

Ancient Environments

Grade Level:

- 5
- 6
- 7
- 8

Lesson Time:

45 minutes

Objective:

- Students will be able to relate characteristics of individual fossils and fossil assemblages to probable living environments by investigating fossils and applying their interpretation to models of past Earth conditions that might be very different from present day at any given location

Preparation

Before going to the classroom, you will need to:

1. Contact the teacher to find out the length of the class period. Alert the teacher that this investigation is set up for groups of four and whole class discussion. You will also need to arrange for an overhead or digital projector and screen.
2. Gather the fossil sets and supplemental data as described in the materials section. Make sure you have enough supplies for each group. Contact the teacher to find out how many student groups are in the class.
3. Duplicate the observation sheet. Contact the teacher to find out how many copies you need to make.
4. Collect any giveaways for the students, such as fossil posters or geologic time bookmarks.
5. Make an overhead copy of the Modern Environment Examples found below.

Materials:

Provide students, in groups of four, with the following:

- Fossil kits: these should be sets of 2 or 3 fossil animals or plants that came from the same paleo-environments.
- Fossil shells and invertebrates in sandstone from beach/ shoreface; leaf imprints and wood

fragments in coal rich silts from swamps; ammonites and fish in shales from open marine; etc.
(or you can order fossil kits)

- Hand lenses or magnifiers
- Rulers
- Modern Environment Examples

For individual students

- Observation sheet

For instructional purposes:

- (Optional) Video or image of Geerat Vermeij
- Modern Environment Examples (make an overhead of this)
- Flip chart or black board and markers

Purpose

Fossils give us an amazing picture of past life on Earth, because they are evidence of living things from long ago. Fossils can tell us about the living conditions, or environments, of ancient times. In this investigation, students will explore a set of fossils to determine the living conditions of the ancient life

Safety

This investigation is considered safe to do with students. However, consider the contents of your individual sample kits for potential hazards.

Investigation Question

What can fossils tell us about ancient life and ancient environments?

What to do

1. **(5 minutes)** Introduce students to the concept of fossils by either sharing the story of Geerat Vermeij or sharing some of your experiences as a paleontologist. If you decided to share your story about being a paleontologist, keep it short and be sure to point out how you make observations and collect data. The story about Geerat Vermeij is below:

Geerat (pronounced Gary) Vermeij (pronounced ver-may) is a scientist who studies Earth's past life. He is an expert on mollusk fossils, and studies them by collecting evidence through his fingers. Because Geerat has been blind since childhood, he has become more dependent on his other senses, particularly touch. With his sense of touch, Geerat learns about a mollusk's shell through its curves, chips, spiral growth and ridgelines. Share the little video clip on Geerat Vermeij from PBS. Please note that the video clip is about 3 min long and your computer would need Real Player to use it.
2. **(5 minutes)** Discuss the many ways scientists collect and record data to understand past Earth conditions. Be sure to accept as many explanations as you can. Questions you might ask:
 - How does Geerat Vermeij make observations about mollusks? (*Record responses on a flip chart or board.*)

- What can Geerat Vermeij's observations about mollusk shells tell us about mollusks? Could you make similar observations about fossils? (*Record responses on a flip chart or board.*)

3. **(20 minutes)** Explain to the students that, in their student groups, they will use the hand lenses or magnifiers and their senses to make observations about the fossils to find clues about what kind of life the fossil represents. Stress that students will need to use their senses, particularly touch and sight, to look for clues. Distribute the fossil kits to each team. Tell students that the fossil kits are all different, so there will be many different interpretations on the fossils. Encourage teams to first collect observations and then make interpretations.
4. **(10 minutes)** Pass out observation sheets to all the students and have students pick one fossil from their fossil kits and draw a picture of it on their observation sheet.
5. **(10-20 minutes)** Show the *Model Environment Examples* overhead. Inform students that modern living things may help provide insights into paleo-environments. Instruct student groups to pick a fossil and draw a picture of the environment their fossil lived in on their observation sheet. Visit with individual teams and ask them about their interpretations and evidence.
6. **(5-10 minutes)** Have each team prepare to present their fossil and its environment. Tell them they will need to describe their observations and explain what evidence they used to justify their paleo-environment interpretation.
7. **(10-20 minutes)** Provide each team with 2-3 minutes to present their results, with another 1-2 minutes for a question from the rest of the class (remind the class that as scientists, they are peers that help improve the investigation). Be sure to provide each team with positive feedback.
8. **(2 minutes)**. Thank students for their time and attention. You can leave giveaways behind for the classroom teacher to distribute.

