



MIRACLE PLANET

EPISODE 3

New Frontiers

For billions of years, life existed only in the Earth's oceans. But about 350 million years ago, some of those earliest life forms began to explore new frontiers on land. They could breathe oxygen from the air and were able to support their weight on land. Over the next hundred million years, these life forms would spread across the globe.

Before Screening the DVD

1. Most scientists believe that life began in the oceans and eventually moved onto land. Why do you think that life didn't first develop on land and then migrate into the oceans?
2. What major changes do you think life had to go through to make the transition from water to land?
3. If you were a scientist looking for clues about what life looked like hundreds of millions of years ago, what kinds of things would you look for?
4. Try to put these in order of what appeared first, second, third, and fourth in Earth's history: dinosaurs, trees, fish and mammals.

After Screening the DVD

1. Why was the jaw an important advancement in the development of life on Earth?
2. How did the formation of continents create a new watery habitat for life?
3. Why was the development of trees important for other life as well?
4. What did the first trees look like? Are there any trees on Earth today that they resemble?
5. Why are fossils important for scientists today in understanding the early development of life?
6. How is the Amazon rainforest in South America similar to life on our planet 350 million years ago?
7. Why do scientists think that early life in water may have developed lungs?
8. How is the lung fish both like fish and like humans?
9. Fish today breathe through gills but they still have a lung. What is their lung used for?
10. For life to survive full-time on land, creatures had to have limbs. What may have been some of the reasons fish first developed them?
11. What caused the mass extinction 250 million years ago that wiped out 95 percent of all life on Earth?

Follow-Up Projects

1. Draw a picture of what the Earth looked like when the first trees, Archeopteris, developed on the planet roughly 350 million years ago. Refer to **New Frontiers** for some ideas.
2. If you had to choose one adaptation that changed the course of life on Earth more than any other, which one would it be? Defend your choice.
3. Today, some animals live on land, some in water. A few live in both worlds. They are known as amphibians. Find out what adaptations make this possible.
4. In **New Frontiers** you learned that there was a mass extinction 250 million years ago, when only 5 percent of all creatures survived. Are there any life forms today on Earth that survived that period?

GLOSSARY

- Convection:** The circulation of fluids caused by changing temperatures.
- Devonian Period:** A period in Earth's history that lasted from 410 million years ago to 360 million years ago.
- Ecosystem:** The interaction between living organisms and the environment where they live.
- Folding:** The bending and curving of layers of rocks, caused by powerful geological forces.
- Fossil:** An impression of a plant or animal preserved in a rock.
- Gondwana:** An ancient "supercontinent" that consisted of South America, Antarctica, Africa and India.
- Herbivore:** A plant-eating animal.
- Reptile:** Cold-blooded creatures like snakes and lizards, which usually lay eggs.
- Respiration:** The act of inhaling and exhaling; breathing.
- Terrestrial:** Life that lives on land.
- Tetrapod:** A four-footed animal, such as a reptile.



Suitable for ages 13 to 17

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

For more information, visit the Web site at <www.ambrosevideo.com>. Study guide available online at <www.ambrosevideo.com>.

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