

## 2023 Indiana Science Trade Book Annual Reading List (IN-STAR): Teaching Science Through Literature

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### Abstract

The 2023 IN-STAR List is a resource for Indiana teachers who wish to integrate children's literature and science. Several nationally recognized lists are produced to help teachers identify books that can be used in elementary classrooms, but these lists don't align their selections to grade levels and Indiana's K-5 science standards. The IN-STAR list bridges that gap by identifying two high-quality titles per grade level and honorable mention selections for the primary and intermediate grade bands. Books were published in 2022 and are vetted using a set of expectations for scientific content and applicability to the elementary classroom. A brief description and ISBN number are offered so that the reader may consider classroom connections and work with local libraries to acquire books.

The 2023 Indiana Science Trade Book Annual Reading List (IN-STAR) features unique selections which provide thought-provoking connections between rich literature and science content. The criteria and process to identify books has been previously described (Thomas & Gulley, 2012). Selections meet the following criteria:

1. The book has substantial science content.
2. The information is clear, accurate, and up to date.
3. Theories and facts are clearly distinguished.
4. Facts are not oversimplified to the point where the information is misleading.
5. Generalizations are supported by facts and significant facts are not omitted.
6. Books are free of gender, ethnic, and socioeconomic bias.
7. Information can be connected to the Indiana Science Standards for grades K-5.
8. Books are readily available in public libraries or bookstores.
9. Books have received at least one positive review in one of the identified professional journals: *Booklist*, *Bulletin of the Center for Children's Books*, *Horn Book*, *Kirkus Reviews*, *Publishers Weekly*, *School Library Journal*, and *Science and Children*.

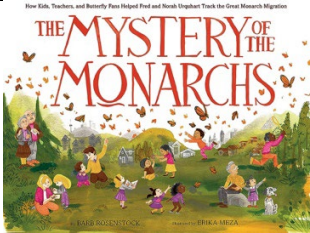
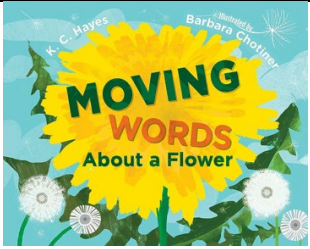
Items one through five are critical because they help teachers select quality science-focused books for classroom use. Item six ensures a teacher's universal responsibility to promote classrooms and resources which promote a variety of populations and cultures. Items seven through nine ensure the selections are high quality and easily attainable by classroom teachers.

Chosen titles were published in the preceding year. Books are selected through a continuous review of resources highlighting new publications in children’s literature. As interesting and appropriate books are discovered, they are purchased or acquired through local libraries for review. Their content is assessed for the nine criteria and if they address the science content listed in the Indiana Academic Standards for each grade level. The reading level of books is considered when aligning them with grade levels.

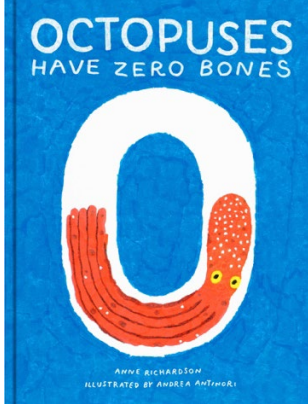
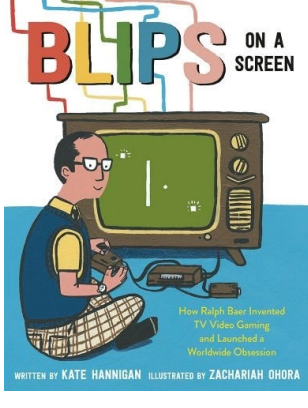
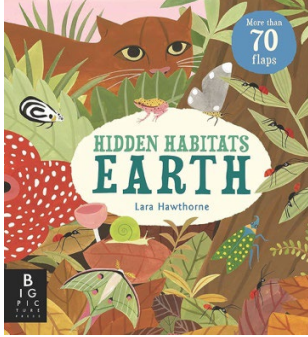

Because teachers work with students along the reading continuum, it can be beneficial to explore selections at adjacent grade levels. Some titles might be best suited as classroom read aloud selections, while others could be suited for independent reading. The authors anticipate that teachers will employ the spectrum of reading strategies while using these titles. Examples include retelling lessons, identifying key science vocabulary when summarizing content, and using the material to explore the nature of science or engineering by characters. Below are overviews of this year’s winning selections.

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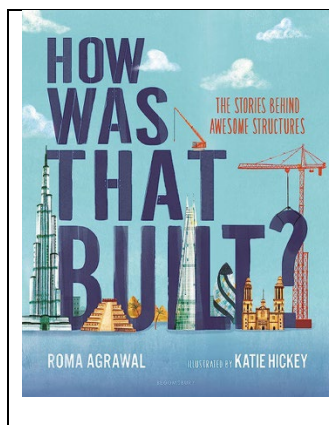
<b>Kindergarten</b>	
	<p><b>THE MYSTERY OF THE MONARCHS: HOW KIDS, TEACHERS, AND BUTTERFLY FANS HELPED FRED AND NORAH URQUHART TRACK THE GREAT MONARCH MIGRATION.</b> 2022. Barb Renstock. Illus. Erika Meza. Knopf Books for Young Readers. 40 pp. ISBN-13: 978-1984829566. True-life account of the discovery of monarch migration to Mexico and how the scientists asked questions as they went about their work. The book is a wonderful companion to butterfly life cycle lessons common to the primary curriculum. <b>STANDARD: LIFE SCIENCE</b></p>
	<p><b>MOVING WORDS ABOUT A FLOWER.</b> 2022. K.C. Hayes. Illus. Barbara Chotiner. Charlesbridge. 40 pp. ISBN-13: 978-1623541651. Using shape poetry, the author creatively shares the life cycle of a dandelion. If your students are new to shape poetry, they will enjoy watching how the words, fonts, and style enhance telling the story. <b>STANDARD: LIFE SCIENCE</b></p>
<b>First Grade</b>	

	<p>THE ANIMAL TOOLKIT. 2022. Steve Jenkins &amp; Robin Page. Clarion Books. 32 pp. ISBN-13: 978-0358244448. Another winner from Jenkins and Page. Students will instantly make the connection between how animals use tools and humans use tools. The tools to technology connection will also support teaching fundamentals of what engineers do. STANDARD: LIFE SCIENCE</p>
	<p>LION LIGHTS: MY INVENTION THAT MADE PEACE WITH LIONS. 2022. Richard Turere &amp; Shelly Pollock. Illus. Sonia Maria Luce Possentini. Tibury House Publishers. 32 pp. ISBN-13: 978-0884488859. This title highlights the real-life story about how a 12-year-old Kenyan helped save his family’s cattle from lions even when local adults and outside experts could not. Richard created a prototype from a solar panel, battery, and small light bulbs. The technology was adopted by his community and propelled him to international acclaim! STANDARD: ENGINEERING</p>
<p><b>Second Grade</b></p>	
	<p>OVER AND UNDER THE WAVES. 2022. Kate Messner. Illus. Christopher Neal. Chronicle Books. 56 pp. ISBN-13: 978-1797203478. Another successful contribution to this long-running series. Told through a family’s day adventure paddling in a bay, the title will help teachers share the types of bodies of water, and the life which inhabits them, outside Indiana. Dynamic imagery from above the water, at the water level, and below the water’s surface heightens the reader’s enjoyment. STANDARD: EARTH AND SPACE SCIENCE and LIFE SCIENCE</p>

	<p>OCTOPUSES HAVE ZERO BONES. 2022. Anne Richardson. Illus. Andrea Antinori. Tra Publishing. 68 pp. ISBN-13: 978-1735311524. This counting book is fun and feeds the reader’s curiosity to start making observations and asking science and math questions about the world around them. While the reading level targets younger readers, the mathematics connections might be more appropriate for older students. STANDARD: LIFE SCIENCE</p>
<p><b>Third Grade</b></p>	
	<p>BLIPS ON A SCREEN: HOW RALPH BAER INVENTED TV VIDEO GAMING AND LAUNCHED A WORLDWIDE OBSESSION. 2022. Kate Hannigan. Illus. Zachariah Ohora. Knopf Books for Young Readers. 48 pp. ISBN-13: 978-0593306710. Told within the historical context that starts with his family’s flight from Nazi Germany, the story of Ralph Baer’s determination to turn televisions from passive viewing gadgets to entertaining technologies will fascinate young readers who have never lived in a world without gaming devices. Vocabulary such as “prototype” are contextually used in the text, and end pages provide additional information about Baer’s other inventions. STANDARD: ENGINEERING</p>
	<p>HIDDEN HABITATS: EARTH (SMALL WORLDS). 2022. Camilla de la Bedoyere. Illus. Lara Hawthorne. Big Picture Press. 18 pp. ISBN-13: 978-1536226690. How do plants and animals survive in diverse habitats? This lift-a-flap book showcases the symbiotic relationships between organisms that allow them to thrive in a variety of terrestrial habitats. Full-color illustrations provide realistic, yet not overly technical, depictions of the organisms. STANDARD: LIFE SCIENCE</p>
<p><b>Fourth Grade</b></p>	
	<p>BLAST OFF: HOW MARY SHERMAN MORGAN FUELED AMERICA INTO SPACE. 2022. Suzanne Slade. Illus. Sally W. Comport. Calkins Creek. 48 pp. ISBN-13: 978-1684372416. This biography chronicles Mary Sherman Morgan’s life, starting from her childhood on a North Dakota farm to eventually supporting the NASA space program through her innovative fuel design. The importance of perseverance is prevalent throughout the text. STANDARD: ENGINEERING</p>

	<p><b>LUMINOUS: LIVING THINGS THAT LIGHT UP THE NIGHT.</b> 2022. Julia Kuo. Illus. Julia Kuo. Greystone Kids. 44 pp. ISBN-13: 978-1771648882. Useful as a resource for both physical science and life science concepts, this book’s multilayered text extends the content to provide intermediate students with an opportunity to explore the often-hidden world of organisms that possess the fascinating structural capability of generating light. Sharply colored illustrations against the black background add to the visual appeal. <b>STANDARD: LIFE SCIENCE and PHYSICAL SCIENCE</b></p>
<p><b>Fifth Grade</b></p>	
	<p><b>YOSHI AND THE OCEAN: A SEA TURTLE’S INCREDIBLE JOURNEY HOME.</b> 2022. Lindsay Moore. Illus. Lindsay Moore. Greenwillow Books. 64 pp. ISBN-13: 978-0063060982. Watercolor illustrations complement the narrative of the journey of Yoshi, an injured loggerhead sea turtle who traveled 25,000 miles home after being rehabilitated and released. End pages provide valuable information about Yoshi’s travels and characteristics of sea turtles. <b>STANDARD: EARTH AND SPACE SCIENCE</b></p>
	<p><b>BRISTLECONE: THE SECRET LIFE OF THE WORLD’S OLDEST TREE.</b> 2022. Alexandra Siy. Illus. Marlo Garnsworthy. Web of Life Children’s Books. 32 pp. ISBN-13: 978-1970039030. Locked away in the bristlecone’s tree rings is the historical record of natural disasters and climate changes over a 5,000-year period. This beautifully illustrated text reveals how environmental changes affect organisms. The author’s website offers multiple resources for incorporating this book into science and ELA lessons. <b>STANDARD: LIFE SCIENCE</b></p>
<p><b>Primary Honorable Mention</b></p>	
	<p><b>COPYCAT: NATURE-INSPIRED DESIGN AROUND THE WORLD.</b> 2022. Christy Hale. Lee and Low Books. 40 pp. ISBN-13: 978-1643792309. This book will certainly help spark creativity among your students. Numerous examples show how inventors used biomimicry for inspiration in their quest to solve problems and meet the wants and needs of society. Teachers can use the book’s Tanka poetry format to inspire writers. <b>STANDARD: ENGINEERING and LIFE SCIENCE</b></p>

	<p><b>THE DEPTH OF THE LAKE AND THE HEIGHT OF THE SKY.</b> 2022. Jihyun Kim. Floris Books. 48 pp. ISBN-13: 978-1782507420. This wordless book shares the story of a boy and his dog journeying from the city to his grandparents’ house in the country. Along the way he discovers the wonders of countryside habitats beautifully revealed using monochromatic illustrations. <b>STANDARD: EARTH AND SPACE SCIENCE</b></p>
	<p><b>FOOTPRINTS ACROSS THE PLANET.</b> 2022. Jennifer Swanson. Reycraft Books. 40 pp. ISBN-13: 978-1478876038. Close-up images punctuate this book to share the variety of animal footprints and the small and big imprints they leave. Connections to humans will help students compare and contrast their feet to animals’ feet (physically and metaphorically). <b>STANDARD: LIFE SCIENCE and EARTH AND SPACE SCIENCE</b></p>
<p><b>Intermediate Honorable Mention</b></p>	
	<p><b>BREAKING THROUGH THE CLOUDS: THE SOMETIMES TURBULENT LIFE OF METEOROLOGIST JOANNE SIMPSON.</b> 2022. Sandra Nickel. Illus. Helena Perez Garcia. Harry N. Abrams. 48 pp. ISBN-13: 978-1419749568. As the first woman to earn a doctorate in meteorology, Joanne Simpson doggedly pursued her interest in learning about weather as a pilot, Air Force instructor, and ultimately as a university student. A combination of whimsical and content-based illustrations supports the text. <b>STANDARD: EARTH AND SPACE SCIENCE</b></p>
	<p><b>TOTALITY: AN ECLIPSE GUIDE IN RHYME AND SCIENCE.</b> 2022. Jeffery Bennett. Big Kid Science. 32 pp. ISBN-13: 978-1937548865. Two-line rhymes are extended by sidebar text, illustrations, diagrams, and photos to provide a wealth of information about eclipses. This book is particularly useful with both annular and total solar eclipses occurring during the 2023-24 school year. End pages include a glossary and suggested classroom activities. <b>STANDARD: EARTH AND SPACE SCIENCE.</b></p>



HOW WAS THAT BUILT? THE STORIES BEHIND AWESOME STRUCTURES. 2022. Roma Agrawal. Illus. Katie Hickey. Bloomsbury Children's Books. 80 pp. ISBN-13: 978-154760929. Organized in "How to..." sections, such as "How to Build Across" for types of bridges, this non-narrative informational book combines physics, engineering, geography, and history in text that will engage anyone who has asked that simple question about well-known and lesser-known structures. Colorful sketches enhance text.

STANDARDS: PHYSICAL SCIENCE AND ENGINEERING

### References

Thomas, J., & Gulley, J. (2012). Spotlight on science: Introducing the Indiana science trade book annual reading list. *The Indiana Reading Journal*, 45(1), 31-35.

### Resources

Thomas, J., Gulley, G., & Rearden, K. (2023, October 28). *INSTAR booklist by year*. University of Southern Indiana. <https://www.usi.edu/science/southwest-indiana-stem/instar-book-list>

### Author Information

Jeff Thomas, University of Southern Indiana, Professor of Teacher Education, works with emerging and current elementary teachers to promote integration of inquiry-based science, children's literature, and technology.

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Kristin Rearden, University of Tennessee-Knoxville, Clinical Professor of Science Education, strives to promote effective practices in teacher preparation, the impact of place-based education, and the integration of children's literature and science.