Geo Gelato

OBJECTIVE

- Understand how animals and plants become buried and turn into fossils and resources like natural gas.
- Investigate rock layers to discover different types of fossils.
- Analyze evidence to determine fossil and rock layer age.

CLASS TIME

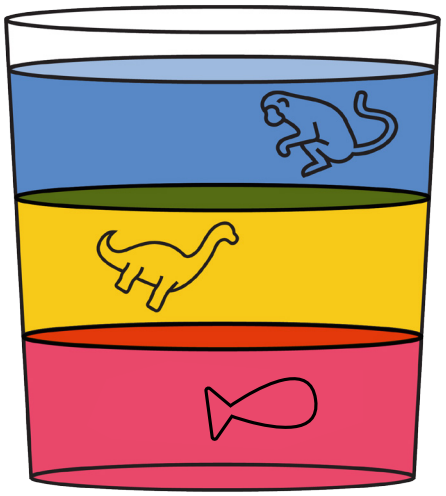
60 minutes

MATERIALS

- Pens, pencils, colored pencils, crayons or markers
- 9 oz. clear plastic cups
- Red gelatin
- Yellow gelatin
- Blue gelatin
- Plastic fossils *(can be represented by any of the below)*
  - Plastic toys
  - Gummy snacks
  - Animal crackers
  - Laminated cutouts
- Geo Gelato Worksheet *(included)*

Procedure

1. The night before the lesson:
   a. Select your fossils. Select one organism from each of the Cenozoic, Mesozoic and Paleozoic eras. For the Cenozoic, select a mammal. For the Mesozoic, select a dinosaur. For the Paleozoic, select an aquatic organism (trilobite, ancient fish, ancient shark, etc.).
   b. Prepare the **red** gelatin according to package instructions. Allow it to cool slightly so it is still pourable but not hot. Fill a cup 1/3 full. Drop your Paleozoic fossil into this layer.



c. Prepare the **yellow** gelatin according to package instructions. Allow it to cool slightly so it is still pourable but not hot. Pour this mixture on top of the red layer until the cup is about 2/3 full. Drop your Mesozoic fossil into this layer.

d. Prepare the **blue** gelatin according to package instructions. Allow it to cool slightly so it is still pourable but not hot. Pour this mixture on top of the yellow layer until the cup is full. Drop your Cenozoic fossil into this layer.

e. Repeat steps a-d until you have enough cups for your class to work in groups of two or three.

2. To begin the lesson, ask students, **"What is a fossil?"** Record their answers on a whiteboard or poster paper. Highlight answers such as, "old bones" and "dinosaurs", and explain that fossils are actually more than just dinosaur bones. Fossils can include shells, teeth, leaves and even impressions of skin, feathers or footprints. We have fossils from all sorts of time periods, from hundereds of millions of years ago to just tens of thousands of years ago.

3. Next, ask students, **"Where do fossils come from?"** Record their answers. Discuss fossilization at an appropriate level for your class; you may explain, for example, that fossils are actually mineralized remains of organisms – the actual bones and organic structures no longer remain, and have been replaced by mineral compounds.

4. Then, bring out the cups of gelatin. Divide the class into groups of two or three. Explain to students that the cups represent a model of sedimentary rocks that contain fossils. Ask students, **"Which layer of rock is oldest?"** Explain to students that typically, older sedimentary rocks are deposited first, which means the oldest layers are below the newest layers. This is called the Law of Superposition.

5. Pass out the **Geo Gelato Worksheet**. Explain to students that their job is to figure out the era of each layer and describe the fossil in each layer. Give students 20 minutes to complete this activity. Remind them not to eat the gelatin!

6. Once 20 minutes have passed, bring the class back together. Using the Critical Thinking Questions as a guide, discuss what each group learned from their fossil investigation. If time permits, allow each group to share their drawings with the class.

CRITICAL THINKING QUESTIONS

1. **What is a fossil and how do they form?**

   Answer: *Fossils are the remains of ancient organisms. Fossils are formed after millions of years of heat and pressure from being buried under the Earth's crust. We can have all sorts of fossils, from plants to animals to bacteria.*

2. **Why do fossils matter to scientists?**

   Answer: *Fossils help us understand what life used to live on Earth. In addition, fossils help us figure out the ages of rocks. If we know that one organism is older than another, then we know that the rocks around that organism must be older, too.*

3. **How are natural resources, like natural gas, formed?**

   Answer: *While some organisms are able to be preserved as fossils, most organisms break down under heat and pressure. These organisms turn into natural gas, oil and coal deep in the earth. When we use these natural resources, we're not burning dinosaur bones – typically natural gas is formed from the remains of tiny, aquatic organisms.*

Adapted from: https://igws.indiana.edu/outreach/lessonplans/gelatin

STUDENT WORKSHEET

Geo Gelato

Name _____

Each color layer of the gelatin represents an era of rock layers. To determine which era each layer represents, read its description on the left, then draw a line to the matching era on the right.

GELATIN LAYERS

Red Layer

Sandstone, limestone and shale

You might find ancient ocean fossils, including trilobites

Yellow Layer

Limestone, shale and sandstone

You find large fossils here, like dinosaurs and huge trees

Blue

Shale, basalt and pumice

You find all sorts of fossils here, like ancient mice, saber-toothed cats and even early wolves

GEOLOGIC ERA

Cenozoic Era

Some sedimentary rocks such as shale, some igneous rocks such as basalt and pumice

Fossils include mammals, from small shrews to big mammoths

Paleozoic Era

Primarily sedimentary rocks such as limestone, sandstone and shale

Fossils include corals, early fish and trilobites

Example: The Grand Canyon

Mesozoic Era

Primarily sedimentary rocks such as limestone, sandstone and shale

Fossils include dinosaurs and other large organisms

For each layer, identify the fossil found in the layer. Then, using the table below, draw a picture of where that organism might have lived.

Paleozoic Era	Mesozoic Era	Cenozoic Era
Almost all organisms found in the Paleozoic Era lived in the ocean. Many of these creatures fed on plant life, although some fed on each other! Another important part of the Paleozoic ecosystem was coral – coral might look like a rock, but it is actually made up of tiny organisms!	You may have heard of one part of the Mesozoic Era – the Jurassic Period! We often call the Mesozoic Era the "Age of Dinosaurs". Organisms were very large in this era due to an abundance of oxygen. Imagine a dragonfly the size of your arm!	The Cenozoic Era is the one we're currently living in! This era was the beginning of the familiar mammal and bird life we see around us today, from cats and dogs to sparrows and hawks – even the platypus!

In the **red layer**, which is the _____ Era, I found _____. I think its environment might have looked like:

In the **yellow layer**, which is the _____ Era, I found _____. I think its environment might have looked like:

In the **blue layer**, which is the _____ Era, I found _____. I think its environment might have looked like:

Not all organisms become fossils – in fact, fossils are pretty rare! So what happens to the rest of the organisms? They become resources! When plants and animals die, they get buried under layers and layers of rock. Over time, this creates a lot of heat and pressure, which turns them into natural resources, such as natural gas, oil and coal.

Which layer or era would be most likely to have natural gas? Why?

_____

_____

_____

_____

Answer: The Paleozoic Era, or the blue layer, is most likely to have natural gas. The organisms that lived in this era are the oldest. Therefore, they were exposed to the most heat and pressure over time.