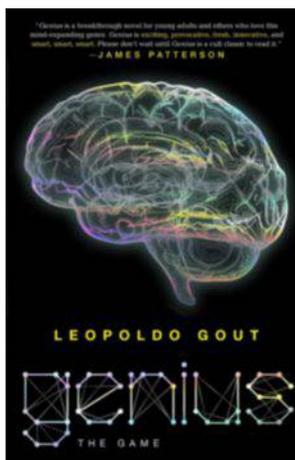


MAKING MATH COUNT: Exploring Math through Stories

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. The annual Mathical Book Prize recognizes 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 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 fbmarketplace.org. For more Mathical titles for youth ages 2-18, see mathicalbooks.org.



GENIUS: THE GAME

Written by Leopoldo Gout

Rex, a US student of undocumented parents, is searching for his vanished brother. Tunde is an optimistic engineering wizard from Nigeria who creates technological marvels from trash-heap discards. Painted Wolf is a fiercely moral Chinese blogger who specializes in video-game-like journeys to expose corruption. The three have never met in real life, but online they are best friends, working together running a website called LODGE. When tech rock star Kiran Biwas invites the most advanced young minds under 18 to compete in a worldwide completion known only as The Game, not only does the group meet in real life for the first time, they must also depend on each other to overcome a series of challenges that threaten those they love the most.

GRADES
9-12
WINNER

KEY MATH CONCEPTS

Genius: The Game focuses on:

- Technology
- Cryptography
- Personal and community ethics

The Mathical Book Prize is presented by the Mathematical Sciences Research Institute (MSRI) in partnership with the National Council of Teachers of English (NCTE) and the National Council of Teachers of Mathematics (NCTM), and in coordination with the Children's Book Council (CBC). The Mathical Prize 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, and others.



This reading guide was created by First Book with the generous support of the Firedoll Foundation and MSRI.

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TALK AND ASK QUESTIONS AS YOU READ

Before reading

The main characters in this book come from three different countries around the world. They work together as a very tight-knit team online, even though they have never met in person. *ASK: How are online friendships different from in-person friendships? How are they the same?*

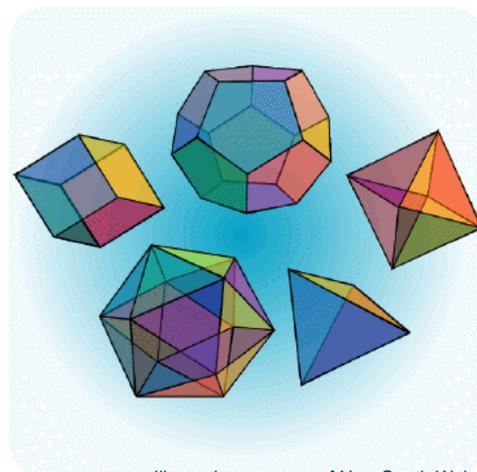
While you're reading

Cryptography, or the art of writing and solving codes, is central to the book. You may not realize it, but cryptography is a common part of your daily life. Anytime you use a device such as a computer or mobile phone, or make a credit card purchase, you are relying on encryption to keep data private. *ASK: Why is cryptography important? What could happen if everyone's online data were suddenly made public? How do you decide what information you share online and what you keep private?*

The young people invited to participate in The Game all excel in the fields of math and science in a variety of (sometimes surprising) ways. Rex is an expert programmer, Tunde can turn trash into practical inventions, and Painted Wolf uses technology as a tool to advance a more transparent society. There's even a character who uses biotechnology to turn insects into robots! *ASK: What are some surprising and cool ways that people you admire use math? How are math and technology a part of your interests and hobbies?*

Draw connections after you read

The use of technology for both good and evil purposes is an important theme of the book. Some ethically questionable uses of technology by the main characters include the LODGE group's use of spying to uncover corrupt actions; Rex breaking into The Game to claim someone else's spot; and Tunde's difficult decision whether or not to create a jammer. *ASK: Do you agree with the characters' choices in these situations? When might it be appropriate to break a rule or a law? Can you think of any ways our society has been impacted in the past by people who have made such tough ethical decisions?*



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



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BUILD YOUR OWN CIPHER WHEEL

Have students make their own cryptographs, or coded messages. Using the provided template, students can create their own cipher wheel. Have students use their cipher to code the following key words from the book.

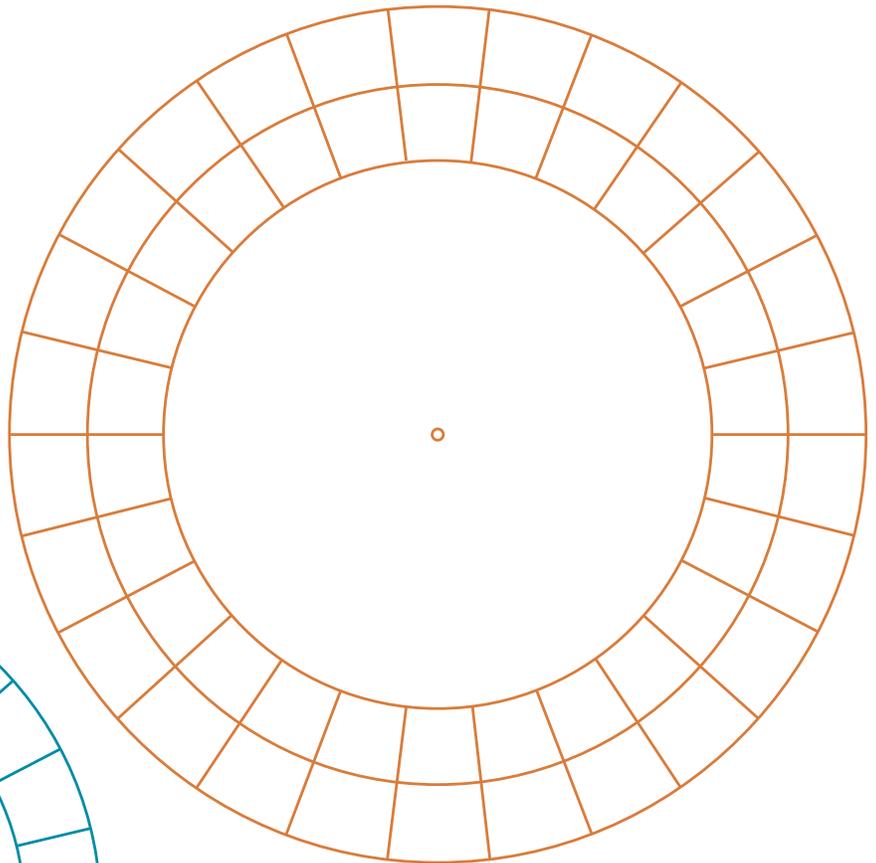
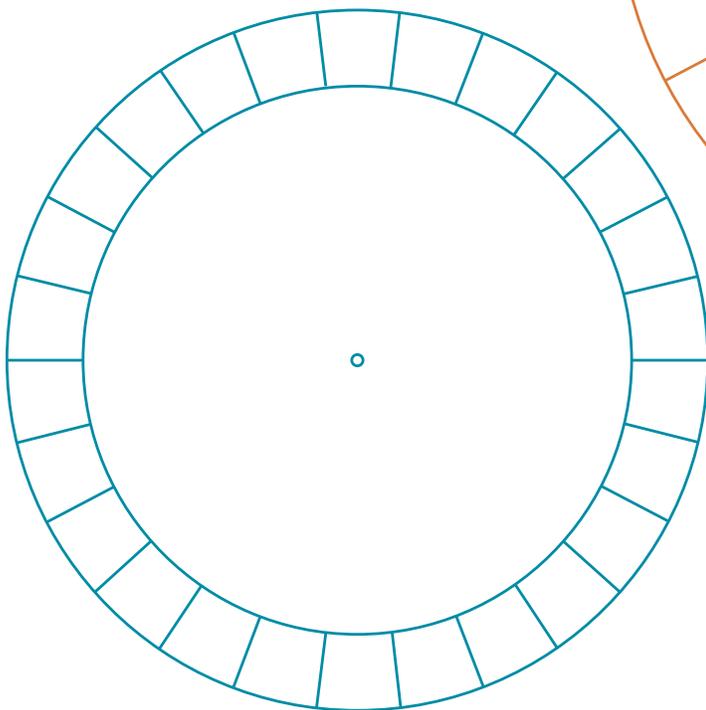
ACTIVITY 1

LODGE

WALKABOUT

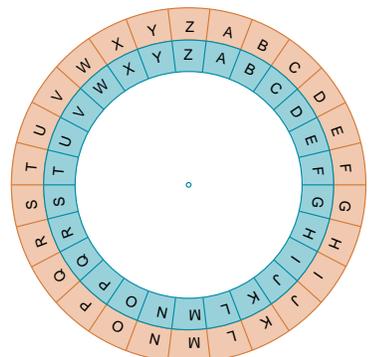
QUANTUM COMPUTING

THE GAME



The Caesar Shift Wheel:

Write the letters of the alphabet, in order, into each block on the two outer circles. Cut the two circles and put a split pin through the middle connecting them so the inner circle can be rotated with the 26 sections matching up.



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CRYPTOGRAPHY GAME



For a bit more challenge, give students the opportunity to work together to decode a memorable phrase from the book, giving them only key letters to help them crack the code!

Explain to students what a cipher is and how they work (see above). As in the example above, create your own cipher. Then use that cipher to code the phrase:

EVERY CAMERA IS AN EYE.

Divide students into small groups to work together as teams. Give students the coded phrase. Groups can race to see which group can break the code first. To help them get started, give them the ciphers for a few key letters from the phrase, such as E, R, and A.

Here is an example of a cipher you could use if you do not have time to make your own.

Plaintext letter	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Ciphertext letter	Q	W	E	R	T	Y	U	I	O	P	A	S	D	F	G	H	J	K	L	Z	X	C	V	B	N	M

Using this code, "Every camera is an eye" is "Tctkn eqstkq ol qf tnt" and key letter ciphers are T = E, K = R, and Q = A.



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