

MAKING MATH COUNT: Exploring Math through Stories

Mathical
Books for Kids from Tots to Teens

Great stories are a wonderful way to get young people of all ages excited and interested in mathematics. Now, there's a new annual book prize, *Mathical: Books for Kids from Tots to Teens*, to recognize the most inspiring math-related fiction and nonfiction books that bring to life the wonder of math in our lives. This guide will help you use this 2015 Mathical award-winning title to inspire curiosity and explore math in daily life with the youth you serve.

For more great books and resources, including STEM books and hands-on materials, visit the First Book Marketplace at www.fbmarketplace.org.



NEARLY GONE

written by Elle Cosimano

A high school student named Nearly Boswell notices and understands the patterns formed by people and events around her. But, when things stop making sense and people start getting hurt, no clean formula or balanced equation can explain or solve for what's wrong.

GRADES
9-12
WINNER

KEY MATH CONCEPTS

Nearly Gone focuses on:

- Building confidence in intuition and reasoning skills
- Tenacity in tackling tough situations
- Recognizing strengths

Very little modern math relies on learning procedures or memorized formulas. Instead, studying math requires creativity and determination, as well as precision and skill. By having perseverance, anyone – from students to mathematicians – can solve tough problems.

The Mathical: Books for Kids from Tots to Teens book prize, presented by the Mathematical Sciences Research Institute (MSRI) and the Children's Book Council (CBC) recognizes the most inspiring math-related fiction and nonfiction books for young people of all ages. The award winners were selected by a diverse panel of mathematicians, teachers, librarians, early childhood experts, authors and others.



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TALK AND ASK QUESTIONS AS YOU READ

Before reading

Nearly faces a variety of struggles ranging from feeling isolated to intense pressure to succeed. *ASK: How do you face the challenges in your own life? Who do you talk to? What do you do?*

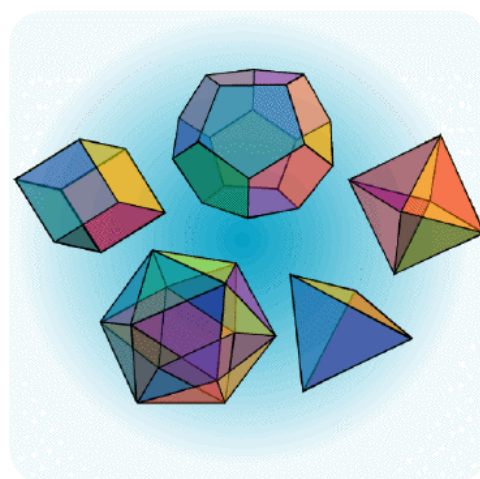
While you're reading

Encourage students to think about what similarities or differences they have with Nearly as they read. *ASK: What strengths do you have that would help you solve a problem or puzzle? What is special about Nearly that helps her figure out what is going on?*

Observe the ways in which Nearly uses her math and science skills to solve the mystery she faces. *ASK: How does math and science help Nearly in her quest? If you were faced with a problem, in what ways could you use your own math skills to solve it? Have you ever used math to solve a problem in your own life?*

Draw connections after you read

Nearly works to find her own strengths even as her world seems to break down around her. *ASK: What are some of your personal strengths? What are you good at? What do your peers admire in you? What strengths do you hope to build over time?*



*Illustration courtesy of New South Wales
Department of Education and Communities,
<http://www.curriculumsupport.education.nsw.gov.au/primary/mathematics/>*



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Nearly uses her unique strengths to solve a difficult puzzle. These two activities will help students discover their own strengths and think about ways they can use them in their own lives.

SHOWING STRENGTHS

MATERIALS

- An even number of chairs
- Timer
- Interview questions

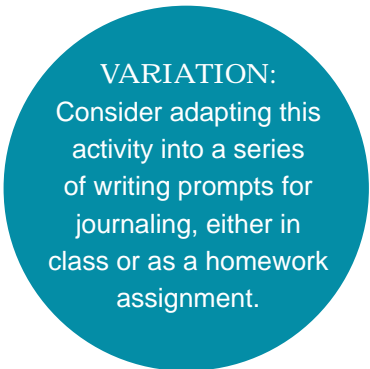


1. Prepare

- Organize two rings of chairs – one large ring with a smaller ring of chairs inside. The chairs in the inner ring should face the chairs in the outer ring so that students sitting in them would face one another.

2. Interview

- Each pair of students will take turns interviewing one another about their strengths and abilities. The students in the outer ring will interview the students in the inner ring first. Set the timer for three to five minutes. Then, switch so they students in the inner ring interview the students in the outer ring for another three to five minutes.
- Share these questions, or encourage the students to come up with their own.
 - *What is a skill or strength you are most proud of? Why are you proud of it?*
 - *How did you develop this skill or strength? Did you take lessons? Did someone teach you? Did you figure it out yourself?*
 - *How has this skill or strength affected you? How do you use it in your life?*
 - *How would you advise someone else to build this skill/strength?*
- After the first interview session is done, have the students in the inner ring stand up and move two chairs to their right. Repeat the interview process as many times as you like.



3. Review and make connections

- Everyone has unique strengths and abilities. *ASK: What struck you about how different people develop their strengths and abilities?*
- Think about your strengths and a challenge or problem you're facing in your life. *ASK: How can this strength or skill help you face that challenge? (Note: Invite the students to share only if they are comfortable. Alternatively, invite them to journal their answers to this final question.)*



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MATHEMATICAL REBELS

Many influential mathematicians challenged the accepted standards of their times and pushed math in directions that surprised and sometimes upset their peers. Have students each choose a mathematician from the lists below or find their own to research. They should then prepare a presentation that includes information on the mathematician's life and contribution to mathematics. Have students present their mathematicians and share thoughts on some of the following questions:

- *What surprised you about your mathematician?*
- *Would you consider your mathematician a rebel? Why or why not?*
- *How are you similar/different from your mathematician?*
- *Could you identify with any aspect of his/her life or work?*

ACTIVITY 2

Students might be surprised at what they find!

Historical Mathematicians

Hippasus of Metapontum (5th century BC)
Brahmagupta (598-670)
Bhaskaracharya (1113-1185)
Yang Hui (1238–1298)
Madhava of Sangamagrama (1340-1425)
Jamshid al-Kashi (1380-1429)
Rafael Bombelli (1526-1572)
Muhammad ibn Muhammad al-Fullani al-Kishnawi (d. 1741)
Leonhard Euler (1707-1783)
Sophie Germain (1776-1831)
Carl Friedrich Gauss (1777-1855)
Evariste Galois (1811-1832)
Ada Lovelace (1815-1852)
Georg Cantor (1845-1918)
Sofia Kovalevskaya (1850-1891)
Alicia Stott (1860-1940)
Kelly Miller (1863-1939)
Emmy Noether (1882-1935)
Srinivasa Ramanujan (1887-1920)
Mary Ouimette-Kinney (1908-2008)
Alan Turing (1912-1954)
Marjorie Lee Browne (1914-1979)
Alberto Calderon (1920-1998)
John Nash (1928-2015)

Living Mathematicians

Artur Avila
Manjul Bhargava
Ingrid Daubechies
John Conway
Jonathan Farley
Ruth Gonzalez
Martin Hairer
Trachette Jackson
Cleopatria Martinez
William A. Massey
Maryam Mirzakhani
Lenhard Ng
Hee Oh
Katherine Okikiolu
Arlie Petters
Richard Tapia
Terence Tao
Daina Taimina
Cedric Villani



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