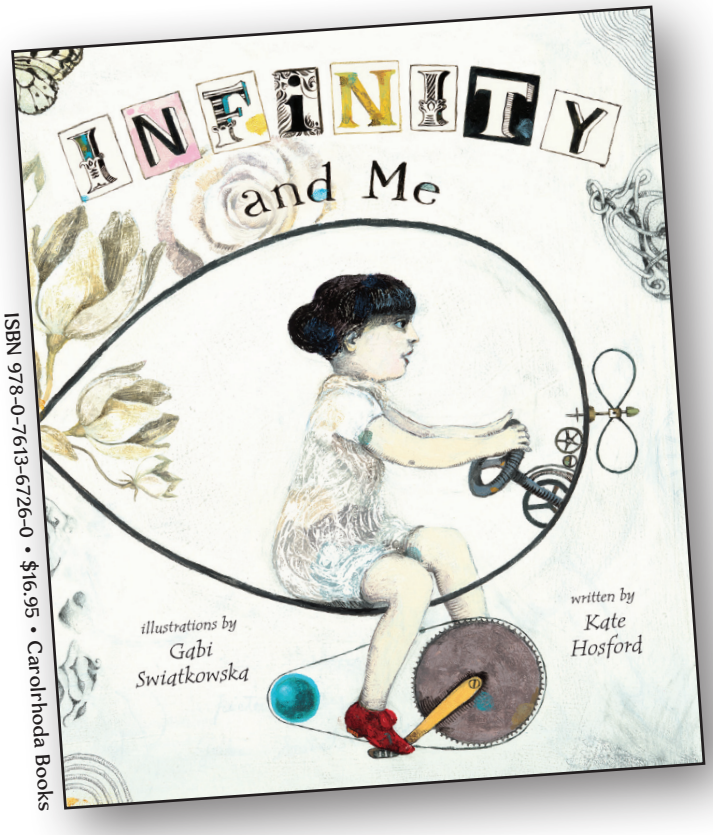
Curriculum Guide



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INFINITY and Me

By
Kate Hosford
Illustrated by
Gabi Swiatkowska

UMA CAN'T HELP FEELING SMALL when she peers up at the night sky. She begins to wonder about infinity. Is infinity a number that grows forever? Is it an endless racetrack? Could infinity be in an ice cream cone? Uma soon finds that the ways to think about this big idea may just be . . . infinite.

One little girl's contemplation of a very big concept makes for a marvelous, kid-friendly introduction to mathematical infinity. In the end, Uma discovers the perfect definition for this vast notion—her love for Grandma is as big as infinity.

★ "Uma's struggle with the concept of infinity offers readers a playful, gorgeous introduction to the mathematical concept."
—KIRKUS REVIEWS, starred review

"Hosford effectively reflects the ways in which young children might grapple with, and come to some understanding of, such an impenetrable notion."
—THE NEW YORK TIMES BOOK REVIEW

A JUNIOR LIBRARY GUILD SELECTION

BEFORE READING

Some things are easy to count, like cans of soup on a pantry shelf. Others are more difficult to count because the quantities are so large, like grains of sand on a beach. But some things are impossible to count. Can we measure how much someone loves us or can we count the number of points on a line? Create a chart and brainstorm things that are easy to count, hard to count, and impossible to count.

DISCUSSION QUESTIONS

- At the beginning of the story, the idea of infinity makes Uma feel very small. What words could you use to describe how she feels? Why does she feel this way?
- Uma asks many people what they imagine when they think of infinity. Why does she get the opinions of so many different people?
- Uma notices that it is hard to talk about infinity without using the word "forever." Why is that true?
- What would you like to do forever? Eat ice cream sundaes for dinner? Ride your favorite roller coaster? What would these activities be like if you really had an infinite amount of time to do them? Would your choice be as special when it is no longer defined by something else? For example, would an infinite amount of recess be as special if there wasn't any school? Discuss with classmates the pros and cons of doing something that you love FOREVER.
- Do you believe that a feeling, like love, can last forever? How about an idea? Can it last forever?
- Do you think that infinity is a number or an idea? Support your statement with examples from the book.
- At the end of the story, Uma says that her love for Grandma is as big as infinity. What does she mean by that?

Roberto Falck

KATE HOSFORD graduated from Amherst College with a degree in English and Philosophy. In 2011 she received an MFA in Writing for Children and Young Adults from Vermont College of Fine Arts. Before becoming an author, she worked as an elementary school teacher. Kate lives in Brooklyn, New York, with her husband and their two sons. *Infinity and Me* is her third children's book. Her first two, *Big Bouffant* and its sequel, *Big Birthday,* were also published by Carolrhoda Books.

Visit Kate's website, www.khosford.com, for more activities based on *Infinity and Me,* as well as a listing of the **Common Core State Standards** addressed by this curriculum guide.

AFTER READING

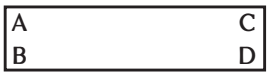
Infinity Symbols


LEMNISCATE


OUROBOROS

No one knows exactly where the infinity symbol, the lemniscate, came from, but some scholars think it was related to an ancient symbol called the Ouroboros, which shows a snake eating its own tail. Why are the Ouroboros and the lemniscate good symbols of infinity? Do they have anything in common? Use the Infinity Symbol worksheet to create your own symbol for infinity.

Mysterious Möbius



Create a Möbius strip. Named for nineteenth century German mathematician and astronomer August Ferdinand Möbius, this fascinating strip has only one side and one edge. Give each student a 1 x 11 inch strip of white paper. With the strip flat on the desk, label the corners A B on one end and C D on the other end. Holding the paper on both ends, give the strip a half twist and bring the ends together so that the A is touching the D and the B is touching the C (one set of letters will be upside down when compared with the other). Tape the ends together giving a semi twisted shape. Does this shape have one side, or two? Test your hypothesis by putting a pencil point at the taped end. Draw a line down the center of your strip, keeping the pencil always in contact with the paper until you reach the point where you started. Did you ever cross an edge? What do the Möbius strip and the lemniscate have in common? How are they different?

Infinity Is . . .

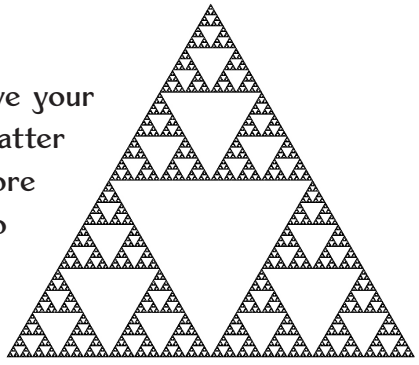
In the book, Uma finds out how lots of other people imagine infinity. Have each student come up with his/her own personal vision of infinity and illustrate it using the Infinity Is . . . worksheet. Author Kate Hosford is collecting infinity visions from students around the country. Before you display your class's visions of infinity or combine them into a class book, scan each one and submit them to Kate Hosford via the contact page on her website, www.khosford.com. Include the student's first name, grade, school name, city, and state with any submissions.

Fun with Fractals

Infinitely Divisible Line Segments

Most of the people that Uma talks to in the book describe ideas that are infinitely large, but Mr. Mancini, the school chef, describes the process of cutting a noodle in half over and over again to make something that would grow infinitely smaller. When the same pattern repeats on a smaller and smaller scale forever, it is called a fractal. Using the Cutting the Line worksheet, try cutting the line segment in half as many times as you can. Would you ever finish?

Sierpinski Triangles



Another great example of a fractal pattern is the Sierpinski triangle. Have your students make their own Sierpinski triangles in order to see that no matter how many triangles they draw, there will always be room to draw more triangles. The Fractal Foundation has a worksheet that makes it easy to construct this pattern. Download it free of charge at fractalfoundation.org/resources/fractivities/sierpinski-triangle.

Visit www.khosford.com for more fun pattern activities, including Koch Curve fractals and tessellations.

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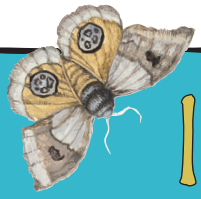

Infinity Symbol

LEMNISCATE

Create your own symbol for infinity. Will it have anything in common with a lemniscate or the Ouroboros?

OUROBOROS

Name: _____

Cutting the Line

Take the line below, divide it in a half with a ruler, and label the midpoint as 1/2. Now take the half on the left, cut it in half, and label the midpoint 1/4 (since it is 1/4 of the whole segment). Take the midpoint of the remaining segment on the left and label it. What fraction of the whole segment would that small segment represent? Continue in this manner for as many times as you can. Do you notice a pattern in the fractions? How many times could this pattern repeat?

Name: _____

Infinity Is . . .

How do you imagine infinity?
Describe it in words and draw a picture.

Infinity is _____

_____

_____

(Continue on the back if you need more room!)

