

# How Life on Earth Began

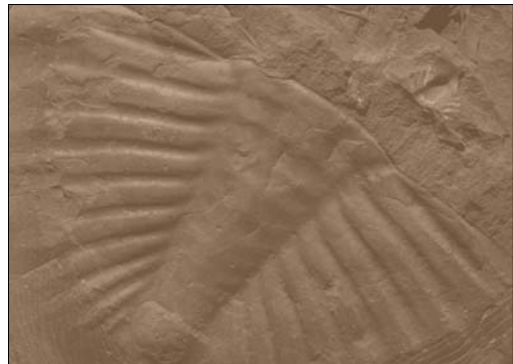
**Author:** Jodie Loverro

**Grade:** 7th

**Subject:** Life Science Unit

**Topic:** Evolution in Mammals

**Materials:** Textbook, others listed for each activity



## Pre-assessment:

- Write an essay (about 300 words) in "How Life on Earth Began."
- Students may share essays with the class. These will not necessarily be used for student group placement, however will give the teacher an idea of background and interest in the subject.

**Concept:** Evolution

## Generalizations:

1. Evolution Theory is a well-accepted theory, however the beliefs of individuals will be respected in the classroom.
2. Genetic variation and environmental factors are causes of evolution and diversity of organisms.
3. Lines of evidence from geology, fossils, and comparative anatomy provide the bases for the theory of evolution.
4. Branching diagrams are used to classify living groups of organisms by shared derived characteristics.
5. Extinction is caused by environment changes and insufficient adaptive characteristics for survival.

## Terms:

Theory, Evolution, Mammals, Adaptation, Species, Fossil, Trait, Natural Selection, Mutation, Speciation, Vestigial Structure, Selective Breeding, Mutation

## Standards:

**Evolution**

3. Biological evolution accounts for the diversity of species developed through gradual processes over many generations. As a basis for understanding this concept:
- a. Students know both genetic variation and environmental factors are causes of evolution and diversity of organisms.
  - b. Students know the reasoning used by Charles Darwin in reaching his conclusion that natural selection is the mechanism of evolution.
  - c. Students know how independent lines of evidence from geology, fossils, and comparative anatomy provide the basis for the theory of evolution.
  - d. Students know how to construct a simple branching diagram to classify living groups of organisms by shared derived characteristics and how to expand the diagram to include fossil organisms.
  - e. Students know that extinction of species occurs when the environment changes and that the adaptive characteristics are insufficient for its survival.
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## **Evolution**

### **Differentiated based upon interest**

#### **Research Mini Projects Description:**

- Students will choose three projects out of nine options to complete by the end of the unit.
- Projects will be self- chosen according to abilities and interests.
- A variety of art materials will be supplied to students, such as colored paper, markers, glue, etc.
- Students will be given time in class, however, they will be expected to complete projects at home if necessary.
- Groups will have a chance to choose projects from a tic-tac-toe board and grading rubrics for each project, with detailed expectations will be provided for students after they have made their selections.

Example Board:

Directions: Choose three of the following project ideas, making sure that you create a proper tic-tac-toe line (straight across, down or diagonal).

Poster	Computer Program	Comic Strip
Board Game	Timeline	Pamphlet
Newscast	Puppet Show	Mobile

**Assessment**

Grading rubrics will be used for each of the projects that explain what expectations students have met.

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## **Survival of the Chocolates**

**Tiered based upon readiness**

**Lab Description:**

- This is a lab found in the textbook on page 587. It asks students to work in groups of two to determine which (if any) color-coated candies provided by the teacher (M&M-like candies) have the hardest candy shells.
  - Group One worksheets will be given to those students who have been observed by the teacher to be in need of some extra assistance in reaching standards.
  - Group Two worksheets will be given to those students who have been observed by the teacher to be close to reaching standards.
  - Group Three worksheets will be given to those students who have reached or exceeded standards, as observed by the teacher.
- Observations should have been made and recorded throughout past lessons and laboratory assignments by the teacher.

**Group One:**

- A lab sheet with the Introduction and Instructions, Procedure and a Data Table are provided for students.
- They are asked to conduct the experiment and record results.
- A partial graph and lab write-up has been provided for these students.

**Group Two:**

- A lab sheet with the Introduction and Instructions, with spaces and structure for the Procedure, Data Table and Graph have been provided.
- Information and prompts for the graph and lab write-up are also provided.

**Group Three:**

- A lab sheet with an Introduction and Instructions are provided, with spaces for all of the necessary components.

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## Mystery Footprints

### Tiered based upon readiness

**Description:**

- Class trip to the beach (1 mile away from school).
- Make an assessment of all the "Mystery Footprints" made in the sand.
- Students work in groups to complete a data table, brainstorming and creating hypotheses about each footprint found.

**Mystery Footprints Data Table:**

	Footprint Set 1	Footprint Set 2	Footprint Set 3
Length			
Width			
Depth of toe			
Depth of heel			
Length of stride			
Mammal (guess)			

**Evaluation/Analysis:** (when returned to school):

Tasks are differentiated by ability as determined by the teacher based on observation.

**Group One:**

- Answer #s 8, 9, 10 on page 585 in complete sentences.
- Discuss in an interest group at table.

**Group Two:**

- Answer #s 5, 6, 7, and 10 on page 585.
- Discuss in an interest group at table.

**Group Three:**

- Communicate results of the class to the entire group by completing #s 11 and 12 on page 585.

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## **Making a Fossil**

### **Tiered based upon readiness**

**Description:**

- Using simple materials (listed), students will conduct the activity on page 175 in the textbook. Using simple materials, students will simulate a fossil.
- Each group will make two types of fossils.
- Students who complete the activity early will assist other students ("Student Helpers").
- Students are placed into groups according to ability determined by teacher observation.
- They should be prepared to share results with the rest of the class when they are finished.

**Group One:**

- Answer "What do you think?" questions #s 1-3. Follow Procedures, then answer Analysis Question #6 on page 175.

**Group Two:**

- Answer "What do you think?" questions #s 1-3. Follow Procedures, and answer Analysis Question #7 on page 175.

**Evaluation/Analysis:**

Teacher will evaluate understanding by observing and facilitating the activity and by listening to student answers shared with the class.