

Lesson 23: End of the Dinosaurs

Sixty-six million years ago, a rock from space ended an era. It was roughly 10 kilometers across, about the size of a city, and it struck Earth at tens of kilometers per second near what is now Mexico's Yucatan Peninsula. The energy released was billions of times greater than any nuclear weapon ever built. The ground shook across the entire planet. Enormous fires erupted across the continents. A cloud of vaporized rock, dust, and debris was blasted into the upper atmosphere and spread around the world within days.

What followed was a period called **nuclear winter**, months or years of darkness and cold, as the debris cloud blocked sunlight across the globe. Plants could not photosynthesize. Food chains built on plant life fell apart. Animals that depended on those food chains starved. The oceans were affected too. About 75 percent of all species on Earth went extinct, including every **non-avian dinosaur**: every T. rex, every Triceratops, every sauropod. This catastrophe is called the **K-Pg Extinction**, named for the boundary between the Cretaceous and the Paleogene periods in the rock record.

How do scientists know an **asteroid** caused this? The evidence is multiple and mutually confirming. A worldwide layer of rock, exactly 66 million years old, contains high concentrations of **iridium**, a metal rare at Earth's surface but common in asteroids. The same layer contains minerals that could only form under the pressure of a massive impact. And buried beneath the Gulf of Mexico is the **impact crater** itself, the Chicxulub Crater, over 150 kilometers across, the scar left in Earth's crust by the end of the dinosaurs.

But not everything died. Small mammals, hiding in burrows and eating seeds and insects, survived. Crocodylians survived in rivers and lakes. And birds, the avian descendants of theropod dinosaurs, survived too, meaning the dinosaurs are not entirely gone. With the giants erased, the survivors found themselves in a world of empty opportunities. And the age that followed would belong to them.