Simulating Fossils: Imprints and Molds

Lesson Topic
Acting as a Scientist: Creating Imprints to Simulate Fossils

RIEL Biology Element
Affirming Identities

Time Required
Two to three class periods

Standards Addressed
- SC.912.N.1.1 Evaluating scientific explanations; Evaluating scientific investigations; Making inferences understand the basic process of creating imprints of objects using plaster of Paris.
- SC.912.L.15.1 Evidence for evolution—comparative embryology; Evidence for evolution—fossil record

Science and Engineering Practice
- Asking questions and defining problems
- Planning and carrying out investigations
- Constructing explanations
- Engaging in argument from evidence

Lesson Summary
Students will define what a fossil is and describe how an impression fossil forms. They will then explain how scientists study fossils to learn about the past.

Scientists study fossils to learn about ancient life and environments. Students will act as scientists to create their own mold and imprints. Museum collections teach us about landscapes and life of the past. Afterwards students will analyze what questions they can answer by looking at imprint fossils (teachers should use examples from students' home regions if possible).

Students will develop their own questions: What can you imply by looking at fossils? What supporting evidence is there to support your answer? They will create their own molds and casts. Afterwards students will observe their own and other groups' models and determine what they could conclude about the organism which left that evidence. They will then construct an explanation of sample fossils and compare their explanations to other archaeologists'.

Materials
- Plaster of Paris (or Play Doh)
- Mixing bowl
- Pie Pans or Paper Bowls
- Chicken feet or other "future fossils"

Before the Activity
Teachers may choose to introduce the lesson with a reading assignment developed from one of the following resources to reinforce reading content material in biology:

a. https://education.nationalgeographic.org/resource/fossil/
b. https://sciencing.com/imprint-fossil-5155010.html

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Lesson Activities

1. **Introduction.** Introduce the lesson by asking students if they have ever heard of fossils and what they know about them. Let them share their experiences and ask if anyone owns a fossil. Explain that fossils are evidence of life on earth in the past and that scientists use them to study the history of life on earth. Mention that in this activity they will be acting as scientists/archaeologists by creating imprints of chicken feet to simulate fossils.

2. **Preparation of Plaster of Paris.** Give each student a mixing bowl and a stirring stick. Explain that plaster of Paris is a mixture of gypsum powder and water that hardens into a solid material. Provide instructions on how to mix the plaster of Paris:

    a. For every cup of plaster of Paris, add two cups of water.

    b. Mix the two ingredients together until the mixture is smooth and lump-free.

3. **Making Imprints.** Give each student a paper or cardboard base and a chicken foot. Ask the students to place the chicken foot on the base and press down firmly to create an imprint. Teachers may wish to give students other objects to make impressions with such as sand dollars, shark teeth, or leaves. Have the students fill the imprint with the plaster of Paris mixture, making sure to fill it completely. Repeat the process for as many imprints as desired.

Content Learning Objectives

- Students will be able to analyze fossil evidence and explain what information can be derived from them. They will be able to explain how mold and cast fossil types are formed and what specific conditions are required.

Teacher Notes

Alternative method:

- https://youtu.be/j9XumXdY_c4

Additional resources:

- https://www.nps.gov/dena/learn/nature/fossils.htm
- https://education.nationalgeographic.org/resource/fossil/
- https://sciencing.com/imprint-fossil-5155010.html

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Lesson Activities

4. **Analysis and Discussion.** Once the imprints have hardened, have the students use a pen or pencil and ruler to measure and draw the imprints. Lead a discussion on what the students observe about the imprints, including their size, shape, and texture. Ask the students to compare the imprints to real fossils and what they can learn from them about the creatures that made them.

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    b. https://sciencing.com/imprint-fossil-5155010.html

    Encourage the students to use their critical thinking skills to imagine what the creatures might have looked like, what they ate, and how they lived. Engage the students in a discussion on what they learned from the activity, including what they might do differently next time and why.

5. **End of class/Next Day Review.** Summarize the key points of the lesson, reiterating the importance of fossils as evidence of life on earth in the past. Emphasize the role of scientists in studying fossils and what they can learn from them. Encourage the students to continue exploring the world around them and to think like scientists as they observe and analyze what they see. Follow up questions:

    a. How does an impression fossil form?

    b. What objects in this activity made good impression fossils?

    c. Which ones didn't work well?

    d. What does that tell us about what parts of plants and animals become fossils?

    e. What can we learn about an organism and its environment from an impression fossil?

    f. What can't we learn?

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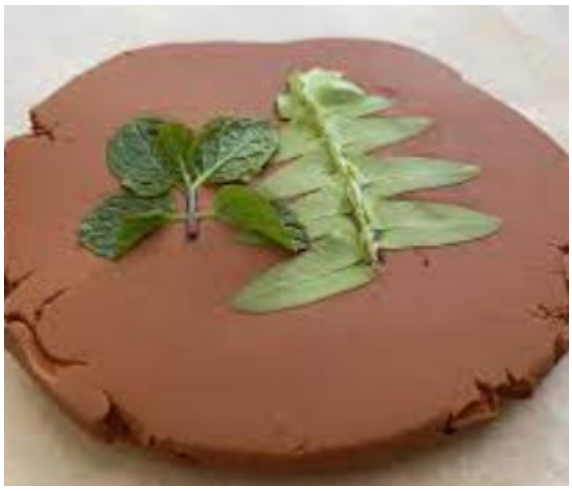
Name: _____ Date:_____

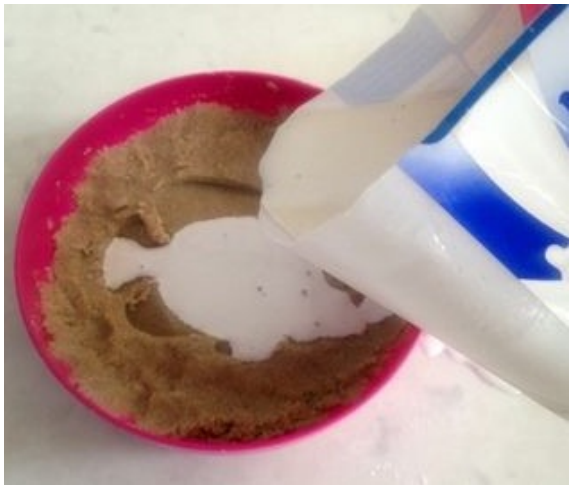
Example

1. Create imprint



2. Remove sample being used to create the imprint

3. Pour plaster of Paris into imprint and allow to harden



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