

Using Fossils to Determine Earth's Past

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Introduction

The Guiding question: What did this ecosystem look like during the Eocene Epoch based upon the fossils?

- Prior to this lesson, students will know the different ways in which fossils are formed, types, and that there are different time periods. Students will have prior knowledge in developing Argument Driven Inquiry Labs (ADI).
- Students will be briefed on:
 - Eocene Epoch
 - What matrix is
 - Where this matrix came from (Ex: waterway in Alabama)
 - How to use an identification chart
 - How to distinguish fossils from matrix

Standards

SC.912.N.1.3: Recognize that the strength or usefulness of a scientific claim is evaluated through scientific argumentation, which depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented.

SC.912.N.1.6: Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied.

SC.912.N.1.7: Recognize the role of creativity in constructing scientific questions, methods and explanations.

Steps Students will Take:

- Students will group themselves and sort through matrix from an Eocene site in Alabama



- Students will use the matrix to collect data, collaborate with each other to organize the data and use that data to develop a claim about what lower Alabama's ecosystem was like during the Eocene Epoch.

- During the gallery walk, one student will stay with their groups' chart. The other group members will walk around viewing the other groups' claims and leave relevant feedback.
- After the gallery walk, there will be a class discussion on claims made by all of the groups.
- Then students will use the ADI Rubric for high school levels to individually write a lab report make their own claim, provide evidence for their claim and justify why they used this evidence.

ADI ARGUMENT PRESENTATION ON A WHITEBOARD

The Guiding Question:

Our Claim: YOUR ANSWER TO THE GUIDING QUESTION

<p>Our Evidence:</p> <p>ANALYSIS SHOW A TREND, DIFFERENCE OR A RELATIONSHIP</p> <p>REASON EXPLAIN WHY THE EVIDENCE MATTERS</p>	<p>Our Justification of the Evidence:</p> <p>- We decided to use this evidence because.</p> <p>- This evidence is important because.</p> <p>- When we analyzed our data we assumed the following:</p>
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INTERPRETATION
EXPLAIN WHAT THE ANALYSIS MEANS

This graph indicates...
This graph shows...
This graph suggests...

http://www.argumentdriveninquiry.com/store/p74/5_Posters_Pack.html

- In their groups, students will write out a justification statement on how the data they gathered and analyzed supports their claim. Each group of students will be given chart paper and be asked to follow the model above and fill it out with the information they gathered. When the charts are completed the students will participate in a gallery walk.



<http://www.dwmiller.net/pics/eocene2.jpg>

Gained Knowledge

- Students will recognize the usefulness of a scientific claim through scientific argumentation based upon their own critical and logical thinking.
- They will actively consider alternative scientific explanations to explain the data gathered and address these other claims in the write up portion of the lab report.
- Students will make scientific observations, provide examples of those observations and draw scientific inferences based upon these observations on their chart paper for the gallery walk and in their written ADI lab report.
- Students will recognize the role of creativity in constructing scientific methods and explanations during the gallery walk and written portion of the ADI lab by addressing other groups' claims different than their own.
- Students will learn how fossils tell us information about the past.

Extension 1

After completion of this ADI Lab, students will create their own account on myFOSSIL. Students will be instructed to select their favorite fossil. They will photograph this fossil with a scale and upload their fossil photograph onto the myFOSSIL "What is it??" Forum page. Students will provide pertinent information such as time period and rough location and ask the myFOSSIL community for help in identifying their fossil.

Extension 2

Students will watch the recorded webinar on Field Notes 101. Students will write up one entry on the fossil they selected as if they had collected this fossil. They will draw the fossil and document as much information as they can about the fossil.

Literature cited

Background photograph of the Earth during the Eocene Epoch 50 million years ago.
<http://jan.ucc.nau.edu/rcb7/namPe50.jpg>

Argument Driven Labs, Florida State University,
<http://www.argumentdriveninquiry.com/>

