mystery science

Grades K-5
Mini-Lesson: “Why do we have leap years?”

VIDEO TRANSCRIPT

VIDEO 1

[Video Call]

- Hi, Doug!

- Hi, Sire!

- I have a question for you. Why do we have leap years?

- Ooh, that's a great question.

The month of February always has twenty eight days. Except every four years. We add one more day on the end, a February 29th, In other words, we add an extra day to our whole year. When this happens, this is what we call a leap year. Why do we do this? What's worse? Think about how weird it is if it's a leap year and you were born on February 29th. Would that mean you don't get to have your first birthday until you're four years old? And that when all of your friends are eight years old, You're technically only two years old? These adults were all born on February 29th. Listen to them describe their age.

[Video Clip]

- I'm Cherie and I'm 11.

- I'm Genevieve and I'm 12.

- And I'm Brianna and I'm going to be 7.

Why do we do this? Why do we add an extra day to our calendar once every four years? What ideas do you have?

VIDEO 2

So why do we add a day to our calendar every four years? Well, first, you have to know something about our calendar. This calendar that we use today was something that was invented by people a long time ago. You might even know that our one year calendar contains three hundred and sixty five days. That's not just some random number that these ancient calendar inventors made up. They chose that number on purpose because it's the number of days it takes for the earth to go around the sun. Or another way of looking at that, three hundred and sixty five days is the number of days it takes for the earth to go through all four seasons. Winter, spring, summer, fall. These inventors of the calendar wanted the calendar to match what the earth is actually doing. And three sixty five is the number of days in a year. But wait a second. Because these same ancient inventors of the three hundred and sixty five day calendar that we use today, they're also the people who created the idea of a leap year. The idea of adding an entire day to our calendar once every four years. Why would they do that? That almost seems like a bad idea when you stop and think about it. I mean, if you want your calendar to match up nicely with the seasons, don't add an extra day It's not like the Earth has an extra day in its orbit around the sun every four years. So why do we do this then? Well, the easiest way to answer this might be for us to imagine that you and your friends could travel back in time. And stop the ancient inventors of the calendar from ever starting the idea of leap years to begin with. Let's imagine you did that. You and your friends go back in time, found the people who invented our calendar and convinced them not to add February 29th. You say, we're smart. We're from the future. Trust us. Let's just keep the calendar simple. Keep it at three hundred and

sixty five days. Each year always. Then you get in your time machine and you come back to the present. But guess what? As soon as you come back, you'd soon find out that you and your friends really messed something up with our calendar. Because now, winter is happening in the middle of August. Summer is happening in the middle of December. What? Now, whatever season your birthday was in, it's the opposite season. Oh, no. What have you done? At this point, you and your friends decide to go find an expert who studies how the earth moves around the sun. An astronomer. You ask them, what did we screw up? They tell you? Well, actually, we found out a long time ago. That the earth doesn't go around the sun in three hundred and sixty five days. Wait. What? It doesn't? Well, it's just not exactly three hundred and sixty five days. Three hundred and sixty five is just a close number. You see, when ancient astronomers studied the sky very carefully, they were able to figure out that one year isn't quite three sixty five days. It's not three sixty six days, either. It's somewhere in between that. In fact, it's about three hundred and sixty five days plus six hours. A year isn't perfectly three hundred and sixty five days. There's an extra six hours? What do you do with that on a calendar? This is a tricky problem. If you completely ignore the extra six hours, you don't even worry about putting them on your calendar. Well, that's no good because even though it is just a little bit of time, As each year goes by, those extra six hours keep adding up. Eventually, after a few hundred years, The months on your calendar won't be connected to the right seasons anymore. That's what happened in that time machine scenario. One of your friends has an idea. What if, every year, we add a day to the calendar, but it's a day that's only six hours long. That is one way to solve this problem. Now, the calendar will match how long the earth actually takes to go around the sun each year. It's a little bit of a weird way to solve it though. Think about it. A day that's only six hours long, you'd be sleeping then wake up, eat your breakfast, then get your teeth brushed, and it'd be like, oh, six hours is almost over. It's almost March first now. Time for bed, again, I

guess. Most people probably don't want a weird six hour day on their calendar. Another friend has a different idea for how to solve this. What if, instead of adding a six hour day to the calendar, And instead of ignoring the six hours altogether, we just ignore the six hours for a few years. We save them up. Then, once every few years, we can just add an entire day and it will all even out. Now, that's a pretty great idea. And you know how many years you should wait before you add an entire day? Well, if you wait every four years, that adds up to one entire day. That's what a leap year is. And that is why the ancient people who invented this calendar decided a long, long time ago. To make sure we add an extra day once every four years so that the calendar we're using always stays lined up with how long it takes for the earth to go around the sun. That's all for this week's question. Thanks, Sire, for asking it.