

Fossils
 Aligned Lesson 1

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<p>Related Unit: Earth and Its Environment</p>	<p>Lesson Length:</p>
<p>NGSS Standards: 3-LS4-1. Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.</p>	
<p>Library of Congress Primary Sources</p>	<p>Materials/Supplies/Resources</p>
<div data-bbox="240 997 792 1434" data-label="Image"> </div> <p>Fossil mastodon skull showing teeth, in diggings</p>	<ul style="list-style-type: none"> • Fossils • Science notebooks • Book- Fossils Tell of Long Ago (Ailiki) • small bowls • plaster • wet wipes • videos- see below
<p>Enduring Understandings</p>	<p>Essential Question(s)</p>
<p>Fossils provide evidence about the types of organisms that lived long ago and also about the nature of their environments. 3-LS4-1</p>	<p>How does studying fossils help us understand our environment? (3-LS41)</p>
<p>Transfer Goals</p>	
<ul style="list-style-type: none"> • Asking questions (for science) and defining problems (for engineering) • Developing and using models • Planning and carrying out investigations 	

- Analyzing and interpreting data (LS4-1)
- Using mathematics and computational thinking
- Constructing explanations (for science) and designing solutions (for engineering)
- Engaging in argument from evidence (LS4-1)
- Obtaining, evaluating, and communicating information

**Learning Objectives
I Can Statements**

- I can use a chart to organize data about animal or plant fossils that includes: the type, size and type of land that on which they were found
- I can use information gathered to determine the relative ages of fossils.
- I can use information gathered to determine where fossilized animals and plants currently live and where they lived before.
- I can use data to describe the relationship that some fossils that lived long ago have no modern counterparts. (or relative animals that are the same. I.e. dinosaurs)
- I can describe that fossils provide evidence of animals or plants lived long ago but have become extinct.
- I can use information gathered to determine where fossilized animals and plants currently live and where they lived before. (On land or ocean)

Engage: How can I get students interested in this?

- Describe how the teacher will capture students' interest.
- Include what kind of questions the students can ask themselves to further engage with the material?
- Identify the Primary Source(s) that can be used to observe and make connections.
- Approximate how long this portion of the lesson should take.

Teacher will display examples of fossils using the Smart Board or Elmo (Library of Congress photos)

Using the Primary Source tool, students will write down and share their observations. (* included in the folder) ***Science Engineering Practice**

As a class, discuss to try to identify the imprint using the characteristics, and students background knowledge. Teacher will pose the following questions as students view the pictures.

What (animal, fish, insect, etc.) do you think it is? Why?

What environment do you think it came from?

How did the bones stay together?

Is there another animal that the bones remind you of? If so, what?

Teacher can read: **Fossils Tell of Long Ago (by Alik)**. Teacher will write the following questions on the board that students will answer in their Science notebooks.

1. What is a fossil?
2. Have you ever seen one? If so, where and how do you know it was a fossil? If not, where do you think you could find one?

3-D learning will occur in this section

***This part of the lesson should take 1 hour to 2 hours.**

Explore: What tasks/questions can I offer to help students puzzle through this?

- Describe what hands-on/minds-on activities students will be doing.
- Include some probing questions teachers could possibly pose to encourage and/or focus students' on exploring and gathering more information related to the essential question(s).

- Approximate how long this portion of the lesson should take.

Students will discover how fossils are made doing a hands on activity. This part of the lesson I suggest doing it in a small group. Students will create their own fossil.

*Teacher may use different objects to represent animals , plants, footprints, droppings and bones to show how paleontologist use these materials to understand how life was in the past and the history on earth. (teacher may use items from the dollar story like toy dinosaurs, sticks to represent bones, rocks, or raisins to represent droppings, plants or flowers.)

1. Give each group a basket of plastic objects to make fossils with, small paper bowls, and a container of wet wipes. Students are not to touch anything until instructed.
2. Explain to students that you are going to put some plaster in the bottom of their bowl.
3. They will then choose one of the plastic objects to create a fossil with, and press it into the plaster. Once a good impression has been made they can remove the object. Try not to spill or touch the plaster. Do not touch the plaster until it has time to dry.
4. Wet wipes will be used to clean up the plastic object or any messes. Later, the students can peel the bowl off of their plaster fossil after it has dried.

Ask students to make observations about the following:

1. What their fossil looks like...
2. How they made it...
3. What can you learn from what you just made?
4. What could another person learn from looking at your fossil? (list 3 things)

Once students have answered the question above in their science journal teacher can play video from YouTube: <https://www.youtube.com/watch?v=TVwPLWOo9TE>

In science journals students will take notes of the different types of fossils. (Fossil types include:)* all information is in video.

1. Trace fossil
2. Mold fossil
3. Resign fossil
4. Body fossil (teeth and bone that has turned into stone)

Teacher will pose the question: What can fossils tell us? Teacher will break students into partners or keep them in the same groups. (If technology is limited teacher can show websites to small groups while the other students are looking at picture books on fossils. (consult neighborhood library to increase class selection)

Peer partner/group activity and exploration: research using computers. Students will explore the following websites to discover different kinds of fossils, how they were made, and what can be learned from a fossil: www.fossilsforkids.com and <http://www.onegeology.org/extra/kids/fossils.html>

Move around the room while students are exploring the websites. Stop and talk to each pair/ group. Make sure students are focused and on task, guide as necessary. Ask questions about the fossils students are looking at.

Ask students to write down their thoughts about classifying a fossil on fossil classification chart. (chart is

in folder)

Things to consider:

- What animals look familiar to you?
- Are there any animals present that you have never seen before? (What could have happened to those animals?)

3-D learning will occur in this section

1 ½ to 2 hours

Explain: How can I help students make sense of their observations?

- Have the students reflect upon their experiences and the Primary Source(s).
- Have the students write down questions they wondered about and want more information on.
- Include questions* and/or strategies teachers can utilize to help students connect their experiences to the essential question(s) and enduring understanding(s).
- Approximate how long this portion of the lesson should take.

***Questions should be of higher order, to encourage student explanations and support of claims and/or evidence.**

Teacher will refer to the lesson from the previous day. (At this point the fossils should be dry). Students will observe the fossils that they made the previous day and discuss what type of fossil that they made and why. (students may refer to their notebooks for types.)

Teacher will direct students back to the Library of Congress photos. As students preview the photo students will discuss the types of fossils that is in the picture.

Teacher will begin class discussion:

Talk with class as a whole about their exploration experience, thoughts, and what they have discovered.

Define and discuss new vocabulary - extinct, sediment, fossil, and paleontologist

Link new vocabulary to findings and experience. Students can define these words in their science journal. * other vocabulary may be added as students are exploring. Teacher can direct vocabulary by creating an anchor chart were student can add to it words as they are working through the unit or teacher can direct vocabulary by providing a specified list at the beginning of the unit or as you go along.

Play the following video about the different kinds of fossils, how they form, and what fossils tell us about how and where things lived long ago. <https://www.youtube.com/watch?v=sPFiwW8J3sY>

*3-D learning will occur during this section

1 to 2 hours

Extend/Elaborate: How can my students apply their new knowledge to other situations?

- Describe how the students will apply their new knowledge to new or similar situations.
- Include how the teacher can help the students make relevant connections to their observations, address misconceptions, and extend students' learning.
- Approximate how long this portion of the lesson should take.

Teacher can extend the lesson by allowing students to pretend they are a paleontologist.

Using the two websites used previously in class teacher will pass out paper and pencils and have students draw a 2 row X 2 column chart. Choose two images and have students use the chart to compare similarities and differences between the two fossils. * teacher can have some students choose plants and some choose an animal and share out findings.

(Teacher guided questions)

What do fossils have in common? How are they different? What does examining fossils tell us about common ancestry and diversity?

Elaborate

Chose two more fossil images. Hold a class discussion about identifying the fossil, what it may be, and where it might have come from. What parts of the animal become fossilized? Do you think all animals or things can become fossilized? Have students describe animals, insects, etc. around today that resemble the fossil animals and why. Point out how some animals today may resemble fossil animals, while others are no longer found. Note that impressions of plants and teeth have also been fossilized.

Extend

* Teacher can extend this to types of plants and allow students to continue to research using the same platform and questions from above.

*Students could create a presentation of the information in the form of a poster, or digital format.

* Students could also write a narrative from a fossils point of view their process of life to a fossil.

*Disciplinary Core Idea and Cross-cutting concepts covered in this section

This part of the lesson could take 1-2 days

Evaluate: How can I help my students self-evaluate and reflect on the learning?

- Identify how students and the teacher can assess understanding.
- Describe how the lesson activities can help students demonstrate achievement of the learning objectives.
- Include examples (or descriptions) of evidence related to each learning objective.
- Approximate how long this portion of the lesson should take.

Teacher can give assessment questions below.

1. What is a fossil?
2. How would you explain the formation of fossils?
3. How would you organize fossils to show the environment from which they came?
4. What is the relationship between fossils and life today?
5. What inferences can you make about life long ago compared to life today?
6. Why is it important to learn about fossils?
7. What can fossils tell us about our environment?

* Disciplinary Core idea covered in this section

This part of the lesson can take 1 hour or more.

