

Mom, I'll Love You 'Til Infinity...

Discussing the concept of infinity with your family can be eye opening for everyone.

We have a going to bed ritual. How much do I love you? A googol? A googol and one? A googolplex? Double a googolplex! I love you 'til infinity! One evening, my three year old, in his usual stalling tactic mode, asked me one more question: "Mom how many words are there in the English language?"

I answered, "Well, I guess there are about 600,000 and a few more are added each year." Then we talked about other languages. He pondered for a while and then asked, "Isn't there a name for each number?" Now that was a good question – good enough to talk about and, of course, delay going to bed for at least another 10 minutes.

I'd never thought about this. If we have a name for each number, and numbers go on and on, then the number of words (or combinations of words) could be infinite as well. I'd been taught that there are a set/finite number of words in a language. So of course it takes a young child to get me to think outside the box and use my own imagination, which tends to get somewhat lost in the daily chores of adulthood. After this awakening (for me) we had many interesting discussions that emerged from the concept of infinity.

What To Teach Your Child About Infinity

Ask your child what is the biggest number he or she can think of? What is that number plus one? Soon they will get the idea that there is always one number bigger. You can always identify a higher number.

Children need to understand that infinity is NOT a number; it cannot be defined. If there was such a number then we could easily add one more to it, or double it and then it would not be infinity.

The idea you want them to understand is the concept of going on and on without a limit, the endless, the limitless, no boundaries... forever.

Use Your Imagination

Even though you can never define infinity, you can imagine it! And you can have fun together trying to imagine infinity. You and your child can imagine adding one more grain of sand to a beach. Imagine a very fun day – could you think of one more fun thing to do? And then another, and another... Would you want this day to go on forever?

Talk about large numbers you know. Can you count the number of grains of salt in a teaspoon, a bucket, the world? Discuss the number of odd or even numbers, negative numbers, patterns of numbers, points on a line, tangents of a circle.

Bring up the concept of time. How long does it take to write out a googol? Can you write out a googolplex? (No!) How long would it take to write out an infinite set of numbers? How many seconds in a day, a year, a millennium? How long has the Earth been around? Our sun? The universe?

If you keep getting larger, you can also keep getting smaller. How small is an atom? How big is the universe? How many stars in the universe? How many molecules, atoms, quarks are in the universe? Is there a googol of matter in the universe? Does anyone know for sure? What do scientists know?

Cycles that seem to go on forever are another fun discussion – the water cycle, the cycle of life on our planet, the life of the sun, the re-birth and life cycle of a star.

Look at the symbol for infinity. What does it mean to you? Could anyone skate around in a figure 8 forever? What about a racecar driving down an infinity shaped track? What does "etc" or "..." mean?

Imagine a building with infinite floors. How high up would it go? Past the moon? Beyond our solar system? How long would it take to get down the elevator? What if they added one more floor? Who is going to wash all those windows?

Hold up two mirrors facing each other. How many reflections are there? If the mirrors are large enough you can demonstrate an infinite number of reflections of your child – infinite tongues, infinite waving hands, infinite smiles. How many cookies would mom need to buy for all those kids?

My son has his favourite imaginary mountain: Mount Biggest, which is bigger than Mt. Everest. It goes all the way up past the moon, past Pluto. There are all sorts of things to talk about: How long it would take to climb? Is there air? How cold is it? How fast is it moving at the top if the Earth is spinning? What happens if it crashes into something?

Googols of Fun for All Ages

Infinity is just such a fun concept for children. Young children love the names of large numbers like a googol and googolplex. They have fun making up their own large numbers. Learning about infinity can lead to big discoveries for children of all ages. It opens their minds to the concept of time, life cycles, molecular particles, large numbers and the magnitude of the universe. There are so many questions that can get everyone THINKING. You cannot ever reach infinity but you CAN have **googols of fun** trying.

Susan Jarema is the founder of **Googol Learning** and the **Crazy 4 Math Contest**. The **Learning with Googol Power Website** combines math, music and reading to promote family learning. There are many FREE resources such as music downloads, online videos, printable games, worksheets, lessons and e-books to inspire mathematics in your home. Visit www.googolpower.com for more information on the award winning **Googol Power Math Series**.