

## Title

### Nature of Science

Students learn about the use of fossils as evidence in science and history. In this lesson, students practice classification and defense of arguments (why they classified them the way they did).

## Intended Audience

Middle School

## Time Frame

2 classes X 1hr.

## Standards

### NGSS

MS-LS4-3.

Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy.

### New Mexico

NM Benchmark: Explain that reproduction is essential for the continuation of living things.

NM Benchmark: Describe the organization levels of classification

## Resources

Interactive journals

Fossils

Fossil classification guides

Stratigraphy charts

## Guiding questions

1. What information can be gathered from a fossil?
2. What is the relationship between these fossils?
3. When do these fossils occur in Earth's history?

## Objectives

1. Students will be able to classify and identify fossil shells and defend their arguments.

## Assessments

### Formative Assessment

Discussions in small groups and whole group of:

1. Classification
2. Argumentation
3. Use of guide for identification
4. Graphing, construction of graph for frequency data

### Summative Assessment

Exit ticket: formative or summative depending on your unit goal, length, or next steps.

“What information can be determined by analyzing fossils?”

## Teaching phase

Day 1: Students will be grouped in small groups of 3 to observe fossils. Students will then be asked to group the fossils into 2 different groups and explain why they grouped the way they did. Students will then make 2 different groups for the fossils and explain this classification.

Day 2: Students will work in the same groups as the day before with the fossils. Using the identification guide, the students will classify the fossils once again and discuss as a class. Students will then graph the frequency of fossils using Excel and present their research with an inference as to why there are more occurrences of one fossil vs. another.

### Academic Vocabulary:

Analysis  
Defending arguments (not a “fight”)  
Critiquing  
Evidence

### Scientific Vocabulary:

Stratigraphy  
Classification  
Adaptation  
Frequency  
Natural selection

## Reading | Writing | Speaking | Listening Strategies

Reading: students will read articles and a fossil classification guide, as well as an article on Panama and its uniqueness to the fossil record.

Writing: Recording notes and observations, opinions, in the interactive journal.

Speaking: Students will work in groups to classify fossils, create an argument, and defend it.

Listening: Students will listen to the teacher's experiences collecting fossils in Panama alongside professional scientists.

## Learning Progression

### Prior Knowledge/Skills

- Classification
- Observation
- Inference

### Current Knowledge/Skill

- Scientific argument based on evidence
- Graphing
- Analyzing complex scientific text

### Future Skill Connections

- Stratigraphy
- Plate tectonics
- Fossil record as evidence