How do two first-grade students interact with SITBs? **Listing & Grouping Open Codes:**	
Listing open codes:	**Placing open codes in following categories:**
self-selecting SITBs on plants	Self-selecting SITBs with Familiar Topics
self-selecting SITBs on rain forests	Self-selecting SITBs with Familiar Topics
Jerrick self-selects SITBs on various animals of interest to him	Self-selecting SITBs with Familiar Topics
Leesha motivated to self-select SITBs about keeping the Earth clean	Self-selecting SITBs with Familiar Topics
Jerrick self-selects SITBs to learn more about the sun and moon	Self-selecting SITBs with Familiar Topics
Leesha self-selects SITBs to learn more about plants	Self-selecting SITBs with Familiar Topics
Jerrick's repeated reading of *Jaguars* (Guidon, 2009)	Rereading SITBs of Interest
Leesha's repeated reading of *Our Earth Helping Out* (Hock, 2009)	Rereading SITBs of Interest
Jerrick's repeated reading of *A Windy Day* (Schaefer, 2000)	Rereading SITBs of Interest
Leesha explaining the importance of saving rain forests so animals have homes	Connecting Text to Real World
Jerrick relating today's weather to *A Windy Day* (Schaefer, 2000)	Connecting Text to Real World
Jerrick discussing his experiences with snow on vacation	Connecting Text to Own Experiences & Interests
Leesha referring to previous lesson on plants needing space	Connecting Text to Previous Lesson
using prior knowledge to discuss plants' basic needs in self-selected texts from library	Using Prior Knowledge to Discuss Information in Text
using prior knowledge to explain illustrations in self-selected texts	Using Prior Knowledge to Discuss Information in Text
Leesha restates events in order for *The Great Kapok Tree* (Cherry, 1990), as she progresses through book	Linearly Discussing Events in Order in SITB (e.g., storybook, narrative category, dual purpose, Donovan & Smolkin, 2002)
Leesha restates events in order for *From Seed to Plant* (Gibbons, 1991), as she progresses through book	Linearly Discussing Events in Order in SITB (e.g., storybook, narrative category, dual purpose, Donovan & Smolkin, 2002)
Jerrick describes jaguars and their offspring in *Jaguars* (Guidone, 2009), as he flips to different pages in book	Nonlinearly Discussing Topics & Subtopics in Text (non-narrative category, Donovan & Smolkin, 2002)
Jerrick describes rain forests layers, animals & plants in *Life in a Rain Forest* (Lindeen, 2004), as he flips to different pages in book	Nonlinearly Discussing Topics & Subtopics in Text (non-narrative category, Donovan & Smolkin, 2002)
discussing specialized vocabulary in bold print and using glossary with illustrations to support understanding of these terms	Using Text Features to Visually Support Information
examining illustrations with labels & captions for the rain forest animals and where they live in the rain forest	Using Text Features to Visually Support Information
examining diagram, reading labels, & captions for layers of the rain forest to visually support information in text	Using Text Features to Visually Support Information
demonstrating table of contents to locate topics of interest and reading exerts about them	Using Text Features to Navigate the Text

Table 2. (Continued) Data Analysis: Refinement of Codes and Categories

using the index to locate topics of interest and reading exerts about them	Using Text Features to Navigate the Text
Jerrick's book reporting for *A Windy Day* (Schaefer, 2000)	Restating Information from the Text
Leesha's book reporting for *Caterpillars* (Frost, 2000)	Restating Information from the Text
Jerrick orally summarizes information in *A Windy Day* (Schaefer, 2000)	Restating Information from the Text
Leesha orally summarizes information in *Water as a Solid* (Frost, 2000)	Restating Information from the Text
Jerrick fluently reads aloud exerts from *A Windy Day* (Schaefer, 2000)	Fluent Reading of Simple Text in SITBs with Familiar Vocabulary (e.g., labels, captions, single sentences or short paragraphs, large font, familiar concepts)
Leesha fluently reads aloud exerts from *Water as a Solid* (Frost, 2000)	Fluent reading of Simple Text in SITBs with Familiar Vocabulary (e.g., labels, captions, single sentences or short paragraphs, large font, familiar concepts)
fluently reads captions & labels to make meaning of text	Fluent reading of Simple Text in SITBs with Familiar Vocabulary (e.g., labels, captions, single sentences or short paragraphs, large font, familiar concepts)
Jerrick's lack of fluency and skipping text with unfamiliar vocabulary, lengthier text, complex concepts in *The Sun* (Winrich, 2011)	Diminished Fluency & Skipping Over Complex Text in SITB (e.g., lengthier text, smaller font, unfamiliar concepts & unfamiliar vocabulary)
Leesha's diminished fluency and skipping text with unfamiliar vocabulary, smaller font, and lengthier, complex concepts in *In the Trees, Honey Bees* (Mortensen, 2009)	Diminished Fluency & Skipping Over Complex Text in SITB (e.g., lengthier text, smaller font, unfamiliar concepts & unfamiliar vocabulary)
Discarded Open Codes:	
Students reading self-selected SITBs at home	
Students buddy reading SITBs during free-choice reading times	
Refinement of Categories:	
Earlier Categories:	**Refined Categories:**
Self-selecting SITBs with Familiar Topics	Forming Connections to Science
Rereading SITBs of Interest	Forming Connections to Science
Connecting Text to Real World & Own Interests	Forming Connections to Science
Connecting Text to Own Experiences	Forming Connections to Science
Connecting Text to Previous Lesson	Forming Connections to Science
Connecting Text to Book Used in Previous Lesson	Forming Connections to Science
Using Prior Knowledge to Discuss Information in Text	Individual Interactions with the Text
Linearly Discussing Events in Order in SITB (e.g., life cycle of plants, information in a storyline)	Individual Interactions with the Text
Nonlinearly Discussing Topics & Subtopics in Text (topics & subtopics)	Individual Interactions with the Text
Using Text Features to Visually Support Information	Individual Interactions with the Text
Using Text Features to Navigate the Text	Individual Interactions with the Text
Restating Information from the Text	Individual Interactions with the Text

Table 2. (Continued) Data Analysis: Refinement of Codes and Categories

Fluent reading of Simple Text in SITBs with Familiar Vocabulary (e.g., labels, captions, single sentences or short paragraphs, large font, familiar concepts & familiar vocabulary)	Individual Interactions with the Text
Diminished Fluency & Skipping Over Complex Text in SITB (e.g., lengthier text, smaller font, unfamiliar concepts & unfamiliar vocabulary)	Individual Interactions with the Text
Discarded Category:	
Students' Strategies for Selecting Appropriate SITBs	

In Table 3, *Data Analysis: Category Construction and Refinement,* p. 91, I provided the subcategories of more refined categories that held up during my study. These subcategories developed from earlier categories, and the earlier categories developed from grouping my initial open codes. As I looked for regularities or patterns in the data, I reconsidered and refined categories in order to provide more abstract ways to represent data related to my research questions. As indicated in Table 3, I used identifying letters and numbers to identify and track subcategories and categories during data analysis. For instance, under research question one, Table 3, p. 91, I identified the subcategory "prompting discussion of the text" as A1, and the category that it fit into, "Guided Conversations Revolving Around the Text," as A. Although, I did not conduct an exact frequency count of these subcategories and categories, this method of identifying and tracking codes provided evidence that they were represented in my data consistently in numerous observations, interviews, and student documents over the course of my study.

Conceptual saturation. Corbin and Strauss (2008) referred to conceptual saturation as, "The process of acquiring sufficient data to develop each category/theme fully in terms of its properties and dimensions and to account for variation" (p. 195). Further, Merriam (2009) describes saturation as operating primarily in a deductive stance, "When nothing new is coming forth" (p. 183).

Table 3. Data Analysis: Category Construction and Refinement

Research Question #1. In what ways does a first-grade teacher use SITBs?	
Subcategories	**Refined Categories**
A1. prompting discussion of the text (e.g., repeating comments, confirming, questioning, pausing) **A2.** scaffolding students' understanding of the text during conversations **A3.** providing students access to the text during shared reading lessons with SITBs (e.g., close proximity to text, pointing to text, big books, etc.) **A4.** sharing ideas and information from text during interactive read-alouds of SITBs & learning activities during integrated literacy and science units **A5.** facilitating intertextual connections (e.g., connecting text to students' experiences & interests, the real world, prior lessons, and related books	**A.** Guided Conversations Revolving Around the Text
B1. explicitly discussing specialized vocabulary **B2.** modeling thinking about vocabulary in text **B3.** using text features to support understanding of vocabulary (e.g., text features providing visual representations of vocabulary, such as diagrams, illustrations with labels, captions)	**B.** Teaching Tools for Vocabulary
C1. questioning to facilitate understanding **C2**. rereading text to check understanding **C3.** reviewing & summarizing information **C4.** modeling thinking about text **C5.** rephrasing statements & information **C6.** explaining & clarifying information	**C.** Teaching Tools for Comprehension Strategies
D1. identifying text features **D2.** modeling use & purpose of text features (e.g., visuals of information, such as diagrams, illustrations, or to navigate the text, such as table of contents, index) **D3.** demonstrating diversity of text features	**D.** Teaching Tools for Text Features
Research Question #2. In what ways do first-grade students respond to the first-grade teacher's instruction with SITBs?	
Subcategories	**Refined Categories**
E1. sharing ideas and observations of information presented in text during conversations of the text **E2.** using prior knowledge to add own perspectives of information in the text in response to teacher's questions & prompts during discussions of information in text **E3.** shared rereading of text to check for understanding **E4.** using text features to visually support information (e.g., diagrams, illustrations with captions & labels) **E5.** using text features to navigate the text (e.g., table of contents, index) **E6.** connecting text to own experiences, interests, the real world, prior lessons, and related books	**E.** Participation in Guided Conversations Around the Text

Table 3. (Continued). Data Analysis: Category Construction and Refinement

F1. restating information in response to teacher's questioning **F2.** summarizing information from text **F3.** restating information from text during learning activities	**F.** Restating Information from Text
Research Question #3. How do two first-grade students interact with SITBs?	
Subcategories	**Refined Categories**
G1. self-selecting SITBs with familiar topics of interest (e.g., topics learned in class or encountered in library) **G2.** rereading SITBs of interest **G3.** connecting text to personal experiences, the real world prior lessons, and related books	**G.** Forming Connections to Science
H1. using prior knowledge to discuss information in text **H2.** linearly discussing events in order in SITBs with sequencing structures (e.g., life cycle of plants, information presented in a storyline) **H3.** nonlinear discussion of topics & subtopics in SITBs **H4.** using text features to visually support information (e.g., diagrams, illustrations with captions & labels) **H5.** using text features to navigate the text (e.g., table of contents, index) **H6.** restating information for the text (e.g., book reports, summarizing information, flip book) **H7.** fluent reading of simple text in SITBs with familiar vocabulary (e.g., labels, captions, single sentences, short paragraphs, large font, familiar concepts) **H8.** diminished fluency and skipping over complex text in SITBs (e.g., lengthier text, smaller font, unfamiliar concepts, & unfamiliar vocabulary	**H.** Individual Interactions with Text

Near the end of week nine of my study, I reached a point in my data analysis where my existing categories were well developed and defined. Furthermore, new data from observations, interviews, and student documents were fitting into existing categories associated with my research questions and I was working in a deductive stance. At this point, I recognized I had reached a point of conceptual saturation. As I reflected on the categories, I again thought about them more abstractly and collapsed them into overarching themes representational of my findings for the research questions.

In Table 4, *Data Analysis: Categories/Theme for Research Question One, First-grade Teacher's Use of SITBs*, p. 93, I provided an overarching theme representational of my findings

for research question one addressing the ways a first-grade teacher uses SITBs, which is "Using SITBs as Teaching Tools During Guided Conversations Around the Text." Furthermore, I provided the categories and their descriptions that support this theme. For example, this theme is supported by the following categories: "Guided Conversations Revolving Around the Text," "Teaching Tools for Vocabulary," "Teaching Tools for Comprehension Strategies," and "Teaching Tools for Text Features."

Table 4. Data Analysis: Categories/Theme for Research Question One, First-grade Teacher's Use of SITBs.

Theme: Using SITBs as Teaching Tools during Guided Conversations Around the Text	
Category	**Category Description**
Guided Conversations Revolving Around the Text	Statements or behaviors in which first-grade teacher engaged students with SITBs during shared reading lessons, interactive read-alouds, and learning activities to scaffold their understanding of the text during guided conversations revolving around the text. During these conversations, the first-grade teacher prompted discussion of the text using pedagogical moves (e.g., repeating comments, questioning, pausing during read-alouds, and confirming responses), shared ideas, and encouraged intertextual connections to students' experiences, the real world, prior lessons, and other related texts.
Teaching Tools for Vocabulary	Statements or behaviors in which the first-grade teacher explicitly discussed specialized vocabulary in the text, modeled her thinking about vocabulary, and used text features to support understanding of vocabulary (e.g., illustrations and diagrams with labels and captions to visually support students' understanding of vocabulary and the glossary).
Teaching Tools for Comprehension Strategies	Statements or behaviors in which first-grade teacher used SITBs as teaching tools to model comprehension strategies (e.g., questioning to facilitate understanding, rereading text to check understanding, reviewing and summarizing information, modeling thinking about text, rephrasing statements or information, explaining and clarifying information).
Teaching Tools for Text Features	Statements or behaviors in which first-grade teacher used SITBs to identify text features, model their use & purpose, demonstrate diversity of text features (e.g., modeling illustrations, diagrams, captions, & labels as visuals to support information, demonstrating how to enter the text with table of contents and index to locate topics, comparing text features in various SITBs, etc.).

Likewise in Table 5, *Data Analysis: Categories/Theme for Research Question Two, First-grade Students' Response to Instruction with SITBs*, p. 94, I provided an overarching theme representational of my findings for research question two addressing the ways first-grade students respond to instruction with SITBs, which is "Active Meaning-making of SITBs in Response to Instruction." I also provided the categories and the categories' descriptions that support this theme, which are: "Participation in Guided Conversations Around the Text," and "Restating Information from the Text."

Table 5. Data Analysis: Categories/Theme for Research Question Two, First-grade Students' Response to Instruction with SITBs.

Theme: Active Meaning-making of SITBs in Response to Instruction	
Category	**Category Description**
Participation in Guided Conversations Around the Text	Statements and behaviors in which first-grade students participated in guided conversations revolving around SITBs during shared reading lessons, interactive read-alouds, and learning activities (e.g., sharing ideas about a plant's basic needs whole group, using prior knowledge to discuss how plants are used by humans, turn and talk about the parts of a peanut plant, rereading the text to clarify how bees spread pollen, examining a diagram of the rain forest layers and reading aloud its labels and descriptive caption, entering the text through the table of contents to locate topics of interest, and connecting the text to personal experiences, the real world, prior lessons, and related books).
Restating Information from the Text	Statements or behaviors in which first-grade students responded during instruction with SITBs to restate information from the text (e.g., restating information from the text in response to teacher's questioning or prompting about how plants make their own food, restating information during a class play of the plant life cycle, summarizing information from the text in a flip book that depicts and describes the layers of the rain forest, etc.).

Moreover in Table 6, *Data Analysis: Categories/Theme for Research Question Three, First-grade Students' Interactions with SITBs*, p. 95, I further provided an overarching theme representing my findings for research question three addressing how two first-grade students

representing my findings for research question three addressing how two first-grade students interacted with SITBs, which is "Interacting with SITBs to make Sense of Science" Additionally, the categories and their descriptions supporting this theme are: "Forming Connections to Science" and "Individual Interactions with SITBs."

Table 6. Data Analysis: Categories/Theme for Research Question Three, First-grade Students' Interactions with SITBs.

Theme: Interacting with SITBs to Make Sense of Science	
Category	**Category Description**
Forming Connections to Science	Statements and behaviors in which first-grade students interacted with SITBs to form strong connections to science (e.g., self-selecting SITBs on topics learned in class or other familiar topics of interest, rereading SITBs of interest from the school library, connecting the text to personal experiences, the real world, prior lessons, and related books on the same topics.)
Individual Interactions with SITBs	Statements or behaviors in which first-grade students interacted with the text on their own to make meaning of it (e.g., using prior knowledge to discuss plants' basic needs, linearly discussing events for the plant life cycle, nonlinearly describing various animals (topics) and their habitat, diet, offspring, etc. (subtopics); using illustrations and diagrams with labels and captions to visually support their understanding of the text, using the table of contents and index to locate topics, summarizing information from the text, writing book reports, fluently reading aloud simple text with large font, such as labels, captions, single sentences, and short paragraphs with familiar concepts & vocabulary; having diminished fluency or skipping over complex text, such as lengthier text, smaller font, unfamiliar concepts, and unfamiliar vocabulary.

Establishing Credibility & Dependability

Credibility. Credibility was established during my study through rigorous methods for collecting, analyzing, and interpreting data, as well as reporting my findings (Merriam, 2009). In qualitative research, what is under investigation is how people construct reality or how they understand or make sense of their world. Thus, I realized it was not possible to totally capture a

single version of reality. Hence, to achieve credibility in my qualitative study, I included triangulation (i.e., observations, interviews, and documents), thick description, peer review, and researcher's reflexivity to examine the data from different angles.

Dependability/validity. Lincoln and Guba (1985) asserted that dependability is analogous with consistency, or "whether the results are consistent with the data collected" (p. 221). During my study, I achieved dependability by providing a detailed account of how I arrived at my findings. In the same vein, Creswell (2007) described validity in qualitative research as "validation" that attempts to assess the "accuracy of the findings, as best described by the researcher and the participants" (p. 206 - 207). Thus, to add to the dependability of my study, I adopted a number of Creswell's (2007), "validation strategies" (p. 207), which also included triangulation (i.e., observations, interviews, and documents), thick description, peer review, and researcher's reflexivity.

Triangulation. To improve the credibility and dependability of my study, I used triangulation (i.e., multiple observations at different times and places, multiple interviews with each of the participants, and analyses of documents). Triangulation provided a way for me to cross-check data to find consistencies and inconsistencies (Merriam, 2009). During data analysis, I was alert to consistencies between what participants reported in interviews and what they actually did in observations.

Thick description. Patton (2002) explained, "Thick, rich description provides the foundation for qualitative analysis and reporting. Good description takes the reader into the setting being described." (p. 437). Thus, I included rich, thick, descriptions of the setting, participants, analysis, and findings of the study. Further, I substantiated this with numerous quotes from participants and supporting documents.

Peer review. In order to obtain an outside perspective for the credibility of my study's findings, a peer at the university I attended, who was a graduate student with an interest in my research, read some of the raw data and provide feedback for whether my findings were plausible based on the data (Merriam, 2009). My colleague coded raw data using transcribed field notes and viewed video-recordings for two separate observations: (a) the first-grade teacher and her students interacting with SITBs during a shared reading lesson that included an interactive read-aloud and learning activity, and (b) a semi-structured interview with the first-grade teacher. Further, my colleague provided extensive notes regarding her interpretation of the data and how it addressed my research questions. We met on several occasions to discuss my study, review my methods, and make comparisons of how we each coded the data. In particular, my colleague pointed out comprehension strategies employed by the first-grade teacher during shared reading lessons and interactive read-alouds with SITBs. My peer reviewer's comments made me more aware of the strategies the first-grade teacher used to facilitate understanding of specialized vocabulary and science concepts during her instruction. Through our discussions, we estimated a high rate of coding agreement. However, coding agreement was not statistically measured, as is done with inter-rater reliability. Overall, we determined the data analysis provided plausible findings. Further, she provided new insights into my interpretation of the data, such as the first-grade teachers' use of a SITB as a teaching tool to prompt discussion of specialized vocabulary during interactive read-alouds, adding to the credibility of my study.

Researcher's journal. During my study, I kept a researcher's journal to provide a detailed log of how I collected and analyzed data (Merriam, 2009). I included information, such as reflections, questions, notes regarding categories, school events, concerns, and decisions that I made during my investigation.

Reflexivity. According to Patton (2002), authenticity is a reflexive awareness of one's own perspectives and the fair depiction of the values that undergird them. Although my study was largely an inductive process, it was additionally informed by a sociocultural framework (Bakhtin, 1981, 1986; Gee, 2004b; Vygotsky, 1978; Wertsch, 1991), as well as a supporting body of literature, my orientation, and my knowledge of the issues. In order to clarify the expectations and assumptions I brought to this study, I have placed an account of them in Table E4, *Literature Review Categories* (See Appendix D). Through reflexivity, I critically reflected on myself as a researcher, acknowledging my assumptions and biases toward this research (Lincoln & Guba, 1985).

Further, at the onset of my study, the first-grade teacher was at a transition in her instruction. She told me in an interview that her students had difficulty reading and recalling information in nonfiction books; thus she planned to use them more extensively in two integrated units on plants and rain forests. Although I did not attempt to influence any of her decisions for instruction with texts, my presence may have inadvertently done so, due to the nature of my study. Merriam (2009) pointed out the important question is not whether the researcher influences what he or she is observing, but how the researcher identifies those influences and describes them in his or her interpretation of the data.

Moreover, I referred to Donovan and Smolkin's (2002) categories for science informational trade books (i.e., *non-narrative, narrative, storybooks, and dual-purpose*) frequently during my study to distinguish how these texts vary according to their features and structures. I chose to reference Donovan and Smolkin's (and colleagues') work due to their extensive research to understand the SITB genre, as well as how primary teachers use it in the primary literacy/science curricula, and how primary students respond and interact with theses

texts during instruction and recreational reading (e.g., Bradley & Donovan, 2010; Coleman, Bradley, & Donovan, 2012; Donovan & Smolkin, 2001, 2002, 2006; Smolkin & Donovan, 2001, 2003, 2004, 2009; Donovan, Smolkin, & Lomax, 2000; Smolkin, McTigue, Donovan, & Coleman, 2009).

Summary

This was a basic qualitative study (Merriam, 2009), in which I examined the ways a first-grade teacher used SITBs, the ways first-grade students responded to the first-grade teacher's instruction with SITBs, and how two first-grade students interacted with SITBs. My study was guided by a sociocultural perspective (Bakhtin, 1981, 1986; Vygotsky, 1978; Wertsch, 1991) providing me with a lens to examine the participants during naturally occurring social interactions, mediated by language and other symbolic systems within their classroom. As first-grade students in my study interacted with each other and the text (e.g., SITBs) during routing social activities in the classroom, I observed the primary teacher in the position of more knowledgeable other, scaffolding students' understanding of the text in order to make sense of science and develop the academic language of science.

Through systematic observations, interviews, and examination of relevant documents, I provided a detailed description of the ways a first-grade teacher used SITBs and how first-grade students responded to her instruction and interacted with SITBs within the context of a primary classroom. Overall, I collected data from 28 observations totaling 74 hours and 10 minutes, 6 semi-structured interviews, 21 unstructured interviews, and 26 documents. As the researcher, I was the primary instrument for gathering data during the study and used my skills and intuition to collect data that answered the research questions (Merriam, 2009).

I employed Glaser and Strauss' (1967) constant comparative method to analyze and compare data, and inductively code and categorize it. My goal during data analysis was to construct categories that captured recurring patterns that cut across my data (Merriam, 2009). After an extensive cycle of data collection and data analysis, I collected and analyzed sufficient data until I found clearly defined patterns. Further, I refined categories until they were sufficiently developed and defined. Finally, I collapsed refined categories into more overarching abstract themes representational of my findings for the research questions.

Additionally, I added credibility to my study by using rigorous study methods for collecting, analyzing, and interpreting data, as well as for reporting my findings (Merriam, 2009). I also used triangulation to examine data from different angles and check for consistencies and inconsistencies, adding to my study's credibility, as well as its dependability (Merriam, 2009, Creswell, 2007). Finally, I enhanced dependability by providing a detailed account of how I arrived at my findings, and by including thick description, peer review, and researcher's reflexivity (Creswell, 2007; Patton, 2002).

CHAPTER FOUR:

FINDINGS

Although it is well documented that narrative texts predominate informational texts in primary classrooms (e.g., Duke, 2000; Jacobs et al., 2000; Jeong et al., 2010; Yopp & Yopp, 2006, 2012), Jeong et al.'s more contemporary analysis suggested a slight move towards informational texts between grades two through four. Further, with emerging curricular demands (Common Core State Standards Initiative, 2010), teachers will need to find new ways to include informational texts in their instruction (e.g., Maloch & Bomer, 2013a, 2013b). Along with Common Core State Standards, we also see publishers' guidelines, grade-level standards, and state assessments placing emphasis on informational texts (Maloch & Bomer, 2013b). With the curricular pressure on informational texts, a shift to more informational texts in primary reading instruction could be expected. Thus, researchers recommend an increase in informational texts represented in primary classrooms, claiming this will increase motivation in reading and writing (Dreher, 2003; Moss, 2003; Ness, 2011; Pappas & Varelas, 2009); facilitate academic language (Honig, 2010; Santoro et al., 2008; Varelas & Pappas, 2006); promote learning in the content areas (Atkinson et al., 2009; Maloch & Bomer, 2013a, 2013b; Morrow et al., 1997); and provide experience with expository text structures (Duke et al., 2012; Duke & Kays, 1998; Pappas, 1993, 2006).

However, research addressing the role of informational books in primary classrooms has gaps and inconsistencies. For instance, a number of researchers reported primary teachers lack the expertise for selecting and using nonfiction appropriately and have assumed these texts are

too difficult for primary students to handle (e.g., Donovan & Smolkin, 2001; Ness, 2011; Palmer & Stewart, 2003). Yet, others report primary teachers regularly used science informational trade books (SITBs) for science instruction during interactive read-alouds (e.g., Smolkin & Donovan, 2001; Varellas & Pappas, 2006), and primary students have dealt with them well during retellings and informational compositions (e.g., Bradley & Donovan, 2010; Coleman et al., 2012; Duke & Kays, 1998; Pappas, 1993). Overall, research investigating primary teachers' use of SITBs and how primary students interact and respond to instruction with these texts is represented by a limited number of studies with a narrow range of study methods and inconsistencies in findings.

The body of research addressing the inclusion of informational texts in the primary grades has extensively focused on the use of informational books in the primary-grade literacy and science curricula (Gill, 2009; Moss, 2003; Saul & Dieckman, 2005). Furthermore, SITBs have emerged as a prominent genre of informational books and are available for primary-grade literacy and science instruction (Coleman et al., 2012; Donovan & Smolkin, 2002; Moss, 2005; Reardon & Broemmel, 2008). Although there has been an influx of developmentally appropriate SITBs available for primary-grade science instruction, these books are currently used in varying degrees by primary teachers (Duke, 2000; Jeong et al., 2010; Moss, 2008; Yopp & Yopp, 2006, 2012).

Purpose for Study

The purpose of this study was to examine the ways a first-grade teacher utilized SITBs in her literacy/science curricula and to understand how two first-grade students responded to her instruction and interacted with these texts. Through a basic qualitative study (Merriam, 2009),

my aim was to provide a descriptive account of the interactions around the use of science informational trade books within the primary literacy and science curricula.

Research Questions

The following research questions guided this study:

1. In what ways does a first-grade teacher use science informational trade books?
2. In what ways do first-grade students respond to the first-grade teacher's instruction with science informational trade books?
3. How do two first-grade students interact with science informational trade books?

Summary of the Findings

In the following sections, I provided a summary of the findings for my investigation of a first-grade teachers' use of SITBs in literacy/science curricula, as well as how two first-grade students responded to instruction and interacted with these texts. I began with a description of the setting in the primary classroom and a description of the three participants (i.e., first-grade teacher and two first-grade students). Next, I provided a descriptive account of my findings for each of the research questions. Furthermore, I discussed the overarching themes that emerged during data analysis that are representational of the findings for this study.

Study Setting

First-grade classroom. The first-grade classroom was laid out for student collaboration with small table groups of three to four students at a table (see Figure 1, p. 106). The first-grade teacher, Mrs. Bryan, seldom sat at her desk. Rather, she sat either in the center of the classroom in front of the projector, in a chair next to the carpeted area for a shared reading, at a small kidney shaped table for individual conferencing, or she moved around the classroom to assist individual students or groups of students. Students worked at different conversation levels at

their tables. For example, during testing and independent writing students worked independently without talking. However, during lessons and activities, students were encouraged to discuss content among themselves at their tables. In addition, there was a classroom library at the back of the classroom, computer area, sink area, bookshelves for books and materials, word wall, TV mounted high in a corner of the room, whiteboard spanning across the front wall, bulletin boards with the class schedule, student' reading levels, class discipline chart, and various other charts with content information covered the walls.

The first-grade classroom consisted of 14 students in the beginning of the study and ended with 15 students (8 female & 7 male) at the end of the study. Ages of students spanned from six to nine, with 10 students' age seven, two age six, two age eight, and one age nine. Ethnicity consisted of 11 African American students, one student was Hispanic, one Haitian, and two Caucasian. Of the 15 students in the classroom, Mrs. Bryan reported seven students were making slow progress in reading and will possibly be retained next year in first grade. Of the eight students making adequate progress in reading in the current school year, four were retained the prior school year.

Mrs. Bryan promoted classroom discourse during shared reading, interactive read-alouds with whole group discussions, turn and talk with a partner, and table group talk. She took measures to call on all students during guided conversations of the text, prompting them to think critically about the content to explain their comments. Throughout the study, students were at ease participating in lessons and discussions.

Availability and use of classroom materials. In this section, I describe the classroom materials and provide a brief explanation of their use in the classroom. I will readdress how the first-grade teacher and students access and use these materials in more detail later in my findings.

Texts in the Classroom library. The classroom library contained 115 fiction books and 116 nonfiction books (approximately 50/50%) for a total of 231 books at the time of my inventory. Of the 116 nonfiction books, 77 were SITBs (66%) and 39 other types of nonfiction books (34%). The books were arranged in small labeled bins (e.g., Animals, Buddy Reading, Easy Readers, Alphabet Books, Nonfiction Books). The majority of books for the classroom library were stored in bins at the back of the classroom on bookshelves. However, there were also eight bins of classroom library books stored at the front of the room.

The fiction books consisted of storybooks (e.g., books from Norman Bridwell *Clifford* series, Marc Brown's *Arthur* series, Rob Scotton's *Splat the Cat* series, and numerous others). Moreover, SITBs in the classroom library were mainly typical SITBs (Pappas, 2006) on topics related to animals (e.g., gorillas, elephants, ants). Other SITBs addressed topics such as plants, rain forests, earth conservation, seasons, five senses, and the sun. Further, there were several atypical SITBs, such as *The Great Kapok Tree* by Lynne Cherry (1990) and *Magic School Bus Gets Caught in a Web* by Jeanette Lane (2007). The other types of nonfiction books in the classroom library covered various topics, such as careers (e.g., police officer, doctor) and sports (e.g., basketball, baseball), as well as biographies of famous people (e.g., Martin Luther King and George Washington).

Student access to classroom library. During my study, I did not observe students select classroom library books from the bookshelves at the back of the classroom during brief independent reading periods taking place each morning as they entered the room. Rather, they selected books from eight book bins at the front of the classroom that served as an extension of the classroom library. The eight book bins contained a variety of trade books (mostly fiction), along with Treasures and Triumphs Basal Readers. During independent reading, students

Classroom Library

Classroom Window

Carpeted Area for Shared Reading/Read Alouds

Figure 1. The First-grade Classroom.

Notes. The first-grade classroom was a laid out for student collaboration with small table groups of three to four students at a table. The first-grade teacher, Mrs. Bryan, seldom sat at her desk. Rather, she sat either in the center of the classroom in front of the projector, in a chair next to the carpeted area for a shared reading, at a small kidney shaped table for individual conferencing, or she moved around the classroom to assist individual students or groups of students. In addition, there was a classroom library, computer area, sink area, bookshelves for books and materials, and a word wall.

frequently selected the Treasures or Triumphs Basal Readers from these book bins rather than trade books. In addition, Mrs. Bryan explained during an interview she seldom changed the books in the bins. However, she did switch the bins around, so they were distributed to different

tables for independent reading. Furthermore, I observed few other times during the routine day that students selected books from the classroom library or from their book bags to read on their own in the classroom.

Basal readers and guided reading books. In addition, district-approved Treasures and Triumphs Literacy Program materials by Macmillan/ McGraw-Hill (2010) were available in the classroom; however, the Mrs. Bryan used them inconsistently in her literacy curriculum. The Treasures basal series was designed for on-level readers, and the Triumphs basal series provided intervention for students reading below level. Overall, I did not observe Mrs. Bryan use the Treasures or Triumphs Basal Readers for her literacy instruction during my study. For guided reading, Mrs. Bryan mainly used leveled fiction, paperback books associated with Houghton Mifflin basal readers, and occasionally she used the leveled fiction paperback books associated with the Treasures or Triumphs basal series. The texts for guided reading were arranged in bins in a bookshelf close to her desk. Mrs. Bryan explained she used fiction texts rather than nonfiction texts for guided reading because her students did not have the background nor vocabulary to use nonfictions texts during guided reading lessons.

Books for shared reading and read-alouds. Additionally, Mrs. Bryan kept a variety of books (approximately 25 fiction books and 8 nonfiction books) for shared reading lessons and read-alouds in bins next to the carpeted area. Mrs. Bryan explained she primarily used fiction for non-instructional read-alouds to model fluency and for students to enjoy the story. For instance, she read the chapter book, *Junie B., First Grader Toothless Wonder* by Barbara Park (2002), when time permitted before lunch or at dismissal time at the end of the school day. The fiction books in the bins were mostly storybooks, such as *A Bad Case of Stripes* by David Shannon (2004) and *Skippyjon Jones* by Judy Schachner (2005). In addition, there were several nonfiction

books in the bins next to the carpet, such as *Growing Vegetable Soup* by Lois Ehlert (1987) and *The Little Yellow Leaf* by Carin Berger (2008). Mrs. Bryan also stored a variety of big books for shared reading lessons also near the carpeted area. For instance, she stored SITBs in big-book format for the plants and rain forests units, such as *The Four Seasons* by Melvin Berger (1995), *From Peanuts to Peanut Butter* by Melvin Berger (1996), *Pasta Please!* by Melvin Berger (1995), *The Great Kapok Tree* by Lynne Cherry (1990), *Rain Forest* by Helen Cowcher (1988), and *Life in the Rain Forest* by Melvin Berger (1996).

National Geographic science materials. Other book resources in the classroom included the National Geographic Science Materials (NGSMs) with various teaching and student materials for six themes: (a) Physical Science: Pushes & Pulls; (b) Physical Science: Properties; (c) Earth Science: Land & Water; (d) Earth Science: Sun & Stars; (e) Life Science: Plants & Animals; (f) Life Science: Living Things. Mrs. Bryan explained she had just received these materials this year and had not used them consistently because she was concerned these texts did not match her students' reading levels. Yet, she was impressed with the beautiful photographs, large font, and typical text features displayed in these texts. Even so, I observed Mrs. Bryan use one informational book (in big-book format) from the NGSMs entitled, *Plants and Animals* by Rose Padilla (2011), during a shared reading lesson for the plant unit. This book had the features of a typical SITB (e.g., table of contents, bold print, index, captions, labels, etc.), large photographs, with expository structures (e.g., sequencing, descriptive, topics and subtopics).

Study Participants

First-grade teacher. Mrs. Bryan held a Bachelors of Science degree in Elementary Education and Specific Learning Disabilities. Her teaching practices included shared reading lessons (i.e., reading lessons in which students had access to the text during the lesson),

interactive read-alouds (i.e., read-alouds in which the teacher guided students in conversations of the text as it was read aloud), Power Points, collaborative groups, hands-on activities, and thematic units of study. She explained that it was important to teach lessons on the carpet where she could share texts in big-book format and interact with students face to face in order to keep them engaged with the text during conversations about the text.

Leesha. Leesha was an attentive first grade-student, who frequently participated during lessons. She also was a confident and eager student, and meticulous with her work. Often, Leesha was the last to complete her work because of the thoughtful effort she put into it. Further, she was interested in science and self-selected books on topics, such as caterpillars, keeping the Earth clean, plants, and rain forests from the school library. She also enjoyed reading Cole's *Magic School Bus* series. Leesha received Academic Intervention Services (AIS) and Daytime ELP in the classroom, which is tutoring for students with middle to high reading levels.

Jerrick. Jerrick was a confident first-grade student, who consistently shared his ideas during class discussions. At times, he rushed to complete his work. He was keenly interested in science, and I observed him self-select books on science topics, such as the wind and jaguars from the school library. He also liked to talk about science and shared SITBs enthusiastically with others, such as the librarian and with me. Further, he was interested in sports and self-selected books on soccer, baseball, or football when given the opportunity. Jerrick was very friendly and social. He also received Daytime ELP tutoring for students with middle to high reading levels.

First-grade Teacher's Perceptions, Inexperience, and Science/Literacy Unit Book Choices

At the onset of my study, Mrs. Bryan was in the planning stages for the plants and rain forests units. Although she had used SITBs in prior content-area units of study, she explained that she planned to use these texts more extensively in the these particular units because she wanted to provide more instruction for her students' use of nonfiction texts in the literacy and science curricula. In this section, I discuss Mrs. Bryan's perceptions for nonfiction as she planned instruction, her inexperience with SITBs, and the books she selected for use during the integrated literacy and science units for plants and rain forests.

Teacher's perceptions for informational books. As Mrs. Bryan planned instruction for the literacy and science units, she recognized challenges that primary students encountered with informational books. During an interview, she expressed her perceptions for how students handled these texts:

> Definitely in first grade and kindergarten a lot of the books we use are books they are familiar with because we're using them for some type of teaching point. And they just feel more comfortable with fiction, I think. When you give them a nonfiction, I think it's just too much information to compute or gather, and there's no set storyline.

Further, Mrs. Bryan described how students in her class handled fiction and nonfiction differently:

> I'm realizing when I see them with a fiction book and with a nonfiction book even the mannerisms, how they handle it and everything is differently because they're not really reading it when it's nonfiction. They're more awkward than they would be with a book that's fiction. They're looking at pictures or they're reading a caption or something. Whereas, with a fiction book, they'll read it. Also, I think with nonfiction, you know how they'll have a heading, and then there'll be some information. And then they may have another heading and there will be more information. So, students being able to internalize this, take it, and connect it.

In addition, Mrs. Bryan explained how one of her higher students, Leesha, was able to retell information in fiction books. However, she noticed she was unable to restate information after reading a nonfiction book. Mrs. Bryan explained how this event opened her eyes:

> I had a student that was having difficulty retelling or relaying information in a book that happened to be nonfiction. So, I thought that if this is one of my higher students then the rest probably can't do it either. So, she (i.e., reading coach) told me to go to the bookroom and pull more nonfiction big books. So, you'll be seeing more of those and being able to show the kids the different text features and things like that and having them be even more comfortable with it because ...yeah, some get it with Super Scientist Club. But she couldn't retell it to me and that opened my eyes. And I was like wow, ok. So, I know I need to use more nonfiction where they are looking for information and be expected to be able to discuss that information. You know, and share it and add on to what other people's ideas are. I need to definitely use more nonfiction.

Teacher's inexperience with informational books. The realization that students were unable to relay information in informational books was the impetus that prompted Mrs. Bryan to include more nonfiction in her literacy/science curricula. In particular, she looked for ways to use SITBs during her instruction to provide students with opportunities to discuss the text and interact with it together in order to make sense of the information it presented. However, Mrs. Bryan was initially unsure how to use informational books in her instruction and consulted with the reading coach for resources.

Mrs. Bryan explained:

> I had to ask the reading coach. I know text features, what do I do with it after that? So, I don't just want them to spew information. I want them to actually learn something. I'm kind of embarrassed to say that out loud. But, yeah. it made me think, like what do I do with it?

Mrs. Bryan found resources in the school book room, selecting SITBs in big-book format for shared reading lessons (i.e., reading lessons in which students had access to the text during the lesson), and interactive read-alouds (i.e., read-alouds in which the teacher guided students in conversations of the text as it was read aloud). In an interview, Mrs. Bryan explained students

were more engaged with books in big-book format during shared reading lessons on the carpet, rather than other methods she had used, such as projecting materials on the ELMO or standing in front of the class to discuss reading materials. She explained that by providing primary students access to the print in big books, they have more opportunities to interact with it and read it, such as pointing out text features, choral reading captions, or rereading the text to make a point. Further, she preferred to have eye contact with students in close proximity in order to keep their attention focused on the lesson.

Book choices for the plants and rain forest units. Since, Mrs. Bryan selected reading materials from what was available in the school resource room and her classroom, it was not clear if her selections of SITBs were purposeful or more a matter of what was available for instruction with the integrated literacy/science units on plants and rain forests. Further, she was unfamiliar with the different types of SITBs or their instructional purposes according to experts (e.g., Donovan & Smolkin, 2002, Dreher & Voelker, 2004). Yet, she selected the following assortment of SITBs, which fulfilled particular instructional purposes during the plants and rain forest units: *Growing Vegetable Soup* by Lois Ehlert (1987), *The Very Hungry Caterpillar* by Eric Carle (1969), *The Little Yellow Leaf* by Carin Berger (2008), *The Four Seasons* by Melvin Berger (1995) , *From Peanuts to Peanut Butter* by Melvin Berger (1996), *Pasta Please!* by Melvin Berger (1995), *The Great Kapok Tree* by Lynne Cherry, *Rain Forest* by Helen Cowcher (1988), and *Life in the Rain Forest* by Melvin Berger (1996). Moreover, Mrs. Bryan included, *Plants and Animals* by Rose Padilla (2011), another SITBs in big-book format associated with the National Geographic Science Materials in the classroom. In the following passage, I describe these books and how they were used in instruction in more detail.

Mrs. Bryan selection of SITBs for plants and rain forests units included narrative texts that sequenced factual events over time (Donovan & Smolkin, 2002). She selected these books to demonstrate the life cycle of the plant and how plants were processed to provide products we buy at the store (e.g., pasta and peanut butter). For instance, *Pasta Please!* by Melvin Berger (1995), included a sequenced structure addressing the life cycle of the wheat plant, how it is harvested, and the process it goes through to end up pasta on our tables at home. Likewise, *From Peanuts to Peanut Butter* by Melvin Berger (1996), took the reader through the peanut lifecycle, it's harvesting, and the process for grinding peanuts into peanut butter that ends up on our grocery shelves. Both of Berger's books sequenced events or occurrences related to the plant life cycle over time, which placed them in a narrative SITBs category (Donovan & Smolkin, 2002). Further these texts provided information related to plants in short passages associated with large, colorful photographs, a table of contents, and an index. Specialized vocabulary was supported by the main text and the photographs. Mrs. Bryan also used Berger's books as teaching tools during interactive read-alouds to scaffold students' understandings of nonfiction text features, specialized vocabulary, and to model comprehension strategies for retelling and summarizing information presented in the plant and rain forest units.

Yet, *The Great Kapok Tree* by Lynne Cherry (1990) offered a different book experience. For instance, the author not only depicted the layers of the rain forest and the animals that lived there using realistic illustrations rather than photographs, but did so in the framework of a colorful story with a strong message to save the rain forest so animals don't lose their homes. Furthermore, Helen Cowcher's (1988) *Rain Forest* repeated Cherry's message, portraying animals running for their lives as man came in with bulldozers to destroy the rain forest and their homes. Both Cherry and Cowcher provided storybooks (Donovan & Smolkin, 2002) with

embedded scientific information in a storyline that entertained as well as informed. Mrs. Bryan explained she liked to use these types of books with both fiction and nonfiction elements to add interest to her lessons, while still providing information relevant to the plants and rain forest units.

Mrs. Bryan alternated storybooks with non-narrative informational SITBs during instruction, such as Melvin Bergers' (1996) *Life in the Rain Forest* and Rose Padilla's (2011) *Plants and Animals*. These texts provided topically organized information in expository structures that used timeless present tense verbs, and contained photographs, a table of contents, captions, labels, bold print, and an index (Donovan & Smolkin, 2002). Mrs. Bryan used these texts not only to provide information related to plants and rain forests, but also to demonstrate the nonfiction text features that they typically displayed. Overall, Mrs. Bryan had limited book resources and was not fully aware of the categories of SITBs or their recommended purposes for instruction (e.g., Donovan & Smolkin, 2002, Dreher & Voelker, 2004). However, she used these texts for her own instructional purposes and engaged students with a variety of them during the plants and rain forests units.

Theme One, Using SITBs as Teaching Tools during Guided Conversations Around the Text

In this section, I present the theme, *Using SITBs as Teaching Tools during Guided Conversations Around the Text*, which emerged from the data demonstrating my findings for the first-grade teacher's use of SITBs, research question one. I begin by revealing the ways Mrs. Bryan used SITBs during guided conversations revolving around the text to scaffold student's understanding of the text. Next, I present how she used SITBs as teaching tools to teach specialized vocabulary, comprehension strategies, and text features.

Guided conversations revolving around the text. Mrs. Bryan guided students to participate in conversations revolving around the text during shared reading lessons (i.e., lessons, in which students had access to the text), interactive read-alouds (i.e., read-alouds, in which the teacher guided students in conversations of the text), and other learning activities. Here, she explicitly talked about specialized vocabulary and science concepts presented in SITBs. Further, Mrs. Bryan encouraged students to share ideas, ask questions, and make intertextual connections to their interests, experiences, the real world, and texts in prior lessons. These conversations occurred during lessons for two integrated literacy/science units for plants and rain forests that lasted eight weeks (see Appendix E).

Interactive read-alouds and shared reading lessons. Mrs. Bryan typically conducted interactive read-alouds during shared reading lessons, in which students sat on the carpet in close proximity to SITBs in big-book format. Thus, students had access to the text during the interactive read-aloud, making it easy for them to interact with the text and reference information the text presented during discussions. In particular, Mrs. Bryan prompted discussion using pedagogical moves, such as repeating comments, pausing, confirming students' statements, asking questions, and providing feedback. She also consistently modeled comprehension strategies (e.g., rereading to check for understanding, reviewing, questioning, rephrasing, summarizing, etc.) to facilitate students' understanding of the text. Further, the first-grade students responded to Mrs. Bryan's prompts and questioning by using their own comprehension strategies during interactive read-alouds, such as prior knowledge, examining visuals of information (e.g., diagrams, illustrations, labels, and captions) to add meaning to the text, rephrasing questions the teacher asked before answering, and restating information in their own words.

The following is an excerpt from Mrs. Bryan's interactive read-aloud with *Plants and Animals* by Rose Padilla (2011); in which she guides students in a conversation around the text:

> Mrs. Bryan read text: "A huge tree and short grass can seem very different. Yet, they are alike in many ways. Both are plants. Both have plant parts" (*Plants and Animals*, Padilla, 2011, p. 12).
>
> Mrs. Bryan: Who can tell how plants are alike and what are some ways they can be different? So, we'll start with alike. Who can tell me some examples? (paused to allow students time to think)
>
> Levon: Plants are alike because all plants have leaves.
>
> Mrs. Bryan: Ok, all plants have leaves.
>
> Brooker: Every plant needs water.
>
> Mrs. Bryan: All plants need water.
>
> Reshawn: They make new living things.
>
> Mrs. Bryan: How do plants create other living things or other plants?
>
> Reshawn: Because the bees land on the plant and get pollen and drop it all over.
>
> Mrs. Bryan: Yes! He said that the bees land on the plants. Oh! Did we see that in a book we read during another shared reading? (Mrs. Bryan held up the book, *The Four Seasons*, Berger,1995, and shows the photograph of bees landing on a flower.)
>
> Mrs. Bryan: Here is what Reshawn was talking about. Here is a good example of bees landing on the flower and he said that the pollen is like little specks of dust in the middle of the plant. The bees dip down in there to get the pollen and it gets stuck on their legs because they have little hair on their legs and when they fly around, it drops and it spreads all over. And that's how the seeds are spread all around. Now, if a bee were to land on a lily, and let's say the seed travels and it lands somewhere and it begins to grow. What would that seed look like? Would it look like a sunflower? What would a seed that came from a lily look like when it grows up?
>
> Lena: A lily.
>
> Mrs. Bryan: Like a lily.

Mrs. Bryan: Would you say it's safe to say that children or babies look like their parents?

Carter: Yes!

Mrs. Bryan: Do we look like our parents?

Students: Yes!

During the interactive read-aloud, Mrs. Bryan began by reading a passage from the book, then asked a question to encourage dialogic talk about the text. She then paused to allow students time to respond. Students responded with information they had learned during the plant and rain forest unit; thus making intertextual connections to prior lessons. For instance, Reshawn's commented about bees landing on plants and dropping pollen indicated he had formed intertextual connections to information he learned in a prior lesson on pollination. Mrs. Bryan facilitated intertextual connections for the entire class by showing an illustration in a different SITB representational of pollination. She also provided feedback to clarify and expand on pollination, and described it to provide a mental image. Her comprehension strategies included questioning, rephrasing, and reviewing information in various texts to scaffold students' understanding of pollination and the life cycle of a plant. In addition, Mrs. Bryan further encouraged intertextual connections by presenting an analogy of seeds growing up to look like the mature plants where they originated, to babies' growing up to look like their parents. Overall, Mrs. Bryan guided students in conversations around the text to help them connect the important science concepts and vocabulary presented in the text to their lives, the real world, prior lessons, and other related texts.

Learning activities. Mrs. Bryan also encouraged students to participate in guided conversations around SITBs during various learning activities, which typically followed interactive read-alouds and shared learning lessons. For example, as an extension to the book,

From Peanuts to Peanut Butter by Melvin Berger (1996), Mrs. Bryan grouped students together on the carpet to discuss how they would make peanut butter from scratch as a class. She began by asking them to recall and summarize information from the text regarding how peanuts plants grew, were harvested, and made into peanut butter. During the review of information in the text, Mrs. Bryan reread portions of the text and modeled her thinking about the process of making peanut butter. Further, she encouraged students to use their prior knowledge based on their experiences to share ideas for making peanut butter in class, such as how to grind peanuts for peanut butter. After discussing grinding machinery depicted in the text, Levon shared grinding equipment at home, "My mom, she uses like this special little thing. Like, she would take a piece of a thing and she would push it in, like a blender, but it's not a blender." Mrs. Bryan responded, "Oh! A food processor. I believe we have one of those today." Thus, Levon made an important connection between the information in the text to his own experiences for how he grinds peanuts and other items at home.

The class also brainstormed together to produce a list of procedures and ingredients for making peanut butter, writing it on a large chart. Mrs. Bryan and students then made peanut butter in a food processor and tasted it on crackers at their tables, describing its appearance (e.g., texture, color), how it tasted (e.g, sweet, salty), how it smelled (e.g., sweet, like peanuts). The student engaged in this activity and were eager to describe in detail their class-made peanut butter. For example, Leesha stated, "I smell the peanuts. It's so soft and smooth." Lena, "It's brown with crunchy stuff." Carter, "Oh! That smells good!" Thus, students formed intertextual connections to the information in Berger's (1996) *From Peanuts to Peanut Butter* as they experienced making peanut butter firsthand in their classroom.

Using SITBs as teaching tools. Mrs. Bryan used SITBs as teaching tools for vocabulary, comprehension strategies, and text features during her instruction. In particular, these texts served as models of specialized vocabulary, important science concepts, and text features that presented information in ways that connected to students' lives and experiences. In this section, I present my findings for the ways Mrs. Bryan used these texts as teaching tools to learn science.

Teaching tools for vocabulary. Mrs. Bryan used SITBs as teaching tools to introduce, model, and teach vocabulary. In particular, she emphasized concern for students in her class who had little exposure to the specialized vocabulary in nonfiction. Thus, she used SITBs during instruction as a context to engage students with specialized vocabulary and scaffold their understanding of it. Mrs. Bryan commented, "The biggest thing is vocabulary for my students because a lot of them come with the lack of vocabulary."

During an interview, Mrs. Bryan explained she chose SITBs for instruction because these texts offered support for specialized vocabulary in the main text, as well as in text features that provided visual representations of information in the texts (e.g., illustrations, diagrams, captions, labels, glossaries, etc.). Further, she explained SITBs placed specialized vocabulary in an interesting context within the book, often highlighting the word or placing it in bold print. For example, Mrs. Bryan used the SITB, *From Peanuts to Peanut Butter* (Berger, 1996) during a shared reading lesson to identify specialized vocabulary and to help students make meaning of these words during guided conversations revolving around the text. To begin, Mrs. Bryan conducted an interactive read-aloud of the book, asking students to be attentive to important vocabulary. The book provided a rich context that supported specialized vocabulary both in the main text and in the illustrations.

During the read-aloud, students interacted with the text using highlight tape to emphasize important vocabulary words, such as authors do with bold print. Mrs. Bryan explained:

> We're going to help Melvin Berger out today as we're reading. And if you see a word that you think is important to the information we've been reading about, we're going to highlight those words to help get that bold print here.

Mrs. Bryan began by pointing out several words she considered important to the information, modeled her thinking, and explicitly talked about these words, the photographs that depicted their meaning, and what was in the main text. She asked students to help her point out important words as she read the book aloud, then demonstrated how to highlight them with highlight tape. As she progressed through the read-aloud, students shared their ideas on which words were important, and then they also physically got up and highlighted them with the highlight tape in the book. Mrs. Bryan required students to explain why they thought these words were important to the information in the text.

Further, Mrs. Bryan facilitated students' active meaning-making of these terms by explicitly talking about how the photographs provided a visual of vocabulary words, and how the text explained what the terms meant. Students had an opportunity to discuss the word "pegs" with a partner in a turn and talk, as well as discuss the important terms again whole class, in which they shared their own interpretations for the term "pegs."

Here, Mrs. Bryan used explicit talk to review the meaning of the vocabulary word pegs, and to explain the importance of it to the information presented in the text:

> Pegs, that word is definitely important to our information because that tells what the stem of a peanut plant is called. They're called pegs. So, if you were explaining to someone the information you were learning, you would definitely want to remember to tell them that.

To expand on the term pegs, Mrs. Bryan had students do an activity, Vocabulary Four Square, after the read-aloud (see Figure 2, p. 122). For this activity, students folded paper to

make four rectangular shapes, in which they wrote the word pegs, defined it, illustrated it, and used it in a sentence. After completion, students shared their sentences for pegs with the class. For instance, Adler shared, "My peg has a peanut at the end." Further, Brooker shared, "A peg is a stem that hold the peanuts." Overall, Mrs. Bryan used the context of the text to engage students with specialized vocabulary in SITBs during interactive read-alouds, shared readings, and learning activities to scaffold their understanding these terms. In particular, she used the main text, as well as text features visually representing information (e.g., illustrations, diagrams, labels, captions, etc.), to support students' understanding of these terms and their related concepts in various SITBs throughout the plants and rain forests units.

Teaching tools for comprehension strategies. Mrs. Bryan also used SITBs as teaching tools to demonstrate comprehension strategies, such as rereading, questioning, rephrasing, reviewing, summarizing, and thinking aloud about the text. She modeled comprehension strategies during shared reading lessons, interactive read-alouds, and learning activities. Here, she prompted students to participate in conversations around the text, where they shared ideas, asked questions, and made connections to their own experiences, interests, the real world, prior lessons, and other related texts. As students asked questions and shared ideas, Mrs. Bryan provided feedback to clarify and explain information. Further, she explicitly discussed vocabulary and concepts presented in SITBs, and modeled her own thinking about the text in order facilitate students' understanding of it. During instruction and learning activities, she also encouraged students to restate information in their own words and connect it to their own lives, in order to demonstrate their understanding of it.

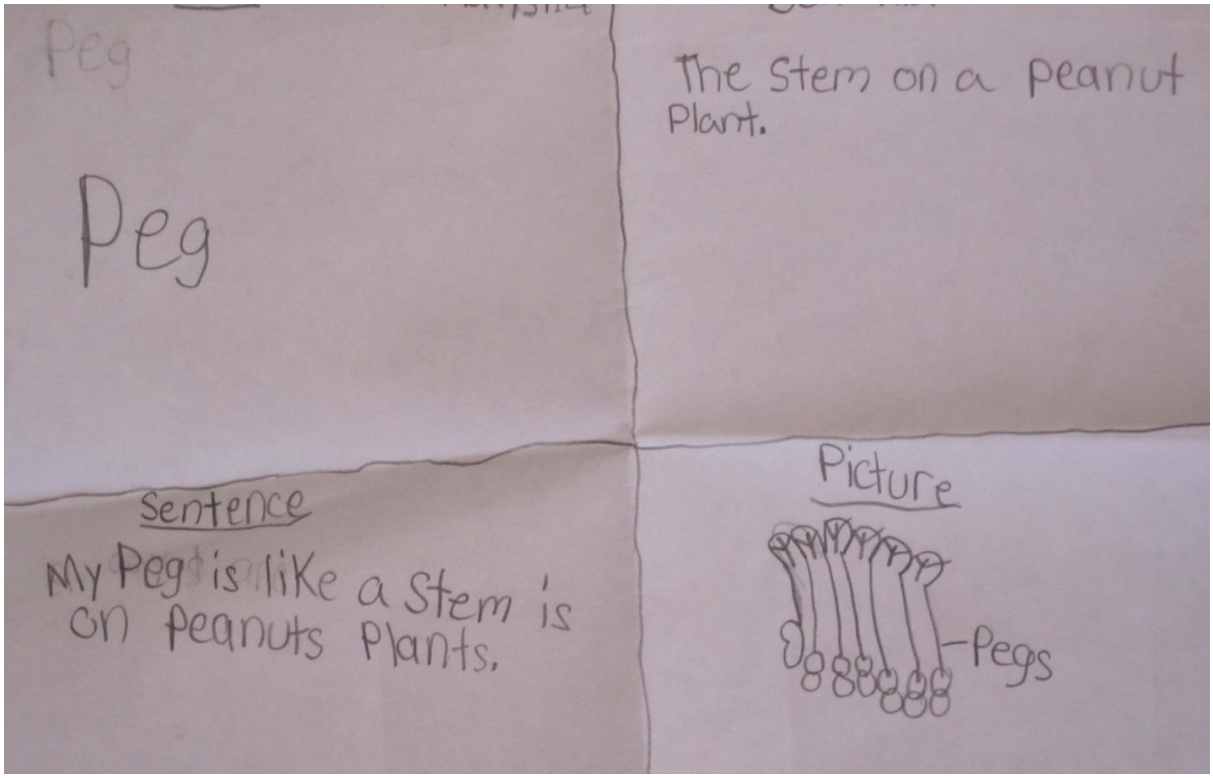


Figure 2. Leesha's Vocabulary Four Square Graphic Organizer for the Term "Peg."

Notes: Leesha recalled and restated information from the SITB, *From Peanuts to Peanut Butter* by Melvin Berger (1996) to compose her Vocabulary Four Graphic Organizer. In this graphic organizer, Leesha defined the term "peg," used it in a sentence, illustrated and labeled it, and shared her sentence for peg with the class seated on the carpet.

Mrs. Bryan explained her expectations:

> I wanted to bring it back to retelling and make them use their own words because a lot of them when you're talking to them, they want to regurgitate what you said. And I don't want you to regurgitate what I said. I want you to show me how you understand it.

For example, during a shared reading lesson and learning activity, Mrs. Bryan modeled how to summarize information from SITBs (e.g., *Life in the Rain Forest*, Berger, 1996; *Rain Forest*, Cowcher, 1988; *The Great Kapok Tree*, Cherry, 1990) used during the rain forest unit. This was an important comprehension strategy she frequently modeled during interactive read-

alouds with these texts. In this instance, she began with a review of the rain forest layers and the animals that lived there by revisiting these texts and the information they presented. She then drew from this information to summarize her description of each layer of the rain forest in a Rain Forest Flip Book (see Figure 3, p. 124).

Mrs. Bryan described how she modeled summarizing information for each layer:

> I had to model the first one (first layer) and then the second one (second layer) was a little bit better. And then once we got toward the end actually one of my lower students, Carter, was able to pull out the last parts at the end. They were able to do it on their own.

To demonstrate summarizing information for the rain forests layers, Mrs. Bryan modeled her thinking processes, referencing the book, *The Great Kapok Tree* (Cherry, 1990), and its descriptive diagram of the four layers of the rain forest. She also compared the rain forest diagram in *The Great Kapok Tree* to the diagram in *Life in the Rain Forest* by Melvin Berger (1996). As she modeled her thinking, she explicitly talked about each layer in the diagram, describing each layer, as she wrote a summary of this information on large chart using scientific language from the text. Thus, she utilized SITBs as important teaching tools to scaffold students' ability to summarize information in SITBs on their own.

During the sixth week of instruction for the plants and rain forests units, Mrs. Bryan described her students' use of comprehension strategies, commenting:

> They are just really impressing me. And you just kind of think to yourself, ok, all the time I've done is not in vain. And you know what I like that they are starting to do is when you ask them a question, they rephrase it before they give you an answer. I mean this is the first class I've seen that does that without having to be taught how to do it. I mean Lena is excellent at it! And Levon, of course. But, I mean, it's just wow! And the amazing part is that academically they're lower than the class I had last year. But they're doing things that those kids were not doing.

Figure 3. Leesha's Rain Forest Layers Flip Book.

Notes: Leesha summarized information from *Life in the Rain Forest*, Berger, 1996, and *The Great Kapok Tree*, Cherry, 1990, to describe each layer of the rain forest in her Rain Forest Flip Book. She also included illustrations of each layer and the rain forest animals that lived there.

I also observed students rephrasing Mrs. Bryan's questions when responding to her during guided conversations around SITBs. By rephrasing her questions in their own words, the first-grade students were more prepared to answer questions in ways that demonstrated their understanding of the text. For instance, as students rephrased questions, they had more think time

and opportunities to relate information to their own experiences, interests, and the real world. Further, during shared readings and interactive read-alouds, Mrs. Bryan repeatedly asked questions, as well as directed students to reread the text to check their understanding and review information. Students also demonstrated their use of these strategies (e.g., questioning, rereading, reviewing) as they participated in guided conversations around the text.

Furthermore, learning activities provided students with opportunities to review information, restate it in their own words, discuss it with their peers, illustrate important terms and concepts, and share information in a finished product, reenactment, or science investigation, etc. Students recalled, restated, summarized, and/or sequenced information during learning activities, such as flip books, foldables, graphic organizers, plant diagrams, science investigations, maps, and dramatic reenactments. Below I provide examples of learning activities, in which student restated information from SITBs used during the plants and rain forests units:

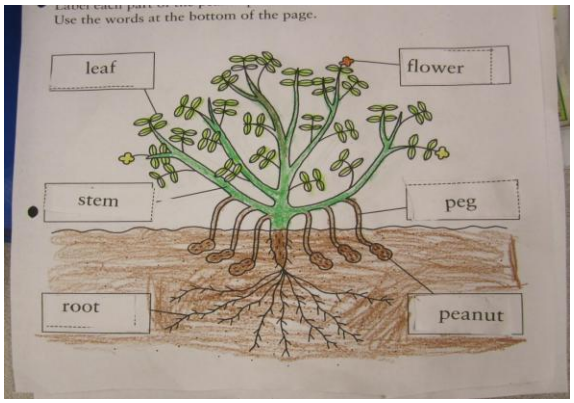
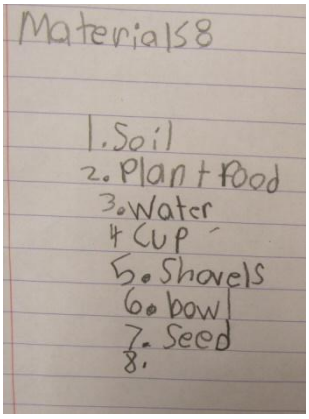


Figure 4. Jerrick's Peanut Plant Diagram.

Notes: Jerrick labeled the parts of the peanut plant in his peanut plant diagram during the plants unit. He restated information for this activity from the SITB, *From Peanuts to Peanut Butter* by Melvin Berger (1996).



Leesha's list of materials for investigation **Cups with soil and seeds placed in sun** **Observation of plant growth**

Figure 5. Science Investigation of Radish Plant Life Cycle.

Notes: First-grade students investigated the life cycle of the radish plant over a period of five weeks. They restated information about the plant lifecycle from SITBs, such as: *Growing Vegetable Soup* by Lois Ehlert (1987), *Plants and Animals* by Rose Padilla (2011), *From Peanuts to Peanut Butter* by Melvin Berger (1996), and *Pasta Please!* by Melvin Berger (1995).

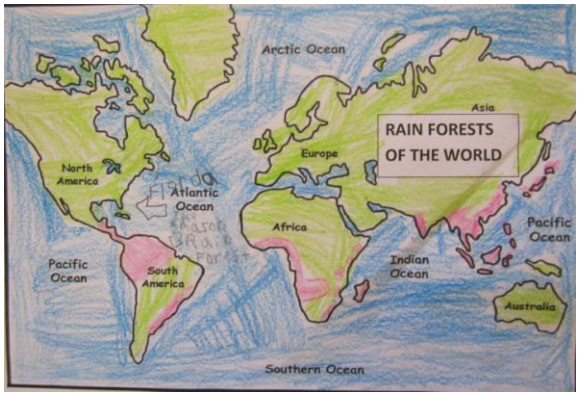


Figure 6. Leesha's Rain Forests World Map.

Notes: Leesha labeled the Amazon Rain Forest in South America and the state of Florida in North America, where she lives, on her Rain Forests of the World Map. She also identified the rain forests of the world by coloring them pink. Leesha restated information for this learning activity from the SITB, *The Great Kapok Tree* by Lynne Cherry (1990).

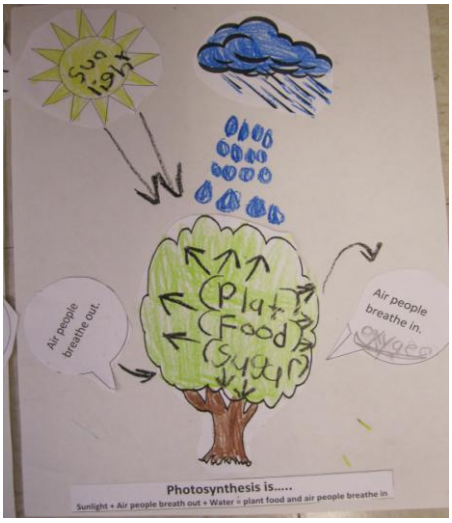


Figure 7. Jerrick's Photosynthesis Diagram.

Notes: Jerrick labeled, colored, and drew arrows to demonstrate photosynthesis in his photosynthesis diagram. He restated information for this learning activity from shared reading lessons and interactive read-alouds with various SITBs during the plants' unit (e.g., *Growing Vegetable Soup* by Lois Ehlert,1987; and *Plants and Animals* by Rose Padilla, 2011) and from Mrs. Bryan's interactive Photosynthesis Power Point.

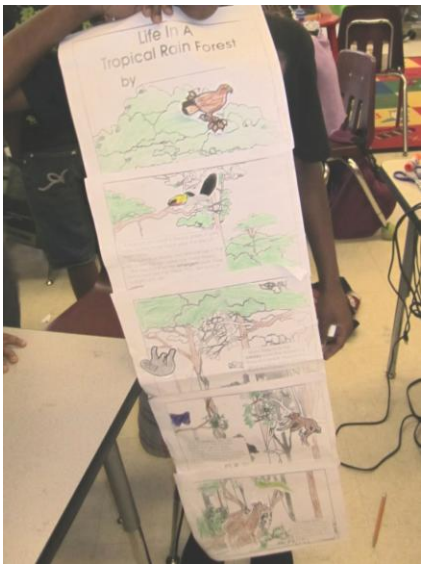


Figure 8. Jerrick's Life in a Tropical Rain Forest Foldable Book.
Notes: Jerrick colored and labeled the layers of the rain forest and the rain forest animals in his Life In a Tropical Rain Forest Foldable Book. He restated information for this learning activity from SITBs used during the rain forest unit (e.g., *The Great Kapok Tree* by Lynne Cherry, 1990; *Rain Forest* by Helen Cowcher, 1988; and *Life in the Rain Forest* by Melvin Berger, 1996).

Teaching tools for text features. Mrs. Bryan utilized SITBs as teaching tools to identify and use their text features, in order to promote students' understanding of how to navigate informational texts and make meaning of the information they present. For instance, she used SITBs as models of nonfiction, to demonstrate how to enter and locate information (e.g., table of contents, index, etc.) in the text. She also used SITBs to show students how to use text features serving as visual representations of information (e.g., illustrations, diagrams, maps, labels, captions, etc.) to add meaning to the explanations for vocabulary and science concepts in the main text.

Mrs. Bryan consistently used SITBs during shared reading lessons and interactive read-alouds to demonstrate how text features facilitated the navigation of information presented these texts. For instance, in the book, *The Four Seasons* (Berger, 1995), she used page numbers listed in the table of contents to enter the text and locate each season (e.g., Spring, p. 1; Summer, p. 5; Fall, p. 9; Winter, p. 13) as they were presented in different parts of the book. Further, she demonstrated how to locate topics listed in the book's index (e.g., apples, p. 11; bees, p. 8, pumpkins, p. 11), and provided students opportunities to locate information for their own purposes and guided them in discussions for how the text features facilitate this process. As students encountered various SITBs with similar text features (e.g., table of contents, index, etc.), Mrs. Bryan reviewed how these text features served to help students enter the text to locate specific topics and items that suited their interests and purposes for reading the text.

Mrs. Bryan also used SITBs during instruction to model how text features providing visual representations of information (e.g., illustrations, diagrams, maps, labels, captions, etc.) added to students' understanding of vocabulary and science concepts presented in the text. For instance, during an interactive read-aloud with, *Life in the Rain Forest* by Melvin Berger (1996),

Mrs. Bryan focused on an illustration of the rain forest layers in this book, with labels and a simple caption to explain each layer it depicted. Students reacted to the visual with interest and questions, in which Mrs. Bryan provided feedback, modeled her own thinking, and explicitly talked about the rain forest layers and how they were demonstrated in the illustration. Further, she had students reread the caption and discuss how bold print called attention to important words in the caption, such as the terms used to name each layer of the rain forest. Throughout the plants and rain forests units, Mrs. Bryan used text features providing visual representation of information to help students make meaning of specialized vocabulary and science concepts presented in these texts. Such text features (e.g., illustrations, diagrams, maps, labels, captions, etc.) provided support for the explanations in the main text and were often the focus of guided conversations about information presented in SITBs during shared reading lessons and interactive read-alouds.

Further, Mrs. Bryan used SITBs as teaching tools to demonstrate the diversity of text features in nonfiction texts. For example, during an interactive read-aloud of the SITB, *From Peanuts to Peanut Butter* by Melvin Berger (1996), Mrs. Bryan used explicit talk to discuss, model her thinking, and to point out the illustrations in this particular SITB did not have captions. She made comparisons of this text, without captions, to other SITBs with captions for illustrations (e.g., *Life in the Rain Forest* by Melvin Berger, 1996), stressing some SITBs have captions and some do not, and that is alright for nonfiction books to have different text features. Additionally, Mrs. Bryan had students examine text features in various, typical types of SITBs (Pappas, 2006) in small groups to locate, discuss, and compare textual features among these books. These typical SITBs contained factual information with expository structures, such as time order or description (Sudol & King, 1996). She explained in an interview, "So, I showed the

kids that it's still nonfiction text even though it may not have all of the exact components that we learned. But if they have these things, they are nonfiction. So, I wanted to show them different kinds."

Over the course of the plants and rain forests units, Mrs. Bryan used SITBs as teaching tools to teach the following text features: table of contents, bold print, captions, labels, illustrations, index, diagrams, maps, and glossary. As students became familiar with text features in SITBs, they frequently identified them and demonstrated their use during shared reading lessons, interactive read-alouds, and learning activities. By being aware of the text features in SITBs, students became more comfortable with these texts, handling them with skill to locate specific information, as well as using them to add meaning to the information presented in the text.

Summary of theme one. Mrs. Bryan used SITBs in her instruction during shared readings, interactive read-alouds, and learning activities to guide students in conversations revolving around the text, where students shared ideas about science and made intertextual connections to their lives, the real world, and other texts. During her instruction, SITBs served as models and teaching tools to scaffold students' understanding of specialized vocabulary, the use of comprehension strategies, and text features. In particular, Mrs. Bryan's explicit talk about specialized vocabulary, her thinking aloud about these terms, and her use of text features to provide visual representations of information (e.g., illustrations, diagrams, captions, labels, etc.), facilitated students' understanding of the scientific language they encountered in SITBs. Also, her consistent modeling of comprehension strategies (e.g., rephrasing, reviewing, rereading, summarizing, etc.) during shared reading lessons and interactive read-alouds with SITBs, provided students with ways to make meaning of the science content presented in these texts.

Further, Mrs. Bryan's use of SITBs to demonstrate text features that aided in the navigation of the text, as well as those that provided visual representations of information in the text, helped students form an awareness for how these features served to locate information and support the meaning important concepts presented in the text.

During Mrs. Bryan's last interview, she reflected on her instruction with SITBs, commenting, "I've done a lot more with the nonfiction than I have in the past years. I feel like I'm stretching as a teacher." Over the course of my study, Mrs. Bryan's appreciation for SITBs grew, as she noted the potential of these texts as teaching tools for vocabulary, comprehension of informational texts, and nonfiction text features.

Theme Two, Active Meaning-making of SITBs in Response to Instruction

The theme, *Active Meaning-making of SITBs in Response to Instruction*, generated from the data addressing research question two, revealing the ways first-grade students responded to the first-grade teacher's instruction with SITBs. In the following section, I provided a descriptive account of my findings associated with this theme, representing the ways first-grade students engaged and interacted with SITBs during Mrs. Bryan's instruction.

Guided conversations around the text. Students' active meaning-making of the text took place during shared reading lessons, interactive read-alouds, and learning activities, where first-grade students participated in guided conversations around the text. Here, Mrs. Bryan prompted students to share ideas about science and make intertextual connections to their experiences, interests, the real world, prior lessons, and other texts.

For example, Mrs. Bryan used *From Peanuts to Peanut Butter* by Melvin Berger (1996) for an interactive read-aloud during a shared reading lesson, followed by a learning activity with captions (see Figure 9, p. 132). Mrs. Bryan often repeated interactive read-alouds with SITBs to

focus students' attention in different areas of the text (e.g., specialized vocabulary, science concepts, text features, etc.). Thus, though she had previously used the book, *From Peanuts to Peanut Butter,* in an interactive read-aloud to focus on specialized vocabulary, she conducted another interactive read-aloud with it to focus on the captions. Students interacted with the text and each other during the read-aloud, as Mrs. Bryan guided them to analyze the illustrations and

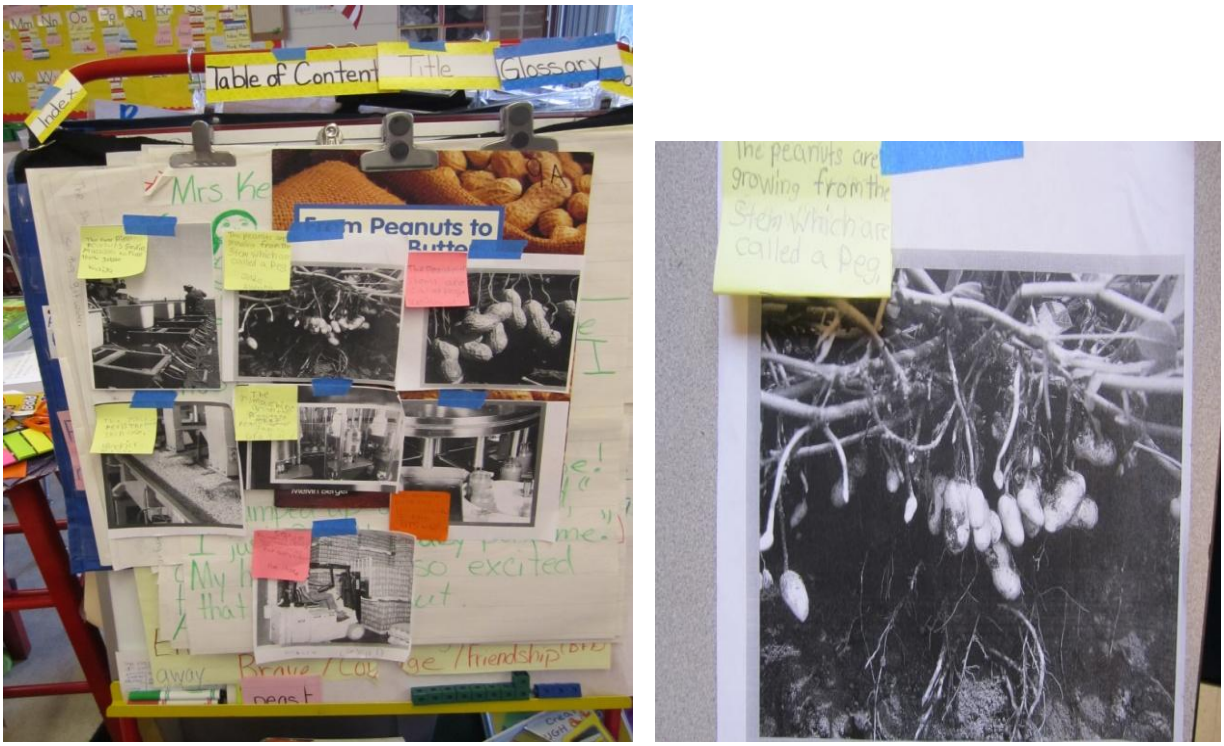


Figure 9. Captions for Photographs in *From Peanuts to Peanut Butter* (Berger, 1996)

Notes: Students wrote captions for the photographs in Berger's (1996) *From Peanuts to Peanut Butter*. Mrs. Bryan explained, "Just because it doesn't have captions does not mean it's not nonfiction. But, we're learning about what nonfiction books have. So, today that is why we practiced writing captions to those pictures." Leesha and Juliann worked together to write the caption for the picture on the right, "The peanuts are growing from the stem which are called a peg."

the information they represented. This provided students multiple opportunities to become familiar with this text prior to the captions learning activity.

To begin the learning activity with captions, Mrs. Bryan explained to her class, "Not all nonfiction books have captions, that's Ok. But, we're learning about it, so I thought that it would be fun for us to practice adding captions to a nonfiction book without them." She then placed students in small groups (i.e., groups of 2-3 students) for the caption activity and provided them with a photocopy of an illustration from the book and sticky notes to write their caption. Upon completion, students regrouped whole class to interact with the book, *From Peanuts to Peanut Butter*, and presented their captions (i.e., read them aloud) in the order the illustrations occurred in the book (i.e., sequencing the factual events in the text). As students interacted with the text, they occasionally reread a portion of it to check their understanding. Mrs. Bryan also encouraged students in conversations around the text to make observations, ask questions, share ideas, and discuss each others' captions, as they presented them to the class.

Example of interactions during this lesson:

> Mrs. Bryan: Which one of these illustrations would come first?
>
> Reshawn: The one with the tractor.
>
> Mrs. Bryan: Why would that one come first?
>
> Reshawn: Because how are peanuts going to grow and you have to plant them with seeds?
>
> Mrs. Bryan: Right, how are they going to grow peanuts if you don't plant them. Very good! So, this one's going to be first. Who wrote the captions for the illustration with the farmer? OK, stand up and read it.
>
> Jerrick and Amber: The farmer is putting peanut seeds in the machine to plant them.
>
> Mrs. Bryan: Alright! Thank you. So, the farmer is putting the peanut seeds into the machine or the tractor so he can do what?

Students: So he can plant them!

Mrs. Bryan: So he can plant them.

Mrs. Bryan: Which illustration comes next?

Carter: The one with the light.

Mrs. Bryan: Ok, who had that one? Leesha and Juliann.

Leesha and Juliann: The peanuts are growing from the stem which are called a peg.

Mrs. Bryan: Alright, so the peanuts are growing from the stem which is called a peg. Alright, they put some vocabulary in there. I like that caption. Next?

Levon and Latonia: The peanuts' stems are called pegs.

Mrs. Bryan: Do they look like they are ready to pick?

Levon: Yes.

Mrs. Bryan: Why do these look ready to pick but these do not?

Jerrick: Because those are little and they can't be white.

Mrs. Bryan: They can't be white? They're white right there. Why do you think? Why are they not ready to pick?

Levon: Peanuts can be white because at my house we have little white peanuts and we eat them.

Mrs. Bryan: They're white after they come out of the shell. You'll have to bring some of those because I'm very curious about that.

The teacher's and students' interactions with Berger's, *From Peanuts to Peanut Butter* (Berger, 1996) during instruction demonstrated how they actively made meaning of the information presented in SITBs during instruction. Drawing from their prior knowledge and understanding of information in this text, the first graders participated in guided conversations around the text, in order to make sense of the illustrations and place the events of planting,

growing, and harvesting of peanuts in a logical order. To begin, Mrs. Bryan asked which illustration would come first, and also asked students to explain why they thought so. For example, Reshawn stated, "The one with the tractor... because how are peanuts going to grow and you have to plant them with seeds?" In his statement, Reshawn recalled that plants grew from seeds and therefore pointed out seeds needed to be planted first. Throughout the lessons, Mrs. Bryan encouraged students to participate in discussions of the text by confirming and repeating their comments, and the captions they read-aloud. She also reviewed events in the book and asked students questions to prompt discussions about the text. For instance, Mrs. Bryan stated, "Alright! Thank you. So, the farmer is putting the peanut seeds into the machine or the tractor so he can do what?" This prompted students to respond, "So he can plant them!" Further, students recalled specialized vocabulary from the text to describe and name the parts of the peanut plant. For instance, Levon and Latonia wrote the following caption, "The peanuts' stems are called pegs."

As the lesson progressed, Mrs. Bryan challenged students to examine the peanuts in the illustration to determine if they were ready to pick. Both Levon and Jerrick shared ideas about the little white peanuts on the page. Levon said "yes" and Jerrick's remark indicated the peanuts in the illustration were too little to be picked, and they should not be white. This discussion indicated students were comfortable with sharing ideas, even if they disagreed and had different ideas for various topics. Mrs. Bryan encouraged more discussion about the white peanuts and suggested students reexamine the illustrations for more clues. For instance, she stated, "They can't be white? They're white right there. Why do you think? Why are they not ready to pick?" Levon responded by relating the text to experiences in his own life. For instance, he stated, "Peanuts can be white because at my house we have little white peanuts and we eat them." Mrs.

Bryan questioned if this made sense, since peanuts are not usually white unless they have come out of their shells. However, she left Levon's idea open to more consideration by suggesting he bring in some of those peanuts to class because she was curious about them.

Overall, students worked with partners to actively make meaning of the illustrations in the text, interact with and reread the text, compose captions for the illustrations, then share their captions with the class. As students participated in conversations around the text, they connected to their experiences and lives, such as Levon relating the little white peanuts in the illustrations to types of peanuts that his family eats at home. Mrs. Bryan took students beyond just identifying captions, by having them compose their own captions representing their interpretations of the information depicted in the illustrations related to growing and harvesting peanuts, as well as, processing and producing peanut butter.

Restating information from the text. One of Mrs. Bryan's initial concerns was that her students were not able to recall and restate information from nonfiction books. Thus, she provided students multiple opportunities during shared reading lessons, interactive read-alouds, and learning activities to restate information from SITBs. Further, her pedagogical moves (e.g., repeating comments, questioning, pausing, and confirming responses) during conversations around the text encouraged students to restate information from the SITBs used in the plants and rain forests units. For instance, Mrs. Bryan reviewed information in *Life in the Rain Forest* (Berger, 1996) during a guided discussion around this text, asking students to describe the different layers of the rain forest. Here, Leesha described the understory as, "A place with hardly any sun," adding, "It is a thick layer because of the thick plants."

In particular, there were numerous hands-on learning activities, in which the students creatively restated information For instance, the first graders restated information from various

SITBs (e.g., *Growing Vegetable Soup*, Ehlert, 1987; *Pasta Please!*, Berger, 1995) during the plants unit to reenact the life cycle of a plant during a class play. To prepare for the class play, the first graders created visuals (e.g., props for sun, rain, soil, seeds, leaves, stems, flowers, etc.), which aided them in restating information, such as naming the parts of the plant, describing the plant's basic needs, and summarizing the stages of the plant life cycle. Also during the plants unit, students collaborated as scientists during a science investigation of the radish plant (see Figure 5, p. 126) to observe each stage in the radish plant life cycle, beginning with the seeds they planted in Styrofoam cups. During this investigation, Mrs. Bryan guided students in conversations revolving around the text, as they restated information in SITBs related to plants and the plant life cycle. For instance, Jerrick observed his radish plant's growth, "Mine's growing! I see a stem! But no leaves yet."

As previously mentioned, Berger's (1996) *From Peanuts to Peanut Butter*, was used repeatedly in numerous shared reading lessons and interactive read-alouds during the plants unit requiring students to restate information in various learning activities. For instance, students completed the peanut plant diagram (see Figure 4, 125) in an learning activity by appropriately coloring and naming the parts of the peanut plant. The SITBs, *Plants and Animals* (Padilla, 2011), was also used in an interactive read-aloud during the plants unit. Following instruction with this text, the first-grade students created a diagram to restate the essential components for photosynthesis (e.g., sunlight, water, air), and to demonstrate how these components are used by the plant to make its own food (see Figure 7, p. 127).

The students also responded to instruction by restating information from various SITBs (e.g., *Life in the Rain Forest*, Berger, 1996; *Rain Forest*, Cowcher, 1988; and *The Great Kapok Tree*, Cherry, 1990), used during the rain forest unit. For instance, students restated information

from these texts to describe each layer of the rain forest and the animals that live there in their Rain Forest Flip Book (see Figure 3, p. 124) and in their Tropical Rain Forest Foldable Book (see Figure 8, p. 127). Also, included in Cherry's *The Great Kapok Tree*, was a "Tropical Rain Forests of the World" map, in which Mrs. Bryan focused on during an interactive read-aloud of the text. After the read-aloud, students created their own Rain Forests World Map, restating information from the text to label the Amazon Rain Forest in South America, and to identify other rain forests by coloring them pink on the map (see Figure 6, p. 126).

Summary of theme two. As Mrs. Bryan engaged students with SITBs during shared reading lessons, interactive read-alouds, and learning activities, where the first graders actively made meaning of these texts during guided conversations revolving around the text. Here, the students responded to Mrs. Bryan's instruction by sharing ideas, interacting with the text, using prior knowledge, and connecting the text to their experiences, interests, and the real world. Furthermore, as students participated in shared reading lessons and interactive read-alouds of SITBs during the plants and rain forests units, they restated information presented in these texts during their discussions of the text and related hands-on learning activities.

Theme Three, Interacting with SITBs to Make Sense of Science

The theme, *Interacting with SITBs to Make Sense of Science*, emerged from the data addressing research question three, revealing how two first-grade students interacted with SITBs on their own. In the following section, I provide a descriptive account of my findings for how students' connections to science and their individual interactions with these texts facilitated their understanding of science.

Forming connections to science. As the first-grade students (i.e., Jerrick and Leesha) interacted with SITBs, they formed strong connections to particular science topics in these texts.

Further, their interest in these topics became more apparent as they repeatedly selected, read and reread, and interacted with various other SITBs addressing the same or related topics from the classroom or school library. Below, I describe how Jerrick and Leesha engaged in SITBs with particular science topics.

***Jerrick's engagement with particular topics*.** Jerrick selected and engaged with SITBs topics during interactive read-alouds, shared reading lessons, and learning activities with SITBs used during the plants and rain forest units. During these activities, he participated in guided conversations around the text, developing some knowledge about plants and rain forests, as well as a curiosity to learn more.

Further, during my observations, Jerrick demonstrated he was especially knowledgeable about the sun and the moon and engaged in SITBs on these topics. In particular, Jerrick selected books about the sun and moon from the school library to discuss during his final interview (see Appendix C). When we began our interview, the first book he picked up was *The Sun* by Ralph Winrich (2008). His voice got excited as he turned the pages and read the text. When Jerrick came to illustrations in the book, he blurted out, "Core! Core! Core! This is hot and this is the Sun." Jerrick proceeded through the book, reading aloud short exerts, discussing illustrations, and elaborating on the importance of the sun to life on earth.

Jerrick also expressed enthusiasm for the book, *The Sun and the Moon* by Patrick Moore (1994). He was quickly drawn to the illustrations, "Oh! See the moon!" Moreover, Jerrick perceived the earth, moon, and sun as life or death topics. He explained, "The earth, the moon, and the sun, like if we did not have all those things, we would not be alive." Jerrick was so engaged in this book that it was difficult to move him on to examine other books during the interview. I asked Jerrick where he learned about the sun and moon. Jerrick explained he learned

about these topics earlier in the school year from books in his classroom.

In the library, Jerrick participated in the Super Scientist Club, in which the school librarian (Ms. Simmons, pseudonym) placed SITBs in a bin by the check-out counter for first-grade students to check out. Jerrick routinely selected books from this bin, engaging and interacting with them on his own in the library and the classroom. The SITBs in the bin were on first-grade reading levels and covered a range of science topics and concepts, such as animals, plants, states of matter, weather, earth science, human body, etc. Examples of SITBs in the Super Scientist Club bin include: *Tree Frogs* by Helen Frost (2006), *Kangaroos* by Sara L. Kras (2009), *From Bud to Blossom* by Gail Saunders-Smith (2000), *Where is Water?* by Robin Nelson (2003). The goal of the Super Scientist Club was for students to read a minimum of five SITBs and write a book report that cited the name of the author, the title of the book, listed two to three facts from the book, and included an illustration of the topic of the book.

In one instance, I observed Jerrick rush into the library and head straight to the check-out counter with a SITB and Super Scientist Club book report (see Figure 10, p. 141) to present to the librarian. Jerrick was especially eager to give his book report to Ms. Simmons, "So, you're a super scientist?" Jerrick, "Yes!" Ms. Simmons, "That's what you're telling me. And, you're going to give me you *A Windy Day* book report by Lola Schaefer (2000)."

Ms. Simmons read his report aloud and commented:

> *A Windy Day* by Lola M. Schaefer. Strong winds moves trees. Wet clothes dry on a windy day. People fly kites on a windy day. And there's your drawing. Ok, good, four stickers. So we'll write on your folder one more to go, right? So, what I need now is for you to go to the Super Scientist box and get another book.

Jerrick had four stickers on his library folder for the four SITBs he read and four book reports he had turned in, and needed one more (i.e., five stickers total) to meet the Super

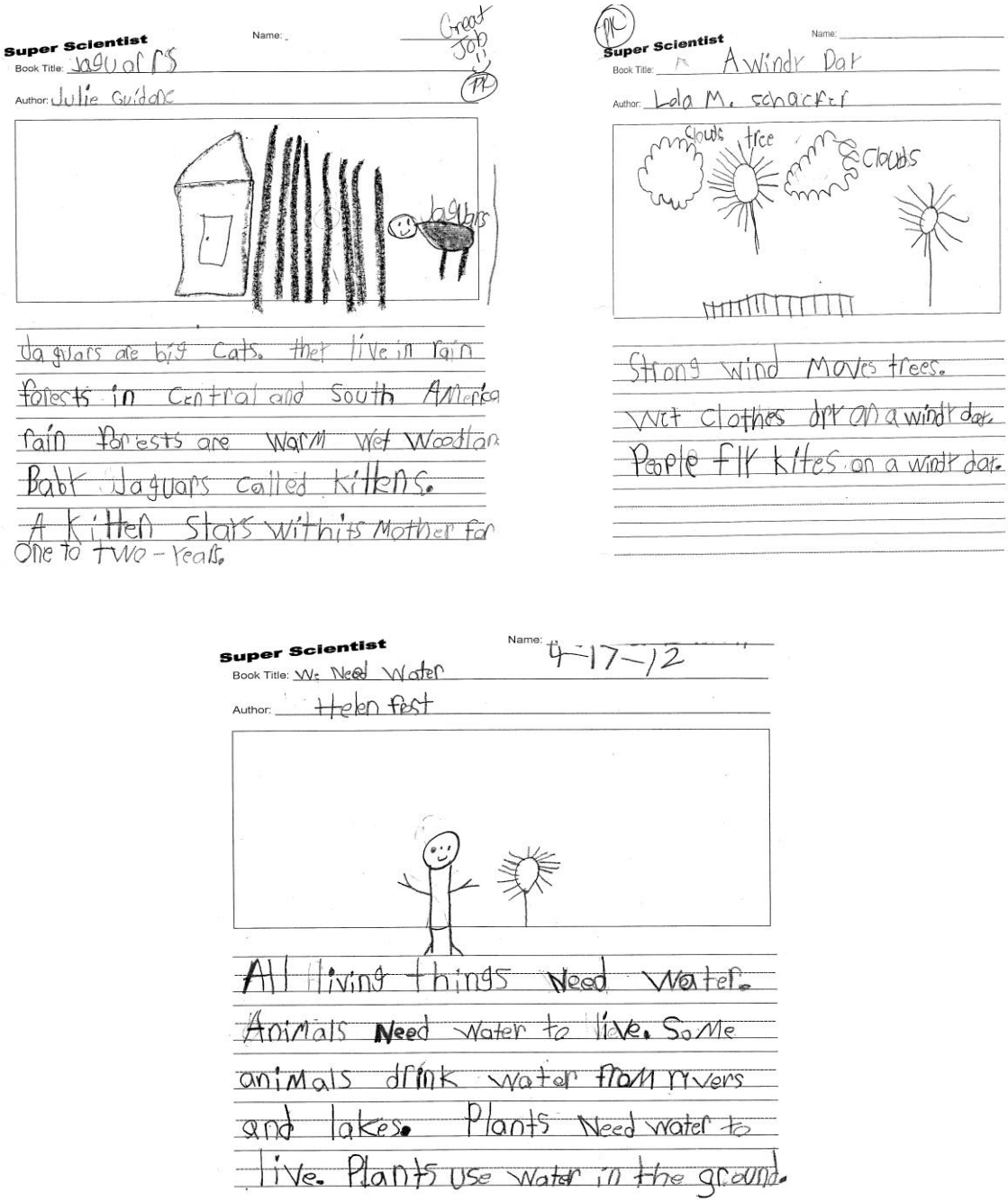


Figure 10. Jerrick's Super Scientist Book Reports.

Notes:. Jerrick wrote book reports for *Jaguars* by Julie Guidone (2009), *A Windy Day* by Lola M. Schaefer (2000), and *We Need Water* by Helen Frost (2000), while participating in the Super Scientist Club.

Scientist Club goal of reading and reporting on five SITBs. Jerrick carefully looked through the book bin and selected the book, *Brown Bears* by Marcia S. Freeman (2000). In a brief unstructured interview, I asked Jerrick why he selected the book, *Brown Bears*. He simply responded, "Because I like animals!"

Jerrick also engaged and interacted with a book he selected from the library, *Life in a Rain Forest* by Carol K. Lindeen (2004), during an interview. He read aloud passages, discussed the rain forest animals in the illustrations, and connected the information in the text to prior lessons. I asked Jerrick how he felt about reading books about the rain forest. His response was, "Good, because I like the rain forest. I like jaguars!" Jaguars was a topic introduced to Jerrick in class during the rain forests unit with various SITBs (e.g., *The Great Kapok Tree*, Cherry, 1990; *Life in the Rain Forest,* Berger, 1996). Jerrick also had checked out a library book on jaguars (i.e., *Jaguars*, Guidone, 2009), describing it as one of his favorite books, in which he kept in his backpack to reread when he had the chance.

Overall, Jerrick formed strong connections to particular topics that were familiar to him and/or he had studied in class (e.g., *Life in the Rain Forest* by Carol Lindeen, 2004, and *The Sun* by Ralph Winrich, 2008). By having some knowledge of these topics, Jerrick engaged in SITBs that supplied more information for these topics to satisfy his curiosity and desire to learn more. In particular, he self-selected SITBs to read and reread on his own from the school library (e.g., *A Windy Day*, Schaefer, 2000; and *Jaguars,* Guidone, 2009) , wrote book reports for these texts, and expressed his interest in reading more about particular topics (e.g., jaguars).

Leesha's engagement with particular topics. Leesha also engaged with SITBs on topics she had learned about in the classroom during the plants and rain forests units. During her first interview, Leesha selected, *From Seed to Plant* by Gail Gibbons (1991) to discuss as she

engaged in and interacted with this text. She was visibly excited about this book (e.g., smiling and pointing) as she flipped through the pages reading the text and examining the illustrations. Further, she discussed the colorful plant diagrams, naming plant parts and discussing their functions. In addition, Leesha made intertextual connections to Gibbons' *From Seed to Plant*, as she recalled information she had learned in previous lessons with SITBs (e.g., *Growing Vegetable Soup* by Lois Ehlert,1987; *Plants and Animals* by Rose Padilla, 2011) regarding the plant life cycle and plant's basic needs during the plants unit that was taking place in class.

Leesha was also noticeably engaged in the SITB, *The Great Kapok Tree* by Lynn Cherry (1990) during her final interview. Mrs. Bryan had previously used this book during the rain forest unit. During the interview, Leesha decisively told me "I want to talk about this book," referring to *The Great Kapok Tree*. She took me through the book, naming the rain forest animals, "Look! The snake, the butterflies, the bees, the bugs, the monkeys, and the birds!" Further, Leesha stated her concern for the animals losing their home in the Great Kapok Tree. Leesha commented, "It's the boy who is chopping out the tree." Leesha explained, "The boy went home because he heard the animals talk about please don't' hurt my Kapok tree!"

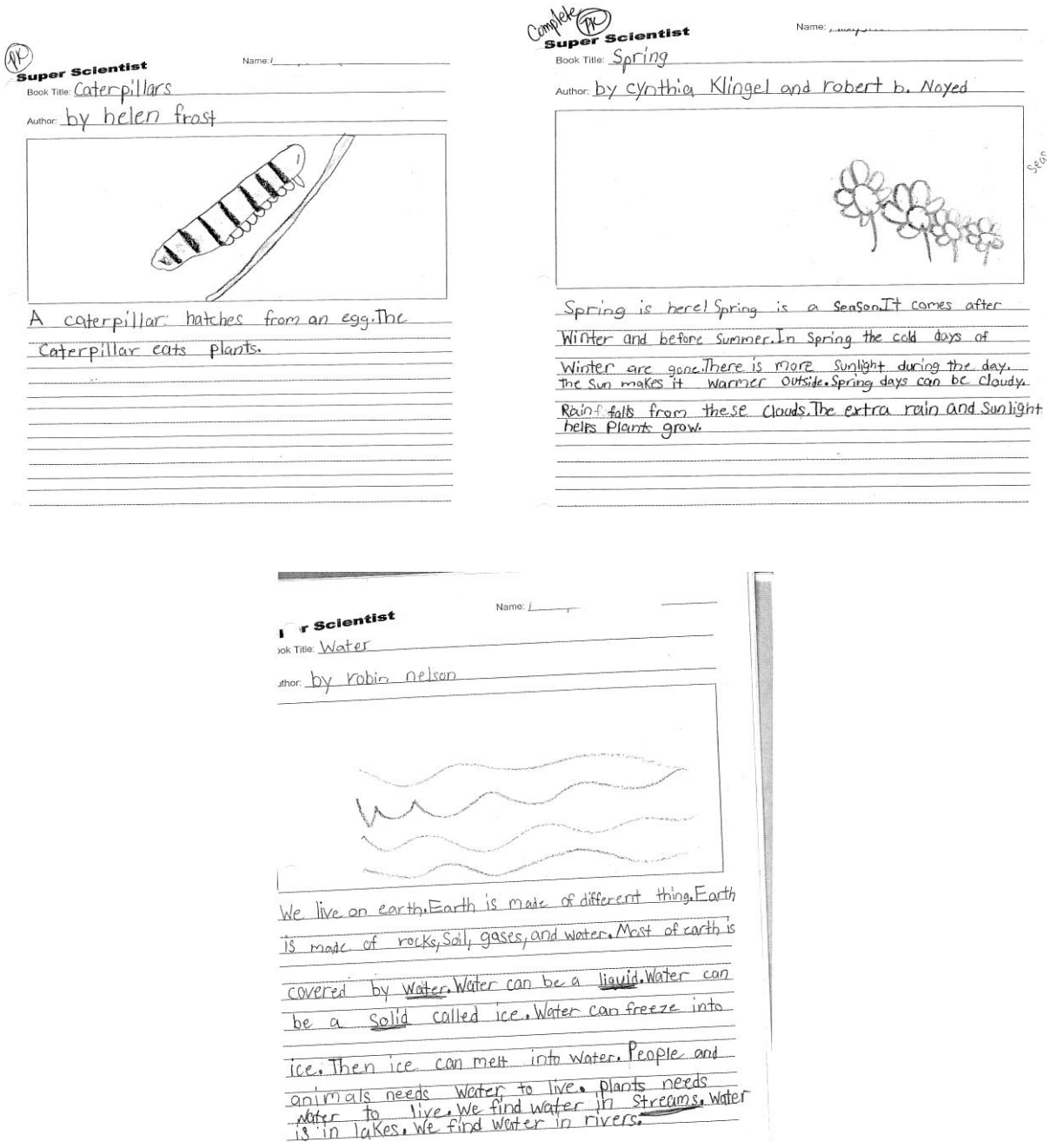
Cherry's *The Great Kapok Tree* (1990) was an informational storybook (Donovan & Smolkin, 2002) about the rain forest, with information embedded in an entertaining story with a strong message to protect the rain forest and its inhabitants. This book also contained a diagram of the layers of the rain forest, a world map of the rain forests, labels for the animals, and factual information about the rain forest on the first three pages of the book. Leesha examined and interacted with the informational pages in Cherry's (1990) *The Great Kapok Tree*, making

intertextual connections to previous lessons and learning activities, in which she had restated information from the text.

Similar to Jerrick, Leesha participated in the Super Scientist Club and selected SITBs from a bin next to the check-out desk on interesting topics, such as animals, weather, and the human body. She was also expected to read a minimum of five SITBs and write a book report for each of them. Leesha expressed excitement and motivation to read and interact with the SITBs she selected from the school library.

In one instance, I observed Leesha enter the library with several other students. When she spotted me, she presented her book report for the SITB, *Caterpillars* by Helen Frost (2000) that included a colorful illustration of a caterpillar (see Figure 11, p. 145). I read her report aloud, "*Caterpillars* by Helen Frost. A caterpillar hatches from an egg. The caterpillar eats plants." This was Leesha's fourth book report, and she needed one more to meet her goal of five as a Super Scientist Club participant. Leesha presented her book report to Ms. Simmons at the check-out counter. Ms. Simmons responded, "Oh! That is so cute! That is an adorable caterpillar!" Ms. Simmons also carefully read Leesha's report aloud and asked questions, "A caterpillar hatches from an egg. The caterpillar eats plants. What does the caterpillar become? Does it change into anything?" Leesha replied, "A butterfly!" Ms. Simmons, "So, that's your fourth one, right? One more, ok. So, I want you to go get another book."

Leesha selected the SITB, *Water* by Robin Nelson (2005) as her fifth book from the bin in the school library. She then shared this text with me in an unstructured interview at a library table. Leesha interacted with this text by flipping through its pages in a nonlinear manner. She also used the table of contexts to locate topics and items in the text that interested her. Further, she examined photographs of water, read the captions aloud, and looked up terms in the glossary



Super Scientist

Book Title: Caterpillars

Author: by helen frost

A caterpillar hatches from an egg. The caterpillar eats plants.

Complete

Super Scientist

Book Title: Spring

Author: by cynthia Klingel and robert b. Noyed

Spring is here! Spring is a season. It comes after winter and before summer. In Spring the cold days of winter are gone. There is more sunlight during the day. The sun makes it warmer outside. Spring days can be cloudy. Rain falls from these clouds. The extra rain and sunlight helps plants grow.

Super Scientist

Book Title: Water

Author: by robin nelson

We live on earth. Earth is made of different thing. Earth is made of rocks, soil, gases, and water. Most of earth is covered by water. Water can be a liquid. Water can be a solid called ice. Water can freeze into ice. Then ice can melt into water. People and animals needs water to live. plants needs water to live. We find water in streams. Water is in lakes. We find water in rivers.

Figure 11. Leesha's Super Scientist Book Reports.

Notes. Leesha wrote book reports for *Caterpillars* by Helen Frost (2000), *Spring* by Cynthia Klingel (2000), and *Water* by Robin Nelson (2005), while participating in the Super Scientist Club.

to aid her in making sense of this text. In addition, she connected this text to how water is used in her life and the real world. Overall, Leesha physically took control of this book, flipping the pages, pointing out the bold print, and reading aloud exerts from the book. Through her mannerisms and behaviors, it became apparent Leesha saw herself as a reader of informational books, as she navigated through Nelson's book *Water* in meaningful ways for her own purposes.

Throughout the course of my study, Leesha formed connections to science topics that were familiar and/or she learned about in class during the plants and the rain forests units (e.g., *From Seed to Plant*, Gibbons,1991; *Plants are Living Things*, Kalman, 2008) Leesha especially engaged and interacted in books that she made strong connections to, such as Cherry's (1990), *The Great Kapok Tree*. In particular, she demonstrated passion for the animals in this book, who were in danger of losing their homes in the rain forest. Leesha also made intertextual connections between Cherry's *The Great Kapok Tree* and other SITBs with a similar theme of conversation (e.g., *Rain Forest* by Helen Cowcher, 1988; *Our Earth, Helping Out*, Hock, 2009). Overall, the books Leesha read and interacted with, on her own, were books she had formed strong connections to their scientific topics during previous lessons or through her own experiences.

Individual interactions with SITBs. Jerrick and Leesha interacted with SITBs in various ways to make meaning of the information presented in these texts. Their interactions varied, as they encountered SITBs with different types of text features and structures, familiar and unfamiliar vocabulary, as well as simple and complex text and/or concepts. For instance, some SITBs the first graders encountered contained topics and subtopics, others presented factual events over time, yet others contained a story with sidebars of information (Donovan & Smolkin, 2002). In this section, I describe how Leesha and Jerrick interacted with SITBs on their own and the strategies they used to make sense of the scientific language and concepts these

texts presented.

Jerrick's interactions with SITBs. Jerrick's interactions with SITBs varied with his familiarity with the vocabulary and the complexity of the text. For example, during his first interview, Jerrick discussed the book, *A Windy Day* by Lola M. Schaefer (2000), using prior knowledge and information in the text and illustrations to describe how wind moved things around in our world. Jerrick explained, "A windy day, see the trees are swaying around... like, grass, trees all twisting around, look!" Jerrick's interactions and discussion of the book demonstrated he understood wind, described it, and was interested in it. He also connected it to the real world by explaining how it impacted movement of various things in our environment, such as trees, grass, seeds, clouds, kites, and flags. Further, Jerrick was familiar with the specialized vocabulary (e.g., movement, air, wind, seeds) and read the simple, limited text (i.e., one sentence passages) fluently. He navigated the text in a nonlinear manner, entering it through the table of contents to locate pages with interesting subjects (e.g., kinds of wind, and what the wind does). Although, wind nor weather were topics the class was currently learning about, Jerrick was very engaged with this book, stating aloud in the interview, "I like this book!," making a strong connection to science.

Jerrick also selected, *From Seed to Plant* by Gail Gibbons (1991) during his initial interview. In particular, he followed the sequence of the life cycle through the book, read exerts, used prior knowledge, and relied on text features visually representing information (e.g., diagrams and illustrations) to make meaning of the text. For instance, he identified information in the illustrations, "This is the stem, this the roots, this the flower, and this the leaves." Moreover, Jerrick described the book as nonfiction because it was about real things in our world, such as plants. However, Jerrick had difficulty with some specialized vocabulary in this

book (e.g., minerals, nutrition, pistil), which impaired his reading fluency with the text. Overall, Jerrick made few attempts to sound out unfamiliar specialized vocabulary and skipped over these terms in passages and labels for illustrations and plant diagrams.

During Jerrick's final interview during the ninth week of my study, he selected the SITB *The Sun* by Ralph Winrich (2008) from the school library. As previously mentioned, Jerrick was especially interested in books about the sun, moon, and earth. The book, *The Sun* had simple text and large font; however, it had slightly more information and more specialized vocabulary in it than *A Windy Day* or *From Seed to Plant.* The text was also organized with topics and subtopics, and contained numerous labeled illustrations and sidebars of information. Jerrick was excited about this reading this book. He passionately turned the pages in a nonlinear manner, using his prior knowledge to discuss the illustrations and read their labels (e.g., Earth, Sun's core, Milky Way Galaxy). In particular, Jerrick discussed the sun's core, sunspots, solar flares, and elaborated on the size of the Sun compared to Earth. Jerrick commented, "Yeah. Look! The Earth is small, tiny. And the Sun is big! The Sun is bigger than the Earth."

Further, Jerrick read short exerts from *The Sun*, but had difficulty with specialized vocabulary (e.g., galaxy, atmosphere, solar) in some of the passages. This impaired his reading fluency and limited his discussions and understanding of the concepts presented in the book. Further, Jerrick used text features to navigate the text (e.g., table of contents, index, and glossary). For instance, Jerrick explained, "The table of contents lets you know like on page four there's a picture of the sun. Like eight the sunlight." Likewise, Jerrick showed how to locate topics and items on particular pages listed in the index. However, although Mrs. Bryan had taught glossary, Jerrick was unclear about the glossary's purpose and the specialized vocabulary listed there was difficult for him to pronounce. He explained, "Gloss (i.e., glossary) gives you

information. It gives you information about the story." Overall, Jerrick relied on his prior knowledge and text features that provided visual representations of information (e.g., illustrations with labels) to explain the important concepts in Winrich's (2008) *The Sun*. Further, his lack of familiarity with the specialized vocabulary impeded his reading fluency, use of the glossary, as well as his full comprehension of the information presented in the book.

Leesha's interactions with SITBs. Leesha's interactions with SITBs also varied with her familiarity with the vocabulary, the complexity of the text, and the diversity of text features and structures in these texts. For example, during an interview, Leesha selected the book, *Our Earth Helping Out* by Patty Hock (2009) from the classroom library, explaining she had previously read this text in class on her own. This SITB was organized with topics and subtopics, and contained text features, such as photographs with labels, captions, glossary, bold print, table of contents, and index. Leesha explained the book , "It's about making less mess. It's about making Earth clean." Further, Leesha used prior knowledge to discuss photographs of children doing tasks to help preserve our earth. She then connected the text to an Earth Day event at her school, where teachers, students, and parents planted new plants and clean the school grounds.

Leesha engaged in this book in a nonlinear manner, using the table of contents and the index to locate interesting topics in the book, such as saving water and making less trash. Leesha read exerts in this book fluently, pronouncing specialized vocabulary (e.g., pollution, litter, recycle), pointing out bold print, and discussing these terms with understanding within the context of the book. Overall, Leesha handled this book with confidence, navigating its text features and organizational structures for her own purposes. Further, she used prior knowledge, real-world connections, and visual representations of information (i.e., illustrations, labels, captions) to make sense of the information the text presented.

Further, Leesha selected the SITB, *What's Inside? Plants* by Angela Royston (1992) during her final interview during the tenth week of my study. Leesha identified the book's genre as, "Nonfiction, a real book because these are real parts of a plant, and because plants do have stems." This text contained numerous photographs and diagrams of various flowers and plants that included descriptive labels and captions with simple text and large font. However, this text lacked other text features, such as a table of contents, index, glossary, etc.

As she interacted with the text, Leesha used prior knowledge and the illustrations and diagrams in Royston's *What's Inside? Plants*, to discuss the plants' parts and their functions. She also read exerts from this book fluently and was familiar with most specialized vocabulary (e.g., petals, roots, stem, sunlight). Further, she connected the text to previous lessons and other texts used during the plants unit. For instance, as she read and interacted with the text, she interjected information she acquired in previous lessons, "They need space because if they all bunched up together, they wouldn't have space to grow and they will die." Overall, Leesha took control of the book, *What's Inside? Plants*, and handled it comfortably in a linear manner. When I asked her why she chose *What's Inside? Plants* by Angela Royston (1992), Leesha responded, "Because we already talking about plants. So, I want to learn more about plants."

Leesha also chose to discuss the SITB, *In the Trees, Honey Bees* by Lori Mortensen (2009) during her final interview. This book provided a dual purpose format, containing a narrative delivery of information written in poetic verse as the main text, and factual information written as sidebars of information at the bottom of the pages (Donovan & Smolkin, 2002). Mrs. Bryan had not used SITBs with a dual purpose format during the plants and rain forest units, so Leesha was unfamiliar with these types of texts. Yet, Leesha was so absorbed in this atypical SITB, it was difficult to get her attention to ask questions during the interview. Leesha

commented, "Wait, wait! We can learn about bees getting hives and honey!" She studied the illustrations, which were missing labels, then suggested labels could be added, "They could have the line that tell about stuff, like they could have a line right here that says honey, what bees eat."

Leesha moved around the pages in a nonlinear manner, interacting with full-page illustrations of bees busy at work, the poetic verse in the main text, and sidebars of information containing bee facts. She was especially drawn to the colorful illustrations, and fluently read the poetic verse, e.g., "Blossoms out. Dancing scout." However, though she attempted to read the sidebars of information at the bottom of the pages, her fluently diminished when she encountered unfamiliar vocabulary (e.g., colony and powdery pollen) in the text, which was written in a smaller font. Leesha chose to skip over this more difficult text in the sidebars, and she was drawn back to the illustrations and simpler poetic verse in the main text.

Leesha also chose Cole's (1987) *The Magic School Bus Inside the Earth*, with a dual-purpose format during her final interview, containing an entertaining story and sidebars of factual information (Donovan & Smolkin, 2002). Leesha was very engaged in this atypical SITB and studied the interesting characters in the illustrations. She read the main text fluently, as well as the limited, simple text in speech bubbles for dialogue among the characters. However, Leesha had difficulty reading sidebars of factual information, containing unfamiliar specialized vocabulary (e.g., sediment, granite, igneous) and concepts. Further, Leesha chose to skip over these sidebars of facts, and focused instead on the illustrations and the simple text in the story, in order to make sense of this book. Yet, this did not deter her from engaging in this book. Leesha also discussed other books she had read in Cole's Magic School Bus series (e.g., *The Magic School Bus Gets Caught in a Web*, Lane, 2007), expressing her pleasure with reading these books.

Summary of theme three. Overall, Leesha and Jerrick interacted with a variety of SITBs containing diverse text features and organizational patterns. Typically, the first graders adjusted their approaches to these texts according to the types of texts they encountered. For instance, I observed the first graders interacting with texts containing topics and subtopics in a nonlinear manner (i.e., moving around the page and/or skipping pages to locate particular topics or subtopics). However, they read texts presenting factual events in order, in a more linear manner (i.e., reading information and pages in order). Further, Jerrick and Leesha often read SITBs with simple text, and familiar specialized vocabulary and concepts fluently; and chose to skip over text with unfamiliar specialized vocabulary, complex concepts, and lengthier text with a smaller font. Jerrick and Leesha also used prior knowledge, intertextual connections to their experiences and the real world, and text features providing visual representations of information (e.g., illustrations, diagrams, labels, captions), to aid them in making sense of the scientific information these texts presented.

Summary

To reach my findings, the data generated the theme *Using SITBs as Teaching Tools during Guided Conversations Around the Text* to demonstrate the ways the first-grade teacher engaged students with these texts to scaffold their understanding of the them during instruction. Further, Mrs. Bryan's instruction with these texts took place during two integrated literacy/science units, where she utilized these texts during shared reading lessons, interactive read-alouds, and numerous hands-on learning activities. As Mrs. Bryan guided students in conversations around the text, she prompted them to share ideas, interact with the text, and make intertextual connections to their experiences, the real world, prior lessons, and other texts.

Furthermore, Mrs. Bryan utilized SITBs as teaching tools for vocabulary, where she

explicitly discussed specialized vocabulary and modeled her thinking for how these terms add meaning to the concepts presented in the text. She also used SITBs to model comprehension strategies (e.g., questioning, rephrasing, summarizing, and rereading) to facilitate students' understanding of the information these texts presented. Finally, Mrs. Bryan used SITBs as teaching tools that served as models of nonfiction text features, in which she demonstrated how text features aid students in their navigation of the text (e.g., table of contents, index), as well as provide visual representations of information (e.g., illustrations, diagrams, labels, captions) that add meaning to the concepts presented in the text.

Moreover, the theme *Active Meaning-Making of SITBs in Response to Instruction* revealed the ways first grade students responded to Mrs. Bryan's instruction with these texts. For instance, the first graders actively made meaning of SITBs as they participated in guided conversations around the text, where they shared ideas, made observations, and connected the text to their lives and experiences. Also, throughout the plants and rain forests units, the first graders engaged in SITBs during shared reading lessons and interactive read-alouds, in which they read and re-read the text, focused on specialized vocabulary, and discussed important science concepts in relation to the real world, in order to make meaning of the text. Students also responded to Mrs. Bryan's prompting and questioning during discussions of the text, in which they recalled and restated information from SITBs during instruction, as well as in numerous hands-on learning activities related to the SITBs used during the plants and rain forests units.

Finally, the theme *Interacting with SITBs to Make Sense of Science* showed us how Jerrick and Leesha formed connections to science with SITBs, as well as, interacted with these text on their own, in order to make sense of science. Overall, Leesha and Jerrick developed strong connections to science, as they interacted with topics they learned about during SITBs

during instruction for the plants and rain forests units. For instance, Jerrick connected to jaguars during the rain forest unit, and then self-selected Guidone's *Jaguars* (2009) from the school library to read more on this topic. Likewise, Leesha developed an interest in plants during the plant unit, and was drawn to Gibbons' *From Seed to Plant* (1991) when self-selecting books during an interview. By having some knowledge of these topics, the students displayed a curiosity about them, and sought out SITBs with related topics in order to learn more.

Furthermore, as the first graders interacted with various types of SITBs, they adjusted their approaches to these texts in order to make sense of the information they presented. For instance, these students interacted with texts sequencing information over time (e.g., the life cycle of a plant), in a linear manner. Yet, they interacted with SITBs presenting topics and subtopics in more of a nonlinear manner to locate particular topics of interest (e.g., brown bears, their attributes, habitats, offspring, etc.). Further, Jerrick and Leesha read SITBs with simple text fluently; however they often chose to skip over text with unfamiliar vocabulary and complex concepts to focus on visual representations of information (e.g., illustrations, diagrams, labels, captions) and simple text with large font that provided support for their understanding of the text. Overall, Leesha and Jerrick began to handle SITBs comfortably during my study, navigating through them in meaningful ways for their own purposes.

CHAPTER FIVE:

DISCUSSION

Children must prepare for the informational texts they will inevitably encounter during their academic years and throughout their adult lives (Duke & Bennett-Armistead, 2003; Kletzien & Dreher, 2004). To prepare our youth as readers, experts claim students need to encounter informational texts at an early age to gain experience with their expository text structures (Duke et al., 2012; Duke & Kays, 1998; Pappas, 1993, 2006), and learn important academic language that will facilitate their success in school and in the technical careers of today's work force (Cope & Kalantzis, 1993; Honig, 2010; Santoro et al., 2008; Varelas & Pappas, 2006). Further, researchers, such as Dreher, 2003; Moss, 2003; Ness, 2011; Pappas & Varelas, 2009, found instruction with informational texts increased primary students' interest in reading and writing in important content areas, such as science. Others have found primary students' learning in the content areas, such as science, is facilitated when teachers include informational texts in their literacy and content area instruction (Atkinson et al., 2009; Maloch & Bomer, 2013a, 2013b; Morrow et al., 1997; Pappas & Varelas, 2009).

Further, the adoption of the Common Core State Standards (Common Core State Standards Initiative, 2010) is imminent, requiring students to read and write more informational texts (Maloch & Bomer, 2013b). Primary teachers will need to find more ways to include informational texts in their literacy and content area instruction to fulfill state and school curricular demands, as well as prepare students for emerging state assessments emphasizing nonfiction. Moreover, primary teachers are faced with finding appropriate nonfiction books for

their instruction that students not only learn from, but can connect to and engage in, as they make this transition to more expository types of reading and writing tasks that will be mandated by the Standards.

Over the past decade, the body of research addressing informational texts in the primary grades has extensively focused on the use of informational books in the primary literacy and science curriculum (Gill, 2009; Maloch & Bomer, 2013a, 2013b; Moss, 2003; Saul & Dieckman, 2005). Further, s*cience informational trade books* (SITBs) have emerged as a prominent genre of informational books and are available for primary grade literacy and science instruction (Coleman et al., 2012; Donovan & Smolkin, 2002; Moss, 2005; Reardon & Broemmel, 2008; Yopp & Yopp, 2012). Although there has been an influx of developmentally appropriate SITBs available for primary-grade science instruction, these books are currently used in varying degrees by primary teachers (Duke, 2000; Jeong et al., 2010; Moss, 2008; Yopp & Yopp, 2006). For instance, over a decade ago, Duke (2000) and Jacobs' et al. (2000) found children in primary grades spent little time reading or listening to informational texts. More recent research has shown narrative texts continue to dominate primary classrooms (Jeong et al., 2010; Yopp & Yopp, 2006); however, this comes with reports that the use of informational texts is slowly increasing in primary instruction.

Purpose for the Study

The purpose of this study was to examine the ways a first-grade teacher utilized SITBs in her literacy/science curricula and to understand how two first-grade students responded to her instruction and interacted with these texts. Through a basic qualitative study (Merriam, 2009), my aim was to provide a descriptive account of the interactions around the use of science informational trade books within the primary literacy and science curricula.

Research Questions

The following research questions guided this study:

1. In what ways does a first-grade teacher use science informational trade books?
2. In what ways do first-grade students respond to the first-grade teacher's instruction with science informational trade books?
3. How do two first-grade students interact with science informational trade books?

Summary of the Study

Design and Data Collection

I conducted a qualitative study (Merriam, 2009) that provided a rich description of a first-grade teacher's use of SITBs in her literacy/science curriculum and two first-grade students' response to her instruction and interactions with these texts. My study was guided by a sociocultural perspective (Bakhtin, 1981, 1986; Vygotsky, 1978; Wertsch, 1991) providing me with a lens to examine the participants during naturally occurring social practices, mediated by language and other symbolic systems within their classroom.

The participants were purposefully selected as information-rich subjects (Patton, 2002) for my study. For instance, the first-grade teacher, Mrs. Bryan, was selected based her interest in children's literature (e.g., informational books), her literature-rich classroom, her collaborative teaching methods (e.g., shared reading lessons, interactive read-alouds, learning activities), her devotion to professional development, and her interest in participating in the study. Leesha and Jerrick were selected based on meeting the basic criteria (e.g., making adequate progress in reading in the current school year according to Mrs. Bryan), and for standing out from the other first-grade students as good communicators (rather than adequate), interacting more often with the teacher and their peers during lessons (i.e., more actively involved in lessons), and interacting

more often with trade books (e.g., SITBs) in the classroom and school library.

Overall, I collected data from 28 observations totaling 74 hours and 10 minutes, 6 semi-structured interviews, 21 unstructured interviews, and 26 documents (e.g., students' work, photographs, teaching materials, etc.) over the course of 10 weeks (April 5 -June 8), primarily in the first-grade classroom and on some occasions in the school library. As the researcher, I was the primary instrument for gathering data during the study and used my skills and intuition to collect data that answered the research questions (Merriam, 2009). Through my descriptive analysis of one first-grade teacher's and two student's interactions with SITBs, my aim was to provide insight and new perspectives for the ways SITBs are used by one particular teacher and her students as they make meaning of science in the primary literacy/science curricula.

Limitations

Further, it is important to note the limitations of my study. Although I did not attempt to influence the primary teachers' instructional decisions with texts, my presence most likely increased her use of SITBs. Moreover, my study was largely an inductive process; however, as I have previously described, it was also informed by a supporting body of literature, the theoretical framework, and my knowledge of the issues. It is not appropriate to generalize these findings to other settings; however, it is possible to take away from this analysis a deeper understanding of the ways a first-grade teacher used SITBs as models of nonfiction to promote students' understanding of science, and to analyze the ways in which her students responded to her instruction and interacted with these texts.

The Teacher's Instruction using SITBs

Mrs. Bryan began my study uncertain how to use informational books in her instruction; however, given my focus on SITBs, she stretched as a teacher, engaging her students with

SITBs, in order to connect science to their lives and the real world. She used SITBs to scaffold students' understanding of informational books and the information they presented. Further, her use of SITBs during two integrated literacy/science units for plants and rain forests, provided students numerous opportunities to interact with these texts during shared reading lessons, interactive read-alouds, and hands-on learning activities, where she engaged them in guided conversations revolving around the text.

Particularly important was the first-grade teacher's use of SITBs as teaching tools for specialized vocabulary and important science concepts, as well as models of nonfiction features and structures. For instance, Mrs. Bryan's explicit talk about vocabulary, her thinking aloud about these terms, and her use of text features to provide visual representations of information (e.g., illustrations, diagrams, captions, labels, etc.), facilitated students' understanding and use of vocabulary on their own. Also, Mrs. Bryan's consistent modeling of comprehension strategies (e.g., rephrasing, reviewing, rereading, summarizing, etc.) during interactive read-alouds and shared reading lessons, provided students ways to make sense of the information presented in these texts. Finally, her use of SITBs to demonstrate text features aiding the navigation of the text, as well as those providing visuals for information, helped students form an awareness for how these features served to locate information and support the meaning of important concepts presented in the text.

The Students' Response to Instruction

Smolkin and Donovan (2003) gave emphasis to SITBs as the impetus for primary children's "spontaneous questions, reflections, and connections, as well as teachers' decisions to model, scaffold, or direct attention to certain aspects, information, or connections" (p. 29). The first-grade students responded to Mrs. Bryan's instruction by actively making meaning of the

concepts and vocabulary presented in SITBs during shared reading lessons, interactive read-alouds, and learning activities. In particular, the students participated in guided conversations around the text, in which they vigorously shared ideas about science, interacted with the text, used their prior knowledge, made observations, and formed intertextual connections to their experiences, interests, the real world, prior lessons, and other related texts.

As the students participated in such conversations, they often responded to Mrs. Bryan's questioning and prompting by recalling and restating information from the various SITBs used during instruction. For instance, Leesha responded to Mrs. Bryan's questioning with the book, *Life in the Rain Forest* (Berger, 1996), where she described understory as, "A place with hardly any sun," adding, "It is a thick layer because of the thick plants." Additionally, the first graders restated information during numerous hands-on learning activities associated with SITBs used during the plants and rain forests units. Such as, Jerrick restated information from various texts during the radish plant investigation to describe his plant's stage of growth, "Mine's growing! I see a stem! But no leaves yet."

Donovan and Smolkin (2002) suggested readability is influenced by reader's motivation, background knowledge, and familiarity with related technical vocabulary. Jerrick and Leesha were very motivated to read SITBs on topics that interested them, and formed strong connections to science, often with topics learned in class during the integrated literacy/science units for plants and rain forests. Routinely self-selecting these texts from the school library, they interacted with them in ways to make sense of the information they presented. For instance, they used text features to enter the text or locate information (e.g., table of contents, index, etc.), or those providing visuals of information (e.g., illustrations, diagrams, labels, captions, etc.) to add to their understanding of specialized vocabulary and science concepts. Further, their use of

strategies (e.g., prior knowledge and re-reading of the text) added to their meaning-making of the text. The first graders also adjusted their approach to the text according to the type of text (e.g., non-narrative, narrative informational) and its level of difficulty. This was especially the case when they encountered unfamiliar vocabulary and more lengthier, difficult text. Overall, they resiliently engaged in SITBs on their own, feeding their curiosity for topics they connected to in science.

Discussion of Findings

Throughout this study, I observed a first-grade teacher engage in a series of practices that led to increased reading opportunities for students. I also anticipated other instructional strategies and levels of support, of which the teacher did not demonstrate. These "missed opportunities" provide possible implications for pre-service and inservice teacher education. In addition to my focus on the teacher, I observed two first-grade students who were categorized with labels, such as "retained" or "below-level readers," but who demonstrated an array of effective reading strategies for navigating and comprehending SITBs. My description and analysis of these students' strategies create possibilities for a reconceptualization of "at-risk" readers and provide direction for future research. Finally, researchers (Atkinson et al., 2009; Donovan & Smolkin, 2002; Dreher & Voelker, 2004; Pappas, 2006) have categorized SITBs focusing on text features, structures, and organizational patterns. I revisit these categorizations in light of teacher and student data and with classroom application in mind.

Below, I have organized my discussion of the data to highlight thematic findings. Specifically, I address the following: (a) The Teacher's Conceptions of Early Reading and Her Preference for Narrative, (b) Scaffolding and Co-Constructing Meaning: Instructional Strategies for Reading SITBs, (c) The Students' Active Meaning-making during Instruction, (d) Making

Sense of Science on Their Own, (e) Revisiting the Categorizations of SITBs.

The Teacher's Conceptions of Early Reading and Her Preference for Narrative

A number of researchers suggested primary teachers lack the expertise to select, share, and use informational books with students in their literacy and science curricula (Donovan & Smolkin, 2001; Duke, 2000; Maloch & Bomer, 2013a; Ness, 2011; Palmer & Stewart, 2003). Further, research has shown primary teachers largely chose narrative texts over informational texts for their classrooms (Duke, 2000; Jeong et al., 2010; Pappas, 1993; Yopp & Yopp, 2006).

Given that my study focused on SITBs, I found Mrs. Bryan used these texts in instruction during the two integrated literacy/science units I observed. Her instruction with SITBs included shared reading lessons, interactive read-alouds, and numerous hands-on learning activities. However, upon further examination of the complete reading program and classroom materials, and based on my observations and interview data, Mrs. Bryan exhibited a clear preference for narrative through her arrangement of student access to text, her limited experience in using SITBs, and with her modeling of how to read.

Students' access to texts. Kamberelis (1998) called attention to children's literacy diets in relation to their genre development, revealing how primary children have developed more knowledge of narrative genres than informational genres. These findings, he argued, were related to primary children's excessive diet of narrative texts with little exposure to informational texts during language arts instruction, as well as teachers' explicit metadiscourse for narrative genres during instructional conversations that mostly focused on narrative texts in primary classrooms.

Mrs. Bryan's classroom library contained approximately 50% fiction books, 33% SITBs, and 17% other types of informational books. However, there were few times students were provided opportunities to select and read these texts during the routine school day. Rather, during

short periods of independent reading, students mainly selected books stored in eight bins circulated among their table groups, containing approximately 70% fiction books, 21% SITBs, and 30% other types of nonfiction books. These book bins were considered part of the classroom library, but books in these bins were not periodically replaced with different books from the classroom library bookshelves. Mrs. Bryan also included several basal readers in these bins for independent reading. She further allowed students to select books from their book bags during independent reading (e.g., library books); however, students mainly just selected books from the bins placed on their tables.

Mrs. Bryan had numerous informational books in her classroom library and elsewhere in the classroom; yet, I did not observe her promote her students' independent reading of these texts, nor assist them in finding informational books that suited their individual interests and needs. Her reluctance could be based on her concerns for how well first-grade students could handle nonfiction. As Mrs. Bryan explained, "They just feel more comfortable with fiction. When you give them a nonfiction, I think it's just too much information to compute or gather, and there's no set storyline." Mrs. Bryan's statement confirmed her reliance on narrative and storyline as the access through which students read independently and how they understood text.

Limited teaching experience with SITBs. A number of studies revealed primary teachers have chosen inappropriately leveled SITBs, have attitudes that SITBs are too difficult for primary students (Donovan & Smolkin, 2001; Ness, 2011; Palmer & Stewart, 2003), and have made assumptions that storybooks are more suitable than nonfiction in the primary grades (Duke, 2000; Donovan & Smolkin, 2001; Pappas, 1993). Thus, it is not surprising to find primary teachers who are inexperienced with using nonfiction in their instruction. These findings have led researchers to conclude teachers need training for how to select and use informational

trade books effectively in the primary literacy and content area curricula (Coleman et al, 2011; Donovan & Smolkin, 2001; Palmer & Stewart, 2003).

Mrs. Bryan's position regarding her limited use of nonfiction may have resulted from inexperience in teaching nonfiction. In reflection upon her inclusion of SITBs into her classroom, Mrs. Bryan discussed how she consulted with the reading coach at her school, "I had to ask the reading coach. I know text features, what do I do with it after that?" Further, she expressed concern for her students' ability to relay the information these texts presented, "I don't just want them to spew information. I want them to actually learn something." Overall, Mrs. Bryan felt challenged, but eager to use informational books in instruction, "This is new for me. I never dove in this much." Though Mrs. Bryan had used SITBs in her instruction in the past, during my observations, she now searched for new ways to use these texts in shared reading lessons, interactive read-alouds, and learning activities during two integrated literacy/science units for plants and rain forests. In particular, she planned to provide her students with models of nonfiction, help them connect the text to their lives, and guide them in conversations of the text that facilitated their understanding of the information SITBs presented. Mrs. Bryan explained, "I know I need to use more nonfiction, where they are looking for information and be expected to be able to discuss that information and share it, and add on to what other people's ideas are."

Narrative is for "modeling" aesthetic reading; Informational text is for "learning disciplinary content. Further, Mrs. Bryan selected fiction over nonfiction for recreational read-alouds during breaks in instruction, explaining that fiction worked best to model fluency and promote interest in reading. During recreational reading times, Mrs. Bryan encouraged students to interject comments, ask questions, relax on the carpet, and simple enjoy the book. Yet, I did

not observe her choose from to the numerous informational books in her classroom and the school library, as an alternative to fiction for recreational reading times.

Mrs. Bryan's sole use of fiction over informational books for recreational read-alouds represents missed opportunities to engage first-grade students in SITBs with interesting formats, descriptive language, intriguing illustrations, and a range of fascinating topics that addresses her students' diverse interests (Galda et al., 2010; Gill, 2009; Kiefer, 2010; Moss, 2003) as they relax on the carpet and enjoy a book. Further, experts suggested read-alouds of SITBs have the potential to nurture students' curiosity of science, and hence, motivate them to read more about the topics they naturally wonder about in their everyday world (Gill, 2009; Moss, 2003).

Teaching reading vs. teaching science. Primary teachers need knowledge of science content in order to be critical readers of informational texts and provide effective science instruction (Atkinson et al., 2009; Rice, 2002; Smolkin et al., 2008; Windschitl, 2009, February). According to Windschitl (2009, February), "Teachers with stronger content knowledge are more likely to teach in ways that help students construct knowledge, pose appropriate questions, suggest alternative explanations, and propose additional inquires" (p. 6). However, there is considerable evidence elementary school teachers lack important science content knowledge and do not perceive themselves well qualified to teach science (McConnel, Parker, & Eberhardt, 2013; Rice 2002; Smolkin et al., 2008; Windschitl, 2009, February). Further, experts suggested teachers' lack of knowledge for science concepts is related to insufficient preparation during undergraduate studies, in which teacher candidates often take only introductory science courses providing minimal understanding of science content (Akerson, 2005; Pomeroy, 1993).

Teacher's limited science knowledge. From the onset of my study, Mrs. Bryan expressed uncertainties about science instruction with SITBs. For instance, as previously discussed, she consulted with the reading teacher at her school for instructional materials and suggestions for effective teaching methods with these texts. Typically, Mrs. Bryan's use of SITBs as models during guided conversations with the text facilitated students' understanding of science and connected the text to their experiences, real world contexts, and other related texts. However, there were a few instances Mrs. Bryan interjected information during interactive read-alouds of these texts that could lead to misconceptions about the science concepts she was teaching. For instance, during her discussion for how plant were alike and different, she suggested plants were alike because they had leaves, without discussing how some plants do not have leaves (e.g., fungi, mosses, & algae, etc.).

Teacher's use of expository reading strategies. Further, there are instances in which the text itself (e.g., SITBs) presents inaccurate information that could lead to misconceptions of science (Atkinson et al., 2009; Galda et al., 2010; Gill, 2009; Moss, 2003). Numerous experts recommended teachers instruct students to question the accuracy in informational books, comparing information they read to their own observations and with other resources, such as encyclopedias, online searches, and experts in the field of science (Galda et al., 2010; Moss, 2003; Rice, 2002; Smolkin et al., 2008).

During shared reading and interactive read-alouds of SITBs, Mrs. Bryan pointed out the researchers' role, in which, authors of informational books take on to provide accurate information in such texts. However, she seldom questioned information presented in these texts that could lead to misconceptions. For instance, Mrs. Bryan and her intern used the *The Very Hungry Caterpillar* (Carle, 1969), during a shared reading lesson associated with

metamorphosis. This text presented confusing information, such as caterpillars eating human food (e.g., apples, pickles, and cherry pie), and misused the term 'cocoon' instead of the correct term 'chrysalis' for butterflies (Donovan & Smolkin, 2002). Although Carle's *The Very Hungry Caterpillar* has been classified by Donovan and Smolkin as a SITB storybook, with a purpose to entertain, it also contains information embedded in its storyline related to metamorphosis. As critical readers of SITBs, teachers and students must question and clarify information presented in all types of informational texts that could leave lasting misconceptions about science.

Scaffolding and Co-constructing Meaning: Instructional Strategies for Reading SITBs.

Primary teachers have been found to engage students with SITBs in interactive read-alouds during integrated literacy/science units to scaffold their understanding of science concepts, scientific language, text features and structures, and informational compositions (e.g., Bradley & Donovan, 2010; Coleman et al., 2012; Smolkin & Donovan, 2001; 2003; Varelas & Pappas, 2006). Moreover, primary students are placed at the center of the meaning-making process during interactive read-alouds, where teachers encourage students to make spontaneous observations, share ideas, make connections, ask questions, and respond to each others' questions as they co-construct the meaning of the text (Malloch & Beutel, 2010; Smolkin & Donovan, 2001, 2003; Varelas & Pappas, 2006). Further, Smolkin and Donovan (2003) argue, "interactive read-alouds not only support co-construction of meaning, but also provided teachers with opportunities to model expert meaning-making, reasoning, and comprehension processes" (p. 28).

Scaffolding through modeling and explicit instruction. Throughout my study, Mrs. Bryan routinely engaged students with SITBs in shared reading lessons, interactive read-alouds, and hands-on learning activities for two integrated literacy/science units of study. During her

instruction, she took on the role of expert to scaffold students' understanding of the text, as students socially interacted with the text and each other (Vygotsky, 1978). In this section, I highlight Mrs. Bryan's use of SITBs to model scientific language, comprehension strategies, and text features, as she prompted students to participate in conversations with and around the text.

Guided conversations. Mrs. Bryan engaged students in guided conversations revolving around the text, prompting them to share ideas about science, make observations, ask questions, and form connections to the real world and their lives. During such scaffolded conversations of the text, Mrs. Bryan encouraged the "hybridity of narrative and scientific language and the evolution toward the latter" through her intentional use of SITBs as thinking devices for children to "construct and own scientific knowledge" (Varelas & Pappas, p. 252). Further, Mrs. Bryan provided opportunities for students to grapple with their understandings for important science concepts and terms during their discussions, as they actively made meaning of the information presented in SITBs.

Modeling vocabulary knowledge and comprehension strategies. Mrs. Bryan used SITBs as teaching tools, modeling her own thinking about specialized vocabulary, and explicitly discussing these terms in contexts that related to her students' experiences and the real world. Further, her consistent modeling of comprehension strategies (e.g., rereading to check understanding of the text, rephrasing, summarizing, reviewing, etc.) provided students with multiple ways to make meaning of the text, as they interacted with it during shared reading lessons, interactive read-alouds, and learning activities. In an interview, Mrs. Bryan noted students began to use such comprehension strategies during instruction. She commented, "And you know what I like that they are starting to do, is when you ask them a question, they rephrase

it before they give you an answer." She also noted students' use of summarizing to describe the layers of the rain forest, after she modeled this strategy during a learning activity:

> I had to model the first one (first layer) and then the second one (second layer) was a little bit better. And then once we got toward the end actually one of my lower students, Carter, was able to pull out the last parts at the end. They were able to do it on their own.

These incidents demonstrated how Mrs. Bryan intentionally used comprehension strategies to facilitate her students' understanding of the information presented in SITBs. They also show how students picked up on these strategies and used them for their own purposes.

Demonstrating text features. Mrs. Bryan also modeled how to use SITBs' text features for various purposes. For instance, she demonstrated the use of text features providing visual representations (e.g., illustrations, diagrams, labels, captions, etc.) for information described in the main text (e.g., science concepts and specialized vocabulary). Such as, Mrs. Bryan's use of labeled illustrations and descriptive captions for the rain forest layers in Cherry's (1990) *The Great Kapok Tree*, and Berger's (1996) *Life in the Rain Forest*. These visuals of information aided students' meaning-making of important concepts and vocabulary during instruction, and served as a strategy for their comprehension of the text. Furthermore, Mrs. Bryan modeled other text features (e.g., table of contents, glossary, index, etc.), to support students' navigation of the text, such as to locate topics of interests, and to access helpful information within the text.

Overall, Mrs. Bryan provided instruction with SITBs mainly in a whole-group setting, in which she read-aloud the text and scaffolded students' understanding of its specialized vocabulary, science concepts, and text features. Further, she provided numerous opportunities for the first graders to discuss and interact with SITBs during guided conversations around the text.

Missed Opportunities for Guided Reading and Individualized Instruction

Experts suggested primary students require multiple opportunities to engage in informational books during instruction and recreational reading to build their understanding and use of these texts (Donovan & Smolkin, 2002; Maloch & Bomer, 2013a; Pappas, 1993). Yet, though Mrs. Bryan worked with students during individual tutoring sessions (e.g., addressing fluency and comprehension skills), she seldom provided individualized instruction or individualized assessment with informational books. Furthermore, she mostly selected leveled, fiction books associated with the basal readers provided by her school district for guided reading lessons. Moreover, Mrs. Bryan's lack of individualized instruction and limited use of informational texts for guided reading stemmed from her perceptions that these texts were too difficult for her students due to the specialized vocabulary and unfamiliar concepts presented in these texts.

Overall, Mrs. Bryan's instruction with SITBs helped students connect science to their lives and the real world. Her prompting during guided conversations of the text encouraged students to explore scientific ideas, make observations, and interact with the text in ways to build an understanding of science. Further, Mrs. Bryan facilitated students' understanding of specialized vocabulary, modeled strategies to facilitate comprehension of these texts (e.g., rereading, rephrasing, summarizing, use of prior knowledge), and demonstrated the use of text features to add meaning to the text with visuals of information and an awareness for how to navigate through it.

However, her instruction stopped short of providing students individual guidance with SITBs, and few opportunities for students to engage with these texts on their own in the classroom. For instance, Leesha and Jerrick each had individual reading needs that should be

addressed when reading informational texts independently. For instance, Mrs. Bryan described Leesha as a more proficient reader than Jerrick, placing her in a position to read books at a higher first-grade level in the classroom for instruction. Further, during my observations, Leesha read various SITBs at high first-grade reading levels with fluency and was familiar with the specialized vocabulary in these texts. Thus, these findings may suggest Leesha is ready for more challenging informational books and needs guidance from the teacher for selecting SITBs that would match her interests and needs. Whereas, though Jerrick was making adequate progress with reading at a first-grade level, according to Mrs. Bryan, she also described his progress in reading as slower than that of Leesha's. Further, during my observations, Jerrick read lower-level first-grade SITBs fluently, but he missed much of the information in higher-level SITBs because he was not familiar with the specialized vocabulary. Yet, without individual instruction and assessment with SITBs, it would be difficult to guide either Jerrick or Leesha in their selection of these texts. Particularly important here is how these findings indicate primary teachers must provide students with the instruction and guidance they need to grow individually as readers of informational texts.

The Role of Retention

With the number of students retained or being considered for retention in Mrs. Bryan's first-grade classroom, it became necessary in my study to address the issue of retention in today's schools. Researchers have associated the increase in grade retention with high-stakes testing and school requirements for students to meet grade-level academic competencies (Bali, Anagnostopoulos, & Roberts, 2005; Wu, Hughes, & West, 2010). Thus, it has become a common practice to retain students not making adequate progress in reading according to their Developmental Reading Assessment (DRA) scores. In particular, both my student participants,

Jerrick and Leesha, were retained in the preceding school year. However, they presented themselves in the current school year as well-adjusted, typical first graders, who Mrs. Bryan described as making adequate progress in reading. Therefore, I selected Leesha and Jerrick to participate in my study based on their performance in the current school year, as well as their ability to communicate and participate in the activities in the classroom.

Limited vocabulary. Further, research suggested children entering school from a lower SES background knew significantly fewer words than their peers with a higher SES background (Beck & McKeown, 2007; Beck et al., 2013; White, Graves, & Slater, 1990). This research highlights low-income SES students entering first grade without an adequate verbal repertoire of vocabulary that would aid them in their development as readers. Thus, such students are challenged to meet grade-level academic competencies in today's schools, making them likely candidates for retention. In particular, a large portion of students attending Belt Elementary were from families with a low income background, with 95% of the student population on free or reduced lunch.

Mrs. Bryan was aware of her students' low SES backgrounds, and she believed they had limited vocabulary, especially in the content areas, such as science. She commented, "The biggest thing is vocabulary for my students because a lot of them come with the lack of vocabulary." Further, Mrs. Bryan reported in an interview that she purposefully used SITBs as models of informational texts, in which support was provided for specialized vocabulary both in the main text of the book, as well as in text features depicting these terms in visual representations of information (e.g., diagrams, illustrations, labels, captions, etc.).

Support for comprehension. Research also suggested interactive read-alouds with SITBs provided teachers opportunities to build background knowledge, scientific language, and comprehension skills that could prepare students as readers of informational texts (Pappas & Varelas, 2009; Smolkin & Donovan, 2003). For instance, Smolkin and Donovan (2003) suggested interactive information book read-alouds provided both nonreaders and nonfluent readers support during a "comprehension acquisition" phase, defined as "an instructional period that precedes actual comprehension strategy instruction" (p. 26). These researchers argued interactive read-alouds of informational books benefited nonreaders and nonfluent readers by building inferential and reasoning skills, as well as adding to their background knowledge and understanding of the text.

Thus, interactive read-alouds of SITBs provided a foundation for nonreaders and nonfluent readers' meaning-making processes, providing them with access to information, specialized vocabulary, and ideas beyond their reading abilities. Furthermore, these read-alouds offered students access to complex text structures that supports comprehension by providing a framework or schema for predicting organizational patterns and structures, in which information will be presented (e.g., Pappas, 2006; Pearson, Roehler, Dole, & Duffy, 1992). Therefore, students' awareness of text structures should be considered an important comprehension strategy for understanding informational texts (Smolkin & Donovan, 2003).

The ways in which interactive read-alouds supported comprehension for nonreaders and nonfluent readers (Smolkin and Donovan, 2003) had important implications in Mrs. Bryan's first-grade classroom with seven students under consideration for retention in the current school year due to slow progress in reading. In addition, although Mrs. Bryan's explained her remaining eight students were making adequate progress in reading for the current school year, four of them

were retained last year and repeating first grade.

With such diversity in her classroom, Mrs. Bryan's use of SITBs during interactive read-alouds provided students at all stages of reading development support for comprehension of informational books. In particular, she provided students whom she determined to be making slow progress in reading, access to specialized vocabulary, science concepts, and scientific thought beyond their reading abilities. Further, during interactive read-alouds of SITBs, all students were provided opportunities to connect scientific information to the real world and their lives, build background knowledge, and develop an awareness of the types of text features and complex expository structures they would encounter in informational texts. Overall, these findings call attention to the diversity in today's mainstreamed classrooms, demonstrating how interactive read-alouds with SITBs can provide a foundation of knowledge, vocabulary, and reasoning skills that supports students at different stages of reading development.

The Students' Active Meaning-making during Instruction

Although I did not attempt to influence the primary teachers' instructional decisions with regard to the amount and types of texts she used, the teacher was well aware of my focus on SITBs and she made an effort to include them in her instruction. As a result, the students' experiences with SITBs included increased exposure to nonfiction texts and instructional modeling through interactive read-alouds. I observed numerous ways in which the students emulated the teacher or applied her strategies as the read on their own. I also observed numerous ways in which the students developed their own strategies for reading SITBs. In this section, I discuss how students responded during instruction with SITBs (i.e., shared reading lessons, interactive read-alouds, and learning activities). In the next section, I discuss their idiosyncratic strategies for navigating SITBs.

Students' intertextual connections. The first graders' eager participation in guided conversations around SITBs demonstrated their consistent engagement with these books during two integrated literacy and science units for plants and rain forests. Such persistent interactions with the text nurtured their connections to the scientific topics these books presented. Further, as students responded to Mrs. Bryan's questioning and prompting during instruction, they actively made meaning of information in the text, as they shared ideas and connected the text to their lives and the real world.

Varelas and Pappas (2006) defined intertextuality as, "making sense of the texts from other contexts that children and teachers bring to, and instantiate in, the read-aloud sessions of the unit, as they juxtapose these meanings with the meanings from the current texts" (p. 215). A number of researchers suggested primary students form intertextual connections to SITBs during interactive read-alouds, which facilitated their understanding of the information presented in these texts (Maloch, 2010; Smolkin & Donovan, 2001, 2003; Varelas & Pappas, 2006).

During interactive read-alouds with SITBs, the first graders participated in guided conversations revolving around the text, in which they formed connections to the real world, personal experiences, their interests, prior lessons, and other texts. At times, Mrs. Bryan prompted students' intertextual connections to the text, often by sharing her own personal experiences to encourage discussion. Yet, frequently students also spontaneously responded to the text itself as it was used during a shared reading lesson or an interactive read-aloud, to share an experience, connect information to the real world, or reference a prior lesson with a related text.

Further, as students looked for such opportunities to form intertextual connections to the text during instruction, these connections became an important strategy they used to help them

make sense of the information presented in the text. For instance, during the interactive read-aloud of Berger's (1996) *From Peanuts to Peanut Butter*, the first-grade students used their prior knowledge to make connections to their lives and the real world, such as eating peanut butter sandwiches for lunch, grinding peanuts at home, and shopping for peanut butter at a store. Particularly important was how students used intertextual connections to support their understanding of where peanuts came from, how peanuts are made into peanut butter, and how peanut butter become an item they purchased at the store.

Students' development of scientific language and concepts. Researchers also claimed interactive read-alouds of SITBs provided opportunities for primary students to develop scientific language and understandings of the science concepts presented in these texts (Honig, 2010; Smolkin & Donovan, 2001; Pappas & Varelas, 2009; Varelas & Pappas, 2006). As the first-grade students' shared ideas, formed intertextual connections, and interacted with the text during guided conversations around the SITBs, they developed scientific language and background knowledge that provided a foundation for their understanding of science.

For instance, during an interactive read-aloud of Berger's (1996) *From Peanuts to Peanut Butter*, the first-grade students utilized the full-page illustrations in the text as visual representations of information to help them make sense of the vocabulary and science concepts presented in the main text. During the read-aloud, Mrs. Bryan scaffolded their conversations around text, as the first graders began to use these important terms for their own purposes and make meaning the concepts described in the main text. For instance, the first graders wrote captions for the illustrations, using scientific language to describe and summarize scientific concepts in the text that were depicted in the illustrations. For example, Leesha and her partner wrote the caption, "The peanuts are growing from the stem which are called a peg." Overall, the

first-grade students demonstrated an understanding of scientific information and specialized vocabulary during their presentations and discussions of the captions they wrote to describe information depicted in the illustrations of this text.

Research also indicated primary students developed knowledge of science and vocabulary during a range of hands-on experiences during integrated, literacy and science units of study that included SITBs (Bradley & Donovan, 2010; Coleman et al., 2012; Smolkin & Donovan, 2001; Pappas & Varelas, 2009; Varelas & Pappas, 2006). During my study, students did numerous hands-on learning activities associated with SITBs during instruction for the plants and rain forest units. For such activities, the first-grade students typically worked with their table groups, providing opportunities for students to share information they recalled from the text and discuss the activity amongst themselves. Mrs. Bryan also begin learning activities with a review and discussion of information from the various SITB associated with the activities.

Particularly important is how first graders in my study appropriately used specialized vocabulary from SITBs (e.g., *Growing Vegetable Soup*, Ehlert, 1987; *Pasta Please!*, Berger, 1995; *Plants and Animals*, Padilla, 2011; *From Peanuts to Peanut Butter,* Berger, 1996) during learning activities, such as to reenact the stages of the plant life cycle during a class play. Likewise, they used terms from the text to name the parts of a plant during the science investigation of the radish plant, where they observed and discussed a plant's growth first-hand (see Figure 5, p. 126). They also created labeled diagrams to name the parts of the peanut plant (see Figure 4, p. 125) and to demonstrate how plants make their own food with the photosynthesis diagram (see Figure 7, p. 127). During the rain forest unit, students summarized information from SITBs (e.g., *The Great Kapok Tree*, Cherry, 1990; and *Life in the Rain Forest*, Berger, 1996; *Rain Forest*, Cowcher, 1988), to compose a informational flip book on rain forests

(see Figure 3, p. 124), and a tropical rain forest foldable book (see Figure 8, p. 127), each describing the layers of the rain forest and the animals that live there.

These learning activities provided insight into students' developing skills to appropriately use specialized vocabulary for their own purposes and to accurately describe scientific concepts from informational books. Yet, as previously discussed, such activities do not replace the need for individualized instruction and assessment with SITBs, which is necessary to guide students individually as readers of informational books.

Making Sense of Science on their Own.

In this section, I discuss how the first-grade students interacted with SITBs on their own to make sense of science. To begin, I discuss how the students formed strong connections to science, as they engaged in these texts during the plants and rain forests units. For instance, the students' connections to familiar topics in science motivated them to self-select other books with similar topics. I then discuss how students individually interacted with SITBs, using their prior knowledge and text features providing visuals of information (e.g., illustrations, diagrams, labels, diagrams) to add meaning to the information presented in the text. Further, I discuss how the primary students interacted with specialized vocabulary and variations of text difficulty, and their navigation of the different types of texts.

Interest in science, exposure to SITBs, and self-selection of texts. Researchers have noted primary children's self-selection and engagement with SITBs on topics of science that interested them when provided the opportunity (Donovan et al., 2000; Dreher, 2003: Maloch, 2008; Maloch & Horsey, 2013). Although, Leesha and Jerrick did not have full-access to the classroom library, they selected books from the school library approximately once a week to read on their own. During brief unstructured interviews in the school library, I observed Jerrick and

Leesha interact and read SITBs. Further, in the classroom, I directed Leesha and Jerrick to select books from the classroom library and/or bring library books to interviews, providing me opportunities to observe the first graders read and interact with these texts on their own.

During such times, Leesha and Jerrick demonstrated strong connections to science by selecting SITBs associated with the plants and rain forest unit they studied in class, as well as other familiar topics they were personally interested in. For example, Leesha's passionate reading of Cherry's (1990) *The Great Kapok Tree*, during an interview, demonstrated her concern for the rain forest' animals' dilemma of potentially losing their homes and the book's message to save the rain forest. Further, Jerrick's fascination with jaguars after Mrs. Bryan's interactive read-aloud of Berger's (1996) *Life in The Rain Forest*, led him to self-select the book *Jaguars* (Guidone, 2009) from the school library. Jerrick later shared this text with me during an interview, and repeatedly reread it during breaks in school. Overall, my findings for students' self-selection of SITBs aligned with the claim that students will self-select and engage in reading SITBs with topics that interest them when given the opportunity (Donovan et al., 2000; Dreher, 2003, Maloch, 2008, Maloch & Horsey, 2013). .

Students' SITBs reading strategies. Researchers also noted how primary students interacted with informational books on their own in meaningful ways to connect to science, making intertextual connections, and using the text features and structures to support their understanding of the text (Coleman et al., 2012; Maloch, 2008; Moss, 2003; Pappas & Varelas, 2009).

Tapping prior knowledge. During my study, the first-grade students' individual interactions with SITBs provided insight into how they made sense of science on their own. For instance, during an interview Leesha selected *From Seed to Plant* by Gail Gibbons (1991) to read

and discuss. As Leesha interacted with the text, she used her prior knowledge of plants to interpret the diagrams of plants in this book. Further, she connected this text to other texts she engaged in during the plants unit, such as Padilla's (2011) *Plants & Animals*.

Jerrick selected the book, *Life in a Rain Forest* by Carol K. Lindeen (2004) from the school library. During his interactions with this text, Jerrick focused his attention on the illustrations of rain forest animals, using his prior knowledge to discuss how animals live in particular layers of the rain forest. Further, he connected this text to prior lessons and other texts with similar information used during the rain forest unit in class. For instance, he explained the world rain forests map in this book, relating it to a similar map he created during a learning activity based on Cherry's (1990) *The Great Kapok Tree*.

Adapting to text features. In reading SITBs, Leesha used text features that were visual representations of information (e.g., the colorful diagrams with labels) to support her understanding of the information presented in the main text. Also, Leesha used the content of the text to determine whether she should read in a linear manner or skip around. For example, when reading about the life cycle of a plant, Leesha followed the sequence of the plant life cycle by reading this text in a linear manner, rather than skipping pages to search for subtopics of interest.

Jerrick skipped around the text in a nonlinear manner to subtopics that interested him the most, such as the topics related to the rain forest plants and animals. Jerrick's meaning-making strategies included his use of prior knowledge to make sense of visual representations of information (e.g., world map of the rain forest) and his reading and rereading of the text to check his understanding of information presented in the text.

Specialized vocabulary, variations of text complexity, and the role of fluency.

Donovan and Smolkin (2002) noted readability is influenced by reader's motivation, background knowledge, and familiarity with related technical vocabulary. When reading SITBs on their own, Jerrick and Leesha often selected and read books containing familiar specialized vocabulary and simple text (e.g., large font and limited text) fluently. However, at times they engaged in books that contained unfamiliar vocabulary and more lengthy text (e.g., two or more paragraphs on a page, smaller font, with unfamiliar vocabulary and concepts). For instance, Jerrick read fluently the book *A Windy Day* by Lola Schaefer (2000) with simple, one sentence passages and familiar vocabulary. However, as Jerrick's reading fluency diminished with *The Sun* by Ralph Winrich (2008), as he encountered unfamiliar specialized vocabulary and more complex, lengthier text. In this instance, he turned his attention to the illustrations and other text features that were visual representations of information to make meaning of the text. Overall, Jerrick was particularly motivated to read about the sun, using his prior knowledge and visual representations of the text (e.g., illustrations, labels, captions, etc.) to make sense of this text.

Likewise, Leesha read SITBs with familiar specialized vocabulary and simple text fluently (e.g., *Our Earth Helping Out* by Patty Hock, 2009); and her reading fluency diminished when interacting with SITBs with unfamiliar specialized vocabulary and more complex, lengthier text. For instance, Leesha read the short poetic verses in the main text of the dual-purpose SITB, *In the Trees, Honey Bees* by Lorie Mortensen (2009) fluently, but had difficulty reading the informational sidebars in this text because of unfamiliar specialized vocabulary, smaller font, more difficult concepts, and lengthier text.

A key finding here, with regard to readability of informational texts, was as the first-grade students interacted with difficult texts containing unfamiliar vocabulary, they turned their

attention to text features that visually represented information (e.g., illustrations, diagrams, charts, labels, etc.), to add meaning to the text. This was especially the case when students had background knowledge and an interest in these topics, which aided them in making sense of visual representations of information in the text.

Revisiting the categorizations of SITBs

Researchers have noted SITBs contain a diversity of text features, structures, and organization patterns (Atkinson et al., 2009; Donovan & Smolkin, 2002; Dreher & Voelker, 2004; Pappas, 2006). Further, SITBs have been placed in categories to help distinguish their textual and structural differences (Donovan & Smolkin, 2002; Dreher & Voelker, 2004; Pappas, 2006). For instance, Donovan and Smolkin (2002) identified four categories associated with SITBs, which are: non-narrative informational, narrative informational, storybooks, and dual-purpose.

In this section, I discuss Donovan and Smolkin's (2002) four categories of SITBs to describe how the participants used and interacted with these texts during my study. For instance, I briefly comment on the extent to which texts from each of the four categories were included in the first-grade teacher's instruction, and how the first-grade students adjusted their approach to different types of SITBs, in order to make meaning of these texts on their own.

Non-narrative informational. I begin with Donovan and Smolkin's non-narrative informational books, which are texts structured with a hierarchy of topics and subtopics rather than sequenced events, and do not contain a storyline. Further, they contain typical features (e.g., generic nouns/pronouns, timeless present-tense verbs, technical vocabulary, diagrams, labels, table of contents, index, glossaries, etc.). Mrs. Bryan used non-narrative informational books for eight lessons and five learning activities. In particular, she used the non-narrative text, *Plants*

and Animals (Padilla, 2011) during the plants unit to provide information (e.g., plant's parts, basic needs, life cycle, photosynthesis), and *Life in the Rain Forest* (Berger, 1996) during the rain forest unit to provide information (e.g., layers of the rain, rain forest animals). She also used these texts to demonstrate text features, such as table of contents, captions, bold print, index, etc.

Furthermore, Jerrick and Leesha frequently self-selected non-narrative SITBs from the school library (e.g., *Brown Bears*, Freeman, 2000; *Life in a Rain Forest*, Lindeen, 2004; *Water*, Nelson, 2005). During my study, Leesha and Jerrick became comfortable handling these texts, taking control of them to serve their own purposes for finding out information. I also noted the first graders interacted with these texts in a nonlinear manner, flipping through the pages in search of an interesting topic or subtopic, or using text features (e.g., the table of contents, glossary, index, diagrams, illustrations, etc.) to locate items of interest or to visually aid their understanding of information in the text. Overall, Leesha and Jerrick self-selected and interacted with non-narrative SITBs from the school library more frequently than other categories of SITBs (i.e., narrative informational, storybooks, or dual-purpose).

Narrative informational. Donovan and Smolkin's (2002) narrative informational books differ from non-narrative texts, in that they provide a narrative delivery of information with factual events occurring over time (i.e., a sequencing structure). Narrative informational books have a purpose to inform and often contain typical text features (e.g., the table of contents, glossary, index, diagrams, illustrations, captions, sidebars of information, etc.), although their text features may also contain atypical features (e.g., colorful drawings, poetic verse, etc.). Mrs. Bryan used narrative informational SITBs (e.g., *From Peanuts to Peanut Butter*, Berger, 1996; *Growing Vegetable Soup*, Ehlert, 1987; *Pasta Please!*, Berger, 1995; *The Four Seasons*, Berger, 1995) during nine lessons and 12 learning activities. Thus, she used narrative informational

SITBs more frequently than any other of Donovan and Smolkin's categories. In particular, she used these texts during the plants unit to depict events over time (e.g., the life cycle of a plant, growing, harvesting peanuts, making peanut butter, the four changing seasons, etc.).

Moreover, Jerrick and Leesha frequently selected narrative SITBs (e.g., *From Seed to Plant*, Gibbons, 1991; *Caterpillars*, Frost, 2000) from the school library. They typically interacted with these texts in a linear manner, seldom skipping over information, and following along with the sequence of events as presented in the texts. They also relied on prior knowledge to make meaning of visual representations of information (e.g., diagrams, illustrations, labels, captions, etc.) to aid them when they encountered difficult text containing unfamiliar vocabulary.

Storybooks. In addition, Donovan and Smolkin's (2002) storybooks category of SITBs has the purpose to entertain, with connections to science. These are atypical informational books containing story elements (e.g., characters, setting, plot, etc.), in which information is conveyed in a storyline. Mrs. Bryan used SITB storybooks (e.g., *The Little Yellow Leaf*, Berger, 2008; *The Great Kapok Tree*, Cherry, 1990; *The Very Hungry Caterpillar*, Carle, 1969) in six lessons and six learning activities. She used these texts to engage students in a story, while providing connections to scientific concepts (e.g., changing seasons, deciduous tree, conservation of the rain forest, metamorphosis, etc.) during the plants and rain forest units.

Overall, there were few occasions the first-grade students selected SITB storybooks to read independently. For instance, I did not observe Jerrick select these texts to read on his own during my study. Yet, Leesha located the *The Great Kapok Tree* in the classroom library to share with me during her final interview. She read exerts from the text; however, encountered unfamiliar vocabulary that impaired her fluency. Still, Leesha was very motivated to read this book, and used her prior knowledge of the text and the illustrations to discuss the story's message

to save the rain forest and the animals that lived there. Further, Leesha connected this conservation theme to other books she had previously read, such as *Our Earth Helping Out* by Patty Hock (2009).

Dual-purpose. Donovan and Smolkin's final category, dual-purpose SITBs, has the purpose to present facts, as well as provide a story. These atypical informational books provide a mix of narrative and expository structures, with factual information presented in sidebars or visual displays (e.g., charts, lists, labels, etc.). During my study, there were no occasions Mrs. Bryan used dual-purpose SITBs in her instruction. Nor, did Jerrick select these texts to read on his own. However, Leesha was attracted to dual-purpose SITBs, selecting these texts from the library and classroom to interact with them on several occasions during interviews.

For instance, Leesha selected Cole's (1987) *The Magic School Bus Inside the Earth*, with a dual-purpose format from the school library to share with me during her final interview. Leesha was familiar with Cole's Magic School Bus books and began by studying the busy pages to discuss the characters and illustrations. She read the main text fluently, as well as the limited, simple text in speech bubbles for dialogue among the characters. However, Leesha moved around the pages, skipping over difficult text in sidebars listing facts with unfamiliar vocabulary, to focus on the illustrations, labels, and simple text to order to make meaning of the text. Overall, Leesha was very engaged with this text and expressed her pleasure for reading other books in Cole's Magic School Bus series (e.g., *The Magic School Bus Gets Caught in a Web*, Lane, 2007).

Inclusion of SITBs in Instruction

Donovan and Smolkin (2002) and Dreher and Voelker (2004) argued primary children become aware of the distinctive features and structures of SITBs when teachers provide a full-range of these books and take time to explicitly point out their text-type distinctions. Overall,

Mrs. Bryan provided students experiences with various categories of SITBs (i.e., non-narrative informational, narrative informational, and storybook) during her instruction with these texts. For instance, she used non-narrative informational texts to teach its specialized vocabulary, science concepts, and to model its typical text features. Further, her use of narrative informational books fulfilled its purpose to present factual events over time, such as the plant life cycle, changing seasons, or the process of making peanut butter. In addition, her use of storybooks added interest to her lessons and connected her students to important themes and topics in science, such as conservation and animal habitats. Yet, her inexperience with these texts did not prepare her to fully point out their text-type distinctions (e.g., topics/subtopics organizational patterns in non-narrative informational texts), or offer her students experiences with the full-range of SITBs (e.g., dual-purpose SITBs).

Also during my study, Jerrick and Leesha had become very comfortable handling non-narrative informational and narrative informational texts on their own. This may be partly because they had more experiences with these texts during instruction, but also these texts were more available for check-out in the school library. As previously discussed, first graders enrolled in the Super Scientist Club selected SITBs from a bin next to the library check-out desk, and non-narrative informational and narrative informational SITBs were the types of texts available in the bin. Thus, the first graders had more experience with these texts both in the classroom and in the school library. Yet, there were no incidents Jerrick selected SITB storybooks or dual-purpose SITBs for independent reading. Also, though Leesha self-selected storybooks and dual-purpose books during interviews, she struggled with some of the unfamiliar vocabulary in these texts, and skipped over information in sidebars of dual-purpose texts. Overall, this comes back to

primary teachers' lack of expertise to select and make available the full-range of SITBs for their students in the classroom, as well as point out text-type distinctions among these texts, in order for students to use them purposefully to make meaning of the text (e.g., Donovan & Smolkin, 2001, 2002; Dreher and Voelker, 2004; Palmer & Stewart, 2003).

Adjusting to the Text

Overall, the first graders adjusted their approach to SITBs depending on the types of texts they encountered. For instance, with non-narrative books, Leesha and Jerrick often flipped through pages or entered the book using the table of contents or the index to locate items of interest to focus on during their reading of the book. Further, with dual-purpose books, Leesha made meaning of the text by moving around the busy pages in a nonlinear manner to focus on illustrations, labels, and reading the simple text presented in a storyline, yet, avoiding the more difficult technical vocabulary presented in sidebars of factual information. However, with narrative texts, the first graders read in a more linear manner to follow the sequence of events presented in the text (e.g., factual events of the plant lifecycle).

Leesha and Jerrick also adjusted to the difficulty of the text, reading simple text with familiar vocabulary fluently, and often choosing to skip over more difficult text with unfamiliar vocabulary to focus on text features providing visuals of information (e.g., illustrations, diagrams, labels, captions, etc.) and the simple text in their labels and captions, in order to make sense of information presented in these texts.

These observations demonstrated how the first graders self-selected and interacted with SITBs for their own purposes. Yet, they had limited access to the full-range of SITBs, both in their classroom and in the school library. Overall, the first graders showed enthusiasm and resilience to read non-narrative and narrative informational SITBs at different reading levels in

meaningful ways on their own. Further, they adjusted their approach to these texts to fit the type of text and its level of difficulty, in order to make sense of the information it presented. These findings underscore the importance of primary teachers providing students access to the full-range of SITBs during recreational reading, as well as during instruction. As numerous researchers suggested for some time, in order for primary students to become readers of informational texts, they must have access to these texts in their classrooms (e.g., Donovan & Smolkin, 2002; Dreher & Voelker, 2004; Pappas, 2006, 1993; Kamberelis, 1998; Moss, 2003; Smolkin, et al., 2009).

Implications

In the following section, I discuss how my findings add to the body of research regarding informational texts in primary classrooms and its implications for researchers, educators, and others whose goal is to advance literacy and science learning in the primary grades.

Including SITBs in Instruction

Mrs. Bryan's preference for narrative texts stemmed from the popular belief primary students learn best in the form of narrative texts, and that informational texts are too difficult for primary students (e.g., Donovan & Smolkin, 2001; Duke, 2000; Jeong et al., 2010; Pappas, 1993; Palmer & Stewart, 2003). To help counter such long-standing assumptions, primary teachers will need training to reconsider how informational texts today are written at first-grade reading levels, contain interesting formats, vivid illustrations, provide support for vocabulary, and contain fascinating topics that address students' interests (Galda et al., 2010; Gill, 2009; Kiefer, 2010; Moss, 2003). I also learned Mrs. Bryan was not fully aware SITBs were available to accommodate students at different stages of reading development, and were designed to fit well in the primary literacy/science curricula (e.g., Galda et al., 2010; Moss, 2003).

Further, Mrs. Bryan's inexperience with informational texts, left her unsure how to begin instruction with SITBs. As she attempted to add SITBs to her instruction, her preference for narrative held her back, as she persistently used fiction in guided and individualized reading instruction, as well as for recreational read-alouds. Moreover, though her classroom library contained numerous informational books, she provided students limited access to these texts during independent reading times in a routine school day. Overall, my findings support research suggesting primary teachers need training for how to select and use informational books effectively in their curriculum (Coleman et al, 2011; Donovan & Smolkin, 2001; Palmer & Stewart, 2003). As, Kamberelis (1998) suggested primary students' knowledge of narrative genres are reflective of their excessive diet of narrative texts during language arts instruction and teachers' explicit metadiscourse for narrative genres during discussions of the text. Thus, my research adds that of others, indicating that until primary teachers find ways to provide their students with a hearty diet of informational texts, as well as ways to explicitly talk about the informational text genre during instruction, it is not surprising their students will be ignorant of this genre and fail to develop fully as readers of informational texts.

Preparing Educators of Science

Another concern was Mrs. Bryan's overgeneralizations of information during her instruction. As young children are developing understandings for science, they easily form misconceptions when teachers provide inaccurate or partial information about important science concepts (Rice, 2002). Adding to this, there were instances during my study, the text itself presented confusing and inaccurate information. Mrs. Bryan's inattentiveness to these inaccuracies in the text, adds further concern for the misconceptions her students may be forming related to science. Galda et al., 2010; Moss, 2003; and Rice, 2002; Smolkin et al., 2008, argue

primary teachers should prepare students to be critical readers of informational books, questioning the accuracy in these texts by comparing it to their own observations and other resources.

My findings add to research claiming primary teachers lack important science content knowledge and do not perceive themselves well qualified to teach science (McConnel, et al., 2013; Rice 2002; Smolkin et al., 2008; Windschitl, 2009, February). Experts contributed teachers' lack of knowledge for science content to their insufficient preparation during their undergraduate studies, in which they often only took introductory science courses providing a minimal understanding of science (Akerson, 2005; Pomeroy, 1993). This underscores the necessity to improve undergraduate coursework that would prepare teacher candidates to be knowledgeable, confident educators of science. Yet, we also must address teachers who are already in primary classrooms, who need training for science content, as well training for how to become critical readers of informational texts and model such practices during instruction.

Student Access to the Full-range of SITBs

Although, Mrs. Bryan introduced students to various types of SITBs during instruction (Donovan & Smolkin, 2002), her students had limited access to these texts in the classroom to read on their own. Thus, Jerrick and Leesha mainly interacted with non-narrative and narrative informational books from the school library. I also learned Mrs. Bryan's inexperience with SITBs did not prepare her to fully point out their text-type distinctions (e.g., topics/subtopics organizational patterns in non-narrative informational texts); and at times, she was at a loss for how to explain the diversity among the categories for these texts.

Thus, my findings add to the existing research suggesting primary teachers need training to learn the full-range of SITBS, in order to point out their text-type distinctions and guide

students in their purposes during instruction (Coleman, et al., 2011; Donovan & Smolkin, 2001; Dreher & Voelker, 2004; Maloch & Bomer, 2013b; Pappas, 2006). In particular, Donovan and Smolkin (2001) found teachers in their study were making uninformed choices for SITBs, based on their assumptions science was boring. In this instance, the teachers mainly selected dual-purpose and storybook SITBs to add feeling to science, neglecting to use the non-narrative and narrative types of SITBs. Further, Pappas (2006) pointed out a caveat for teachers' selection of SITBs, arguing that though atypical SITBs (i.e., dual-purpose and storybook types of SITBs) are engaging and useful, teachers should not exclusively choose these texts over typical SITBs (i.e., non-narrative and narrative SITBs). According to Pappas (2006) "Children cannot truly learn science unless they also learn the distinctive language of science, and using only stories or hybrid books will not accomplish such a goal" (p. 246). Thus, my findings, along with a supportive body of research identify the need for training to help teachers make informed book choices from the full-range of SITBs for their instruction. Moreover, teachers need knowledge of the diversity of SITBs, in order to guide students in their selection and use of these books during guided reading, individualized instruction, and recreational reading.

Practices Supportive of Literacy and Science Learning

Mrs. Bryan's shared reading lessons and interactive read-alouds with SITBs provided students opportunities to interact with SITBs in a whole group setting, in which she scaffolded their understanding of the text and the information it presented. Here, I learned she drew students into the text during guided conversations, in which she connected the text to their lives, experiences, and other texts. These intertextual connections authenticated her instruction, making it real and meaningful to students. Further, her use of SITBs for shared readings, interactive read-alouds, and numerous hands-on learning activities during two integrated literacy/science units

for plants and rain forests showed consistent use of these texts in a meaningful context to promote student learning of important of scientific language and science concepts.

During such instruction, students responded to Mrs. Bryan's prompting and questioning by sharing their personal experiences, asking their own questions, restating information, and using their prior knowledge to actively make meaning of the text. These guided conversations around the text provided a springboard for not only the teachers' use of SITBs to teach vocabulary, science concepts, and text features, but also for students' spontaneous observations, questions, and comments about the text. Through these interactions with the text, I learned Mrs. Bryan used SITBs as models of nonfiction, to explicitly talk about specialized vocabulary, model comprehension strategies (e. g., rereading, summarizing, rephrasing, etc.). She also used text features to navigate the text (e.g., table of contents, index), and add meaning to it with visuals of information (e.g., diagrams, illustrations, labels, captions).

My findings add to research suggesting teachers promote literacy and science learning during integrated literacy/science units that include a range of interactive activities for sharing and learning science, such as interactive read-alouds, science investigations, and compositions of information books and other forms of visual representations of science information (Bradley & Donovan, 2010; Coleman et al., 2012; Pappas & Varelas, 2009). Further, these findings represent teaching practices supportive of literacy and science learning in the primary grades, and have implications for primary teachers who are searching for effective ways to use informational texts in their literacy and science curricula.

Such research is particularly relevant for teachers with students from a low SES background, who enter school without an adequate verbal repertoire of vocabulary to aid them in their development as readers (Beck & McKeown, 2007; Beck et al., 2013; White et al., 1990).

For instance, Mrs. Bryan's use of interactive read-alouds with SITBs provided all her students opportunities to learn and connect to science, but it especially afforded students, whom she considered making slow progress in reading and at risk of retention, access to specialized vocabulary, science concepts, and scientific thought beyond their reading abilities. My findings add to Smolkin and Donovan's (2003) research, suggesting interactive read-alouds of SITBs benefited nonreaders and nonfluent readers by providing them access to information and ideas beyond their reading abilities, as well as added to their background knowledge, and their inferential and reasoning skills. Thus, the implications for such teaching practices have far-reaching implications for students who enter school without the vocabulary skills or the background knowledge they need to adequately develop as readers.

Students' Engagement and Use of SITBs

Jerrick and Leesha were motivated readers of informational books during my study. They selected SITBs to interact with on their own in ways to make sense of the information they presented. Further, they became comfortable handling these texts, using text features to enter the text and locate information (e.g., table of contents, index, etc.), as well as those providing visuals of information (e.g., illustrations, diagrams, labels, captions, etc.) to add to their understanding of specialized vocabulary and science concepts. Moreover, their use of strategies (e.g., prior knowledge and re-reading of the text) added to their meaning-making of the text.

Leesha and Jerrick also demonstrated their resiliency for reading these texts, as they adjusted their approach to the text according to the type of text (e.g., skipping around the text in non-narrative texts to locate particular topics/subtopics verses reading in a linear manner in narrative texts to follow a sequence of factual events), and the text's level of difficulty. This was especially the case when they encountered unfamiliar vocabulary and more lengthier, difficult

text. These findings add to Donovan and Smolkin (2002) research suggesting readability is influenced by reader's motivation, background knowledge, and familiarity with related technical vocabulary.

Throughout the study, the first graders demonstrated motivation and ability to read informational books on their own. These findings add to research suggesting young children engaged in informational books, preferred them, and were capable of using them for their own purposes (e.g., Donovan et al.'s, 2000; Duke & Kays, 1998; Pappas, 1993; Pappas & Varelas, 2004; Varelas & Pappas, 2006, 2009). Overall, this may have implications for teachers who are reluctant to include SITBs in their instruction because they have formed assumptions that these texts are too difficult for their students or that their students are not interested in learning about science (e.g., Donovan & Smolkin, 2001). Notably, I learned the first-grade students in my study not only were motivated to read SITBs on their own, but through these texts and the instruction they received, they formed strong connections to science and considered themselves readers of informational books.

Summary and Future Research

In sum, there is still much to learn with regard to how primary teachers use SITBs in their classrooms that needs to be further addressed. On one hand, a number of researchers reported primary teachers lack the expertise for selecting and using nonfiction appropriately and have developed assumptions these texts are too difficult for primary students to handle (Coleman et al., 2011; Donovan & Smolkin, 2001; Ness, 2011; Palmer & Stewart, 2003). On the other hand, research also indicates primary teachers avidly use SITBs to teach comprehension skills, scientific language, and text features during interactive read-alouds of SITBs during literacy/science units (e.g., Bradley & Donovan, 2010; Pappas & Varelas, 2009; Santoro et al.,

2008; Smolkin & Donovan, 2001, Varelas & Pappas, 2006). Further, it indicates primary students are motivated and able to read informational books and select them when available (e.g., Donovan et al.'s, 2000; Duke & Kays, 1998; Pappas, 1993; Pappas & Varelas, 2004; Varelas & Pappas, 2006, 2009). Additionally, research revealed primary students understood and used scientific language in these texts in their own compositions, navigated their text features, and explained their graphical and pictorial representations of information (Bradley & Donovan, 2010; Coleman, et al, 2012; Pappas & Varelas, 2009).

My study added to this research, demonstrating both ends of the pendulum for the use of informational texts in the primary grades. For instance, I revealed a first-grade teacher's prevailing assumptions that her students learned best from narrative texts, and that informational texts were too difficult for them to handle. Further, her inexperience with SITBs limited her instruction with these texts and her students' access to them. On the other hand, my study demonstrated the teacher's use of SITBs during shared reading lessons, interactive read-alouds, and learning activities during two literacy/science units to teach specialized vocabulary, science concepts, and text features in meaningful ways that connected to students' lives and the real world. As well as, it demonstrated how the first-grade students responded to instruction, using comprehension strategies and visuals of information in the text to make sense of the text, and how they were also motivated and capable readers of informational texts when selecting and reading them on their own.

Overall, the research addressing the role of informational texts in the primary grades is limited by its methods and inconsistencies. More research is warranted that provides qualitative methods over longer periods of time, with first-hand observations and in-depth interviews to better understand primary teachers' use of SITBs and how their students respond to instruction

with these texts in the literacy/science curricula. Further, more quantitative research through experimental design offering a comparison of read-aloud methods, comprehension instruction strategies, and the inclusion of SITBs in the primary literacy/science curricula could provide new evidence of the effectiveness of teaching methods and strategies, such as the interactive read aloud (Smolkin & Donovan, 2001, 2003; Varelas & Pappas, 2006).

What's more, few studies have examined how primary students select and interact with SITBs during guided reading lessons (e.g., Maloch, 2008) or during recreational reading periods (e.g., Donovan et al., 2000), presenting an incomplete picture of how these texts are used in the primary literacy and science instruction. Additionally, Duke's (2000) and Jacobs et al.'s (2000) studies took place over a decade ago, and few studies have shown how primary teachers provided students access to these texts in today's classrooms. Thus, prior research needs to be readdressed and new areas need to be explored to present a more complete picture of the role of informational texts in primary classrooms.

In closing, we must not lose sight of the extent today's children are confronted with informational texts during their academic years and throughout their adult lives (Duke & Bennett-Armistead, 2003; Kletzien & Dreher, 2004; Maloch & Bomer, 2013a). Educators must position our youth as readers of informational texts in order for them to handle the surge of informational texts they encounter on the Internet, in their personal lives, and in the technical and science-driven workforce they will eventually enter as adults (Cope & Kalantzis, 1993; Hall & Sabey, 2007; Smith, 2000).

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APPENDICES

Appendix A: Summary of Observations & Interviews

Weeks Observed	Participant/s Observed	Location	Day/Date	Time Observed/ Interviewed	Purpose	Total time Observed/ Interviewed
Week 1 Obs.#1	Primary Teacher & Students (T & S)	Classroom	Thursday 4/5	9:00-2:00	Obs. Primary T & S UI/Primary T	5 hrs.
Week 2 Obs.#2	Primary T & S	Classroom	Friday 4/13	8:30-11:30	Obs. Primary T & S UI/Primary T	3 hrs.
Week 3 Obs.#3	Primary T & S	Classroom	Wednesday 4/18	9:00-12:00	Obs. Primary T & S	3 hrs.
Week 3 Obs.#4	Primary T & S	Classroom	Thursday 4/19	10:00-12:30	Obs. Primary T & S	2 hrs. 30 min.
Week 3 Obs.#5	Primary T & S	Classroom	Friday 4/20	11:00-12:25 and 2:35 - 3:15	Obs Primary T & S UI/Primary T	2 hours 5 min.
Week 4 Obs.#6	Primary T & S	Classroom	Tuesday 4/24	1:00-2:15	Obs. Primary T & S	1 hr. 15 min.
Week 4 Obs.#7	Primary T & S	Classroom	Wednesday 4/25	10:00-12:30	Obs. Primary T & S	2 hrs. 30 min.
Week 4 Obs.#8	Primary T & S	Classroom	Thursday 4/26	12:45-4:20	Obs. Primary T & S 1st Semi-Structured Interview/Primary T	3 hrs. 35 min.
Week 5 Obs.#9	Primary T & S	Classroom	Tuesday 5/1	11:30-2:00	Obs. Primary T & S	2 hrs. 30 min.
Week 5 Obs.#10	Primary T & S	Classroom	Thursday 5/3	11:00-2:00	Obs. Primary T & S UI/Primary T	3 hrs.
Week 5 Obs.#11	Primary T & S	Classroom	Friday 5/4	9:30-2:30	Obs. Primary T & S 1st Semi-Structured Interview with Leesha & Jerrick	5 hrs.
Week 6 Obs.#12	Primary T & S	Classroom	Tuesday 5/8	9:30-12:45	Obs. Primary T & S UI/Primary T	3 hrs. 15 min.
Week 6 Obs.#13	Primary T & S	Classroom	Wednesday 5/9	8:30-12:00	Obs. Primary T & S UI/Primary T	3 hrs. 30 min.
Week 7 Obs.#14	Primary S	Library	Monday 5/14	9:15-11:30	Obs. Primary S UI/Jerrick & Leesha	1 hr. 15 min.
Week 7 Obs.#15	Primary T & S	Classroom	Tuesday 5/15	10:15-12:15	Obs. Primary T & S	2 hrs.
Week 7 Obs.#16	Primary T & S	Classroom	Wednesday 5/16	10:30-1:30	Obs. Primary T & S UI/Leesha & Jerrick	3 hrs.
Week 7 Obs.#17	Primary T & S	Classroom	Friday 5/18	11:00-12:15	Obs. Primary T & S UI/Primary T	1 hr. 15 min.
Week 8 Obs.#18	Primary T & S	Classroom	Monday 5/21	9:50-12:00	Obs. Primary T & S	2 hrs. 10 min.
Weeks Observed	Participant/s Observed	Location	Day/Date	Time Observed/ Interviewed	Purpose	Total time Observed
Week 8 Obs.#19	Primary T & S	Classroom	Wednesday 5/23	1:10-2:10	Obs. Primary T & S UI/Primary T	1 hr.

Week 8 Obs.#20	Primary T & S	Classroom	Thursday 5/24	10:00-12:15	Obs. Primary T & S UI/Primary T UI/Leesha & Jerrick	2 hrs. 15 min.
Week 8 Obs.#21	Primary T & S	Classroom	Friday 5/25	10:15-12:15 & 2:30-3:30	Obs. Primary T & S UI/Primary T	3 hrs.
Week 9 Obs.#22	Primary T & S	Classroom	Tuesday 5/29	11:30-12:15 & 2:02-2:17	Obs. Primary T & S UI/Jerrick & Leesha	1 hr.
Week 9 Obs.#23	Primary T & S	Classroom	Wednesday 5/30	10:35-11:35	Obs. Primary T & S Collect Documents	1 hr.
Week 9 Obs.#24	Primary T & S	Classroom, Library & Workroom	Friday 6/1	9:00-12:00	Obs. Primary T & S 2nd Semi-Structured Interview/Jerrick	3 hrs.
Week 10 Obs.#25	Primary T & S	Classroom, Library & Workroom	Monday 6/4	10:00-1:00	Obs. Primary T & S 2nd Semi-Structured Interview/Leesha	3 hrs.
Week 10 Obs.#26	Primary T	Classroom	Monday 6/4	11:00-3:05	2nd Semi-Structured Interview/Primary T UI/Primary T UI/Jerrick & Leesha	4 hr. 5 min.
Week 10 Obs.#27	Primary T & S	Classroom	Wednesday 6/6	9:55-2:25	Obs. Primary T & S Collect Documents	4 hrs. 30 min.
Week 10 Obs.#28	Primary T & S	Classroom	Friday 6/8	9:50-10:50	Obs. Primary T & S Collect Documents	1 hr. 30 min
Total: 28 Obs.					Semi-Structured Interviews: Primary T 2 Primary S 4 Total: 6 Unstructured Interviews: Primary T 11 Primary S 10 Total: 21 Documents: 26	Total time: 74 hrs. & 10 min.

Appendix B: Semi-structured Interview Questions

I. First Grade Teachers' Semi-structured Interview Questions

Interview questions that address:	1st Interview (conducted during week 4 of study)	2nd Interview (conducted during week 10 of study)
Research question #1: In what ways does a first-grade teacher use science informational books (SITBs)? Research question #2: In what ways do first-grade students respond to the first-grade teacher's instruction with SITBs? Research question #3 How do two first-grade students interact with SITBs?	--Tell me about your literacy curriculum and the texts you use. --Describe your content area curriculum (e.g., science) and the texts you use. -- Tell me how you collaborate with the school librarian regarding your curriculum and for what purposes. --What types of books do you have in your classroom? Describe genres, reading levels, and how they are organized. -- What types of books are appropriate for primary teachers to use during science instruction? Please describe. -- What types of books do you feel are important for students to read in class? Describe. --Describe fiction and informational trade books and the extent that they are available for students to read in your classroom. ---Describe how fiction and informational trade books are used in science instruction and for what purposes. --Describe the types of books you share with students(e.g., shared reading lessons, read-alouds, etc.) --How do students respond when you share trade books with them? In what ways do students discuss books during lessons? ---How do students benefit from reading fiction and nonfiction trade books in the classroom during instruction? --Describe students' behavior as they read and engage with informational books during independent reading times?	--Describe the reading materials that you routinely use in your classroom curriculum and how they are used. Why do you choose these books and materials? --Describe your instruction in the content areas (e.g., science). ---What makes trade books appropriate or inappropriate for primary children to read? Discuss these books. ---Describe fiction and informational trade books and the extent that they are available to students in your classroom. ---Describe how you use trade books in your literacy and content area instruction (e.g., literature circles, inquiries, vocabulary, small group activities, etc.) ---Describe several of your favorite trade books that you feel students are especially engaged in during instruction and other times in the classroom. What makes these books so engaging? How do you share these books with students? ---Describe how students respond to books you use during science instruction. --Describe how students participate in learning activities for science in the classroom. What do you expect them to learn? --Describe you students discuss information in books during read-alouds. --Describe how students use and interact with trade books in the classroom on their own? --What are students' preferences for choosing trade books? Why do you think they make these choices?

II. First-grade Students' Semi-structured Interview Questions

Interview questions that address:	Note: During the first semi-structured interview, students self-selected books from the classroom library and their book bag, as well as from books I preselected for interview, to discuss with me spontaneously, as they interacted with these texts and read exerts of them aloud. --Show me books you would choose to read.	Note: During the second semi-structured interview, students self-selected books from the school library, as well as from books I preselected for interview, to discuss with me spontaneously, as they interacted with these texts and read exerts of them aloud. --Show me books you would choose to read.

Research question #1: In what ways does a first-grade teacher use SITBs? Research question #2: In what ways do first-grade students respond to the first-grade teacher's instruction with SITBs? Research question #3 How do two first-grade students interact with SITBs?	--Tell me about these books, examine the cover and inside pages --Why did you select these books? --Tell me about books your teacher reads to you. Why does she read them to you? --How do you feel when your teacher reads books to you? Describe the books she reads to you. --What do you do during lessons and activities in class? ---Tell me about when you read books in your classroom. Describe the books you read. --Describe what you learn when you read books? --Tell me about books you choose to read by yourself. Where do you go to select books to read by yourself? What types of things do you like to read about by yourself? --Describe the books you choose to take home to read. Why do you choose these books to take home? --Tell me about any books you read over and over? Why do you reread these books? --Tell me what you think of these books. (Have additional fiction and nonfiction books available. Students examines and interacts with books).	--Tell me about these books, examine the cover and inside pages --Why did you select these books? --Describe these books and how you feel about reading them. --How do you feel when your teacher reads books to you? Describe the books she reads to you. --Tell me about lessons and activities in class, and the types of things you read about. --What are the things you like to read about with your teacher when you sit on the carpet? --What kinds of things do you like to learn about in the classroom? --Describe the books you read by yourself in the classroom. --What types of books do you check out from the school library? --Describe what you learn when you read books by yourself? --Describe the books you choose to take home to read. Why do you choose these books to take home? --Tell me about any books you read over and over? Why do you reread these books? --Tell me what you think of these books. (Have additional fiction and nonfiction books available. Students examines and interacts with books).

Appendix C: Books Used in Students' Semi-structured Interviews

Leesha's Semi-structured Interview Book Selections	**Jerricks's Semi-structured Interview Book Selections**
First Semi-structured Interview	**First Semi-structured Interview**
Informational books: *From Seed to Plant* (Gibbons, 1981) *Gases* (Nelson, 2005) *Growing Vegetable Soup* (Ehlert, 1990) *Ladybugs* (Llewellyn & Watts, 2002) *Our Earth Helping Out* (Hock, 2009) *Pancakes for Breakfast* (dePaola, 1978) *Starting Life Frog* (Llewellyn & Mendez, 2003) *The Very Busy Spider* (Carle, 1989)	Informational books: *A Windy Day* (Schaefer, 2006) *From Seed to Plant* (Gibbons, 1981) *Growing Vegetable Soup* (Ehlert, 1990) *Horse Show* (Lock, 2001) *Jobs People Do: A Day in the Life of a Police Officer* (Hayward, 2001) *Ladybugs* (Llewellyn & Watts, 2002) *The Four Seasons* (Berger, 1995) *The Very Busy Spider* (Carle, 1989)
Fiction books: *Arthur's TV Trouble* (Brown, 1995) *Chrysanthemum* (Henkes, 1996) *Frog and Toad Together* (Lobel, 1979) *Happy Mother's Day Dear Dragon* (Hillert, 2005) *Happy Birthday Moon* (Asch, 2000) *Marvin K. Mooney Will You Please go Now!* (Seuss, 1972) *One More Sheep* (Kelly, 2006) *The No-Tail Cat or I Like What I Am* (Hillert, 2005)	Fiction books: *Arthur's TV Trouble* (Brown, 1995) *Chrysanthemum* (Henkes, 1996) *Happy Birthday Moon* (Asch, 2000) *Lady and The Tramp* (Disney, 2006) *Meet the Muppet Babies* (Gikow & Henson, 1986)
Second Semi-structured Interview	**Second Semi-structured Interview**
Informational books: *In the Trees, Honey Bees* (Mortensen, 2009) *Plants are Living Things* (Kalman, 2008) *Plants That Never Ever Bloom* (Heller, 1984) *The Great Kapok Tree* (Cherry, 1990) *The Magic School Bus Inside the Earth* (Cole, 1987) *The Magic School bus Gets Caught in a Web* (Lane, 2007) *What's Inside Animal Homes* (Parsons, 1992) *What's Inside? Plants* (Royston, 1992)	Informational books: *Black All Around!* (Hubbell, 2010) *Hills and Mountains* (Crewe, 1996) *Ice Hockey* (Ditchfield, 2003) *Life in the Rain Forest* (Lindeen, 1976) *The Snowy Day* (Keats, 1962) *The Sun* (Winrich, 2008) *The Sun and Moon* (Moore, 1994)
Fiction books: *If You Give a Cat a Cupcake* (Numeroff, 2008) *If You Give a Mouse a Cookie* (Numeroff, 1985) *If You Give a Pig a Pancake* (Numeroff, 1998) *Merry Christmas, Splat* (Scotton, 2009)	Fiction books: *David Gets in Trouble* (Shannon, 2002) *Clifford's Kitten* (Brigwell, 1992) *Whistle for Willie* (Keats, 1964)

Appendix D: Literature Review Categories

Category Headings	What I Know Regarding Primary Teachers	Cited in Research
Primary Teacher's Preference for Narrative	Primary teachers have chosen narrative texts over informational texts for their classroom.	Donovan & Smolkin, 2001; Duke, 2000; Jeong et al., 2010; Kamberelis, 1998; Pappas, 1993; Palmer & Stewart, 2003; Yopp & Yopp, 2006)
Teachers' Perceptions for Science Informational Trade Books (SITBs)	Primary teachers have formed perceptions that SITBs are too difficult for their students.	Donovan & Smolkin, 2001; Ness, 2011; Palmer & Stewart, 2003
Teacher's Lack of Expertise & Need for Training	Primary teachers lack the expertise to select and share informational books in their literacy and science curricula. They need training to build genre awareness of these texts, and to use them purposefully in instruction.	Donovan & Smolkin, 2001; Dreher & Voelker, 2004; Duke, 2000; Maloch & Bomer, 2013b; Moss, 2003; Ness, 2011; Palmer & Stewart, 2003; Pappas, 2006
Models for Scientific Language	Primary teachers should choose and share science informational trade books that are appropriate models for scientific language.	Honig, 2010; Smoklin & Donovan, 2001; Pappas, 2006
Interactive Read-alouds with SITBs	Primary teachers conduct interactive read-alouds with SITBs to model expository features and structures, to scaffold students' understanding of scientific language and science content, and to provide opportunities for students to share ideas about science, make intertextual connections, and co-construct meaning for science.	Bradley & Donovan, 2010; Coleman et al., 2012; Pappas, 2006; Pappas & Varelas, 2009; Smolkin & Donovan, 2001, 2003; Varelas & Pappas, 2006
Experience with Informational Books (e.g., SITBs)	Primary teachers should provide students with multiple experiences with informational books (e.g., access to SITBs in the classroom library, use of SITBs during interactive read-alouds, and use of SITBs in integrated science and literacy units of study), in order for students to gain experience with them.	Donovan et al., 2000; Donovan & Smolkin, 2002; Kamberelis, 1998; Maloch & Bomber, 2013a; Pappas, 1993, 2006; Pappas & Varelas, 2009
Integrating Science & Literacy Instruction	Teachers should combine literacy instruction with content area instruction (e.g., incorporate SITBs into reading, writing, and content area instruction) to promote both literacy and content area learning.	Morrow, et al., 1997; Pappas & Varelas, 2004, 2009; Saul & Dieckman, 2005
Narrative & Scientific Language	Teachers need to allow for both narrative and scientific language during interactive read-alouds with SITBs, where the teacher models and facilitates scientific language and allows for children to construct their own scientific knowledge.	Pappas, & Varelas, 2009; Smolkin & Donovan, 2001, 2003; Varelas, & Pappas, 2006
Evaluating Science Informational Trade Books	Teachers should evaluate SITBs for appropriateness (e.g., accuracy, stereotyping or bias, complexity, appropriate language), writing (e.g., voice, unity, & coherence), and design (e.g., attractiveness, structures, & visual representations)	Atkinson et al., 2009; Donovan & Smolkin, 2002; Dreher & Voelker, 2004; Gill, 2009; Hall & Sabey, 2007; Moss, 2003; Saul & Dieckman, 2005; Smolkin et al., 2009; Smolkin & Donovan, 2005; Sudol & King, 1996

Category Headings	**What I Know Regarding Primary Students**	**Cited in Research**
Self-Selection of Books	Primary students choose SITBs on topics that interest them when provided the opportunity.	Donovan et al., 2000; Dreher, 2003 Duke & Kays, 1998; Maloch, 2008; Maloch & Horsey, 2013; Moss, 2003; Pappas, 1993
Range of Experiences	Primary students demonstrate their understanding of scientific language, informational book features, and science content in their informational compositions after participating in a range of hands-on experiences (e.g., science experiments, literature circles, drawing and writing, interactive read-alouds with SITBs) during meaningful units of study that integrate science with literacy.	Bradley & Donovan, 2010; Coleman et al., 2012, 2001; Pappas & Varelas, 2009; Smolkin & Donovan, 2001
Intertextual Connections	Primary students' intertextual connections with SITBs (e.g., connections with the text to students' lives, the real world, and other texts) during interactive read-alouds facilitates their development of scientific thought and language.	Honig, 2010; Smoklin & Donovan, 2001; Pappas, 2006; Varelas & Pappas, 2006, 2009
Awareness of Features & Structures	Primary children become aware of the features and structures of SITBs when teachers provide them with a full-range of these books and take time to explicitly point out the text type distinctions for each category (e.g., non-narrative, narrative, storybooks, and dual-purpose).	Donovan & Smolkin, 2001, 2002; Dreher & Voelker, 2004
Background & Vocabulary Knowledge Influences Readability of Text	Students' understanding of SITBs on particular topics is influenced by their background knowledge of the topic and their understanding of the vocabulary in the text.	Donovan & Smolkin, 2002; Smolkin & Donovan, 2003
Category Headings	**What I Know Regarding SITBs**	**Cited in Research**
Availability of Informational Books	There has been an influx of informational books available for primary grades, featuring SITBs appropriately written for primary-grade reading levels, with interesting formats, visual support for science content, and addressing the diverse interests of young readers.	Coleman et al., 2012; Galda et al., 2010; Gill, 2009; Kiefer, 2010; Moss, 2003; Rearden & Broemmel, 2008; Smolkin et al., 2009
Emergence of Science Informational Trade Books	Science informational trade books have emerged as a prominent sub-genre of informational books, and have been included in varying degrees in the elementary grade literacy and science curriculum .	Dreher & Voelker, 2004; Palmer & Stewart, 2003; Donovan & Smolkin, 2002; Maloch & Bomer, 2013b; Moss, 2005; Yopp & Yopp, 2006; 2012
The categories of Science Informational Trade Books	Researchers have formed categories for SITBs to represent their diverse features and structures (e.g., *non-narrative informational books* present expository structures, topics & subtopics, timeless or present-tense verbs, *narrative informational books* present factual events over time with a narrative delivery, *storybooks* include typical story elements with scientific information embedded in a story;	Atkinson et al., 2009; Donovan & Smolkin, 2002; Dreher & Voelker, 2004, Duke et al., 2012; Duke & Bennett-Armistead, 2003; Maloch & Bomer, 2013b; Moss, 2003; Pappas, 2006

	dual-purpose books that contain a mix of narrative & expository structures, such as a story, along with information in sidebars. Donovan & Smolkin, 2002)	
Pappas' Four Obligatory Elements for Typical Types of SITBs	Pappas' (2006) four obligatory elements of structure are represented in typical types of SITBs, which include: 1) topic presentation (e.g., an introduction of the topic), 2) description of attributes (e.g., depiction of the characteristics of the topic), 3) characteristic events (e.g., a description of typical behaviors and events associated with the topic), and 4) final summary (e.g., a summary of the main ideas and information on the topic).	Donovan, 2002; Pappas, 2006
Pappas' Typical & Atypical Types of SITBs	Pappas (2006) describes typical SITBs as having expository structures (e.g., topics & subtopics, time order, comparison & contrast, etc.), as well as, generic nouns/pronouns, timeless present-tense verbs, etc. Whereas, Pappas describes atypical SITBs as a mix or hybrid of expository and narrative structures containing information, such as in a storyline or poetic verse.	Donova & Smolkin, 2002; Pappas, 2006
Multimodal Aspects	The multimodal aspects of SITBs (e.g., main text, illustrations, diagrams, captions, labels, charts, sidebars of information, glossaries, etc.) provide teachers with different ways to support children's comprehension of these texts.	Bradley & Donovan, 2010; Coleman et al., 2012; Galda et al., 2010; Gill, 2009; Pappas & Varelas, 2009; McTigue, & Flowers, 2011; Smolkin & Donovan, 2005
Unequal Representation for Science Domains	Life science and nature facts have been more represented in SITBs than earth sciences, physical sciences, or space sciences.	Rearden & Broemmel, 2008; Ford, 2004

Appendix E. Plants and Rain Forests Integrated Literacy/Science Units

Lesson/ Activity	SITB/ Materials	Science/Literacy Concepts/Skills	Location	Instruction & Learning Activities
Lesson 1 Week 1	*Growing Vegetable Soup* (Ehlert, 1987)	Plant Life Cycle Plant Parts Functions & Uses Sequencing & Retelling Specialized Vocabulary Nonfiction Text features (illustrations with labels)	Carpet Area	Shared Reading Lesson Interactive Read-aloud Whole class & small group discussions Identified & discussed specialized vocabulary Restated information from text
Activity 1 Week 1	*Growing Vegetable Soup* (Ehlert, 1987)	Plant Life Cycle Plant Parts Functions & Uses Sequencing & Retelling Specialized Vocabulary	Student Tables	Hands-on learning activity for sequencing steps of plant life cycle and making soup Restated information from text
Lesson 2 Week 1	*Growing Vegetable Soup* (Ehlert, 1987)	Plant Life Cycle Plant Parts & Attributes Plant Parts Functions & Uses Sequencing & Retelling Specialized Vocabulary	Student Tables	Interactive Plant Power Point Plant poem Prepared to reenact plant life cycle in class play (made props & practiced parts at tables) Whole class & small group discussions
Activity 2 Week 1	*Growing Vegetable Soup* (Ehlert, 1987)	Plant Life Cycle Plant Parts & Attributes Plant Parts Functions & Uses Sequencing & Retelling Specialized Vocabulary Nonfiction Text features (illustrations with labels)	Student Tables/ Carpet Area	Shared Reading Lesson Review plant life cycle Whole class & small group discussions Performed "Plant Life Cycle Play" on carpet Students restated information from text during play
Lesson 3 Week 3	*The Very Hungry Caterpillar* (Carle, 1969)	Metamorphosis/ Butterfly Life Cycle/ Sequencing & Retelling Specialized Vocabulary Insects role in Pollination	Carpet Area	Shared Reading Lesson Interactive Read-aloud Identified & discussed specialized vocabulary Recalled information from text for The Very Hungry Caterpillar Pocket Puppet Apron retell & sequence events activity.
Activity 3 Week 3	*The Very Hungry Caterpillar* (Carle, 1969)	Metamorphosis/ Butterfly Life Cycle/ Sequencing & Retelling Specialized Vocabulary Insects role in Pollination	Student Tables	Hands-on learning activity to create mobiles that sequence steps for metamorphosis and book events Restated information from text
Lesson 4 Week 3	*Plants and Animals* (Padilla, 2011) *big book format Plants Teaching Chart Photosynthesis Power Point	Photosynthesis Plants Basic Needs Nonfiction text features Specialized Vocabulary Restating information Specific Details Nonfiction text features (illustrations, captions, labels)	Carpet Area/ Students Tables	Shared Reading Lesson Interactive Read-aloud Interactive Photosynthesis Power Point Presentation Discussed specialized vocabulary Reviewed & summarized information in text

Lesson/ Activity	SITB/ Materials	Science/Literacy Concepts/Skills	Location	Instruction & Learning Activities
Activity 4 Week 3	*Plants and Animals* (Padilla, 2011) *big book format Plants Teaching Chart Interactive Photosynthesis Power Point	Photosynthesis Plants Basic Needs Specialized Vocabulary Restating information Specific Details Nonfiction text features (illustrations, diagrams, captions, labels)	Student Tables	Hands-on learning activity to create plant diagram demonstrating a plant's basic needs (e.g., sun, rain, soil) and photosynthesis Reviewed & referenced information from *Plants and Animals* (Padilla, 2011), Power Point & Plants Teaching Chart
Lesson 5 Week 4	*Plants and Animals* (Padilla, 2011) *big book format	Plant Parts Functions & Attributes Plants Basic Needs Photosynthesis Specialized Vocabulary Restating information Specific Details Nonfiction text features (illustrations, captions, labels)	Carpet Area	Shared Reading Lesson Interactive Read-aloud Whole class & small group discussions Identified & discussed specialized vocabulary Discussed photosynthesis
Activity 5a Week 4	*Plants and Animals* (Padilla, 2011) *big book format	Plant Parts Functions & Attributes Plants Basic Needs Photosynthesis Specialized Vocabulary Restating information Specific Details	Student Tables	Hands-on learning activity to create plant diagram and label plant parts and their functions. Reviewed & referenced *Plants and Animals* (Padilla, 2011) and *Growing Vegetable Soup* (Ehlert, 1987) Restated information from texts for activity
Activity 5b Week 4	*Plants and Animals* (Padilla, 2011) *big book format	Radish Plant Lifecycle Plant Parts Functions & Attributes Plants Basic Needs Photosynthesis Specialized Vocabulary Restating information	Student Tables	Radish Plant Lifecycle Science Investigation (ongoing for 5 weeks). Planted seeds, tracked growth, and discussed findings in small groups and whole class Reviewed & restated information from SITBs in plants unit, e.g., *Growing Vegetable Soup* (Ehlert, 1987), *From Peanuts to Peanut Butter* (Berger, 1992), *Pasta Please!*(Berger, 1995), *Plants and Animals* (Padilla, 2011)
Lesson 6 Week 4	*The Little Yellow Leaf* (Berger, 2008)	Tree Life Cycle Changing Seasons Specialized Vocabulary Character Attributes Specific Details Restating information Discuss illustrations	Carpet Area	Shared Reading Lesson Interactive Read-aloud Whole class & small group discussions of changing seasons and tree life cycle Identified & discussed specialized vocabulary Character Attribute Chart Reviewed & referenced information from the text

Lesson/ Activity	SITB/ Materials	Science/Literacy Concepts/Skills	Location	Instruction & Learning Activities
Activity 6 Week 4	*The Little Yellow Leaf* (Berger, 2008)	Tree Life Cycle Deciduous Trees Changing Seasons Specialized Vocabulary Character Attributes Specific Details	Student Tables	Writing Activity- Students wrote about leaf character's attributes related to changing seasons Recalled vocabulary from the text during writing activity
Lesson 7 Week 5	*The Four Seasons* (Berger, 1995) *big book format	Changing Seasons Deciduous Trees Specialized Vocabulary Restating information Nonfiction text features (table of contents, index, bold print, captions, glossary, bold print, etc.)	Carpet Area	Shared Reading Lesson Interactive Read-aloud Whole class & small group discussions Identified & discussed specialized vocabulary Discussed text features in various SITBs used in plants unit Restated information from text
Activity 7 Week 5	*The Four Seasons* (Berger, 1995) *big book format	Changing Seasons Deciduous Trees Nonfiction Text Features Specialized Vocabulary Sequencing Specific Details Sensory Details	Student Tables/ Carpet Area	Reader's response to text "My Favorite Season" Restated information from SITB for writing activity Reviewed specialized vocabulary Shared writings by reading aloud to class on carpet and discussing
Lesson 8 Week 6	*From Peanuts to Peanut Butter* (Berger, 1996) *big book format	Peanut Plant Life Cycle Peanut Butter Making Process Specialized Vocabulary Nonfiction Text Features (captions, sequencing & retelling) Specific Details	Carpet Area	Shared Reading Lesson Interactive Read-alouds Discussed photographs and captions Whole class & small group discussions Identified & discussed specialized vocabulary Recalled information from text
Activity 8 Week 6	*From Peanuts to Peanut Butter* (Berger, 1996) *big book format	Peanut Plant Life Cycle Peanut Butter Making Process Specialized Vocabulary Nonfiction Text Features with emphasis on captions Sequencing & Retelling Specific Details	Student Tables/ Carpet Area	Students worked in pairs to write a caption for a photograph from the text Reviewed & referenced *From Peanuts to Peanut Butter* (Berger, 1996) Students shared their captions with class on carpet in sequence Students restated information from text for activity Whole class & small group discussions
Lesson 9 Week 6	*From Peanuts to Peanut Butter* (Berger, 1996) *big book format	Peanut Plant Life Cycle Peanut Butter Making Process Specialized Vocabulary Nonfiction Text Features with emphasis on bold print (reviewed diagrams, labels, illustrations, captions) Sequencing & Retelling Specific Details	Carpet Area	Shared Reading Lesson Interactive Read-aloud Whole class & small group discussions Identified & discussed specialized vocabulary Students placed highlight tape on specialized vocabulary Discussed purpose for bold print

Lesson/ Activity	SITB/ Materials	Science/Literacy Concepts/Skills	Location	Instruction & Learning Activities
Activity 9a Week 6	*From Peanuts to Peanut Butter* (Berger, 1996) *big book format	Peanut Plant Life Cycle Peanut Butter Making Process Specialized Vocabulary Nonfiction Text Features with emphasis on bold print Retelling Specific Details	Carpet Area	Students created Vocabulary Four Square Graphic Organizer for specialized vocabulary word "peg" (i.e., write word, define word, illustrate word, & write word in a sentence) Discussed with partner and shared sentences for peg with class on carpet Recalled information from text
Activity 9b Week 6	*From Peanuts to Peanut Butter* (Berger, 1996) *big book format	Peanut Plant Life Cycle Peanut Butter Making Process Specialized Vocabulary Scientific Investigation Procedures	Carpet Area/ Student Tables	Class made peanut butter Reviewed *From Peanuts to Peanut Butter* (Berger, 1996) Listed materials and procedures together on large chart and placed ingredients food processor Students described taste, smell, texture of peanut butter Recalled & restated information
Lesson 10 Week 7	*Pasta Please!* (Berger, 1995) *big book format	Wheat Plant Life Cycle Uses for Wheat Plant Harvesting Wheat Pasta Making Process Nonfiction Text Features with emphasis on bold print Sequencing & Retelling Specific Details	Carpet Area	Shared Reading Lesson Interactive Read-aloud Whole class & small group discussions Identified bold print and discussed specialized vocabulary Discussed & placed highlight tape on specialized vocabulary (Note: similar to lesson 9)
Activity 10a Week 7	*Pasta Please!* (Berger, 1995) *big book format	Wheat Plant Life Cycle Uses for Wheat Plant Harvesting Wheat Pasta Making Process Sequencing & Retelling Specific Details	Student Tables	Reader's response to text "How I Like to Eat Pasta" Personal connections to eating pasta at home Intertextual connections to text Recalled information from text
Activity 10b Week 7	*Pasta Please!* (Berger, 1995) *big book format	Wheat Plant Life Cycle Uses for Wheat Plant Harvesting Wheat Pasta Making Process Sequencing & Retelling Specific Details Sensory Details	Student Tables	Hands-on learning activity to create pasta art demonstrating uses for pasta Recalled information from text for activity Shared art and discussed in small groups
Lesson 11 Week 7	*The Great Kapok Tree* (Cherry, 1990) *big book format Additional reading: National Geographic Weekly Reader on Rain Forests	Rain Forest Layers Rain Forest Animals (e.g., habitats, attributes, etc.) Specialized Vocabulary Rain Forests Locations on World Map Fiction & Nonfiction Components in text Message of conservation Sequencing information Discuss illustrations	Carpet Area	Shared Reading Lesson Interactive Read Aloud Discussed fiction & nonfiction components in text Discussed layers of rain forests and rain forest animals Discussed World Map of Rain Forests Identified & discussed specialized vocabulary Restated information from text

Lesson/ Activity	SITB/ Materials	Science/Literacy Concepts/Skills	Location	Instruction & Learning Activities
Activity 11a Week 7	*The Great Kapok Tree* (Cherry, 1990) *big book format	Rain Forests Locations on World Map Rain Forest Layers Rain Forest Animals (e.g., habitats, attributes, etc.) Specialized Vocabulary Sequencing & Retelling	Student Tables	Labeled and color coded a World Map of Rain Forests with a key Restated information from text for activity Whole class and small group discussions of illustrations and text
Activity 11b Week 8	*The Great Kapok Tree* (Cherry, 1990) *big book format	Rain Forest Layers Rain Forest Animals (e.g., habitats, attributes, etc.) Specialized Vocabulary Summarizing Information	Student Tables	Hands-on learning activity to create descriptive Rain Forest Flip Book of rain forest layers Compared and referenced information in *Life in the Rain Forest* (Berger, 1996), *The Great Kapok Tree* (Cherry,1990) Summarized information for rain forest layers from texts for activity Shared and discussed Flip Books
Lesson 12 Week 8	*Rain Forest* (Cowcher, 1988) *big book format	Rain Forest Layers Rain Forest Animals (e.g., habitats, attributes, etc.) Specialized Vocabulary Restating Information Sequencing Message of Conservation Text Features with emphasis on illustrations	Carpet Area	Shared Reading Lesson Interactive Read-Aloud Whole class & small group discussions Shared Intertextual connections to *The Great Kapok Tree* (Cherry, 1990) Reviewed and discussed specialized vocabulary & information from text
Activity 12 Week 8	*Rain Forest* (Cowcher, 1988) *big book format	Rain Forest Layers Rain Forest Animals (e.g., habitats, attributes, etc.) Specialized Vocabulary Sequencing & Retelling Summarizing Information	Student Tables	Rain Forest Graphic Organizer Reviewed and referenced SITBs, e.g., *Rain Forest* (Cowcher, 1988), *Life in the Rain Forest* (Berger, 1996), *The Great Kapok Tree* (Cherry, 1990) Teacher modeled summarizing information from texts in rain forest unit for graphic organizer. Each student summarized information in his/her own graphic organizer for the rain forest layers. Shared and discussed graphic organizers in small groups
Lesson 13 Week 8	*Life in the Rain Forest* (Berger,1996) *big book format	Rain Forest Layers Rain Forest Animals (e.g., habitats, attributes, etc.) Specialized Vocabulary Restating Information Nonfiction Text Features (reviewed diagrams, labels, captions, bold print, table of contents, index)	Carpet Area	Shared Reading Lesson Interactive Read-Aloud Whole class & small group discussions Shared Intertextual connections to *The Great Kapok Tree* (Cherry, 1990) and *Rain Forest* (Cowcher, 1988) Identified, reviewed & discussed specialized vocabulary Reviewed nonfiction text features Summarized information from texts

Lesson/ Activity	SITB/ Materials	Science/Literacy Concepts/Skills	Location	Instruction & Learning Activities
Activity 13 Week 8	*Life in the Rain Forest* (Berger,1996) *big book format	Rain Forest Layers Rain Forest Animals (e.g., habitats, attributes, etc.) Specialized Vocabulary Restating Information	Student Tables	Hands-on learning activity to create Rain Forest Foldable with information about the rain forest layers and animals Reviewed & restated information from *Life in the Rain Forest* (Berger, 1996), *Rain Forest* (Cowcher, 1988) , & *The Great Kapok Tree* (Cherry,1990) Shared and discussed Rain Forest Foldable in small groups and whole class

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Appendix F. Institutional Review Board (IRB) Approval Letter for Study

Virginia Schrier <vschreie@mail.usf.edu>

eIRB: Continuing Review Approved
1 message

eirb@research.usf.edu <eirb@research.usf.edu> Thu, Jul 26, 2012 at 5:34 PM
Reply-To: eirb@research.usf.edu
To: vschreie@mail.usf.edu

USF UNIVERSITY OF SOUTH FLORIDA arc

IRB Continuing Review Approved

To:	Virginia Schreier
RE:	2012 Review for Pro00005146 Perceptions, Attitudes, and Practices for Science Informational Trade Books in the Primary Grades
PI:	Virginia Schreier
Link:	CR1_Pro00005146
	You are receiving this notification because the above listed continuing review has received Approval by the IRB. For more information, navigate to the project workspace by clicking the Link above.

***WARNING: DO NOT REPLY**. To ensure a timely response, please do not reply to this email. Direct all correspondence to **Research Integrity & Compliance** either through your project's workspace or the contact information below.*

University of South Florida
Division of Research Integrity & Compliance - Office of Research and Innovation
3702 Spectrum Blvd Suite 155 - Tampa, FL 33612

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