Inside the Restless Earth
The Early Earth  Scientists hypothesize that life began when conditions were quite different from Earth's current environment. These conditions included an atmosphere that lacked oxygen but was rich in other gases, such as carbon monoxide, carbon dioxide, hydrogen, and nitrogen. Also, the early Earth, as illustrated in Figure 8, was a place of great turmoil. Meteorites crashed into the Earth's surface. Violent thunderstorms and volcanic eruptions were constant on the young planet. Intense radiation, including ultraviolet radiation from the sun, bombarded Earth's surface.

Figure 8 The early Earth was a violent place.

How Did Life Begin? Scientists hypothesize that under these conditions, life developed from nonliving matter. In other words, life started from the chemicals that already existed in the environment. These chemicals included water, clay, dissolved minerals in the oceans, and the gases present in the atmosphere. The energy present in the early Earth caused these chemicals to react with one another, forming the complex molecules that made life possible.

Some scientists further hypothesize that for millions of years these small, complex molecules floated in the ancient oceans and joined together to form larger molecules. These larger molecules combined into more-complicated structures. As time passed, complicated structures developed into cell-like structures that eventually became the first true cells, called prokaryotes. Prokaryotes are cells that lack a nucleus. Early prokaryotic cells, like the one shown in Figure 9, were anaerobic, which means they did not require oxygen to survive. Many varieties of anaerobic organisms still live on Earth today. Organisms that need oxygen could not have survived on early Earth because there was no free oxygen in the atmosphere.

Figure 9 Fossilized prokaryotes (such as the circular structure in the photograph) suggest that life first appeared on Earth more than 3.5 billion years ago.

ACTIVITY

Using Maps Have students locate the three earthquake zones on a world map. One zone extends nearly all the way around the edge of the Pacific Ocean. A second zone is located near the Mediterranean Sea and extends across Africa into India. The third zone extends through Iceland and the middle of the Atlantic Ocean. Sheltered English

GUIDED PRACTICE

Concept Mapping Have students construct a concept map that shows how life on Earth originated from nonliving matter. They should base their map on the information presented in the last two paragraphs on this page. The primary subject heading should refer to the chemicals that already exist in the environment. The final part of the concept map should identify prokaryotes as the first life-forms to appear on Earth.

Using the Figures

Tell students that fossil evidence indicates how life on Earth has evolved. Ask them to explain how they think scientists could determine if they found a fossil, such as the one shown in Figure 9, high above sea level. (It was once covered by water.)

CONNECT TO EARTH SCIENCE

Have students research mountain ranges that formed during the different geologic eras and locate them on a world map. Paleozoic era: Caledonian Mountains of Scandinavia, Acadian Mountains of New York, Appalachian Mountains of North America, and the Ural Mountains of Russia; Mesozoic era: Palisades Mountains of New Jersey and the Rocky Mountains of North America; Cenozoic era: Andes Mountains of South America, Alps of Central Europe, and the Himalayas of Central Asia.
Astronomy
State of Ohio

County of Knox

Before me, the undersigned notary, having first been duly sworn, do deposit and
execute the following declaration:

1. I, ____________, the above-named person, declare the matters set forth in this affidavit.

2. I was an eighth (8th) grade student in Mr. Freshwater's 8th Grade ELA class during the 2007-2008 school year.

3. On April 11, 2008, I was shown a video from the computer. After I watched the video, the attorney asked me if I had ever seen the video. I told the attorney that I never saw the video. I never saw the planets and rocks out in space. I never seen any religious videos.

4. I did not attend the Fethiye Church. In fact, I never seen the church. I did not attend the Fethiye Church. Before the Fethiye Church, I never seen the church. I never heard any religious discussion with him. I would know because he never came to church. He never held his bible up or anything like that. He was never a member. He was never in the ten commandments.

5. I did not see Mr. Freshwater's arm during the Tesla coil demonstration. Nobody ever seen anybody's arm during the Tesla coil demonstration. Some people volunteered to get a cross burnt onto the arms and I never said anything about it. I never heard anything about it. I would know because he never went to church. He never held his bible up or anything like that. He was never a member. He was never in the ten commandments. Mr. Freshwater was a teacher, and he taught me about the things I learned in 8th grade and I spent me almost in 9th grade.

- When Justin was touched with the Tesla coil, it was an accident. Justin and I have never bothered by it. He was just doing the same thing. Fast after he was touched, he was laughing.
It & Zoren were about it and he told me Mr. Testwater hurt him and I said you didn't at all and he told me his parents blew it somewhat out of proportion.

He was not broadcasting his Bible... He had a messy desk & many papers on it... I would have never noticed the Bible when after Mr. Staff mom said something.
FURTHER AFFIANT SAYETH NAUGHT.

The foregoing affidavit was sworn to and acknowledged before me this April 16, 2010, by ________________ who is personally known by me or who provided satisfactory identification and who did swear to the truthfulness of the above.

Notary Public

R. KELLY HAMILTON, ATTORNEY AT LAW
Notary Public
In and for the State of Ohio
My Commission Has No Expiration Date
Section 14720 R.L.E.

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