A HUNDRED BILLION TRILLION STARS

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Grades Preschool-3

EDUCATORS' GUIDE

About the Book

Try to imagine one hundred billion trillion of anything. Not easy, is it? Conceptualizing enormous numbers, or even a relatively tiny number like one hundred, can be a daunting task for young children. *A Hundred Billion Trillion Stars* brilliantly presents examples of humongous numbers in ways that young readers can wrap their brains around, such as why the earth is green (it's covered in three trillion trees). By comparing things that children can relate to, such as people to ants, the book will help students begin to see the relationships between huge numbers, grasp the meaning of numbers that are impossible to count, and be surprised and fascinated in the process.

Before Reading

Ask students to think of things that come in big numbers. Create a list of responses. Next, ask students to name the biggest number they can imagine. Write the numbers (in word form) next to the list. Ask students if they think that any of their big numbers "match" the listed items. Explain that the story they are about to hear contains special information about some *very* big numbers. Write the number one hundred billion trillion (in number form) on the board, and ask students to guess what it is. Count the zeroes. Share the book's cover and reveal that the number on the board is the same as the number on the book's cover.

Classroom Activities

The Biggest (and Smallest) of the Big. Using the list that students created in the Before Reading section as a starting point, pair students and have them continue to brainstorm things that come in large numbers. When they have finished constructing a list of at least ten items, challenge students to put the items in order from smallest to biggest, or biggest to smallest. Leave time for pairs to share their ideas.

Ants, Lights, and People. From the list students created in the previous activity, have students make an illustration of one of the items. For inspiration, have students look back to some of the images in the book that depict large numbers, such as the lights of "2,500,000 cities, towns, and villages filled with people," or the thriving ant colony below a neighborhood playground.

Ginormous Numbers. A hundred billion trillion is a very big number. Have the class generate a list of synonyms for the word big. Extend this activity by having students think of words that designate an amount, such as many, a lot, tons, millions, billions, trillions, etc. Lead students to make the connection between numbers and amount.

Building 100. Practice basic place value concepts by assembling objects in groups of tens to make one hundred. Students can use manipulative blocks, coins, beads, or any other small object that can be easily grouped into tens. To add a creative touch to this activity, after students have grouped their objects into tens have them glue the objects onto gridded paper to make an array. Small items such as popcorn kernels, Cheerios, and pasta noodles are excellent materials to use in this project.

My School in Numbers. Take a counting tour of the school and have students record important numbers: windows, classrooms, books in the library (estimate, or ask the school librarian for an approximate number), chairs in the lunchroom, etc. When possible, let students work in pairs or small groups to count together. Back in the classroom, write on the board or screen to compile the data that the class accumulated. Have students record their results and share them with the school via a morning announcement or school website.

420,000,000 Yous. One of the most personal and surprising facts in the book is this: 240,000 miles is about ten times around the earth, or almost 420,000,000 yous. The illustration depicts many young children (and "smallish" dogs and snakes) and baseball bats lined up and wrapping around the planet. To visualize common measurements such as a foot, a yard, or a meter, give students a variety of small objects (crayons, paper clips, coins) and have them line up the objects along the unit of measure. To conclude, have students write simple equations, such as: 20 crayons=1 foot.

Stargazing. For centuries, people have been able to identify certain stars and constellations in the night sky, such as the Big Dipper, Orion, and Cassiopeia, as well as those that represent the twelve astrological signs. Share images of these and other star groups. Give students time to create a star picture based on a favorite animal or object. Create an imaginary night sky mural with the collection of drawings.

Number Discovery. Toward the close of the book, the author shares some "crazy" number facts, such as the 300 teeth in a great white shark's mouth, or the fact that a person eats an average of 70 pounds of bugs in a lifetime! Have students brainstorm a series of number questions, asking questions such as, how many grains of sand are on the world's beaches?; or, what is the average number of bees in a hive? Alone or with a media specialist, have students do an online search to discover the answers. To conclude, have students write and illustrate their number fact.

Earthly Numbers. One of the most amazing number facts in the book students will learn is that the earth is blue and green because of its three hundred seventy billion billion gallons of water and three trillion trees! Create a class book called *Earthly Numbers*. Assign students areas of the planet to research, such as deserts, forests, and oceans. Guide students in brainstorming ideas to research. Examples might include the number of bird species in the Amazon rain forest, or the average number of feet in a California redwood tree. Compile facts and illustrations in the class book.

Mile Marker. In collaboration with the physical education teacher, give students an opportunity to walk a mile! Decide upon a space in the school, such as the gymnasium or track. Figure out in advance how to walk out the distance of a mile in your chosen space. (For example, ten times around the perimeter of the gym makes a mile). Share this information with students before beginning the activity. Pair students and have them walk the distance, counting their footsteps as they move. With older students, use the data to begin conversations about multiplication. Gather at the activity's conclusion and have students compare their data, noting and explaining differences in results.

The activities in this guide can be correlated to the following Common Core State Standards:
CCSS.Math.Content.K.CC.A.1,B.4
CCSS.Math.Content.1.NBT.B.2.; B.2.A, MD.A.1
CCSS.ELA-Literacy.RI.K.3, 10; RI.1.3, 7; RI.2.10


Photo By Chelin Miller

About the Author

SETH FISHMAN can hold his breath for 163 seconds and likes to blink about 15,000 times a day. He has also written 2 books for teenagers. He lives with his family in Los Angeles, California.

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About the Illustrator

ISABEL GREENBERG goes through 57 paintbrushes in a year and draws for 6 hours a day with 4 to 5 cups of tea to keep her going. She has written 2 graphic novels and illustrated 5 books for children. She lives in London.

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A HUNDRED BILLION TRILLION STARS

BY SETH FISHMAN
ILLUSTRATED BY
ISABEL GREENBERG

ABOUT THE BOOK

The whole world is filled with big, enormous, gigantic, humongous, incredible numbers. Look all around you. You can see them in the sky, and in the grass, and in the forest, and in the ocean, and in the city. They are even in the pages of this book, just waiting for you—and your one and only imagination.

STORYTIME ACTIVITIES

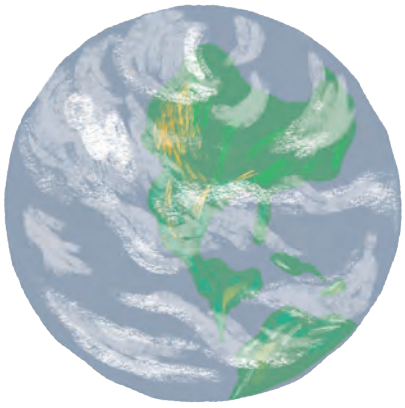
- **FABULOUS FACTS:** This book is filled with fascinating facts about very large numbers! Have children choose one fact from the book. Ask them to record and illustrate their fact on a page. Then collate the pages into a book.

- **HOW MANY?:** The author explains that the numbers in this book are not exact because they are constantly changing, but research and science have enabled him to estimate them. Choose a small object (e.g., dice, shells, rocks, marbles) and fill a jar containing a hundred or less of the object. Have the children write down an estimate of the number of objects in the jar. Collect all estimates. Then open the jar and count the objects together. You can model counting strategies such as counting by twos or putting the objects into groups of ten. After you have determined the number of objects, display a hundred chart and circle that number. Then share the estimates and circle them on the chart. Discuss how accurate their estimates are, using the hundred chart to count by tens and ones.

- **ONE IN A MILLION:** Reproduce or display the image from the Author's Note which depicts the numbers sextillion, quintillion, quadrillion, trillion, billion, million, thousand, and hundred. Discuss the pattern of these names, how "mil" means thousand, "bi" means two, "tri" means three, "quad" refers to four, and so on. Then display some of the numbers from this book and practice reading them aloud.

- **GOOGLE IT!:** Write "Google" and "googol" on a chart. Ask the children if they know the difference between these two words. Explain that "Google" is a search engine on the Internet, but "googol" is a very large number made up of 1 and a hundred zeroes. Give the children paper and ask them to try writing the number googol!

- **GIVE ME SOME SPACE:** Provide resources (books, websites, videos) about our solar system. Then as a group or individually, children should conduct research about an aspect of space. Examples are making a model of our galaxy, creating a star chart of constellations, or researching one of the planets. Young children can draw or color a picture of the earth, depicting the land as green and the oceans blue. Culminate this activity with a "Space Show," during which children share their work with the rest of the group.



HOW MANY IS THAT?

There are a hundred billion trillion stars, but do you know how many zeros makes a billion? What about a trillion? Match the number to its word!

A) 1,000,000

B) 100

C) 1,000,000,000,000

D) 1,000,000,000

E) 1,000

F) 1,000,000,000,000,000

1) One thousand

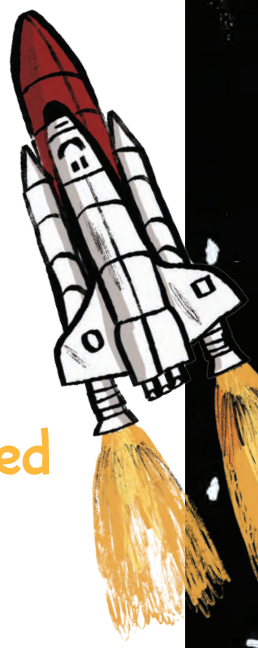
2) One trillion

3) One billion

4) One hundred

5) One quadrillion

6) One million



Answers: A)6, B)4, C)2, D)3, E)1, F)5

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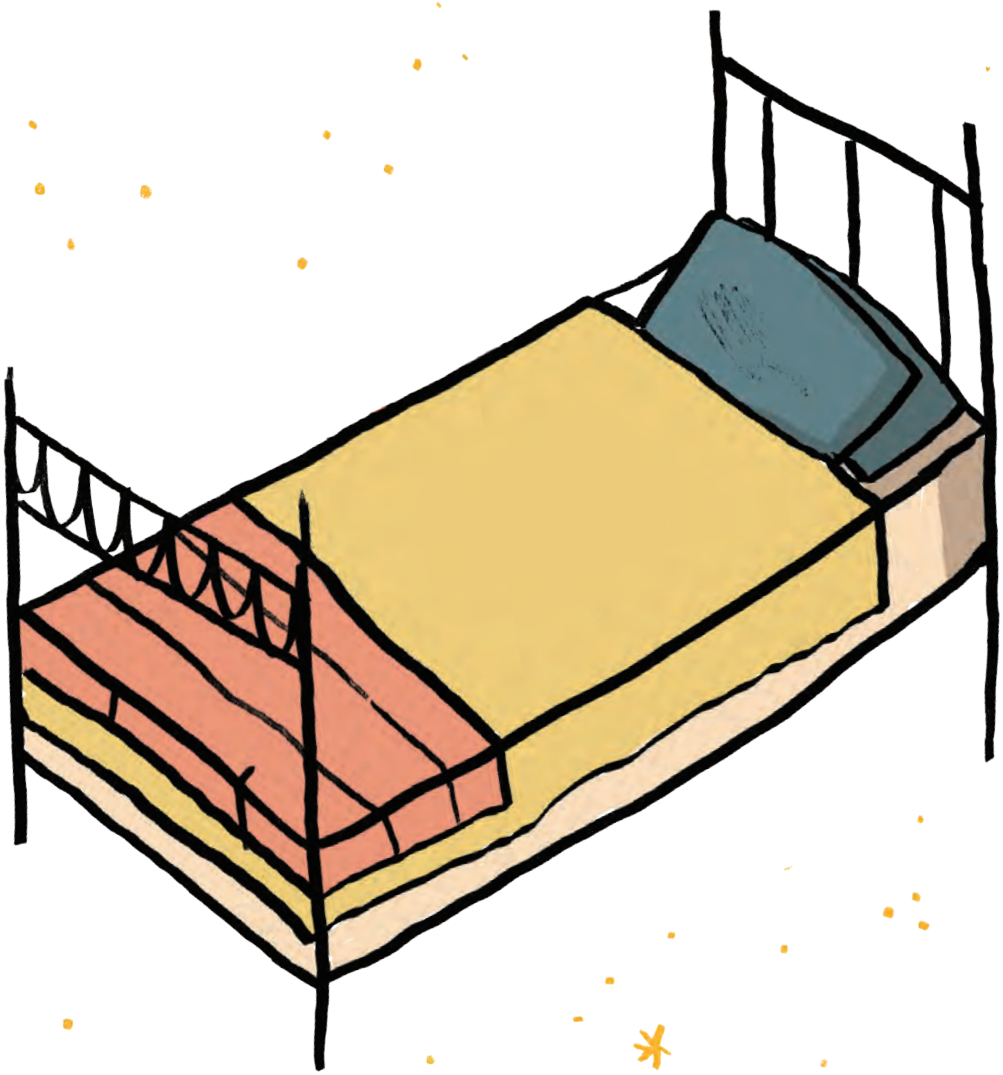
ONLY ONE YOU!

Even though there are 100,000,000,000,000,000,000,000 stars, the author points out that there is only one you! Draw yourself on the outline of this bed, and decorate to match your individual style.



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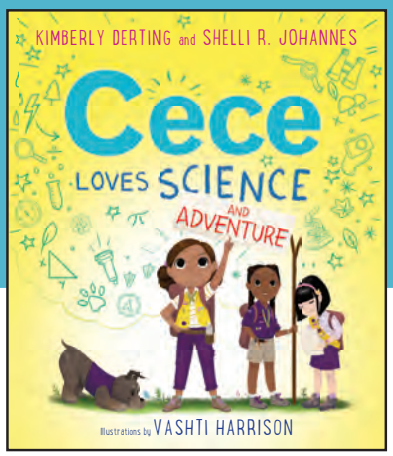


Matching Game

Draw a line from each word in the left column to its matching picture in the right column.

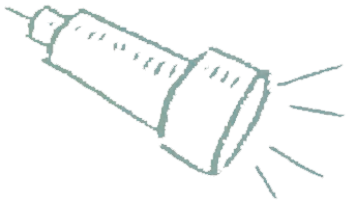
A. Compass

B. Magnifying glass

C. Leaf

D. Flashlight

1.



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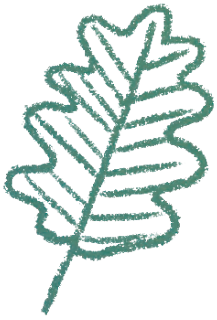
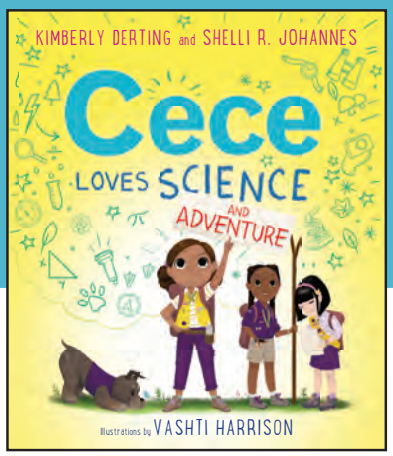


3.

4.

ANSWER KEY: A3, B4, C2, D1



Make Your Own Badge

Cece and her friends go camping in order to earn their camping badge. If you were an Adventure Girl/Boy, what badge would you want to earn? Draw your design in the space below.

_____ Badge