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Interactive Book Reading With Expository Science Texts in Preschool Special Education Classrooms

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Maria is a preschool special education teacher. She has 16 students in her class, eight of whom have disabilities. Many of Maria's students have vocabulary and language acquisition goals in their individualized education programs (IEPs). She wants to target these goals more systematically and believes that using expository (nonfiction) texts may enable her to do so. Maria decides to plan a unit around life cycles, beginning with caterpillars to butterflies. She goes to the library and checks out several expository books. Maria chooses vocabulary words to target with her students from each book. She creates a plan that includes what she will do before, during, and after reading.

Maria starts by asking her students what they know about butterflies and encourages them to make text-to-life connections. While reading, Maria stops on each page to ask questions, alternating between yes-no, "wh," and cloze questions to check for comprehension and expand language. Maria always praises her students for attempting to answer and makes sure they know whether their response was correct. Maria offers her students extra support if they do not know the answer by giving them two answer choices or including a gestural prompt to encourage them to use the photos in the book for clues. Maria differentiates the lessons by using more open-ended questions with some of her students. She supplements her reading routine with several engaging experiments and activities, including making butterflies and caterpillars in the arts-and-crafts center and doing puzzles featuring two-step sequences, such as a baby and a child.

Although her students seem to like the material and activities, Maria is disappointed when, 2 weeks into the unit, most of her students demonstrate a limited grasp on the concept of sequence and cannot accurately order the steps in the butterfly's life cycle. After conducting assessments, she also notes that the class varies widely on their ability to understand and use the new vocabulary words she highlighted in each story. What strategies can Maria use to more effectively integrate expository texts into her reading routines? How can she build on these texts to introduce new vocabulary and help her students increase their language and learning?

Expository, or informational, text can be defined as a type of nonfiction that describes a topic categorically by moving from subtopic to subtopic with the intent to teach content or convey information (Maloch & Bomer, 2013). Although this genre is considered more difficult to read due to the variety of text structures (e.g., sequencing, compare and contrast, problem–solution) and use of language such as signal words (e.g., *first* signals temporal order, *but* signals contrast, *because* signals causal relations) and academic vocabulary, evidence supports the need to expose young children to expository text (Duke & Kays, 1998; Pappas, 1991; Pentimonti, Zucker, Justice, & Kadervek, 2010; Yopp & Yopp, 2006). In addition, most states have adopted the Common Core State Standards, which state that "preparation for reading complex informational texts should begin at the very earliest elementary school grades" (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010, p. 33). Thus, there is an increased need to introduce and expose children to the structure and language of expository texts, particularly in the preschool years.

Interactive Book Reading

One vehicle for teaching the text structure and language of expository text to preschool-age children is through interactive book reading. Although interactive book reading has traditionally used narrative texts to teach text structure (i.e., story grammar) and content, the activity of interactive book reading has a lot to offer teachers, such as Maria, wanting to expand children's understanding of text structure and build children's language and vocabulary in particular. Yet, simply exposing preschool children to expository text through read-alouds is likely not enough to build a foundation for the language of expository text for children, particularly given the language needs of those with language or learning disabilities (e.g., language impairment, autism spectrum disorder). Rather, it may be more beneficial to build this foundation through a strategic approach, such as explicit instruction focused on a text structure. A study with school-age children by Williams et al. (2005) supports this view.

Specifically, Williams and colleagues (2005) found that explicit instruction of text structure (i.e., compare and contrast) and signal words (e.g., *alike, both, however*) in second-grade classrooms yielded higher scores than exposure to content only on measures of recalling and locating signal words. The children in the explicit-instruction intervention were also able to generalize these taught skills when summarizing compare-and-contrast paragraphs that were not explicitly taught during the intervention. Despite the emerging research base supporting use of strategic approaches to expository text instruction, there has been limited research on using such strategies with children in preschool and especially preschool children identified with language or learning disabilities. However, guidance on ways to support language development for young children with disabilities can be incorporated into what is known about teaching science using expository text to support instruction within early childhood special education (ECSE) classrooms.

Importance of Expository Text for Preschool Children With Disabilities

Knowledge of the text structures and language of expository texts is essential to later reading achievement (Griffin, Hemphill, Camp, & Wolf, 2004); however, it is more difficult to comprehend than narrative text. The language encountered in expository text is often far more sophisticated than the spoken language skills of young children with disabilities (Schuele, Spencer, Barako-Arndt, &

Guillot, 2007). For example, expository text uses language to inform and explain phenomena, thus requiring terminology that is specific to the topic (e.g., academic vocabulary). In addition, research has shown that children with disabilities tend to be less aware of text organization, which leads to difficulties synthesizing the information in the text (Gersten, Fuchs, Williams, & Baker, 2001). This is particularly important because estimates of reading proficiency of fourth-grade students with language and learning disabilities indicate that approximately 69% cannot read at a basic level (National Center for Education Statistics, 2013). Prior to fourth grade, much of the content read in the classroom is narrative text. However, by fourth grade, narrative text is read far less, and content-specific expository text, such as science, history, and social studies, is read far more. Thus, given the increased cognitive and reading demands in the elementary years, there is a need to explicitly expose children with disabilities to the text structures and language of expository texts in the preschool years so as to potentially minimize later reading difficulties. In addition, exposing young children to expository text opens the door to teaching content such as science, and this exposure will provide science readiness that will prepare children with the expectations they will be encountering as they move through the curriculum (Greenfield et al., 2009).

Integrating Expository Text in the ECSE Classroom

In order to appreciate the unique benefits expository text offers preschool-age children with disabilities, it is important to understand what makes these texts different from the most commonly used texts with preschool children, namely, narrative text. Narrative text tells a story using story grammar elements, which include settings, characters, plots, and conflicts and resolutions (Stetter & Hughes, 2010). As a result, narratives provide a predictable, developmentally appropriate structure that establishes consistency, thus providing one of the best tools for teaching children emergent literacy skills and vocabulary (Egan, 1993; Justice & Pullen, 2003). In comparison, expository text utilizes multiple text structures as a way to organize content and show relationships within the text (Dymock, 2005). The language of expository text is also more content-specific, providing readers with exposure to vocabulary and structures not found in narrative text. As such, children need more opportunities to explore expository text and become familiar with its conventions. Expository texts can be developmentally appropriate for preschoolers because they help build background knowledge and abstract thought, support vocabulary and inferential language skills, and reduce the gap between "learning to read" and "reading to learn" (Culatta, Hall-Kenyon, & Black, 2010; Duke & Kays, 1998; Pappas, 1991; Pentimonti et al., 2010; Yopp & Yopp, 2000). In addition, Kraemer, McCabe, and Sinatra (2012) found that more children selected expository text over narrative in a book-selection task, indicating that not only is expository text a vehicle for academic success, but it is also preferred and interesting. The question becomes how to teach text structure and the language of expository text through life science content.

There is a crucial need to explicitly expose children with disabilities to the text structures and language of expository texts in the preschool years.

Teaching the Structure and Language of Expository Life Science Texts

We recommend that delivery of text structure and language instruction within the context of expository book reading occur in repeated whole- and small-group book-reading settings. Repeated readings of both narrative and expository books have been shown to increase children's vocabulary and listening comprehension of stories and information heard, particularly for young children (Leung, 2008; Penno, Wilkinson, & Moore, 2002). Further, a combination of whole- and small-group book readings of both narrative and expository texts has been shown to be effective for increasing the vocabulary skills in children with low language and low vocabulary skills (Gonzalez et al., 2010; Pollard-Durodola et al., 2011). As a result, the approach described here as conducted in repeated whole- or small-group book readings can be specialized for the needs of students with language-based disabilities. Specifically, three components can be used as a guide when teaching life science using a sequence text structure.

1. Talk About the Text Structure as a Sequence

Structural design features found in expository texts include anything used to organize the information. This includes images as well as print. Expository text utilizes detailed photographs or diagrams, captions, indexes, and glossaries to support the understanding of the content (Duke & Kays, 1998). Structural features found in expository text can be used to quickly define or locate information within a text as well as support and organize comprehension. One important structural feature of expository text is the use of signal words. *Signal words* indicate how information is related across the overall text and can be used to identify text structure (Nippold, Mansfield, Billow, & Tomblin, 2008).

To talk about a text structure, such as sequence, found in a book, teachers may want to first identify and point out any explicit or implicit signal words found in the text, such as *first, next, then*, and *finally*. Second, teachers may

want to talk about that text structure with the children, telling them that the book they will read or are reading tells the steps or sequence for how something happens and that some words, like *then* and *next*, signal those steps. Third, teachers may want to depict the text structure and how information is related visually. Graphic organizers or maps show children how the text is organized visually and can be particularly effective for children with disabilities (Culatta et al., 2010; Kim, Vaughn, Wanzek, & Wei, 2004). They also provide an opportunity to teach the vocabulary of signal words. Teachers utilizing graphic organizers can present graphic organizers at any point in time before, during, or after the interactive book reading. When presenting the graphic organizers, teachers should introduce children to the graphic organizer or map and engage them in constructing the map. Figure 1's lesson plan includes examples of how teachers can talk about text structure.

Although Maria selected appropriate expository texts, exposing children to a sequencing text structure, she did not support her students by explicitly talking about the text structure or providing visual support.

2. Talk About Linguistic Features, Such as Academic Vocabulary

Whereas text structure involves the organization of information, linguistic features of expository text include word choice and vocabulary. As mentioned previously, expository text is often ordered so that it moves from subtopic to subtopic (e.g., "how plants grow" to "how plants survive"). The use of timeless verbs (e.g., tomatoes *grow* on vines) and generic noun constructions (e.g., *tomatoes* grow on vines) are other common linguistic features of expository text (Duke & Kays, 1998; Yopp & Yopp, 2000). Narrative text, on the other hand, tends to employ past-tense verbs (e.g., the tomato *grew* on the vine) and concrete nouns (e.g., *the tomato* grew on the vine). Expository text offers domain-specific technical or academic vocabulary. *Academic vocabulary* refers to the words in the text that are important for understanding the content (Fey, Catts, Proctor-Williams, Tomblin, & Zhang, 2004). For example, to understand the life cycle of a plant, readers must know words such as *seedling* and *sprout*.

Teachers may want to first identify and point out any explicit or implicit signal words found in the text.

To talk about academic vocabulary, teachers should draw upon the tenets of rich vocabulary instruction proposed by McKeown and Beck (2004) in which teachers first identify the academic vocabulary word and define the word using child-friendly definitions. These child-friendly definitions can be taught either before, during, or after reading. Second, after defining the word, teachers should prompt students to think about the vocabulary by asking questions (i.e., "Have you ever seen a seedling? What did it look like?") and discussing the vocabulary with the group. Third, teachers should give students the opportunity to use the vocabulary during extension activities—such as dramatic play in which children pretend to be seeds growing into plants—to develop children's deeper knowledge of the words directly taught. Another way to support academic vocabulary is to readdress the vocabulary in future lessons. This allows students to see the vocabulary across multiple contexts. Examples of addressing and talking about academic vocabulary are included in the lesson plan in Figure 1.

Particularly for children with language-based disabilities or who are at risk for reading difficulties, research suggests that more opportunities to use and interact with vocabulary result in better knowledge of targeted vocabulary words (Pullen, Tuckwiller, Konold, Maynard, & Coyne, 2010). For example, in a study conducted by Loftus, Coyne, McCoach, Zipoli, and Pullen (2010), kindergarten children identified as at risk for reading difficulties due to low vocabulary scores on a standardized assessment who received vocabulary instruction in small-group narrative storybook reading sessions in addition to vocabulary instruction incorporated into classroom-based narrative storybook reading sessions made greater gains in vocabulary knowledge than at-risk children receiving classroom-based instruction only. Further, in a study conducted by Fien and colleagues (2011) with first-grade children identified with low language and vocabulary skills, children who received vocabulary instruction within small-group reading sessions of both narrative and expository books made greater gains in vocabulary than children who received only vocabulary instruction in classroom-based book reading of the narrative and expository texts.

Maria highlighted the vocabulary during her lessons; however, asking questions regarding the targets, giving the children opportunities to use the vocabulary in extension activities, and providing instruction in small groups could have provided a deeper experience with new words and academic vocabulary.

3. Use Language Facilitation Strategies

Engaging children in discussions surrounding the text structure and vocabulary of expository texts is an integral component of shared book reading as an activity in addition to generally building children's language proficiency. It is these discussions that have been shown to be the mechanism through which shared book reading (at least in narratives) exerts its effects on young children's language and literacy skills (Beck, McKeown, & Kucan, 2013; Coyne,

Figure 1. Sample Interactive Reading Lesson Plan

Lesson Plan	Language and literacy	
Unit/Theme	Life cycles	
Activity	Interactive book reading	
Group size	Large/small group	
Materials	*From Egg to Butterfly* (Zemlicka, 2003), sequence map, picture cards	
Lesson Objectives	**Procedure**	**Examples**
Before reading		
Activate prior knowledge of expository content and structure.	Ask an open-ended question.	What do you know about butterflies? What do you know about how butterflies grow?
Introduce children to a text structure found in the book.	Talk about the sequence of how a butterfly grows.	This book is about butterflies. It tells the steps for how butterflies grow. The steps are called a *sequence*.
Introduce children to the associated graphic organizer of the text structure.	Talk about the text structure as a sequence using the graphic organizer.	We can use this picture and these picture cards to show how butterflies grow. These are squares (point to squares on graphic organizer). These squares are for what happens in each step of a butterfly growing. I will put a picture of each step in a box. These are arrows. The arrows tell us the sequence of what happens first, next, then, and last. I will use the words first, next, then, last when I touch the arrows and talk about the steps. Now let's read the book and find the sequence for how butterflies grow.
During reading		
Talk about words that signal the text structure.	Define, give examples, and discuss the words *first, next, then, last*.	That sentence has an important word in it, *then*. The word *then* tells us something is going to come right after or follow. See this picture. The eggs grow for a few months. Then they hatch. We can use *then* when we talk about other steps for how butterflies grow. A mother butterfly lays her eggs. Then the eggs grow. What does *then* mean? Tell me about other steps for how butterflies grow. Try to use the word *then*.
Talk about linguistic features such as academic vocabulary.	Define, give examples, and discuss the word *molting*.	That sentence has an important word in it, *molting*. *Molting* means shedding skin. Look, this picture shows the caterpillar shedding its skin. A snake also molts. A snake sheds its skin. What does *molting* mean? How might molting be important for caterpillars?
After reading		
Review the text structure and academic vocabulary found in the book.	Re-build the graphic organizer as a group.	So, we just read *From Egg to Butterfly*. I used this picture and these picture cards. I showed how butterflies grow. Now we're going to use this picture and these picture cards as a group. Tell me about how a caterpillar turns into a butterfly. What happens first? What happens next? What happens then? What happens last?

Simmons, Kame'enui & Stoolmiller, 2004; Santoro, Chard, Howard, & Baker, 2008). Teachers in ECSE classrooms are particularly poised to engage children in book-reading discussions but often need guidance regarding asking more complex questions and scaffolding students' responses when they respond off topic, respond incorrectly, or do not respond at all. Therefore, we recommend three language facilitation strategies for engaging children in shared book-reading discussions surrounding the content and structure of expository texts: Ask open-ended questions, expand and extend what the child says, and develop and aid the child's response. Specific examples of these language facilitation strategies are included in Figure 1.

Ask open-ended questions. Asking children questions that may have more than one correct answer and require extended responses is considered an open-ended question (Wasik & Hindman, 2013). Teachers who ask open-ended questions during narrative storybook reading have been shown to positively and significantly impact children's language skills (Wasik & Bond, 2001; Whitehurst & Lonigan, 1998); thus the same is likely true for expository book reading. Open-ended questions can come in the form of "wh" questions, such as "where" and "what," but can also be prompts that encourage elaborated responses, such as "tell me about" or "how." When teaching text structure or academic vocabulary in the context of expository texts, questions should focus on the ideas or vocabulary being instructed and allow multiple children to respond. This allows for *rich instruction*, where vocabulary can be seen in a variety of contexts and reinforces the content as it is repeated by multiple students (McKeown & Beck, 2004; Wasik & Hindman, 2013).

Inferences are ideas that are taken from the child's background knowledge of the content but are not directly stated in the text (Cain, Oakhill, & Bryant, 2004). Asking questions eliciting inferences include predicting what will happen (e.g., "Tell me about what happens after the seed is planted"), making hypotheses about content (e.g., "What happens to plants that don't get enough water?"), or identifying similarities and differences within content (e.g., "How are leaves different from roots?") or between content (e.g., "How are tomatoes and pumpkins the same?"). The potential answers to these types of open-ended questions are not readily available on the page, so they are an excellent way to monitor reading comprehension and determine the child's level of background knowledge (Tompkins, Guo, & Justice, 2013). In relation to the literature on narrative texts, van Kleeck, Vander Woude, and Hammet (2006) implemented an 8-week book-reading intervention with preschool children identified with language impairment using scripted literal and inferential questions embedded in fictional narrative texts. Outcomes of the study indicated moderate to large effects (w^2 = .13) on preschool children's inferential language skills.

> Maria asked questions requiring a single-word response (i.e., yes-no or cloze questions), rather than open-ended questions that provide children the opportunity to use more complex language as well as make inferences about content.

Expanding and extending. When expanding and extending, the teacher takes what the child said and adds to it. This may include creating a syntactically correct response or adding new information to the child's original response. Expanding and extending allows teachers to model more complex language while offering the praise and support that keeps children engaged (van Kleeck et al., 2006). Expanding and extending is a characteristic of adult speech that can be associated with responsiveness to children's input. Adult responsiveness is associated with gains in children's language development (Landry, Smith, & Swank, 2003; Tamis-LeMonda, Bornstein, & Baumwell, 2001). Research demonstrates that when preschool teachers use more syntactically complex sentences and model syntactically correct sentences in their responses, children demonstrate significant growth in their understanding and use of syntax (Huttenlocher, Vasilyeva, Cymerman, & Levine, 2002). So, although Maria's responses to the children in her classroom were of praise, she missed the opportunity to expand and extend the children's responses. Instead, Maria could fill out the child's response to model higher-level language. For example, after Maria asked her 4-year-old student Justin what *next* meant, Justin responded, "After." Maria could say, "Yes, *next* means it comes after. So next, the caterpillar builds a cocoon."

When a child gives a response that is incomplete or incorrect, teachers should take the opportunity to develop the child's ideas and aid by providing additional support.

Developing and aiding. When a child gives a response that is incomplete or incorrect or gives no response, teachers should take the opportunity to develop the child's ideas and aid by providing additional support (e.g., showing additional pictures, referring back to the book, or asking additional questions). As we saw with Maria, she often responded to the child's incomplete or incorrect response by providing two-answer choices. When this failed, Maria provided the child with the answer. Instead of providing the answer, asking questions that will lead the child to the original question's answer helps to develop the child's ideas by walking him

or her through the thinking process. This also encourages teachers to ask a more difficult question and then scaffold, or guide, the child to the answer through a series of lower-level questions.

Maria asks her student Dillon, "How might molting be important for caterpillars?" Dillon responds by saying, "Skin." Maria develops and aids Dillon's response by responding, "Let's go back a page. Here, the book says, 'Eating makes the caterpillar grow. It gets bigger and bigger. But its skin does not grow.' So how might molting be important for caterpillars?" Dillon looks at the picture and connects what he knows about molting to the caterpillar getting bigger, without the skin growing. He responds, "Caterpillar gets bigger skin." Maria tells Dillon, "Right! Remember how big the caterpillar got after eating all of that food? It is important for the caterpillar to molt so that it can get new, bigger skin."

Putting It All Together

ECSE teachers such as Maria, are particularly poised to teach the text structures of expository text through signal words; teach the language by targeting academic vocabulary; and build science and expository text knowledge by using language facilitation strategies, such as asking open-ended questions, expanding and extending what the child says, and developing and aiding the child's response.

Maria decides to plan a unit around life cycles, beginning with caterpillars to butterflies. She decides to focus on the sequence text structure. Maria goes to the library and searches for books. When selecting books, Maria looks for words that signal the sequence text structure, such as first, next, then, *and* last. *Next, Maria prepares for the unit by planning for before, during, and after reading. Maria formulates and records several open-ended questions to elicit her students' prior knowledge of both caterpillars and butterflies and of the sequence text structure. Maria plans to introduce the sequence text structure before reading the book and also show an example of a graphic organizer she will use to visually represent the information in the text. While reading, Maria plans to address both signal words and the academic vocabulary she has chosen to target. Finally, after reading, Maria plans to build a graphic organizer with her students to extend their understanding of the text structure and the content covered.*

After planning, Maria is ready to implement her life cycles unit. Maria begins by asking her students, "What do you know about butterflies?" Several students share facts or observations from their own experience. Next, Maria asks her students what they know about how butterflies grow. Maria explains that the book will tell about butterflies but also about how butterflies grow; the steps are called a sequence. Maria begins to read the book interactively; she pauses to define, give examples, and discuss the signal words and the academic vocabulary. She facilitates student involvement by asking open-ended questions, expanding and extending her students' responses, and scaffolding their responses by supporting them with evidence from the book. Maria notices that the lesson takes a little longer but that her students are more engaged. Finally, after reading the book, Maria involves her students in an extension activity. Maria uses picture cards and a sequence map to rebuild the events of the story with her students. She asks the students to talk about the sequence of a butterfly's life. Maria uses the signal words in her questions and discussion and models higher-level language for her students throughout the lesson.

A few days later, Maria revisits the book and is encouraged to find that several of the students are able to use the signal words to describe the life cycle of a butterfly. Their discussion features several of the vocabulary words Maria targeted as well. When Maria introduces the life cycle of a frog the following week, her students have background knowledge for both the structure and the content of the book. Maria finds that her students are able to build the graphic organizer and talk about it with increasing independence. They are interested in the topic and engaged in the lessons; Maria is excited about their learning and plans to continue to use these strategies in the future.

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