

# How did a meteor impact affect life on Earth?



## You will read:

- **A Science Article**  
*It Came from Outer Space*
- **A Radio Interview**  
*Why Did Dinosaurs Become Extinct?*
- **A Question-and-Answer Website**  
*How Did Mammals Survive the K-T Extinction?*

## You will write:

- **An Informative Essay**  
*How did a meteor impact affect life on Earth?*

## Source 1: Science Article

### AS YOU READ

You will be writing a cause-and-effect informative essay that explains how a meteor impact affected life on Earth. As you read the sources, underline information that you may cite as textual evidence in your essay.

### Notes

# It Came from Outer Space

by Jane Park

In 1981, two scientists uncovered an element called iridium in the ground in Italy. Iridium is rare on Earth, so they thought it must have come from space, where it is more common. They dated the iridium to 65 million years ago.

Ten years later, scientists found that a crater called Chicxulub (CHEEK-she-loob) in Mexico was formed 65 million years ago. Chicxulub is 110 miles across and almost a mile deep. If iridium reached Earth 65 million years ago, maybe the crater was formed by a huge object from space.

Here's what happened. A meteor measuring more than six miles across and weighing over 1,000,000,000,000 tons hit Earth at a speed of 40,000 miles per hour,





20 20 times as fast as a bullet. An object that huge traveling that fast has an enormous amount of energy. On impact, it released as much energy as 100 trillion tons of TNT! The explosion of hot rock and gas would have looked like a huge fireball.

A lot of that energy turned into heat. It scorched the surface of the earth and started wildfires across the world. Debris scattered all across the western hemisphere. It turned the sky black and blocked out the sun, starting a winter that lasted for years. So much debris in the air caused poisonous acid rain to fall, too. The impact caused earthquakes and  
30 mile-high tsunamis across all of what is now North and South America.

Many scientists believe that it also spelled the end of the dinosaurs.



### Discuss and Decide

How is the presence of iridium on Earth connected to the Chicxulub Crater? Cite text evidence in your discussion.

## Source 2: Radio Interview



# Why Did Dinosaurs Become Extinct?

**Mike DeMarco:** Welcome back to Dino Discussion.

Our guest today is Dr. Tara Nadon, a scientist at the National Dinosaur Center. Thank you for joining us, Dr. Nadon. Dinosaurs roamed the earth for over 150 million years. But then they went extinct. Can you tell us about the extinction and why it happened?

**Dr. Nadon:** Thanks for having me on the show. Scientists call that extinction the Cretaceous-Tertiary event, or K-T event for short. It happened about 65 million years ago. We don't know exactly why it happened, but many scientists think a meteor that hit the Yucatán Peninsula at around the same time played a huge part.

**Mike DeMarco:** What effects would that meteor have had on dinosaurs?

**Dr. Nadon:** It wasn't just the dinosaurs that were affected. Any plants or animals near where the meteor hit would have been killed instantly by the explosion or broiled alive by the incredible heat given off. Then acid rain and wildfires would have killed most of the life that survived the impact. What's more, all the dust kicked into the air blocked out the sun for many years. This killed most plant species because they needed the sun to make food for themselves.



**Mike DeMarco:** But clearly not all life went extinct, or else we wouldn't be here right now. Why the dinosaurs?

**Dr. Nadon:** Well, many dinosaurs were large creatures that needed a lot of food to survive. When all the plants died due to the lack of sunlight, plant-eating dinosaurs starved to death. Then the dinosaurs that ate those plant-eating dinosaurs died, too, because they had nothing left to eat.

**Mike DeMarco:** I see. So the effects went all the way up the food chain.

**Dr. Nadon:** That's right. Also, most dinosaurs had very specific diets, so they couldn't adapt when their food sources disappeared.

**Mike DeMarco:** It's incredible that anything could adapt in such a harsh environment. Thanks for your time today, Dr. Nadon.



### Close Read

Explain how the effects of the meteor impact "went all the way up the food chain." Cite text evidence in your response..

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## Source 3: Question-and-Answer Website

Science & Mathematics > Zoology



Search This Website



User johnnie1337 asked:

How Did Mammals Survive the K-T Extinction?

Best Answer

Asker's Choice



User dinofan65:

After the meteor hit, some small mammals survived by burrowing underground. Others escaped to rivers or the oceans.

A lack of sunlight killed many of the land plants that herbivorous dinosaurs ate. When the herbivores died, the carnivorous dinosaurs had nothing to eat, either. But many small mammals were scavengers, eating all types of plants, insects, and even the remains of dead animals. Underwater plants and insects survived fairly well, so the mammals had a food supply.

Mammals took over roles in the environment that used to be filled by dinosaurs. They had lots of babies, too, so their numbers grew quickly.

Some mammals probably survived just because they were lucky or in the right place at the right time.



Asker's rating & comment



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Thanks!

### Discuss and Decide

What are two reasons mammals survived the K-T Extinction while dinosaurs didn't?

# Respond to Questions

The following questions will help you think about the sources you've read. Use your notes and refer to the sources as you answer the questions. Your answers will help you write the essay.

- 1** Which detail in Source 2 best explains why plant-eating dinosaurs went extinct?
  - a.** "... acid rain and wildfires would have killed most of the life ..."
  - b.** "... all the plants died due to the lack of sunlight ..."
  - c.** "... animals near where the meteor hit would have been killed instantly ..."
  - d.** "... most dinosaurs had very specific diets ..."
  
- 2** Which detail in Source 1 best describes the force with which the meteor hit the Yucatan Peninsula?
  - a.** "... it released as much energy as 100 trillion tons of TNT!"
  - b.** "... a crater called Chicxulub in Mexico was formed 65 million years ago."
  - c.** "So much debris in the air caused poisonous acid rain to fall, too."
  - d.** "A lot of that energy turned into heat."
  
- 3** What is the best meaning for *debris* as it is used in lines 25 and 28 of "It Came from Outer Space"?
  - a.** heat and light
  - b.** energy
  - c.** cold
  - d.** dirt and rocks



- 4 Which of the following is a claim you could make after reading the sources?
- a. One of the ways mammals survived the meteor impact was by eating dinosaurs.
  - b. The sky turning black killed only plant-eating dinosaurs.
  - c. The fact that mammals were picky eaters helped them survive.
  - d. The extinction of the dinosaurs allowed mammals to fill more roles in the environment.

- 5 **Prose Constructed-Response** What are some reasons that the meteor had such a great effect when it hit Earth? Cite details from “It Came from Outer Space” in your response.

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- 6 **Prose Constructed-Response** Look at the interview in Source 2 and the post in Source 3. How do they work together to give you a better understanding of how mammals managed to survive the K-T Extinction? Cite text evidence in your response.

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# Write the Essay

Read the assignment.

## Plan

Use the graphic organizer to help you outline the structure of your informative essay.

### Assignment

You have read about a meteor impact that happened 65 million years ago. Write an informative essay about how this meteor impact affected life on Earth. Cite text evidence from what you have read.

**Introduction**

◀ State your main idea. Include an interesting detail, question, or quotation to hook your audience. Identify the causes and effects you will be writing about.

**Cause and Effect**

◀ Organize your causes and effects in a way that makes sense. Each paragraph should give details that support the ideas you presented in the introduction.

**Cause and Effect**

**Cause and Effect**

**Conclusion**

◀ Restate your overall idea and try to include a further insight or observation.


## Draft

Use your notes and completed graphic organizer to write a first draft of your informational essay.



## Revise and Edit

Look back over your essay and compare it to the Evaluation Criteria. Revise your essay and edit it to correct spelling, grammar, and punctuation errors.

 You may wish to draft and edit your essay on the computer.

## Evaluation Criteria

Your teacher will be looking for:

### 1. *Statement of purpose*

- Did you clearly state the main idea?
- Did you support your main idea with details and evidence?

### 2. *Organization*

- Are the sections of your essay organized in a way that makes sense?
- Did you use connecting words to link your ideas?
- Is there a clear conclusion that sums up your main idea?

### 3. *Elaboration of evidence*

- Did you include only evidence that is relevant to the topic?
- Is there enough evidence to support your main idea?

### 4. *Language and vocabulary*

- Did you use a formal tone?
- Did you explain any vocabulary that may be unfamiliar to your audience?

### 5. *Conventions*

- Did you follow the rules of grammar usage as well as punctuation, capitalization, and spelling?