



Extinction Events

The world today is experiencing what scientists call the sixth mass extinction, meaning that five other major extinction events have already occurred throughout Earth's history. Explore the causes and consequences of these events and how they have reshaped life on our planet.



<p>0:00</p> <p><i>Colorful animated planets zoom past the screen set against a purple nebula background settling on the Earth. Images appear next to the Earth. A red image of a volcano appears.</i></p>	<p>Within our vast, ever-expanding universe, there's only one place we know of that has life. A single 12-mile-thick layer of Earth known as the biosphere. It's here, from deep in Earth's ocean into the atmosphere, that most life exists. And it's supported by a crucial mixture of ingredients: oxygen, relatively comfortable temperatures, and access to water and food. But even here, life isn't guaranteed. Conditions in the biosphere aren't always stable. And when they become unbalanced, it can create huge obstacles for life. In fact, while Earth has a long, long history of supporting life, it also has a history of destroying it.</p>
<p>0:52</p> <p><i>Animation shows cells under a microscope with a green background. White text appears on either side of the circle.</i></p>	<p>The earliest life on Earth emerged about 4 billion years ago before Earth's atmosphere even had oxygen in it. Instead, these anaerobic organisms lived on minerals in the ocean. Then, between 2 and 3 billion years ago, tiny bacteria released so much oxygen that it actually poisoned and killed off most life in what's sometimes called the Oxygen Holocaust.</p>
<p>1:18</p> <p><i>A colorful timeline of mass extinction events with the organisms affected. A volcano and the earth appear out of the timeline. The screen zooms in on the extinction events.</i></p>	<p>Since then, more complex forms of life have gone through at least five more periods of widespread and sudden death known as mass extinction events. During these events, more than 70% of all species die out quickly because of major changes in the biosphere, like volcanic eruptions or extreme temperature changes caused by shifting tectonic plates. The first of these mass extinction events happened about 455 million years ago when around 85% of species were killed. Then about 250 million years ago, up to 96% of marine animals and around three out of four land species were killed in a crisis so bad we now call it the Great Dying. What's maybe the most famous extinction happened about 65 million years ago when the dinosaurs, who had been ruling the planet for 165 million years, vanished almost overnight.</p>
<p>2:18</p> <p><i>Animated map of North and Central America. Colorful animated images appear.</i></p>	<p>We're still learning about what happened, but the most popular theory blames an enormous asteroid that hit the Yucatan Peninsula in what's now Mexico. The impact seemingly triggered wildfires, earthquakes, and tsunamis and kicked up a cloud of dust so big it blocked the sun. That meant plants couldn't grow, and the triceratops and T-Rex couldn't find food.</p>
<p>2:43</p> <p><i>A rotating grid shows animals, a plant, and a glowing shape with a question mark at the center. The screen scrolls right as a lizard morphs into a dinosaur, then into an early mammal, followed by more complex mammals.</i></p>	<p>Yet, despite all that death, Earth's biosphere is still full of all kinds of life bacteria, plants, reptiles, fish, mammals, and more. And that's because while extinctions are devastating and destructive, they can also create conditions that allow new life to emerge. That's been true since the very beginning. The Oxygen Holocaust wiped out most anaerobic life. But all that new oxygen in the atmosphere allowed new, more complex life to thrive. And the Great Dying paved the way for early tiny lizards to evolve into the much larger, much more powerful dinosaurs. They thrived because they could live in various environments, and they quickly rose to the top of the food chain. When the dinos eventually went extinct, yet another group of animals thrived. Early mammals were small and kept themselves hidden away from the giant reptiles who could stomp on them. After those reptiles disappeared, mammals evolved rapidly. They took up the space the dinosaurs left, gaining dominance and evolving into everything from elephants and whales to apes and humans.</p>

**3:53**

The colorful timeline of mass extinction events reappears and shifts right to reveal a bright orange sunburst labeled “Human Mass Extinction Event,” with question marks instead of organisms.

But the success of humans may be responsible for another sixth mass extinction event. See, around 200,000 years ago, humans were evolving alongside megafauna or large animals in Africa.

4:07

An animated map of Europe, North Africa, and the Middle East settling on Europe. Red mammoths appear dotting the map.

Once people began to migrate out of Africa sometime between 60,000 and 90,000 years ago, they did what they had to do to survive, and they adapted fast. That meant killing megafauna from giant kangaroos to woolly mammoths on almost every continent, which many researchers say led to extinctions everywhere they went.

4:29

A shadowy figure in black and purple appears, followed by animated green hills. Machines arrive, turning the hills brown and shrinking them. Factories rise and the sky turns grey. The figure reappears holding a dinosaur in one hand and an asteroid in the other, then glows brightly as Earth floats above their hands.

And this human-caused extinction is still happening in a lot of different ways. As millennia passed, humans cleared land for farming, leading to deforestation that took away crucial ecosystems for many species. And ever since industrialization began in the 1700s, we've relied on fossil fuels to power almost everything in our lives, leading to more pollution, habitat destruction, and climate change. Scientists estimate that the current extinction rate is 100 times higher than the natural extinction rate. We've become like both the dinosaurs, the dominant group at the top of the food chain, and the asteroid that may have led to their extinction. But unlike the dinosaurs or that life-ending asteroid, we have another advantage. Learning about the extinction events that have shaped Earth's history means we have the knowledge and opportunities we need to be able to protect life in the biosphere instead of continuing to destroy it.