



MIRACLE PLANET

EPISODE 4

Extinction & Rebirth

A massive volcanic explosion triggered a wide scale extinction of life on Earth. Eventually life returned in the form of huge reptiles—dinosaurs—which would rule the Earth for 150 million years. They also would eventually go extinct and the world saw the rise and dominance of mammals.

Before Screening the DVD

1. Dinosaurs ruled the Earth for many times longer than humans have been on the planet. What do you think the chances are that we may be extinct one day?
2. Other than dinosaurs, what other animals can you name that are extinct?
3. What do you think are the most important causes of extinctions that are occurring in the present age?
4. Make a list of the top 10 reasons you think mammals are better adapted to life than reptiles.

After Screening the DVD

1. What caused the massive volcanic explosion that erupted 250 million years ago and triggered the extinction of almost all life on Earth?
2. The gases tossed out by the volcano helped hold heat in the Earth's atmosphere. That led to the melting of a substance called methane hydrate below the oceans. Why was that event so important?
3. The global warming that happened after the volcanic eruption also led to a drop in the amount of oxygen, a gas essential for life. Why?
4. What feature of the dinosaur's body made them well suited to a world with less oxygen than we have today?
5. Why were mammals at a disadvantage when dinosaurs were the dominant animals on Earth?
6. What does the fact that birds share some similar body design to dinosaurs suggest?
7. Why are birds today able to fly at an altitude where humans would have great trouble breathing?
8. How did the change in the design of mammals' rib cages lead to improvement in their evolution?
9. How did low oxygen levels end up actually helping the long-term survival of mammals?
10. What event caused the extinction of the dinosaurs?
11. What role did the continent of Asia play in the development of mammals?

Follow-Up Projects

1. You saw at the beginning of *Extinction and Rebirth* that the biggest volcanic explosion in history 250 million years ago wiped out almost all life on the planet. Find out what the biggest volcanic explosions have been in the last century. Where did they occur? What damage did they cause?
2. Draw a diagram of a bird's breathing system and a human's. What are the main differences?
3. What are the most endangered species of mammals and birds today in Canada?
4. Oxygen levels in our atmosphere have varied throughout history. Just before the mass extinction 250 million years ago, they shot up to 30 percent before dropping down to 10 percent. Today they are back at levels around 20 percent. Find out what makes up the other 80 percent of the air we breathe.
5. There are many reasons that scientists believe that an asteroid ended the life of dinosaurs on the planet—a belief known as the Alvarez Asteroid Impact Theory. Do a little research and see if you can discover those reasons.

GLOSSARY

Bivalve: A shelled-animal with two shells—or valves—joined together by a hinge.

Carnivore: A meat-eating animal.

Cretaceous: A period of Earth's history that extended from 140 million to 65 million years ago.

Diaphragm: A muscle between the abdomen and the chest that helps us breathe.

Greenhouse gas: A gas such as carbon dioxide and methane that traps heat between the Earth and the atmosphere, warming up temperatures on the planet.

Herbivore: A plant-eating animal

Hypothesis: A proposal, not yet proven, that tries to explain certain facts or observations.

Lava: Rock that is in an extremely hot liquid form (molten). Before it reaches the surface, lava is known as magma.

Methane: A colourless, odorless gas that burns.

Pangaea: A "supercontinent" that existed roughly 300 million years ago, when all the continents were joined together into one land mass.

Permian: A period of Earth's history that extended from 285 million to 245 million years ago.

Placenta: Tissue in the mother that provides her fetus with oxygen, water, and food during pregnancy.

Triassic: A period of Earth's history that extended from 245 million to 195 million years ago.

Suitable for ages 13 to 17

Related subjects: Geography, biology, physics, chemistry, earth science

For more information, visit the Web site at <www.nfb.ca/miracleplanet>.

Study guide available online at <www.nfb.ca/guides>.

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Produced in association with
Discovery Channel Canada / Shannan LaMorre
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