mystery science

Grades K-5
Mini-Lesson: “What’s the biggest number?”

VIDEO TRANSCRIPT

VIDEO 1

Hi, it's Doug! What's the most number of birthday candles you've ever seen on someone's birthday cake? Whoa, that's a lot of candles there! Now this guy, this is my grandpa. His name is Lou. In just two years, he's going to turn 100 years old. It's amazing! This year, instead of having to blow out 98 candles, he decided to have two candles to remind him of how many birthdays he's got until he hits the big 100. Someone named Aven has a question about numbers. Let's give Aven a call now.

[Video Call]

- Hi, Doug!

- Hi, Aven!

- I have a question for you. What's the biggest number?

- That's a great question.

When I was in kindergarten, I remember each morning my teacher, Mrs. Schlavene, would write a number on a piece of paper that she'd cut out like a teddy bear. Then she'd tape it up on the wall. And so for each day of school, we'd count a new number. One on the first day of school, two on the second day of school, and so on. By the middle of the school year, those numbers were getting pretty high—97, 98, 99, and that's when we hit the 100th day of school. Wow, 100! I remember thinking what a huge number that is. I never counted 100 of anything before. That

was my first time. Now maybe that's because when we're really young, it doesn't seem like there are a lot of things in your life that are 100 of anything. You're definitely still a long way from being 100 years old. And oh my gosh, can you imagine if you found $100? Woo, that'd be amazing to find! But you know what, there *are* 100 of some things around you. Even if you found $1 and you took it to the bank, that's worth 100 pennies. So you could walk out of the bank with 100 pennies. But as you might know, there are numbers even bigger than 100, like the number 1,000, which looks like this. That's the number you get if you count to 100, 10 times. There are things in your life that are definitely 1,000. Like if you go to a really big movie theater, there might be 1,000 seats in the theater. Or if you're more than three years old, congratulations, give yourself a pat on the back because you've been alive for more than 1,000 days. Or it's thought that most people speak about 1,000 words for every hour that they're awake and talking. So you've probably said 1,000 words already today. Okay, but there are still way bigger numbers than 1,000. Now before I say anything more, I'm curious, what's the biggest number you've heard of? Go ahead right now and tell someone near you.

VIDEO 2

Well, you might have said a few different things. Maybe you said a million, a billion, a trillion. Or here's another one you might have heard someone talk about before, infinity. Ooh, infinity! Is Infinity the biggest number? Well no, it's not. Now don't get me wrong. Infinity is a word, but there's something about this word, infinity, that causes some confusion. You see, it's not a number. It's easier to understand if, instead of using the word infinity, we use the word that it comes from, the word infinite. Infinite means something with no end, something that has no stopping point. Now there aren't a lot of things in our lives that have no end, no stopping point. But counting, or numbers, is one of those things. There's no end to how many numbers there

are. You can always keep counting. Think about it like this, if someone tries to challenge you by saying they can think of the biggest number ever, you can just challenge them right back by adding one. A million, a million, and one. A billion, a billion, and one. Each time you add one more, that's a bigger number. So infinity isn't the biggest number because there really is no such thing as the biggest number since you can always keep counting. You can always add one more number. That said, just because we can keep counting forever, doesn't mean we have names for every number. We tend to only have names for numbers that we actually use. Million, billion, and trillion are all huge numbers. There aren't a lot of things you bump into that are these numbers. When we're talking about a million, you're at a number that's like the number of pizzas eaten every hour in the United States. That's a lot of pizzas! A billion, that's even bigger. Now that's more like how many pizzas are eaten every year. If you want to get a sense of just how big a billion is, check out the episode we did, called "How many people are in the world?" Even so, these aren't the biggest numbers we have a name for. The winner of ‘biggest number’ we have a name for, some would say, are you ready for this, it's the number googol. You heard me right, googol. Not the internet company, though they are named after the number, just spelled differently. There's really a number called googol. If it sounds like a little kid made up that name, that's because they did! About 100 years ago, a mathematician, someone who studies math and numbers, decided that he would like to give a name to the number one with 100 zeros after it. He asked his nine-year-old nephew for advice. He said, "What do you think we should call it?" The nephew said, "I don't know, how about googol." And amazingly, that name has stuck. It's not a number that comes up very often, but it is officially considered the name of the number one with 100 zeros after it. So in summary, there is no biggest number because numbers just keep going on forever. You could always keep counting. But we do have names for some really

big numbers. Not just million, billion, and trillion, but even numbers as big as googol. That's all for this week's question. Thanks, Aven, for asking it!