

Module 3: Collaborative Collection Development

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I. Introduction

Our collection development is grounded in two core beliefs as stated by the American Association of School Librarians (*Common Beliefs - National School Library Standards*, 2018):

1. The School Library is a unique and essential part of a learning community
2. Learners should be prepared for college, career and life.

As such we curated a collection of 15 items to support common core math standards aligned between kindergarten and second grade. We focused on two types of patrons: students and faculty. It is important to note that our team used a filter that included pre-k, however Common Core standards start at kindergarten. Our goal for our earliest mathematicians was to engage and inspire those learners using read alouds and hands-on experiences. This is cited as a best practice by many, including Cindy Garcia, a bilingual educator who stresses that the single most effective teaching strategy is to start with physical objects. “Students are able to manipulate these materials and make sense of what works and what does not work” (Ferlazzo, 2021).

In kindergarten, math instructional focus is two-fold: representing and comparing whole numbers and describing shapes and space. As students move to first grade, students develop understanding of addition and subtraction between zero and 20; place value; linear measurement; and attributes of geometric shapes. By the end of second grade, students will apply these skills to add and subtract within 100; explain place value concepts with whole numbers upto 1,000, measure using smaller units; and describe geometric shapes by examining their sides and angles. (*Mathematics Standards*, 2021)

To address the belief that learners should be college and career ready, our team included titles that spotlight STEM (science, technology, engineering, and mathematic) concepts. This inclusion also offered opportunities to share stories that uplift previously silenced communities.

As we started our project, we were all struck by the abundance of resources available. This made it doubly important to use a strict selection process that addressed the accuracy, relevance, and authority of these resources. Moreover, our team felt compelled to elevate titles that spotlighted inclusion and diversity. These newer titles offer mirrors and windows for our

diverse readers. Remembering the five laws of library science, specifically, “every book a reader”, we searched for titles and resources that helped all learners to access and enjoy the subject. Mathnesium tells how many families are frustrated by what their child is asked to do in math (*Are You a Parent Frustrated With Common Core Math Standards?*, 2017). This frustration made its way to the mainstream in *The Incredibles 2* movie when Mr. Incredible yells, “I don’t know that way—why would they change math? **Math is math. Math is math!**” (Bird, 2018). Titles like *What Will Fit?*, by Grace Lin, can help give voice to frustrations and offer strategies for overcoming those challenges and serve as a family engagement tool to bridge understanding and empathy.

Lastly, it is important to recognize the challenge to find a math book for our age group published by a small press or university press; however, university presses did publish materials on best practices for teaching math. Additionally, it was difficult to find primary sources for math texts, and while existing math realia is obscure but obtainable, we felt that it was best to include student-created realia.

II. Process Summary

Clare Brown notes that curation can be defined as “the act of individuals chartered with the responsibility to find, contextualise, and organise information, providing a reliable context and architecture for the content they discover and organise” (Brown, 2016). Our team drew direction from key points in this definition. Overall, we strove to curate titles and resources that engage, support and elevate the reader. We used authoritative sources to help us weed through the sheer amount of resources. These sources include:

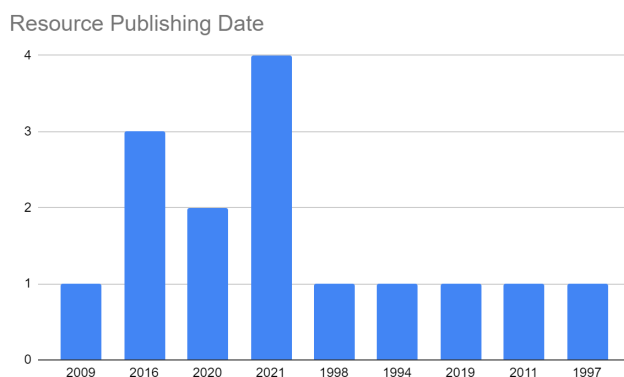
- Mathical Book Prizes, which are awarded by the Mathematical Sciences Research Institute (MSRI)
- NCSS-CBC Notable Children’s Trade Book in the Field of Social Studies
- NCTE Notable Children’s Trade Book in the Language Arts

Additionally, we worked to create a collection with multiple access points -- readability, content, concepts, themes. To achieve this curation goal, we worked to balance the format and type of materials in the collection. There is a range of books that can also be accessed in both

print and electronically, from professional development resources for teachers and families to support learners, to student created realia to promote multiple modalities for learners. These research-based choices were informed by articles found in educational and library journals and websites.

We wanted to include current resources. The oldest print title was printed in 1994. The average age of our collection is eight years old. However, the most frequent publication date is 2021 as evidenced in Chart 1 found below. If a resource was older than 5 years, we used a second lens of authority to justify its inclusion. *The Greedy Triangle* which was published in 1994 was included because the author, Marilyn Burns is a highly respected mathematics educator with more than 55 years of experience in education (Burns, 2021). Additionally, *Grandfather Tang's Story*, publication date of 1997, was included because of its awards.

Chart 1: Resources Publishing Date



III. Annotated Bibliography

Adler D. A., (2009). *Money madness*. Holiday House Inc.

This is a children's book that focuses on the basic premise/function of money (economics). Why we use money and citing real life use cases. An account of different things that have been used in the past. A simple supply and demand analogy for prices and different monies around the world. There is also a section on bank ledgers/accounts. The book is a simplistic overview on a fairly complex overall topic. It more or less explains why counting (specifically with currency) is important in everyday life. It is a great supplemental material for children that have learned to count money or will be learning to count money. There are

also examples of counting coins and dollars, however this book is mainly to explain the purpose of money and how it relates to counting numbers.

Ball, J. (2016). *Why pi?* DK Publishing.

This book demonstrates to readers the importance of math throughout history. From how ancient Egyptians used math to solve scientific problems and today with modern science. The content tries to add some excitement to the subject of math with experiments and puzzles to solve that are relatable to those in the real world. A big emphasis is used on how math is used to measure different things and the importance of why counting is a fundamental math concept to do more complex problem solving. The intended age group is a little bit older than 2nd grade but it does a great job explaining the importance of using math (specifically counting) for measurements and calculations that involve everyday aspects of life; Such as speed, temperature, weight, time, and distance. *Community Resource:* This comes from an Appomattox Regional Library catalog on the subject of math for children.

<https://catalog.arls.org/kids#/categorySearch?id=1719024816>

Burns, M. (1994). *The greedy triangle*. Scholastic Corporation.

This is a children's book that focuses on basic geometric shapes. The overall story revolves around a triangle that wants to be another shape (hence the greedy triangle title). The main character adds sides to achieve this. The emphasis being what makes certain shapes triangles, rectangles, and other polygons. Three sides, four sides, five sides, etc. It is an excellent narrative story that can supplement in class activities because of its simplistic and illustrative content. The intention of the book is to get children to notice and identify the shape of objects around them.

Cline-Ransome, L. (2019). *Counting the stars: the story of Katherine Johnson, NASA mathematician*. (Turpin, B, Narr.) [Audiobook].

This biography of Katherine Johnson won the Mathical Award in 2020 for ages 5-7. It has been hailed as “sensitive, informative, and inspiring” and provides age -appropriate content about Jim Crow laws and how a black genius navigated the complexities and roadblocks of a racially unfair and patriarchal system to make incredible mathematical and scientific

contributions to NASA. This book not only details a historical topic that is often challenging to explain to young children, and can be traumatic when not done carefully, but it also presents a female heroine, who has a local tie to the area since she worked at NASA in Virginia. This is also an excellent companion piece to Johnson's own autobiography, which is included in our collection. The audiobook format offers a way to appeal to diverse learners and help students hone their listening skills, and the narration and delivery is professional, polished, and engaging.

Crespo, A. (2020). *Who has more?* (Medeiros, G, Illus.) Charlesbridge.

This is an outstanding introduction to the basic math concepts of measuring while also addressing emotions, diversity, and bi-lingualism for pre-k students. The premise of this brightly illustrated story is a sibling rivalry between Lia and Luis, who get snacks from their family store and worry that Luis may have more than Lia. The dialogue includes words in Portuguese and a glossary along with a pronunciation guide, so it is an effective and age appropriate way to introduce young children to the concept of different languages.

Ultimately, as the siblings work through their difficult emotions (anger, frustration, injustice, delight), it is revealed that the snack amounts are indeed unequal, and they must devise a plan to make it fair. This book helps children learn to cope with difficult emotions, problem-solve, understand foundational math concepts, and universality through Brazilian culture and Portuguese language. This book won the 2021 Mathical Book Prize, and also includes activities for families to continue the exploration of measurement and comparison.

Danielson, C. (2016). *Which one doesn't belong?* Stenhouse Publisher.

A 2017 Mathical Book Prize recipient that will inspire all readers to see math around them. Each page shows four geometric figures and asks the reader "which one doesn't belong?". There are no right or wrong answers. This book promotes mathematical reasoning to our earliest readers. Readers learn how to craft and justify arguments.

Johnson, K., Hylick, J., and Moore, K. (2021). *One step further: my story of math, the moon, and a lifelong mission.* National Geographic Kids.

This is a gorgeously crafted primary source in which the now-famous and revered "human

computer,” Katherine Johnson, conveys her personal account of her childhood, her schooling, her teaching career, her work for NASA, and her family life. Her two daughters, who are co-authors, recall their memories of being raised by Johnson and how she pioneered new opportunities for them through example and support. Although there are ample illustrations to capture young minds, primary photographs are skillfully woven in, and the resulting images are stunning and add veracity. This book remains uplifting but realistic while tackling difficult issues, such as racial and gender discrimination, in an honest, simple, yet profound narrative. The direct perspective of the persevering Johnson is inspiring. The design of the book, which includes thought bubbles, illustrations, photographs, and keepsakes (such as report cards, endearing family snapshots) creates an intimate feel and emotional connection to the reader. The end of the book details Johnson’s long overdue recognition by NASA and her daughters’ careers: both emulate their mother: one becomes a teacher and one works for NASA. This is a fantastic introduction to primary sources, nonfiction, and provocative themes that are healthy for this age group, such as the power and importance of math, the inequities of society, the personal grit to face those inequities and stand up for yourself, and the love of a supportive family. Moreover, it is a wonderful way to diversify the collection.

Lin, G. (2020). *What will fit?* Charlesbridge.

This title in the Math Stories series features an African American girl who asks the question, “what will best fit in my basket?”. As the character walks through the farmers market she tries and tries to find the just right item. The story offers language development skills along with math reasoning. There is also a story of resilience as the little girl, Olivia, is faced with a complex problem who faces that problem with a smile and eager curiosity.

Overholt, White-Holtz, J., & Dickson, S. S. (1998). *Big math activities for young children for preschool, kindergarten, and primary children*. Delmar Publishers.

The big math activities for young children book is exactly as the title implies. It is a perfect supplemental resource to help math teachers with creating additional math content/activities at the elementary school level for lesson plans. Designed to illustrate activities that help improve a child's mathematical reasoning, through multiple grades at the elementary level.

Another reason/justification for the book is the value it brings, there is a lot of content within the book and the activities have in mind to use inexpensive means for demonstration.

Schwartz, R.E. (2011). *You can count on numbers*. American Mathematical Society.

This is a vibrant children's book written by Richard Schwarz, a mathematics professor at Brown University, who was spurred to write this book by a desire to help his own children understand number concepts. Schwartz is a talented and respected professor at a prestigious university, and was the recipient of the Mathical Award in 2015. The book helps young readers understand prime numbers and factors by using monsters and the visual lay-out of dots to help students understand the number's factorization. The monsters are simple, vibrant, and have feelings. For example, number 1 is not a prime number because it is a monster that is "disappointed it doesn't get to interact with any other numbers." By using visual tools, delightful monsters, and clever and entertaining narratives for the monsters, students can think about numbers in new ways and deepen their understanding. The end of the book also contains lessons on Eratosthenes' Sieve and Euclid's proof. This book is a charming, whimsical, and accessible book for children who will be entertained by the book, but it is also a great resource for teachers/parents who could employ these explanations to help their young learners. Furthermore, it not only helps learners understand complicated mathematical concepts, but it also addresses complicated emotions as the monsters explain their stories. This book is a new style for textbooks because it is entertaining, engaging, and vivid.

Tompert, A. (1997). *Grandfather Tang's Story*. Dragonfly Books.

The author blends a folktale, geometry and a story of friendship in this elegantly illustrated book. It is distinguished as both a NCSS-CBC Notable Children's Trade Book in the Field of Social Studies and a NCTE Notable Children's Trade Book in the Language Arts.

Virginia Air & Space Science Center. (2021). *Math Lab (Pre-k to second grade)*. [Learning program] <https://vasc.org/educate/program-information/prek-2nd-grade/>

This is an engaging program offered to schools through the Virginia Air & Space Center in connection with NASA Langley. In the Math Lab program, pre-k through grade 2 students compare numbers and values determining equal, greater than, or less than. They also also

play a number game that will help develop their math sentence skills. The Virginia Air & Space Center is a valuable community resource, and their outreach programs are challenging, fun, and aligned with grade levels and Standards of Learning. This program is an excellent way to connect math with real-life relevance, instill an interest in math learning, experience a hands-on fun learning experience, and also introduce students to this valuable educational resource in our community. Moreover, the museum will travel to schools to present the Math Lab, and there is also an online virtual learning option.

Virginia Department of Education. (2016). *Virginia 2016 mathematics standards of learning kindergarten curriculum framework*.

This document is a Virginia state government published curriculum for the kindergarten grade level. It is for teachers as a guide to develop their lesson plan around the standards of learning as determined by the Virginia Department of Education. It emphasizes a focus on shapes/objects, patterns, measurements, and even colors. It is based around the van Hiele theory of geometric understanding. The levels of understanding are categorized into level 0 - precognition, level 1 - visualization, level 2 - analysis, and level 3 - abstraction. Each section also describes common issues teachers have when teaching specific concepts to students.

Realia Set 1: Tangram sets

A tangram set is a Chinese geometry puzzle consisting of a square that is then cut into five triangles, a square and a rhomboid. These puzzle pieces can be reassembled into different figures. Tangrams support a hands-on concrete learning approach. The use of tangrams can support student math reasoning skills and is an entry point for early STEM activities.

Additional resources about incorporating Tangrams into math instruction can be accessed here: *Tangrams: Geometry Hands-On Math Manipulatives*. (n.d.). hand2mind. Retrieved November 21, 2021, from

<https://www.hand2mind.com/glossary-of-hands-on-manipulatives/tangrams>

Realia Set 2: Student Created Collections

Students created collections because anything can be counted. University of Washington suggests puzzle pieces, blocks, rocks, buttons. Student items may include pokemon cards, race cars, erasers, stickers. This set will change and evolve over time. For more details about how to create counting collection routines, read University of Washington. (2014).

Counting Collections | *TEDD*. Teacher Education by Design. Retrieved November 21, 2021, from <https://tedd.org/counting-collections/>

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