The kinds of plants and animals that have lived on the Earth have changed over time. Prehistoric humans hunted woolly mammoths. Long before humans, dinosaurs roamed our planet. Before that, all life was in the ocean.

How is it we know about the things that lived long ago? How do we know which things lived when?

Evidence of Past Life
You have probably heard of fossils. You may think of fossils as old bones that have turned to rock. This is not completely wrong, but it’s not the whole story. Plants don’t have bones, but plants can leave fossils. Sometimes even footprints or burrows left behind by animals can become fossils. Really, a fossil is just any physical evidence of a plant or animal that lived long ago.

Even before those who discovered fossils understood them completely, people noticed something interesting. Specifically, they noticed that the same kinds of fossils were always found together in the same layer of rock. In fact, rock layers were identified by their unique fossils.

Some unique fossils were discovered in rocks in Russia. The rocks were named Permian, after Permia, an old Russian kingdom, by the geologist who discovered them, Sir Roderick Murchison.

The kinds of fossils found above and below Permian rock are different.

Which Came First?
Eventually people figured out that fossils formed when rock formed. The fossils in the rock represent the plants and animals that lived during that time. If different layers of rock have different fossils, this means that they formed at different times, when different plants and animals were alive.

Fossils form in sedimentary rock. Sedimentary rock is formed when sediments, tiny bits of broken rock, are laid down by moving air, water or ice. Over time, sediment accumulates.

Imagine pouring layer after layer of breakfast cereal into a huge bowl. The layers of cereal would pile up on top of each other like sediments that form sedimentary rock.
Where would you find the first cereal you poured in? Where would you find the cereal you poured in last? You could probably see that the first layer you poured would be on the bottom of the bowl. The last layer would be on top. By looking at any two layers, you would know which came before the other one, based on their relative positions.

<table>
<thead>
<tr>
<th>Rock Layer Name</th>
<th>Location Named For</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jurassic</td>
<td><em>Jura</em> mountains in Switzerland</td>
</tr>
<tr>
<td>Devonian</td>
<td><em>Devon</em>, a county in <em>England</em></td>
</tr>
<tr>
<td>Ordovician</td>
<td><em>Ordovices</em>, the ancient people of <em>Wales</em></td>
</tr>
<tr>
<td>Cambrian</td>
<td><em>Cambria</em>, ancient name for <em>Wales</em></td>
</tr>
</tbody>
</table>

Many sedimentary rock layers are named for a region where that kind of rock is found.

**Putting It All Together**

Over many years, geologists in different countries discovered different rock layers. The rock layers, with their unique fossils, often took on the names of the regions where they were first discovered.

Not every location had every rock layer, but by looking in different regions with the same rock layers, and noticing which layers were above and below, geologists were able to build up a kind of map of geologic time by putting all the different layers in order, from oldest to youngest. It took many years to develop the technology that allowed scientists to declare that Cambrian rock formed between 540 million year ago and 485 million years ago, and to assign actual numbers to these time periods. The relative positions only let us say that Cambrian rock is older than Ordovician rock.
Now it’s your turn to take on the role of paleontologist. You will try to combine information about rock layers and their unique fossils from several different areas to create one sequence that lists all the rock layers from oldest to youngest.

For each region, you are given only a few rock layers with their fossils. If two rock layers from two different regions have the same fossils, this means the rock layers that contain the fossils are the same age. In the space provided, list all the fossils, by name, from oldest to youngest. Remember, older fossils are in rock layers below younger fossils.
Geologic History of Earth

Connecting With Your Child

The History of Earth

Our planet is estimated to be 4.6 billion years old, and living things have been around for most of that time. Although most people are fascinated by dinosaurs, the Earth has been home to many interesting creatures.

A visit with your child to your local museum of natural history provides an excellent opportunity to learn about Earth’s long history and the multitude of life forms that have made it their home here.

Even a simple online search will reveal the captivating story of our planet’s history.

Here are some questions to discuss with your child:

• Do all living things have the same chance of becoming fossilized?
• If only some kinds of living things become fossils, how does this affect our picture of what life was like?
• How does knowing about the plants and animals give us information about the climate of ancient Earth? How might the fossils of a swamp be different than the fossils of a desert?
• Imagine digging for fossils where you live. What kinds would you find first? If you kept digging deeper, how would the fossils change? How is digging deeper and deeper like going backwards in time?

It is easy to practice the skills of a paleontologist even in your home, simply by doing the laundry!

If your family puts dirty clothes in a clothes hamper you can dig through it, from top to bottom, and try to figure out what clothes were worn on different days during the week. Yesterday’s clothes will be on top. Clothes from a week ago will be farther down.