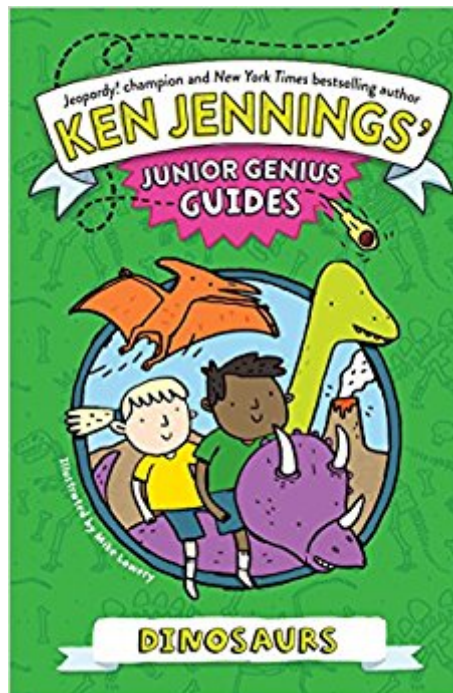




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# Dinosaurs (Ken Jennings's Junior Genius Guides)



## Synopsis

Travel back in time to the dinosaur age with this interactive trivia book from Jeopardy! winner and New York Times bestselling author Ken Jennings. With this book about dinosaurs, you'll become an expert and wow your friends and teachers with some awesome facts: Did you know that dinosaurs skin was more like bump bird skin than modern snake or crocodile scales? Or that the Tyrannosaurus Rex might have croaked like a frog instead of roaring? With great illustrations, cool trivia, and fun quizzes to test your knowledge, this guide will have you on your way to whiz-kid status in no time.

## Book Information

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Age Range: 8 - 10 years

Grade Level: 3 - 5

## Customer Reviews

Ken Jennings grew up in Seoul, South Korea, where he became a daily devotee of the quiz show Jeopardy! In 2004, he successfully auditioned for a spot on the show and went on an unprecedented seventy-four game victory streak worth \$2.52 million. Jennings' book Brainiac, about his Jeopardy! adventures, was a critically acclaimed New York Times bestseller, as were his follow-up books Maphead and Because I Said So! Jennings lives outside Seattle with his wife, Mindy, his son, Dylan, his daughter, Caitlin, and a small, excitable dog named Chance. Mike

Lowery is an illustrator and fine artist whose work has been seen in galleries and publications internationally. Mike is the illustrator of *Moo Hoo and Ribbit Rabbit* by Candace Ryan; *The Gingerbread Man Loose in the School* by Laura Murray; and the *Doctor Proctor's Fart Powder* novels by Jo Nesbø. Currently he is a professor of illustration at the Savannah College of Art and Design in Atlanta, Georgia, where he lives with a lovely German frau, Katrin, and his super genius daughter, Allister. Visit him at [MikeLowery.com](http://MikeLowery.com).

Dinosaurs 3> History means "writing things down," Junior Geniuses. If nobody records something happening, historians will never know about it. Keep that in mind when a grown-up promises to get you ice cream "later" or "some other time." Get the promise in writing, or it didn't happen! Human beings have been keeping written records for only five or six thousand years. Everything that happened before that is prehistoric—before history. We all know how time in recorded history works: We use a calendar. Days, months, years, centuries. Prehistory is different. The dinosaurs didn't know or care if it was Tuesday or Friday or March or October. Prehistoric time uses a geologic time scale, which scientists calculate based on evidence they find in rocks. Comparing geologic time to a modern calendar is like comparing a dinosaur to a flea: It's much, much bigger. Geologic time is measured in: AGES (long spans of time, hundreds of thousands of years) that combine to make up EPOCHS (really long spans of time, millions of years) that combine to make up PERIODS (incredibly long spans of time, tens of millions of years) that combine to make up ERAS (amazingly long spans of time, hundreds of millions of years) that combine to make up EONS (insanely long spans of time, billions of years) 4> The problem with geologic time is that it's hard to wrap your brain around it. Think how long one minute can feel on the last day of school, or when there's not a vacant stall in the restroom and you're desperate. Now try to imagine one billion years' worth of minutes. Good luck! But I have a trick that may help. Let's compress the entire life of the earth down to one twenty-four-hour day. Blink your eyes once. BOOM, more than five thousand years just passed. All of human history, and you missed it. That's how fast time is going on this scale. If the earth has been around for only one day, it was pretty busy. 12:00 A.M.: Earth forms out of dust and gas swirling around the sun. 4:00 A.M.: Life! Microscopic one-cell organisms appear in the oceans. 1:00 P.M.: Not until after lunch do these cells start to have a nucleus and little organs. 6:30 P.M.: Around dinner, tiny multi-cell creatures. 8:30 P.M.: The first plants—simple seaweed. 8:50 P.M.: Right around bedtime, animals finally explode onto the scene. Jellyfish! 9:50 P.M.: Animals and plants evolve

onto land. 10:20 P.M.: Insects! Reptiles! 11:00 P.M.: Dinosaurs rule the earth. 11:40 P.M.: The dinosaurs disappear, and mammals take over. 11:59 P.M.: Human beings evolve and eventually develop farming, the Great Pyramids, democracy, and, finally, the Junior Genius Guides.

That's the time scale we're talking about. Pretty much all of human evolution is the last minute of the day. Sixty seconds. Two TV commercials. So it's not all about us. 4>

For the first billion years, earth was a lifeless rock. But that doesn't mean it was boring. Here are some things you should not do if you ever travel back in time to visit the earth of more than 4 billion years ago. Remember not to . . . Breathe! The atmosphere has no oxygen. Unless you're a fan of poisonous gases such as carbon monoxide, ammonia, and methane, hold your breath. Walk anywhere! Do you like that playground game where you pretend the ground is lava? Well, here the ground is literally lava. Even once the earth's rocky crust forms, giant volcanoes are everywhere. Get wet! Once rain starts to fall and the oceans appear, they are heavy on sulfuric acid instead of oxygen. Go outside! A hail of asteroids and comets is hammering away at the earth, pulled by some mysterious chaos in the orbit of the other planets. On second thought, maybe it's not a nice place to visit at all. COMET RELIEF Of course, we might not be here today if not for those icy comets. When they smashed into the earth, they delivered water that helped make life possible. 4> We don't know exactly how life first appeared on earth, but it was a long, slow process. In the 1950s, a group of scientists combined four simple chemicals (water, methane, ammonia, and hydrogen) and heated and cooled them while zapping them with electricity. Within weeks the mixture had started to form amino acids, the molecules that make up the proteins in living cells. Could the same thing have happened across millions of years as lightning struck the prehistoric ocean? (Sometimes scientists call this liquid the primordial soup, which does not make me hungry for soup.) And could those complex molecules have eventually evolved into early proto-cells? It seems possible. Other scientists think that the first life to arrive on earth may have hitched a ride aboard comets or meteorites. If that's true, we are all space aliens. In any case, life appeared before the earth had its billionth birthday. We've found fossils in Australia that show evidence of one-third-inch-thick mats of microbes more than 3.5 billion years old. 4> Over time these tiny cells got better at being alive, through a simple kind of evolution. They developed different parts that would do different things, such as produce energy, process chemicals, or store food. After another billion years, creatures very much like the bacteria and algae we know today were bobbing in the prehistoric ocean.

THE TIME BEFORE LAND During some of that time, we think that earth turned into a water world, with the oceans covering 98 percent of the surface! There were also eras when earth was a giant snowball. During those times, even the

equator was covered in ice and muddy volcanic ash. But evolution took a long break at that point. For the next billion years the only form of life on earth was some slimy gunk. And I mean “slimy gunk” in the most respectful way possible, because these are our ancestors I’m talking about here! Scientists call this time period the boring billion. But the boring billion ended with a very un-boring bang, about 530 million years ago. This event is called the Cambrian explosion, and it looked exactly like this: Okay, it wasn’t an actual explosion. But during just ten million years—and remember, that’s a very short amount of geologic time—most of the major kinds of ocean life we know today appeared practically at once. These are critters that would look right at home next to modern starfish, sponges, and shrimps. Many had shells. Some had eyes. The first vertebrates—creatures with backbones, like us—evolved then too, in the form of simple, wiggly fishlike creatures. What was the billion-year holdup? For the answer, let’s go to a new Junior Genius feature I like to call Ask a Trilobite. ASK A TRILOBITE It’s a tricky question, but one popular theory is about oxygen. Remember, the earth’s first atmosphere had almost no oxygen. Luckily, there were early bacteria called blue-green algae breathing in carbon dioxide and breathing out oxygen, but it took them millions and millions of years to get enough oxygen into the air and water so that larger species could evolve.

4> The Cambrian explosion began the Paleozoic era, one of the three eras of life we can study through fossils. Each one ended with a massive extinction. (Except ours, luckily! Fingers crossed.) During the Paleozoic, which ended about 250 million years ago, animal life finally made it out of the oceans. The first to try dry land were the arthropods—animals with hard outer skeletons and jointed legs, like today’s crabs, spiders, and insects. Their bony exoskeletons acted like reverse scuba suits, so they could explore land without drying out.

BUG-EYED MONSTERS Some of the scariest creatures ever to live on earth were Paleozoic arthropods. Jaekelopterus was a massive sea scorpion with eighteen-inch-long claws that it used to snatch prey. On land, Arthropleura was a millipede more than eight feet long—the size of a crocodile! Soon some fish began to develop fins that would help them scramble up rivers in search of food, and it turned out those scrambling fins could do something new and cool called walking.

GIVE ME EIGHT! As these fish became amphibious (able to live in water and on dry land), they adapted to their new surroundings. Some had a set of gills, for breathing underwater, and a set of lungs, for breathing air. And eventually the soft, squishy eggs of amphibians evolved into the harder eggs of reptiles, so the animals could lay the eggs on land without the eggs drying out. We know from fossil footprints that some of the early amphibians had seven or eight toes on each fin-foot, but the most successful of them must have had five, because almost all terrestrial\* life today has five

fingers and five toes. You are probably holding this book with five-fingered hands right now, unless you're a cartoon character, like Mickey Mouse. \*Look it up! POP QUIZ! Animals were probably already exploring dry land before plants started to grow there. The first land plants were relatives of what small modern plant, which you might see growing in mats on trees and rocks? 4> "Yes! You are probably saying right now. "It's only page 17 and he's already gotten to the good stuff: That was totally worth the first fourteen boring pages about single-celled algae and trilobites and stuff! Well, I'm afraid we're not quite to the dinosaurs yet, Junior Geniuses. I'm going as fast as I can, but we've got billions of years to deal with here. Did you know that not all prehistoric reptiles were dinosaurs? Did you further know that, at the same time that early reptiles were evolving into dinosaurs, they were also evolving into mammals like us? Let me explain. Reptiles evolved in the swampy Carboniferous period, a geological period that ended 300 million years ago.

That's 100 million years before dinosaurs appeared on the scene. The first reptiles we know of were less than a foot long and looked a lot like modern lizards. One reptilian family, called synapsids, was the ancestors of modern mammals. Being a lifelong mammal yourself, you probably know that most mammals: HAVE FUR OR HAIR • GIVE BIRTH TO LIVE YOUNG ARE WARM-BLOODED • PRODUCE MILK FOR THEIR YOUNG But none of those are things that show up in fossils. Luckily, synapsid fossils do contain other clues telling us how reptiles turned into mammals • such as the changing shape of their jaws, and the addition of tiny inner ear bones to help them hear better. To our modern eyes, lots of these reptiles were lizards shaped like mammals. EXTRA CREDIT A synapsid called Oligokyphus looked so much like a weasel that scientists assumed for decades that it was a mammal. Nope! It was a reptile. 4> About 250 million years ago, a massive extinction ended the Paleozoic era and began a new era, the Mesozoic, the age of reptiles. We don't know what caused the catastrophe, and maybe we never will. But a lot of the synapsids died. Many of the reptiles that thrived after the big extinction were the bigger, stronger ones • like the archosaurs. The archosaurs are the ancestors of modern crocodiles and birds. And in the late Triassic period, some archosaurs evolved into a new kind of lizard • the dinosaur. Hold your horses, kids. Let's learn more about what the earth was like when the first dinosaurs lived. Let's imagine that you're packing a backpack for a trip to the Triassic period. Even with your best supplies, you might be in for a surprise. You'd have to be careful using . . . A WATCH. It would always be wrong, as a day was less than twenty-three hours long in the Mesozoic era. The earth's rotation has slowed down a bit since then. A COMPASS. During much of the age of reptiles, compasses would

have pointed south! The earth's magnetic field has reversed hundreds of times since then, back and forth from north to south. **MATCHES.** Watch out when lighting a fire! From studying air bubbles trapped in amber (a kind of hardened tree resin), scientists guess that the earth's atmosphere back then was 30 percent oxygen, much more oxygen-rich than it is today. **MAPS.** Don't bring a GPS! You wouldn't even recognize the planet earth of 250 million years ago. Here's why: 4> The earth's continents sit on massive shelves called tectonic plates that float on a layer of gooey molten rock. But these plates can move around over time, crashing into or sliding under one another. In the Permian period, 250 million years ago, all the plates were stuck together in one big continent, which we call Pangaea (pan-JEE-uh), meaning "all land." **ASK A TRILOBITE** So there was no Pacific Ocean or Atlantic Ocean back in your day? Just one big superocean? Hi, yes. It was called Panthalassa, meaning "all ocean." By the late Triassic period, Pangaea had broken up into two great landmasses called Laurasia and Gondwanaland. By the Cretaceous period, our modern continents were taking shape. Most of central North America was underwater, part of the shallow Western Interior Seaway. Eventually we got to the world that we see in our atlases today. This map might look the most familiar to you, but it's definitely not the end of the story! Geologists predict that in 250 million years, the continents might once again collide to form a new supercontinent, called Pangaea Ultima. If any traces of New York City still stand in 250 million years, they won't overlook the Atlantic Ocean. They'll be right next to southwest Africa! **EXTRA CREDIT** Because of these changing continents, fossil hunters today find matching species in places as far apart as Portugal and Wyoming. In the Triassic period, the Atlantic Ocean hadn't opened up yet. 4> This dance of the continents meant that reptiles in the age of reptiles lived in a topsy-turvy world. Antarctica was toasty warm. The Sahara, today a barren desert, was once a lush forest. **ASK A TRILOBITE** Wow! So what were the oceans like during dinosaur times? How should I know? I went extinct way before that. But a lot of the earth was a hot, dry desert during the Triassic period. Life mostly flourished along the coasts, where the weather was milder. During the Jurassic period, things got cooler and wetter, but the climate was still warmer than the earth we know today. In fact, there were no polar ice caps at all during the Cretaceous period. Plant life was very different too. On a Triassic nature walk, you'd see some plants you recognized: But the surprise is what you wouldn't see. No grass! No leafy trees or bushes! In fact, no flowering plants at all! They all evolved millions of years later. A lot of modern animals had already evolved. By the end of the Cretaceous period, the earth's forests were full of frogs, snails, ants, worms, and even opossums. There were dragonflies during the Mesozoic

era too, but with one big difference – their wings were longer than a human arm! This is the world that the dinosaurs ruled.

Author Ken Jennings posted this on Twitter today: "Barron Trump saw a very long necktie on a heap of expired deli meat in a dumpster. He thought it was his dad & his little heart is breaking". Making fun of the Presidents son after his seeing a photo even Chelsea Clinton called disgusting, and the author wants your kids to read his books? I think I will pass.

DO NOT BUY HIS BOOKS! This is the lowlife scum that posted this on twitter: "Barron Trump saw a very long necktie on a heap of expired deli meat in a dumpster. He thought it was his dad & his little heart is breaking." A children's book author who mocks children? There are better resources out there for your kids.

My 7 yr old love LOVES this book. Entertaining and factual. Awesome.

Really nice book with lots of great information. My son loved it.

The Smithsonian "Everything you need to know about dinosaurs" was much more informative, awesome photos and better enjoyed by my child. Luckily we only borrowed from a friend, problem is now they don't want it back and we don't want it either.

I bought 3 books and my boys didn't like any of them. So disappointed. They love James Patterson's and Jeff Kinney books, thought they would like this. They did NOT.

I assumed that such a smart person such as Ken Jennings would have written an interesting book. Instead this book is so boring that I wish I was extinct. The author is clearly an adult obsessed with pre-teen boys which makes you wonder what type of person he is. I feel as if I was bullied from reading this awful book

This man did the unconscionable- cyber bullied an 11 year old boy. Taunting the son of the President with sick imagery is beyond the pale. Do NOT reward him by purchasing his books!

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