TOEFL iBT® Test Questions

Reading Section

Directions: The Reading section measures your ability to understand academic passages written in English. You will read one passage and answer questions about it. In the actual *TOEFL iBT*® test, you would have 20 minutes to read the passage and answer the questions. Test takers with disabilities can request a time extension.

Meteorite Impact and Dinosaur Extinction

There is increasing evidence that the impacts of meteorites have had important effects on Earth, particularly in the field of biological evolution. Such impacts continue to pose a natural hazard to life on Earth. Twice in the twentieth century, large meteorite objects are known to have collided with Earth.

If an impact is large enough, it can disturb the environment of the entire Earth and cause an ecological catastrophe. The best-documented such impact took place 65 million years ago at the end of the Cretaceous period of geological history. This break in Earth's history is marked by a mass extinction, when as many as half the species on the planet became extinct. While there are a dozen or more mass extinctions in the geological record, the Cretaceous mass extinction has always intrigued paleontologists because it marks the end of the age of the dinosaurs. For tens of millions of years, those great creatures had flourished. Then, suddenly, they disappeared.

The body that impacted Earth at the end of the Cretaceous period was a meteorite with a mass of more than a trillion tons and a diameter of at least 10 kilometers. Scientists first identified this impact in 1980 from the worldwide layer of sediment deposited from the dust cloud that enveloped the planet after the impact. This sediment layer is enriched in the rare metal iridium and other elements that are relatively abundant in a meteorite but very rare in the crust of Earth. Even diluted by the terrestrial material excavated from the crater, this component of meteorites is easily identified. By 1990 geologists had located the impact site itself in the Yucatán region of Mexico. The crater, now deeply buried in sediment, was originally about 200 kilometers in diameter.

This impact released an enormous amount of energy, excavating a crater about twice as large as the lunar crater Tycho. The explosion lifted about 100 trillion tons of dust into the atmosphere, as can be determined by measuring the thickness of the sediment layer formed

when this dust settled to the surface. Such a quantity of material would have blocked the sunlight completely from reaching the surface, plunging Earth into a period of cold and darkness that lasted at least several months. The explosion is also calculated to have produced vast quantities of nitric acid and melted rock that sprayed out over much of Earth, starting widespread fires that must have consumed most terrestrial forests and grassland. Presumably, those environmental disasters could have been responsible for the mass extinction, including the death of the dinosaurs.

Several other mass extinctions in the geological record have been tentatively identified with large impacts, but none is so dramatic as the Cretaceous event. But even without such specific documentation, it is clear that impacts of this size do occur and that their results can be catastrophic. What is a catastrophe for one group of living things, however, may create opportunities for another group. Following each mass extinction, there is a sudden evolutionary burst as new species develop to fill the ecological niches opened by the event.

Impacts by meteorites represent one mechanism that could cause global catastrophes and seriously influence the evolution of life all over the planet. According to some estimates, the majority of all extinctions of species may be due to such impacts. Such a perspective fundamentally changes our view of biological evolution. The standard criterion for the survival of a species is its success in competing with other species and adapting to slowly changing environments. Yet an equally important criterion is the ability of a species to survive random global ecological catastrophes due to impacts.

Earth is a target in a cosmic shooting gallery, subject to random violent events that were unsuspected a few decades ago. In 1991 the United States Congress asked NASA to investigate the hazard posed today by large impacts on Earth. The group conducting the study concluded from a detailed analysis that impacts from meteorites can indeed be hazardous. Although there is always some risk that a large impact could occur, careful study shows that this risk is quite small.

1. The word “pose” on line 2 is closest in meaning to

    a. claim

    b. model

    c. assume

    d. present

2. In paragraph 2, why does the author include the information that dinosaurs had flourished for tens of millions of years and then suddenly disappeared?

    a. To support the claim that the mass extinction at the end of the Cretaceous is the best-documented of the dozen or so mass extinctions in the geological record

    b. To explain why as many as half of the species on Earth at the time are believed to have become extinct at the end of the Cretaceous

    c. To explain why paleontologists have always been intrigued by the mass extinction at the end of the Cretaceous

    d. To provide evidence that an impact can be large enough to disturb the environment of the entire planet and cause an ecological disaster

3. Which of the following can be inferred from paragraph 3 about the location of the meteorite impact in Mexico?

    a. The location of the impact site in Mexico was kept secret by geologists from 1980 to 1990.

    b. It was a well-known fact that the impact had occurred in the Yucatán region.

    c. Geologists knew that there had been an impact before they knew where it had occurred.

    d. The Yucatán region was chosen by geologists as the most probable impact site because of its climate.

4. According to paragraph 3, how did scientists determine that a large meteorite had impacted Earth?

    a. They discovered a large crater in the Yucatán region of Mexico.

    b. They found a unique layer of sediment worldwide.

    c. They were alerted by archaeologists who had been excavating in the Yucatán region.

    d. They located a meteorite with a mass of over a trillion tons.

5. The word “excavating” on line 25 is closest in meaning to

    a. digging out

    b. extending

    c. destroying

    d. covering up

6. The word “consumed” on line 32 is closest in meaning to

    a. changed

    b. exposed

    c. destroyed

    d. covered

7. According to paragraph 4, all of the following statements are true of the impact at the end of the Cretaceous period EXCEPT:

    a. A large amount of dust blocked sunlight from Earth.

    b. Earth became cold and dark for several months.

    c. New elements were formed in Earth’s crust.

    d. Large quantities of nitric acid were produced.

8. The phrase “tentatively identified” on line 36 is closest in meaning to

    a. identified after careful study

    b. identified without certainty

    c. occasionally identified

    d. easily identified

9. The word “perspective” on line 46 is closest in meaning to

    a. sense of values

    b. point of view

    c. calculation

    d. complication

10. Paragraph 6 supports which of the following statements about the factors that are essential for the survival of a species?

    a. The most important factor for the survival of a species is its ability to compete and adapt to gradual changes in its environment.

    b. The ability of a species to compete and adapt to a gradually changing environment is not the only ability that is essential for survival.

    c. Since most extinctions of species are due to major meteorite impacts, the ability to survive such impacts is the most important factor for the survival of a species.

    d. The factors that are most important for the survival of a species vary significantly from one species to another.

11. Which of the sentences below best expresses the essential information in the following sentence?

    Earth is a target in a cosmic shooting gallery, subject to random violent events that were unsuspected a few decades ago.

    Incorrect choices change the meaning in important ways or leave out essential information.

    a. Until recently, nobody realized that Earth is exposed to unpredictable violent impacts from space.

    b. In the last few decades, the risk of a random violent impact from space has increased.

    c. Since most violent events on Earth occur randomly, nobody can predict when or where they will happen.

    d. A few decades ago, Earth became the target of random violent events originating in outer space.

12. According to the passage, who conducted investigations about the current dangers posed by large meteorite impacts on Earth?

    a. Paleontologists

    b. Geologists

    c. The United States Congress

    d. NASA

13. Look at the four letters (**A**, **B**, **C**, and **D**) that indicate where the following sentence could be added to the passage in paragraph 6.

This is the criterion emphasized by Darwin's theory of evolution by natural selection.

Where would the sentence best fit?

Impacts by meteorites represent one mechanism that could cause global catastrophes and seriously influence the evolution of life all over the planet. **(A)** According to some estimates, the majority of all extinctions of species may be due to such impacts. **(B)** Such a perspective fundamentally changes our view of biological evolution. **(C)** The standard criterion for the survival of a species is its success in competing with other species and adapting to slowly changing environments. **(D)** Yet an equally important criterion is the ability of a species to survive random global ecological catastrophes due to impacts.

Choose the place where the sentence fits best.

a. Option A

b. Option B

c. Option C

d. Option D

14. An introductory sentence for a brief summary of the passage is provided below. Complete the summary by selecting the THREE (3) answer choices that express the most important ideas in the passage. Some sentences do not belong in the summary because they express ideas that are not presented in the passage or are minor ideas in the passage. **This question is worth 2 points.**

    Write your answer choices in the spaces where they belong. You can write in the number of the answer choice or the whole sentence.

Scientists have linked the mass extinction at the end of the Cretaceous with a meteorite impact on Earth.
•
•
•

Answer choices

(1) Scientists had believed for centuries that meteorite activity influenced evolution on Earth.

(2) The site of the large meteorite impact at the end of the Cretaceous period was identified in 1990.

(3) There have also been large meteorite impacts on the surface of the Moon, leaving craters like Tycho.

(4) An iridium-enriched sediment layer and a large impact crater in the Yucatán provide evidence that a large meteorite struck Earth about 65 million years ago.

(5) Large meteorite impacts, such as one at the end of the Cretaceous period, can seriously affect climate, ecological niches, plants, and animals.

(6) Meteorite impacts can be advantageous for some species, which thrive, and disastrous for other species, which become extinct.