

**Name: Shanna Stevenson**

**Standard**

**4-ESS1-1:** Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time

Objective: Students will explore different centers that include physical examples of rocks with marine shell fossils as well as plant fossils to infer the indication of land to water over time. Students will draw pictures of fossils at each center in their science journals and explain in words which fossils they are identifying and predict how old the fossils might be.

**Engage**

- **Phenomena:** Students, how many of you remember learning about dinosaurs back in first or second grade? (Have students raise hands) Today, we're going to revisit those days, but in a little bit of a different way. You are going to become paleontologists today! Does anyone have an educational guess on what a paleontologist might be? (Let one or two people guess) For those that are struggling to remember or have never heard, here's a picture to jog your memory and thoughts! Look at these pictures for about twenty seconds, keeping thoughts to self, and what can we infer about these images?



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- **Background Knowledge:**

Today we are going to become paleontologists and study plant fossils. First we must properly know and define what a paleontologist is based on your insight and educational guesses. Paleontology is the science of forms of life existing in former geologic periods, as represented by their fossils. Part of being a paleontologist requires filing through fossils found in dirt, sand, etc. One of the stations you will be at will take a look at this part of a paleontologist's job. You will learn the proper techniques on how to search and dig for plant and marine fossils, and also make predictions on what kinds of fossils you are studying in your science journals. Another station will have you look at plant and marine fossils- these are fossils that have plant or sea related species apart of them. By looking at the shape of each of the fossils, you will determine which age period the fossils might have come from based on the chart provided at your station (physically show them the chart)- you will make these predictions in your science journals, as well as draw the fossils and write the name of each fossil down. The third and final station will talk about the paleontologist job as a whole- you will read and study in article on your chromebooks called "what are the duties of a paleontologist" on chron. There will be five bolded parts of the article, and I wanted you, in your journals, to give me a summary sentence on each part of the bolded sections of the article. After everyone has this, you will share with your table what you came up with! All the instructions for each center will be there to help you if you've forgotten some of the instructions. – Individual questions can be asked in pods.

### **Center 1**

- **Challenge:** Can you find the fossils? Marine or Plant Fossils?
- **Materials Needed:**
  - Buckets
  - Sand

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- Salt Dough- (Mock plant and marine fossil cut stenciled salt cookies) – MAKE SURE STUDENTS KNOW THESE ARE KNOWN NOT FOR CONSUMPTION
- Big Paint Brushes (to clean off sand and find “fossils”)
- Toothpicks (to teach to clean off any extra fine soil for detail cleaning) –students are not to use these for poking people or they will be confiscated
- Napkins/paper towel
- Tweezers
- Fossil Time Period Chart
- Science Journals
- Pencil

- **Learning Documents:** Students will record information necessary information in their science journal following this layout example:

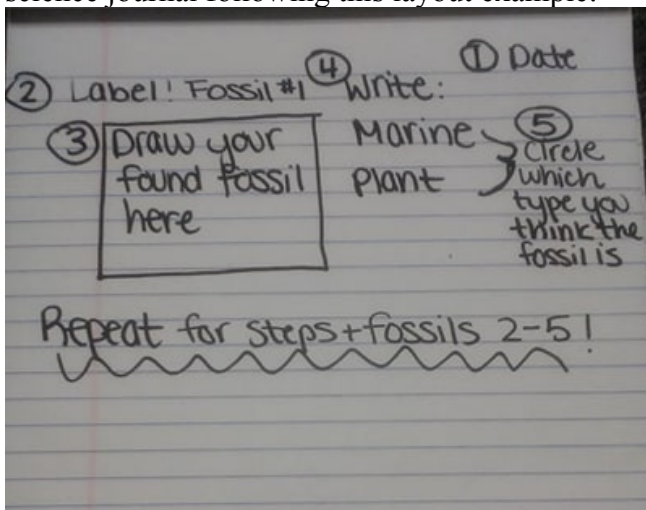
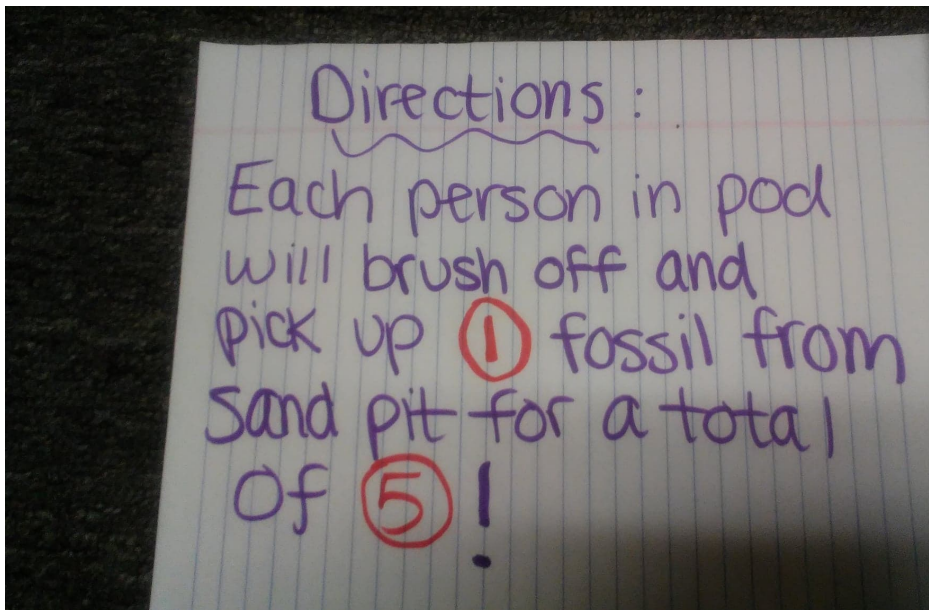
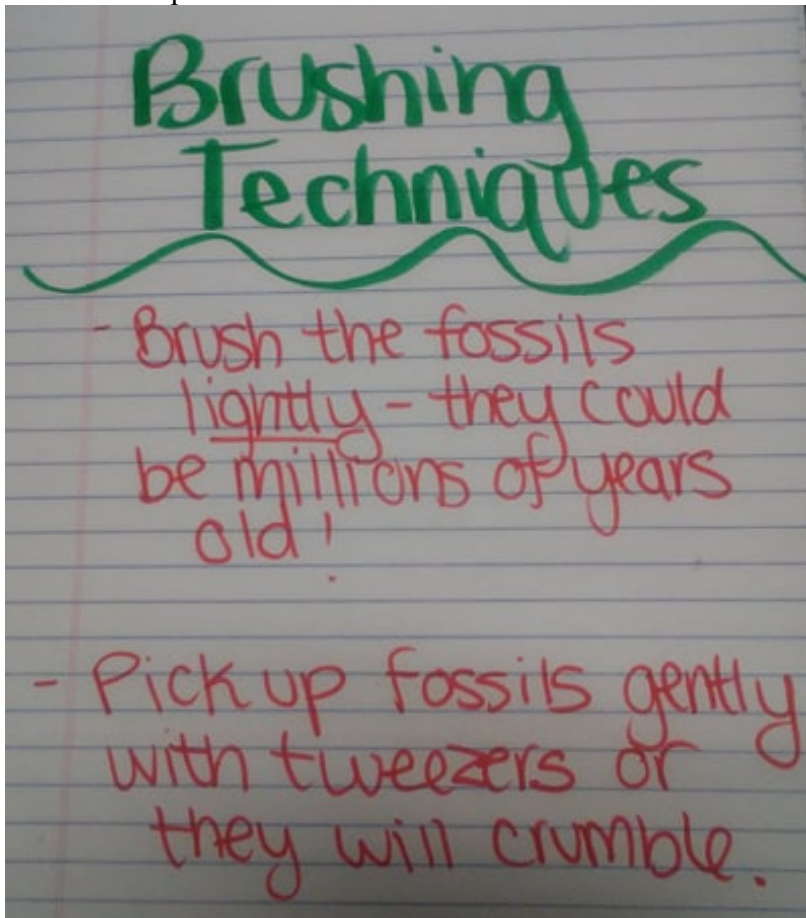


Table Instructions:

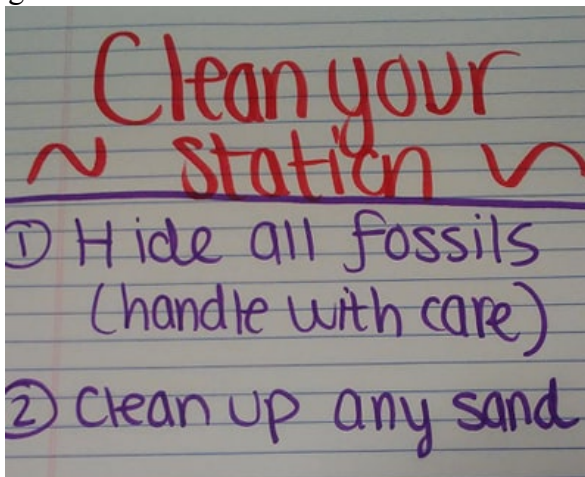


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Tool Techniques Handout at Station:



Cleaning Instructions:



• **Special Directions:**

1. As physical directions show, pods will be in groups of five and each student will get to pick up and brush off a marine of plant "fossil". Student will observe

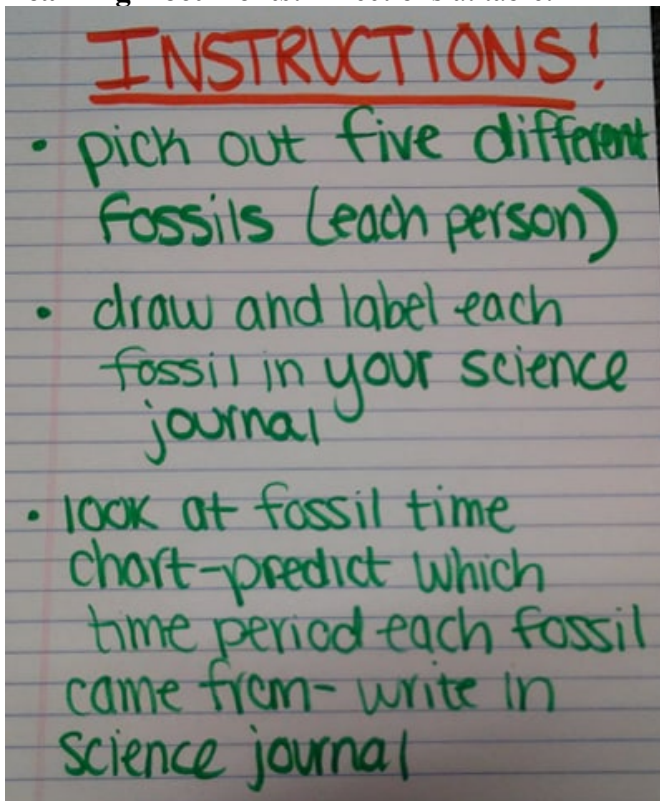
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and touch fossil, drawing in their science journal what the fossil looks like, as well as if they think it's a marine (Sea) or plant fossil

2. Students will be asked to treat the fossil with care, as if it were billions of years old! This will help the students get fully into character with being a paleontologist.
3. As other students will be finding the remaining fossils, all fossils will be placed (under napkins and paper towels) in the center of the pod for all the students to see. This will give all students a chance to draw each fossil. Make sure students are discussing their predictions on if the fossil is a plant or marine fossil!
4. Once all fossils have been found and journaled, students will hide the fossils as best as they can for the next rotation.

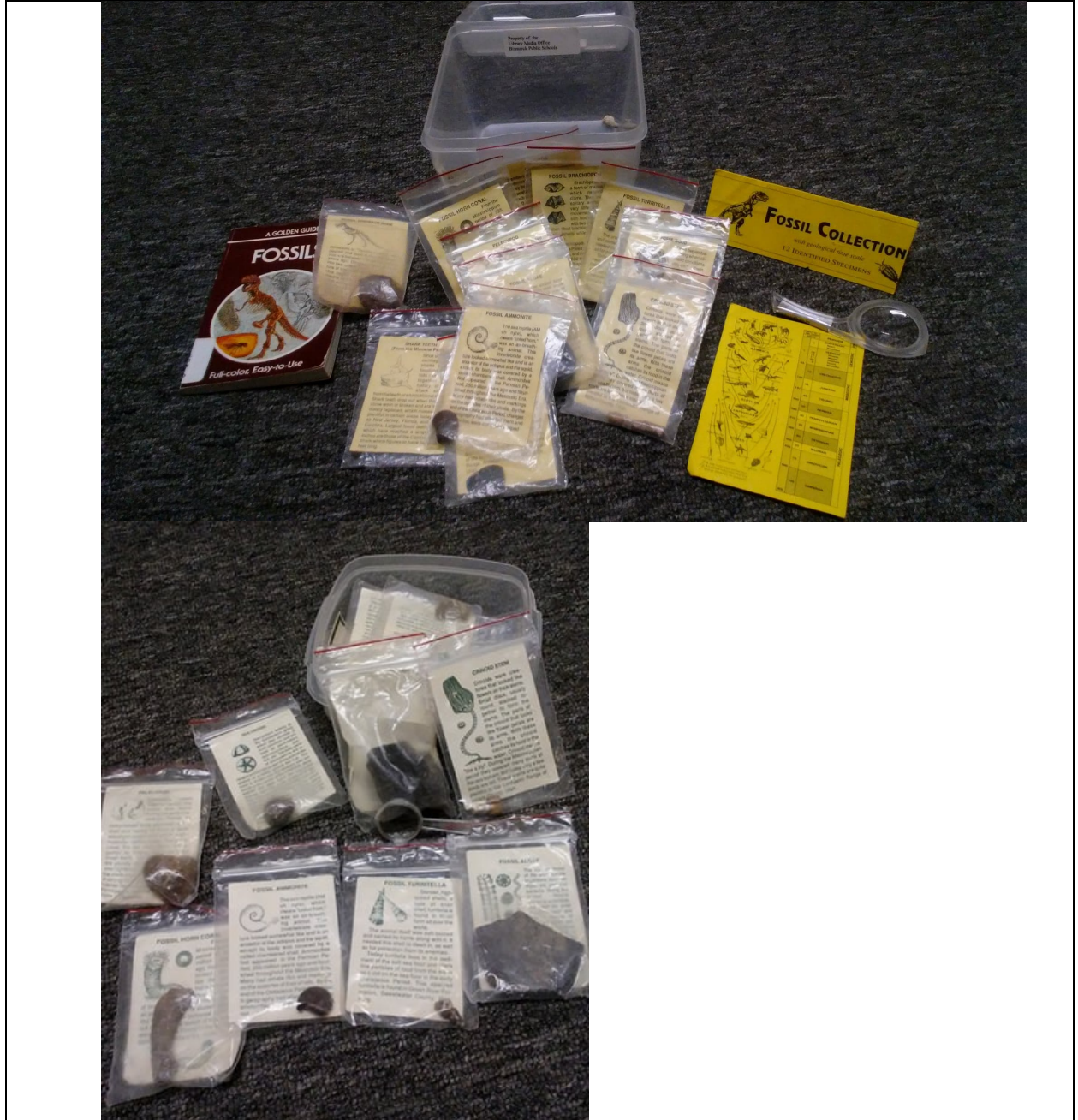
### Center 2

- **Challenge:** Can you predict the time period? (Fossil Age)
- **Materials Needed:**  
Missouri River Fossil Kits (five baggies for each person)  
Science Journals  
Fossil Age Chart (1 for each person)  
Pencils
- **Learning Documents:** Directions at table:

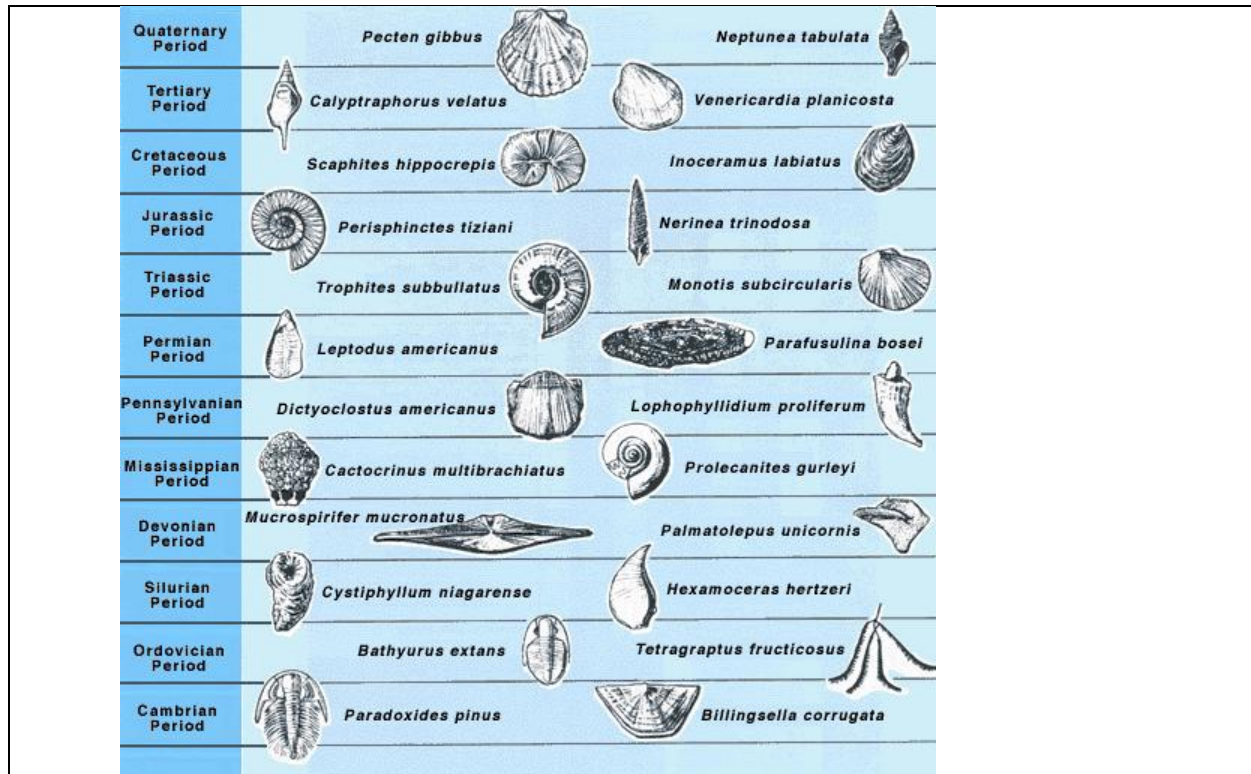


Fossil Kits:

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- **Special Directions:**

1. Make each student is drawing each of their five fossils in their science journals as well as labeling each fossil. Even if the students are unsure of which time period the fossil came from, have them write down an educated guess for each fossil in their science journal.
2. Make sure students are thinking about the shape of each fossil which will help narrow down which time period each fossil comes from. Recommend that students also look to the yellow time period sheet in the Missouri River kit.
3. Each student should have his or her own time period chart.
4. Emphasize to students the instructions about putting fossils back into individual bags after every single package is open. Close the bags tightly!

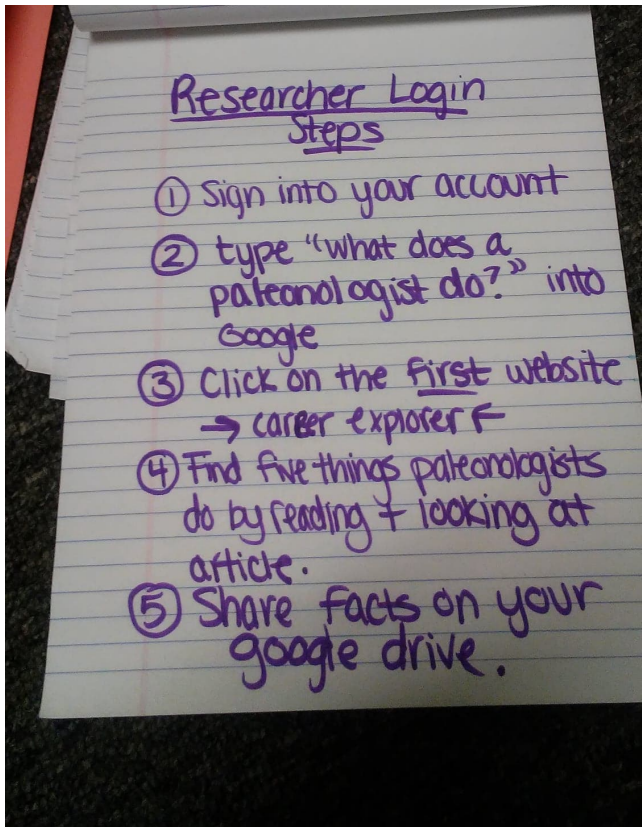
### Center 3

- **Challenge:** Find 5 characteristics of a paleontologist on a career website!
- **Materials Needed:**
  1. Laptops (one for each student) if laptops are not available at each school, have enough printed out copies for each student to have + highlighters
  2. Lab coats – this will make the students feel like they are real researchers (long term purchase)
- **Learning Documents:**
  - Link to main career website for paleontology  
<https://www.careerexplorer.com/careers/paleontologist/>

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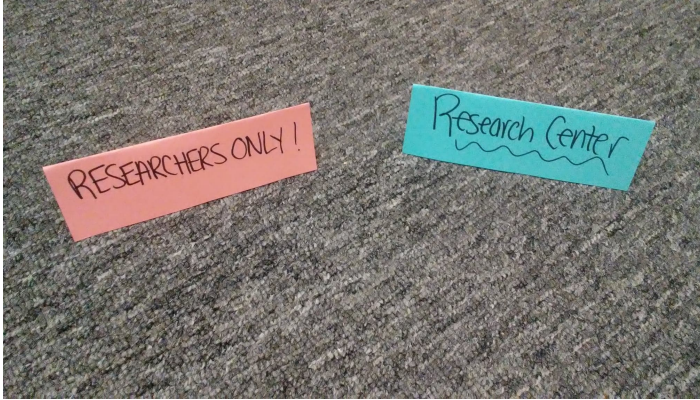
-Google Drive public share page- with 5 things students learned about what paleontologists do based on reading the article and 2 images of things related to paleontology: marine fossils, plant fossils, paleontologists –students will have a google drive prior to this

Internet Instructions:





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- Labels for Paleontologist

### **Research Center**

- **Special Directions:**

1. Students will write their facts in complete sentences on the google drive. Students will make sure to put their names at the top of the document to ensure that the teacher can check to see if the students completed the assignment.
2. If the students have enough time, they can add two pictures to their document that relate to plant and marine fossils. Suggest that students type “plant fossils”, “marine fossils”, and “paleontologists” into google to limit searches.
3. When looking through the article, suggest that students look first at the section physically titled “what paleontologists do” and then look further into the article. Encourage the fact that research is not always finding the obvious facts!

### **Wrap-Up Session**

- **Challenge: Mystery Bags- Marine or Plant Fossils?**

- **Materials Needed:**

- Science/Research Bag
- 10 different cut outs of marine and plant fossils
- individual white boards
- markers

- **Learning Documents:** 5 images of marine fossils and 5 images of plant fossils

- **Special Directions:**

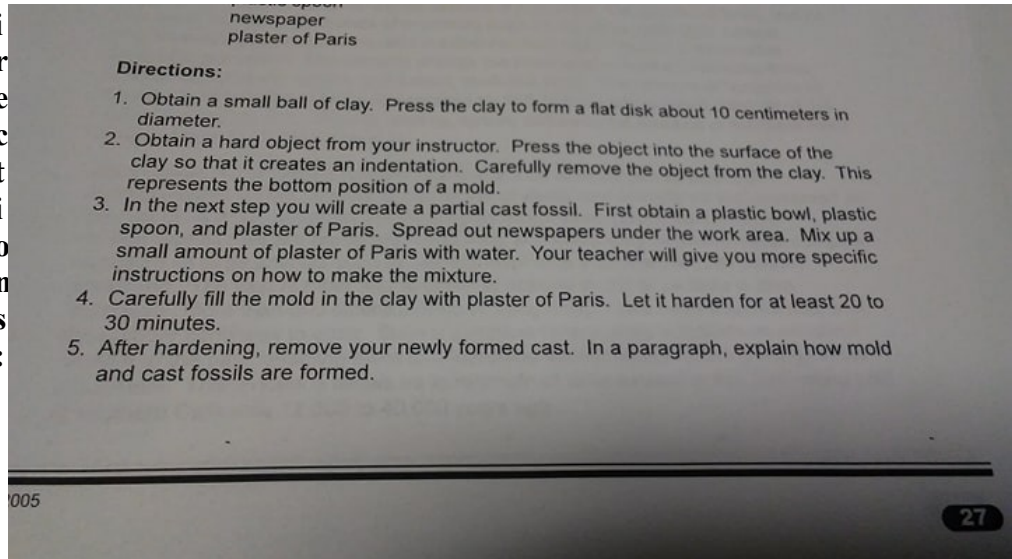
1. Teacher will have the ten different images in the research bag in the middle of the room. Students will stay in the pods they are in and as a pod, one leader of the pod grabbing 1 white board and marker for the team. Students will switch off who gets to write on board for every round.
2. Teacher will pull out each image one by one- teams have to guess if the fossil is marine or plant. The difficulty will become harder as the game continues on. Teams will keep track of their scores in the corner of their white board. Whichever team has the most points at the end wins.
3. Teacher will be talking through each fossil and briefly go over which time period the fossil is from in the midst of each round.

- **Alternative Wrap-Up or Activity: “Fossil in the Making”**

1. Students will make their own fossils using modeling clay, hard objects such as shells, keys, coins, or paper clips; plastic bowl; plastic spoon; newspaper; plaster

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### Big Idea

- **Science Content:** Students will be learning about marine and plant fossils and the time and landscape that those fossils connect to. They will be learning about the differences one would see in marine and plant fossils, as well as the job of a paleontologist. They will learn about the career and what types of characteristics of things to look for in the fossils that might indicate how old they are. This can be done by looking at the shapes and curves of each fossil, as well as by differentiating it between marine and plant.
- **Learning Supports:** Missouri River Fossil Kits + Binders for Assessment Activities , Career Explorer.com, videos on geologic history- *Visual Learning Co.*

### Assessment Plan:

- **Formative:** Students will record information in their science journals as well as on a google drive based on the article they read. Science Journals will be handed in after science centers are done.
- **Summative:** Students will complete a “Windows to the Past” Assessment shown here:

Fossils

Name \_\_\_\_\_

## Windows to the Past

**Background:** Fossils are the remains or traces of once living things. They can range in age from a few hundred years old to several hundred million years old. Fossils are very valuable to scientists because they can be used to tell a great deal about the history of life on earth. For this reason, fossils are often referred to as "windows to the past".

There are many types of fossils and different ways fossils can be formed. A fossil formed from a living thing gives us important clues to what it was like. The way a fossil is created and the environment in which it was formed can also tell us a great deal about the past. Paleontologists spend the majority of their time trying to solve these mysteries. In this activity you will attempt to carry out the job of a paleontologist by describing the living thing in each fossil diagram. You will describe the environment in which it lived and was formed.

### 1. Trilobite



a. Describe the living thing:

b. Where did it live?

c. Describe the environment in which the fossil may have formed.

### 2. Insect in Amber



a. Describe the living thing:

b. Where did it live?

c. Describe the environment in which the fossil may have formed.

Fossils

Name \_\_\_\_\_

## Windows to the Past Cont.

3. Dinosaur Track



a. Describe the living thing:

b. Where did it live?

c. Describe the environment in which the fossil may have formed:

4. Plant Fossil



a. Describe the living thing:

b. Where did it live?

c. Describe the environment in which the fossil may have formed:

5. Ammonite Fossil



a. Describe the living thing:

b. Where did it live?

c. Describe the environment in which the fossil may have formed: