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Mass extinctions in earth history student worksheet answer key

6-8 Next Generation Science Standards Earth Science, Life Science, Paleontology Learning Outcomes Identify historical and potential causes of high extinction rates The number of species on the planet, or in any geographical area, is the result of a balance of two evolutionary processes that are continuously underway: speciation and extinction. Both are natural processes of "birth" and "death" of macro evolution. When speciation rates begin to exceed extinction rates, the number of species will increase; Similarly, the number of species will decrease when extinction rates begin to exceed the speciation rates. Throughout the history of the Earth, these two processes have fluctuated, sometimes leading to dramatic changes in the number of species on Earth as reflected in the fossil record (Figure 1). Figure 1. Percent extinction events as reflected in the fossil record have fluctuated throughout the Earth's history. The sudden and dramatic losses of biodiversity, called mass extinctions, occurred five times. The paleontologists have identified five layers in the fossil record that seem to show sudden and dramatic (more than half of all existing species that disappear from fossil record) losses in biodiversity. These are called mass extinctions. There are many less, but still dramatic, extinction events, but the five mass extinctions have attracted most of the research. A topic can be made that the five mass extinctions are only the five most extreme events in a continuous series of major extinction events throughout the Phanerozoic (from 542 million years ago). In most cases, hypothetical causes are still controversial; However, the most recent event seems clear. Recorded mass extinctions The fossil record of mass extinctions was the basis for defining the periods of geological history, so they typically occur at the point of transition between geological periods. The transition in fossils from one period to another reflects the loss of species and the gradual origin of new species. These transitions can be seen in rocky layers. Table 1 provides data on the five mass extinctions. Table 1. Mass extinction geological period Mass extinction name (millions of years ago) Ordovician-Silurian end-Ordovician O-S 450-440 Fine-Devonian 375-360 Permiano-Final Triassic-Permian 251 Fine-Gurassic 205 Cretaceous-Paleogene end-Cretaceous K-Pg (K The Ordovician-Silurian extinction event is the first recorded mass extinction and the second largest. During this period, about 85 percent of the marine species (then species lived outside the oceans) were extinct. The main hypothesis for its cause is a glaciation period and then heating. The extinction event consists of two extinction events separated by about 10f years. The first event was caused by cooling, and the second event was due to the next heating. The climate changes the temperatures and the sea sea Some researchers have hypothesized that an explosion of gamma rays, caused by a nearby survanova, was a possible cause of the ordoviciano-Silurian extinction. The range of range rays would eliminate the protective layer of ozone of the earth, allowing intense ultraviolet radiation from the sun to reach the earth's surface and could explain climate change observed at that time. The hypothesis is very speculative, and extraterrestrial influences on earth history are an active search line. The recovery of biodiversity after mass extinction lasted from 5 to 20 million years, depending on the location. Late Devonian extinction may have occurred in a relatively long period of time. It seems that he struck above all marine species and not so much plants or animals that live terrestrial habitats. The causes of this extinction are little known. The extinction of the Permiano is the greatest in the history of life. In fact, one might argue that the land has become almost like life during this extinction event. It is estimated that 96% of all marine species and 70% of all terrestrial species have been lost. It was in this period, for example, that the trilobites, a group survived to the ordoviciana extinction, would be extinct. The causes of this mass extinction are not clear, but the main suspected is the extensive and widespread volcanic activity that led to a global overheating event. The oceans became mostly anoxic, suffocating marine life. The diversity of terrestrial tetrapods employed 30 million years to recover after the extinction of the permiano. The extinction of the permiano drastically altered the composition of the biodiversity of the earth and the course of evolution. The causes of the extinction of the «Jurassic» of the triassico are not clear, and the researchers support hypotheses such as climate change, the impact of asteroids and volcanic eruptions. The extinction took place just before the dissolution of the supercontinent Pangea, although recent studies suggest that extinctions could have happened more gradually throughout the triassic. The causes of the ending of the final cretaceous are the best known ones. It was during this extinction event, about 65 million years ago, that most dinosaurs, group of dominant vertebrates for millions of years, disappeared from the planet (with the exception of a Teropode Clade that gave rise to birds). It is believed that the cause of this extinction is the result of the cataclysmological impact of a large meteorite, or asteroid, off the coast of today's Yucatán peninsula. This hypothesis, proposed for the first time in 1980, was a radical explanation based on an acute peak of Iridium levels (which penetrates our atmosphere from the meteors at a fairly constant speed, but for the absent on the surface of the earth) in the rocky layer that marks the border between the Cretaceous and the Paleogene (Figure 2). This border marked the disappearance of dinosaurs in fossils as well asMore taxa. The researchers who discovered that the Iridium Spike interpreted it as a rapid influx of iridium from space to atmosphere (in the form of a large asteroid) rather than a slowing down in sediment deposition during that period. It was a radical explanation, but the relationship of an impact crater adequately aged and sized in 1991 made the hypothesis more credible. Now an abundance of geological evidence supports theory. The recovery times for biodiversity after the end-cretacean is shorter, in geological times, than for the end-permian extinction, in the order of 10 million years. Another possibility, perhaps a little casual with the impact of the Yucatan foreigner, was a vast volcanism that began to form about 66 million years ago, about at the same time the impact of asteroid Yucatan, at the end of the Cretaceous. The lava flows covered over 50 percent of what is now India. The release of volcanic gases, in particular sulphur dioxide, during the formation of traps contributed to climate change, which could have led to mass extinction. Figure 2. Band Iridium (Credit: USGS) In 1980, Luis and Walter Alvarez, Frank Asaro and Elen Michels Michels discovered, worldwide, a peak in the concentration of Iridium within the sedimentary layer of the Ká ě "PG. These researchers speculated that this iridium peak was caused by an asteroid impact that led to the mass extinction of Ká ě "PG. In Figure 2, the Iridium layer is the light band. Scientists measured its abundance of fern spores above and below the border of Ká ě "PG in this rock sample. Which of the following statements most likely represents their results? An abundance of fern spores from different species was found under the border Ká ě "PG, but no one was found above. An abundance of fern spores from different species was found over the border Ká ě "PG, but no one was found below. An abundance of fern spores was found both above and below the border Ká ě "PG, but only one species was found under the border and many species were found over the border. Many species of fern spores were found both above and below the border, but the total number of spores was greater under the border. The extinction of the Pleistocene Pleistocene extinction is one of the lexers extinctions and a recent one. It is known that North America, and at a certain degree Eurasian, a Megafauna "Greater Vertebrate Souls" have disappeared towards the end of the last glaciation period. Extinguishing seems to have happened in a relatively limited time period of 10,000 ě "12,000 years ago. In North America, the losses were quite dramatic and included the woolly mammoths (with an existing population up to about 4,000 years ago)on the Island of Wrangel, Canada), Mastodon, giant beavers, giant beavers, giant ground beavers, cats tooth sabre and North American Camel, to name a few. In the early 1900s, scientists suggested for the first time the possibility that overhunting caused the The extinction of these large animals. Search for this hypothesis still continues today. In general, the timing of the extinction of the Pleistocene was correlated with the arrival of the Paleomans, perhaps up to 40,000 years ago, and not with the events of climate change, which is the main concurrent hypothesis for these extinctions. The extinctions began in Australia about 40,000-50,000 years ago, immediately after the arrival of man in the area: a marsupial lion, a giant swomb of a ton and different species of giant kangaroos disappeared. In North America, the extinction of almost all large mammals took place 10,000-12,000 years ago. Only smaller mammals like bears, moose, elk and puma remain. Finally, on many remote oceanic islands, the extinction of many species took place in coincidence with the arrival of man. Not all the islands had large animals, but when there were large animals, these were often forced to extinct. Madagascar was colonized about 2,000 years ago and the great mammals who lived there were extinct. Eurasia and Africa do not show this scheme, but they have not even experienced a recent arrival of human beings hunters-binders. Rather, humans arrived in Eurasia hundreds of thousands of years ago. This topic remains an active research area and hypothesis. It seems clear that even if the climate has played a role, in most cases the hunting at the man precipitated the extinctions. Extinctions of the current time The sixth, or olocene, mass extinction seems to have begun before what was thought and is largely due to the disruptive activities of the modern Homo Sapiens. From the beginning of the period of the Olocene, there are numerous recent extinctions of individual species recorded in human writings. Most of these coincides with the expansion of European colonies starting from 1500. One of the most ancient and most known examples is the dodo. The strange bird pigeon lived in the forests of Mauritius (a island in the Indian Ocean) and extinct around 1662. The dodo was driven out for his meat by sailors and it was easy prey because people approached people without fear (l Dodo had not evolved with the man). Even pigs, rats and dogs brought to the island from European ships killed the little ones of dodo and eggs. Steller's marine cow extinct in 1768. It was related to the Lamantine and probably lived along the northwestern coast of North America. Discovered by the Europeans in 1741 the Marina di Steller's ě ěs cow was hunted for meat and oil. The last sea cow was killed in 1768. This is equivalent to the first 27 years between the first contact of the sea cow with Europeans and the extinction of the species! Since 1900, a variety of species has become extinct, including: in 1914, the last living traveler pigeon died in a zoo of Cincinnati, Ohio. This species had once obscured the skies of North America during its But it was hunted and suffered the loss of habitat caused by deforestation for The Carolina Parish, once common in the eastern United States, died in 1918. It suffered the loss of habitat and was hunted to avoid eating fruit to fruit. (The parakeet ate fruit orchard because its native foods were destroyed to make way for farmland.) The Japanese sea lion, which inhabited a large area around Japan and the coast of Korea, became extinct in the 1950s because of fishermen. The seal of Monaco of the Caribbean was distributed throughout the Caribbean Sea but was driven to extinction by hunting by 1952. These are just some of the extinctions recorded in the last 500 years. The International Union for Conservation of Nature (IUCN) maintains a list of extinct and endangered species called the Red List. The list is not complete, but describes 380 species of vertebrates extinct after 1500 AD. 86 of which were driven extinct by overheating or overlapping. Estimates of extinction rates estimates of present-time extinction rates are hampered by the fact that most extinctions are likely to occur without observation. The extinction of a bird or mammal is likely to be noticed by humans, especially if it has been hunted or used in some other way. But there are many organisms that are of less interest to humans (not necessarily of less value) and many that are not registered. The background extinction rate is estimated at about one million species per year (E / MSY). For example, assuming there are about ten million extant species, the expectation is that ten species will become extinct every year (each year represents ten million species per year). An estimate of the contemporary extinction rate uses extinctions in the record written since the year 1500. For birds alone this method produces an estimate of 26 E/MSY. However, this value could be an underestimate for three reasons. First, many species would not have been described until much later in the time period, so their loss would have gone unnoticed. Secondly, the number of recently extinct vertebrate species is increasing because extinct species are now described by skeletal remains. And thirdly, some species are already extinct even though conservatives are reluctant to name them as such. The assumption of these factors raises the estimated extinction rate closer to 100 E/MSY. The expected rate by the end of the century is 1500 E/MSY. Figure 3. Studies have shown that the number of species present increases with habitat size. (Credit: modification of Adam B. Smith's work) A second approach to estimating extinction rates of the present time is to correlate species loss with habitat loss by measuring forest loss and understanding of species relationships. The report Species area is the speed with which new species are seen when the interviewed area is increased. Studies have shown that the number of species present increases as the size of the island increases. This phenomenon has also been shown to contain also true in other habitats similar to island, such as the mountain tepuis of Venezuela, which are surrounded by tropical forest. Turning this report around, if the habitat area is reduced, the number of species that live there will also decrease. Estimates of habitat loss-based extinction rates and species-area relations suggested that with about 90 percent habitat loss a predicted 50 percent of species would be extinct. The estimates of the species have led to extinction rate calculations of the species of about 1000 E/MSY and higher. In general, real observations do not show this amount of loss and suggestions were made that there is a delay in extinction. Recent works have also questioned the applicability of the species-area relationship when it is estimated the loss of species. This work argues that the species-area relationship leads to a overestimation of extinction rates. A better relationship with use can be the endemic-area relationship. Using this method would bring estimates up to about 500 E/MSY in the next century. Note that this value is still 500 times the background rate. Discover this interactive exploration of endangered and endangered species, their ecosystems and the causes of threat or extinction. Contribute! Have you had an idea to improve this content? We'd like your contribution. Improve this pageLearn More

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