

Promoting Science Inquiry: Text Sets as a Gateway to Learning

April Mattix Foster & Jennifer Drake Patrick
George Mason University

Inquiry-based learning is defined as a “student centered, active learning approach focused on questioning, critical thinking, and problem solving” (Savery, 2015, p. 10). The growing body of work surrounding inquiry-based learning has demonstrated that inquiry-based teaching practices result in significant increases in student performance, lead learners to understand material more deeply, and encourage students to apply their learning to new situations and contexts (Darling-Hammond et. al, 2008). While the value of instilling an inquiry mindset into classrooms is well-supported, rigorous schedules and pacing guides can at times present a challenge for engaging in inquiry-based instruction in practice. One way to help overcome these challenges and support inquiry in the classroom is through the use of rich text sets. Text sets are collections of books related by a common theme, topic, or idea. These collections contain books and materials from different genres and different reading levels, all centered around one common focal idea. These text collections can help serve as a foundation for supporting and promoting inquiry-based learning in the classroom and can function as a tool for teachers to support readers of various levels during theme-based units of instruction.

Why Use Text Sets?

There is general consensus that reading and writing are integral to doing science (Ebbbers, 2004; Norris & Phillips, 2002). Integrating powerful text sets into the science curriculum engages students in the work of the real scientific community. Reading across texts pushes students to evaluate, synthesize, and examine ideas and concepts, which is complementary to the types of thinking fostered in an inquiry-based classroom (Ebbbers, 2002). Because text sets contain a wide variety of books, they provide an ideal means for promoting not only literacy development, but also engaging students in inquiry-based learning. This blend of purposeful reading within an inquiry setting will deepen students’ conceptual understanding and content acquisition. Text sets provide a number of benefits in the classroom as they support content literacy and knowledge, establish

opportunities to explore diverse and complex texts, encourage students to draw conclusions from multiple resources, enable students to view issues and topics through a variety of perspectives, and help meet the varied interests of students—all while allowing teachers to help establish links with the Common Core State Standards ELA/Literacy Connections (Craig & Guthrie, 2014). Moreover, having access to multiple texts promotes student engagement and interest (Allington, 2007; Craig & Guthrie, 2014). The power of using text sets in the classroom is immense, and their potential to enhance the student learning experience makes them a worthwhile investment for teachers.

How to Create a Text Set

Text sets do not have to be time intensive preparation endeavors by teachers. While initial text set planning to create rich text sets may take some time, established text sets are a valuable resource that can be modified and reused in future classes, so the initial investment in time will pay off in dividends as teachers can create text set resource lists that can be utilized as starting points for multiple years.

The first step in creating a text set is to delineate a unit or a theme such as *weather* or *overcoming obstacles*. Next, teachers can brainstorm topics that would be associated with the unit and use these as key search criteria for finding texts. There are a plethora of resources that can be used for finding text set resources. Teachers may want to consider exploring Booklist (<http://www.booklistonline.com/>), American Library Association (<http://www.ala.org/>), International Board on Books for Young People (www.ibby.org/), or International Literacy Association (<http://www.reading.org/>). Depending upon the theme or unit, teachers can also consider reviewing the websites of leading subject matter associations. For example, if teachers are looking for texts to accompany a math unit, they could use the National Council of Teachers of Mathematics site (www.nctm.org), or the National Council of Teachers of English (www.ncte.org) for Language Arts units, the National Science Teachers Association (www.nsta.org) for science units, or the National Council for the Social Studies (<http://www.socialstudies.org/>) for units on social sciences. School librarians are also a wealth of information.

When books are being selected, it is important for teachers to consider an evaluation system to ensure that the text set is composed of high quality books with appropriate content, various reading (Lexile) levels to accommodate different levels of readers in the classrooms, variation in genre and book type, and diverse perspectives on the subject. It is also helpful to ensure that the text set includes

resources that represent various members of different sociocultural groups, particularly those represented in the teacher's classroom.

| Ideas and Strategies for Selecting Rich and Robust Texts for Text Sets |
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| <ul style="list-style-type: none"> • Ensure the text set has a wide variety of genres represented • Provide a wide variety of reading levels in the texts selected so that all levels of readers in the classroom have multiple choices • Select texts that represent a wide swath of diversity, but also ensure that there are texts in the collection that are representative of the students in the classroom • Consider adding materials and resources that span beyond books - such as websites, music, pictures, maps, graphs, pamphlets, etc. |

Example

To help illustrate the development of a text set that supports inquiry-based learning in the classroom, a text set focused on the topic of *ecosystems* for a 7th grade classroom is presented here. The purpose of this text set is to allow students to start to engage in the unit and to begin to familiarize themselves with topics and ideas in an ecosystems unit, so a wide variety of texts from a general, exploratory standpoint are identified. A more specific text set could be created later in the unit if the teacher would like to focus more intently on a specific idea or theme within the unit, such as social responsibility and the environment or biomes.

Ecosystems Text Set: Middle School

| Title | Author | Book Type | Synopsis | Topics |
|--|--|-------------|--|---|
| <i>Biodiversity</i> Lexile Level: 1200 | Dorothy Hinshaw Patent, illustrated by William Munoz | Photo essay | Examines the concept of biodiversity through a pictorial representation of the various forms of life on earth - and how those forms of life depend on each other for survival. | Interdependence Biodiversity Conservation Habitats |
| <i>Heroes of the environment:</i> | Harriet Rohmer | Non-fiction | Presents twelve inspiring people (many of them young | Pollution Conservation |

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|---|---|----------------------------|---|---|
| <i>True stories of people who are helping to protect our planet</i> Lexile Level: 1070 | | | people) who have made it a mission to help protect different aspects of the environment and our ecosystem. Helps reinforce the idea of “thinking globally and acting locally.” | Recycling Solar energy Mining Oil drilling |
| <i>Exploring ecosystems with Max Axiom, super scientist</i> Lexile Level: 750 | Agnieszka Biskup, illustrated by Tod G. Smith | Graphic novel | Max Axiom leads students on a behind the scenes tour of how ecosystems function in a graphic novel format. Continued opportunities for student exploration are provided in an additional resources section. | Decomposition Producers Scavengers |
| <i>Hoot</i> Lexile Level: 760 | Carl Hiaasen | Realistic fiction | A middle school aged boy, Roy, sets out on a mission to save an endangered owl species, and paints a vivid picture of young students who are able to be activists for the environment. | Endangered species Environmental activism |
| <i>What if there were no bees</i> Lexile Level: 890 | Suzanne Slade, illustrated by Carol Schwartz | Picture book | Told from the perspective of a bee, this picture book illustrates the interdependency of ecosystems. | Interdependence Plant life cycle Food chain |
| <i>Slick</i> Lexile Level: 620 | Sara Cassidy | Realistic fiction | Conflict arises when 13-year old Eliza organizes a protest against an oil company that refuses to pay for damages resulting from oil drilling in Guatemala. | Social responsibility |
| <i>Moonbird: A year on the wind with the great</i> | Philip Hoose | Informational picture book | Elaborate pictures, maps, and scientific notes capture the experiences and | Interdependence |

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|---|----------------------------------|----------------------------|--|--|
| <i>survivor B95</i> Lexile Level: 1150 | | | challenges of the robin-sized red knot bird, who travels in flocks from pole to pole two times a year. | |
| <i>The salmon bears: Giants of the great bear rainforest</i> Lexile Level: 1130 | Ian Macalister and Nicholas Reed | Informational picture book | Vivid pictures and details show how the bears are part of the life cycle in the rainforest as a case is presented for protecting the bears that live on the central coast of British Columbia. | Interdependence, social responsibility |
| <i>Frightful's mountain</i> Lexile Level: 650 | Jean Craighead George | Realistic fiction | The third in the Mountain Series, this book captures the view of the falcon as Sam, the main character, releases the endangered species he befriended back into its natural environment. | Endangered species |
| <i>City critters: Wildlife in the urban jungle</i> Lexile level: 1180 | Nicholas Read | Non-fiction | Filled with colorful illustrations, pictures, and informative facts, this text explores how and why some wild animals live in urban settings. | Social responsibility, adaptation |

Conclusion

Creating text sets is a worthwhile endeavor. Providing a variety of accessible, diverse texts for students engages them in thinking about a topic in a way that a single text simply cannot. Having access to multiple texts around a topic promotes inquiry and essentially deepens students' conceptual knowledge. Using text sets is a viable means of supporting students in the literate practices of reading, writing, and talking about topics as well as engaging them actively in the process of inquiry. Text sets can be, quite simply, a winning strategy for both literacy and inquiry development.

References

- Allington, R. (2007). Effective teachers, effective instruction. In K. Beers, R. Probst, & L. Rief (Eds.), *Adolescent literacy: Turning practice into promise* (pp. 273-289). Portsmouth, NH: Heinemann.
- Darling-Hammond, L., Barron, B., Pearson, P. D., Schoenfeld, A. H., Stage, E. K., Zimmerman, T. D....Tilson, J. L. (2008). *Powerful learning: What we know about teaching for understanding*. San Francisco, CA: Jossey-Bass.
- Craig, M., & Guthrie, J. (2014). Student motivation the key to achieving CCSS Goals. *Reading Today*, 31(5), 4-6.
- Ebbers, M. (2002). Science text sets: Using various genres to promote literacy and inquiry. *Language Arts*, 80(1), 40-50.
- Norris, S. P., & Phillips, L. M. (2002) How literacy in its fundamental sense is central to scientific literacy. *Science Education*, 87(2), 224-240.
- Rowell, P., & Ebbers, M. (2004). School science constrained: Print experiences in two elementary classrooms. *Teaching and Teacher Education*, 20(3), 217-230.
- Savery, J. R. (2015). Overview of problem-based learning: Definitions and distinctions. In A. Walker, H. Leary, C. Hmelo-Silver, & P. Ertmer (Eds.), *Essential readings in problem-based learning* (pp. 5-16). West Lafayette, IN: Purdue University.

Further Reading - Texts Sets for Elementary

- Donham, J. (2013). Text sets, deep learning, and the Common Core. *School Librarian Monthly*, 29(6), 5-7.
- Ebbers, M. (2002). Science text sets: Using various genres to promote literacy and inquiry. *Language Arts*, 80(1), 40-50.
- Giorgis, C. & Johnson, N. J. (2002). Text sets. *The Reading Teacher*, 56(2), 200-208.
- Opitz, M. F. (1998). Text sets: One way to flex your grouping: In first grade, too! *The Reading Teacher* 51(1), 622-624.

Further Reading - Text Sets for Adolescents

- Cappiello, M. A., & Thulin Dawes, E. (2013). *Teaching with text sets*. Huntington Beach, CA: Shell Education.
- Elish-Piper, L., Wold, L. S., & Schwingendorf, K. (2014). Scaffolding high school students' reading of complex texts using linked text sets. *Journal of Adolescent & Adult Literacy*, 57(7), 565-574.
- Mathis, J. B. (2002). Picture book text sets: A novel approach to understanding theme. *Clearing House* 75(3), 127-131.

Wold, L. S. & Elish-Piper, L. (2009). Scaffolding the English canon with linked texts. *English Journal* 98(6), 88-91.

Text Set Creation Worksheet:

http://misiciowa.org/uploads/CCSS_15_CREATING_A_COHESIVE_TEXT_SET_Worksheet.pdf