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**.

ONE BIG PAIR OF UNDERWEAR

written by Laura Gehl, illustrated by Tom Lichtenheld

What's one thing that two bears, three yaks, four goats, and six cats have in common? They hate to share. When the animals don't count and compare to see if they need to share, someone always gets left out. But, by learning to share, the animals discover they can have twice the fun!

GRADES K-2 WINNER

KEY MATH CONCEPTS

One Big Pair of Underwear focuses on:
- Comparing numbers by size
- Noticing problems by counting and comparing
- Using math as a tool to solve problems fairly

This story shows how we can use math to predict and solve problems. Math can help us notice when something is wrong, and by counting and comparing, we can often figure out solutions that are fair.

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.

First Book

This tip sheet was created by First Book with generous support from MSRI.

MSRI
Mathematical Sciences Research Institute

TALK AND ASK QUESTIONS AS YOU READ

Before reading

One Big Pair of Underwear is about sharing. ASK: *What does it mean to share? When are some times that you share?*

Sharing can help things be fair so that everyone can take part or enjoy something. ASK: *How do you know if something is fair? What does it mean to be fair?*

While you're reading

Slow down as you read and take time to count the objects on each page. Compare the number of animals with the number of objects. ASK: *What do you think will happen next?*

On each page, have students identify how many objects would be needed to give one to all the animals. ASK questions like: *If there are three scooters and four seals, how many more scooters would we need so that all the seals can have one?*

Draw connections after you read

The repeating pattern in the first half of the book is that there is always one fewer toy than the number of animals who want to play with it. ASK: *The same problem happened over and over again in the book. What was the problem? How specific can you be? Can you write the animals' problem as a math problem? Can you use words from mathematics, such as "less than" or "more than," to describe what kept happening to the animals?"*

By counting and comparing, the animals found new ways to enjoy their possessions. ASK: *What happened when the animals shared? Do you think what happened was fair? Why or why not?*
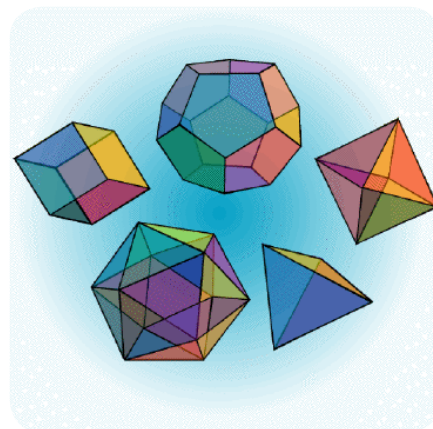
Illustration courtesy of New South Wales Department of Education and Communities, http://www.curriculumsupport.education. nsw.gov.au/primary/mathematics/

HOW TO SHARE WITH MATHEMATICAL FLAIR

ACTIVITY

MATERIALS
- Scenarios listed on the next page
- OPTIONAL: Visual aids to describe the scenario, such as cookies or toys

1. Warm-up
- We saw in the book how sharing can help everyone have a turn and have fun. This is part of being fair. ASK*: Is fairness important? Why or why not? How do we make sure we are being fair to one another?*

2. Explore the scenarios
- Describe the scenarios and invite the children to talk about how they would solve each problem fairly. The scenarios also include some ideas to get the conversation going.
- Think about using visual aids or asking children to act out how they would find a solution.

3. Review and make connections
- After you have gone through each scenario, ASK: *Do you think we could have solved these problems without counting or thinking about numbers? Why or why not? Tell me how we used numbers.*

- Sharing and being fair are important parts of daily life. Reinforce how these two concepts are related, such as making sure everyone has an equal share or turn and that no one is left out. ASK: *What would you do if someone didn't share with you or treat you fairly?*

Scenario	Ideas to share and discuss
Two children both want to play with the same awesome toy during recess. There is only one toy.	• Taking turns that are equally long. For example, divide recess in half, and each child gets to play with the toy for half of recess. • Playing with the toy together
Ten kids want to play basketball, and each team needs the same number of players.	• Lining up by height, from shortest to tallest. Then counting off one, two, one, two, till everyone is on a team. • Choosing randomly (e.g. numbering off)
There are four students and 12 cookies.	• Giving each person one cookie to start. Go around the circle again – give each child one more cookie. Keep going until you run out of cookies. • If everyone wants as many cookies as possible, how many cookies will each child receive?