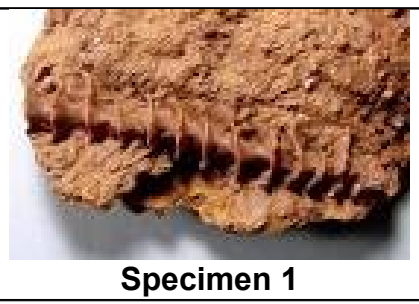
STATION A

 Specimen 1	 Specimen 2

1. To which phylum do the creatures at this station belong?
2. What method did these creatures use to obtain food?
3. Are these creatures classified as <u>solitary</u> or <u>colonial</u>?
4. *With a magnifying lens, you may observe many small pits on the surfaces of both these creatures. These pits are much more obvious on the branching specimen. What was the purpose of these pits?
5. How does the outer surface of the branching Bryozoan genus differ from the *Rhombopora* included on the official NSO list?

STATION B

			
Specimen 1	**Specimen 2**	**Specimen 3**	**Specimen 4**

The phylum Cnidaria consists of jellyfish, anemones and coral.

1. The center of the circular, semi-flattened objects, shown as Specimen # 1, preserves the shape and form of a jellyfish. The jellyfish itself is long gone, but one can easily imagine its former appearance. What name is given to the type of preservation technique represented by this specimen?

2. Why is it difficult for jellyfish to fossilize or leave a trace of their former existence?

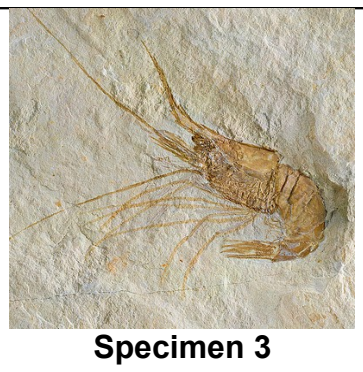
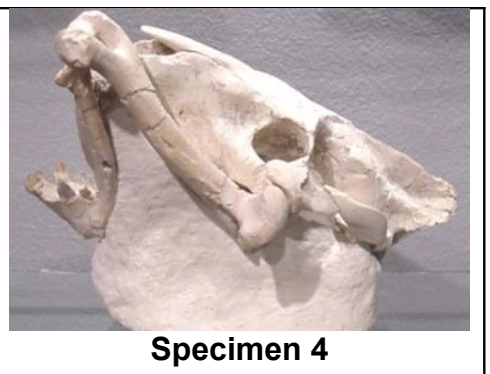
3. Which specimen is a member of the order Rugosa and includes both colonial and solitary members?

4. Identify, by common name, the only solitary coral at this station.

5. Identify, by genus, the coral whose members are solely colonial.

6. *During which geologic period did all corals at this station become extinct?

STATION C

			
Specimen 1	**Specimen 2**	**Specimen 3**	**Specimen 4**

1. Although all *Elrathia* fossil specimens display a flattened appearance, those same trilobites were both taller and rounder when alive. How did their bodies become flattened?

2. *Phacops*, imaged as specimen 2, is well known for its ability to roll itself into a ball-like shape. What benefit was derived from this adaptation?

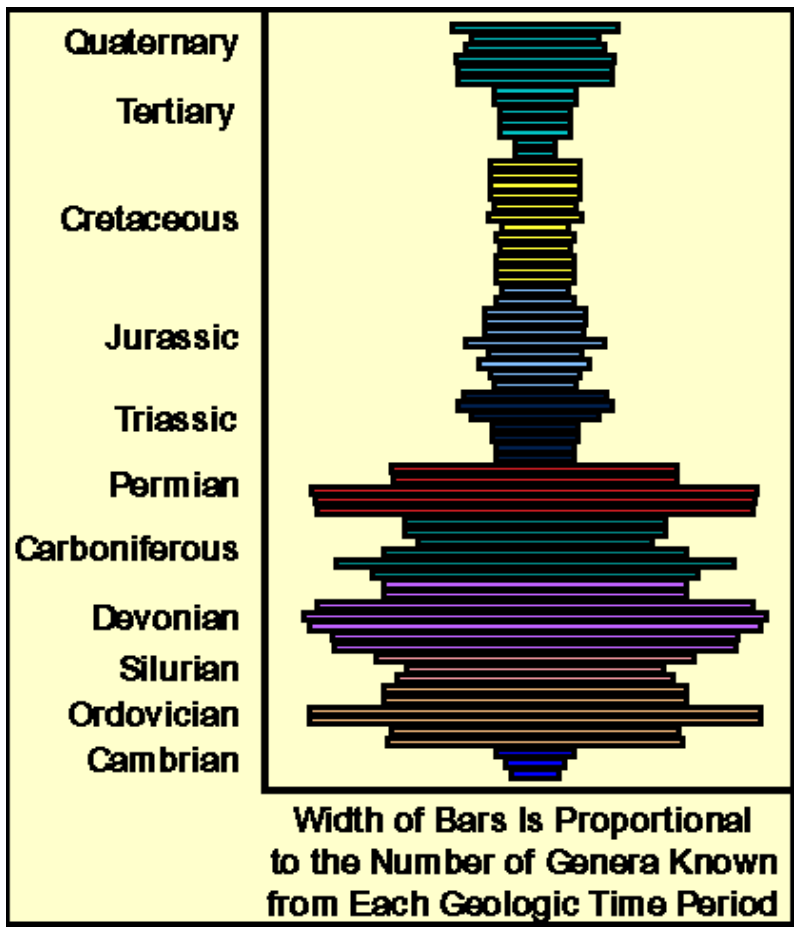
3. Of what inorganic material were the *crystal lenses* of the eyes of those trilobites that actually had eyes composed?

4. The fossil record for smaller crustaceans, such as shrimp images as Specimen 3, is less complete than that of larger crustaceans such as crabs and lobsters. The thickness of which body part, shared by all crustaceans, helps explain this difference?

5. Identify the arthropod fossil at this station which experienced a period of popularity due to its being featured in the following lyrics of a popular tune.

> “Cause I knew you like I knew myself.
> We clung on like ___?___ on a boat.
> Even though the ship sinks, you know you can't let go …”

STATION D



Note: There are no actual specimens at this station.

This spindle diagram is used to gain an understanding of how diverse a group of organisms has been through geologic time. On one axis of the chart is time, from the Cambrian at the bottom to today at the top. The width of the bars indicates how many different kinds of brachiopod fossils have been found by paleontologists from each time period.

1. Between which two time periods did the greatest loss of brachiopods occur?

2. The widest bar represents just over 200 different genera found for that time. During which era, corresponding to the Cambrian, Ordovician, Silurian, Devonian, Carboniferous and Permian periods, were brachiopods most diverse and numerous?

3. Did the brachiopods ever fully recover from the mass extinction detailed in question 2?

4. During which period were brachiopods most numerous and diverse?

Source: Gould, S.J. and Calloway, C.B. 1980. Clams and brachiopods--ships that pass in the night. *Paleobiology* 6(4), 383-396.

STATION E

		
Specimen 1	**Specimen 2**	**Specimen 3**

1. To which <u>class</u> of the Phylum Mollusca do the creatures at this station belong?
2. To which genus does Specimen # 1 belong?
3. In addition to its genus name, what is the common name of Specimen # 1?
4. To what genus does Specimen # 2 belong?
5. By what name, due to its strongly recurved form, is Specimen # 2 commonly known?
6. What parts of these organisms protect their delicate inside organs?
7. *How could one determine the approximate, or actual, chronological age of Specimen # 3?
8. Using the information from question seven, would you determine the age of Specimen # 3 as being =, < or > than 25?

STATION F

 Specimen 1	 Specimen 2	 Specimen 3
 Specimen 4	 Specimen 5	 Specimen 6

1. Specimen # 5 was once a part of an ancient sea creature called a belemnite. This part of a belemnite is identified by two different terms. Identify one of those terms?

2. Did the pointed tip of Specimen # 5 point to the front or the rear of the belemnite?

3. Did belemnites have suckers or hooks at the end of their tentacles to capture food?

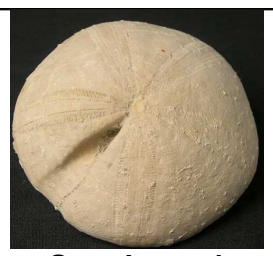
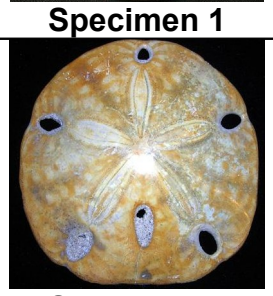
4. Did gastropods or cephalopods use radula to scrape algae off rocks or to make holes in the shells of other mollusks?

5. Which of the creatures at this station was a favorite food of the ichthyosaurs?

6. Which of the two classes represented at this station were solely marine?

7. What is the pattern of lines appearing on the surface of Specimen # 4 which are helpful in identifying different species of these creatures?

STATION G

 Specimen 1	 Specimen 2	 Specimen 3
 Specimen 4	 Specimen 5	 Specimen 6

1. Which specimen used tube feet to move and to pry open the mollusks on which they feed?

2. What does the phylum name “Echinodermata” mean?

3. What important paleontological role did Specimen # 5 play due to its short-lived existence during the early Carboniferous?

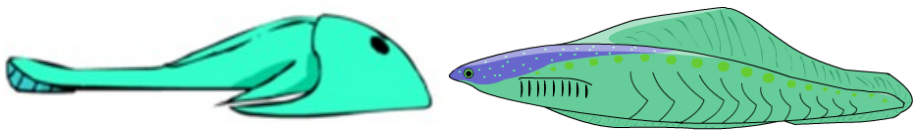
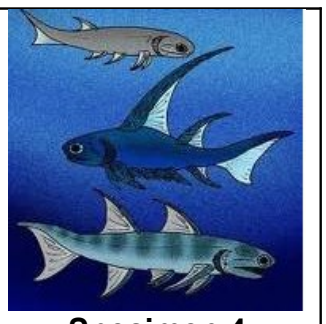
4. Which two specimens of the same creature at this station are sometimes called sea lilies?

5. *Which of the specimens at this station display “five-folded radial symmetry?”

6. Which specimen’s many simple, unbranching arms collected and carried food to its mouth along large “food grooves?”

7. How did the spines of Specimens # 1 and # 4, which did not remain with these specimens once they had died, differ?

STATION H

 Specimen 1	 Specimen 2	 Specimen 3	 Specimen 4

1. The model fish at this station is shown as Specimen # 1 in the chart above. What is the name of this fish?

2. To which class of fishes does Specimen 1 belong?

3. Scars and wounds, sometimes preserved on the bony armor of Specimen # 1, matched those of the same kind of fish. What does this observation indicate about this particular specimen?

4. What major similarity is shared by all members of the class represented by Specimen # 2?

5. Which class of fishes is represented by Specimen # 3?

6. What is the most commonly preserved body parts of the group represented by Specimens in image # 3?

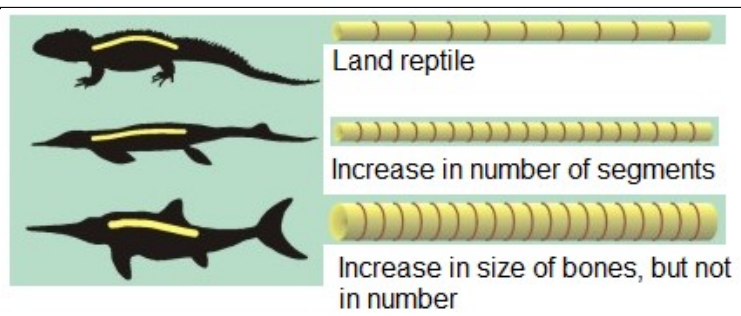
7. To which class do the fishes represented by Specimen # 4 and the fish embedded within a white matrix, Specimen # 3 belong?

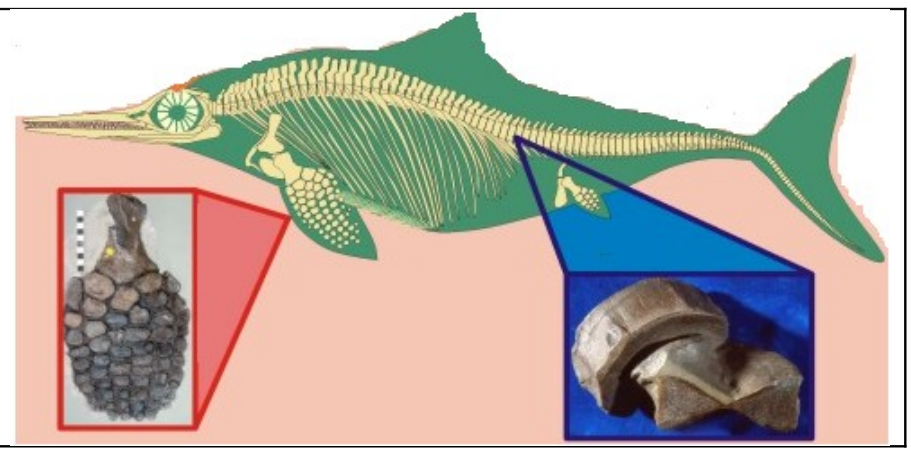
8. What characteristic do the fishes represented by Specimen # 4 and the specimen embedded within a white matrix share?

STATION I

			
Specimen 1	**Specimen 2**	**Specimen 3**	**Specimen 4**

1. The “hockey puck” shaped bone at this station belonged to an ichthyosaur. Identify this bone.





2. It is believed that ichthyosaurs evolved from lizard-like creatures. The early ichthyosaurs were rather thin and long and quite likely swam by undulating their bodies in a manner similar to that of eels. This undulating motion required these bones to provide flexibility. What, do you suppose, happened to the bodies of ichthyosaurs to cause these bones to increase in diameter, but not in number?

3. The large, flat bone at this station was a part of an ichthyosaur feature shown in the illustration above. State the function of this bone.

4. What two characteristics permitted the pterosaur, Specimen # 2 in the image above and the model at this station, to fly?

5. Identify the small object appearing in the inset of Specimen # 2 that once belonged to a pterosaur.

The lone tooth at this station was once in the mouth of a mosasaur, the largest lizard ever to evolve. Mosasaurs had large jaws with stabbing teeth, a hinged mid-lower jaw, and curved teeth on the roof of their mouths just below the throat.

6. What advantage did the hinge in their mid-lower provide?

7. * What advantage did the curved teeth on the roofs of their mouths provide?

8. Which feature of Specimen # 4, the *Dimetrodon*, is responsible for it frequently being referred to as a mammal-like reptile?

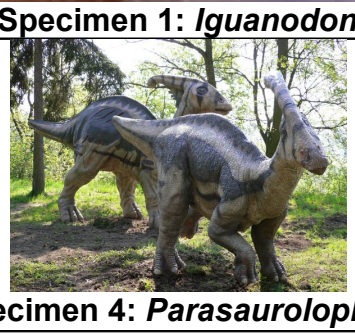
a. Its two differently-shaped teeth

b. Its characteristic sail

c. Its four side-sprawling legs

d. Its synapsid opening

STATION J

 Specimen 1: *Iguanodon*	 Specimen 2: *Allosaurus*	 Specimen 3: *Plateosaurus*
 Specimen 4: *Parasaurolophus*	 Specimen 5: *Triceratops*	 Specimen 6: *Stegosaurus*

Match the information provided for each dinosaur with its corresponding model. The names of each dinosaur are printed directly on the chests of the models.

1. This dinosaur was large bodied with a heavy arching back and a tail that was extremely tough and always held high in an upward position.

2. Since this dinosaur's thumb wasn't particularly flexible or mobile, it probably didn't do much to help the creature collect its leafy food. Instead, this dinosaur may have used its spike to defend itself against predators.

3. This dinosaur had a strong built body with four limbs. Its fore limbs were comparatively shorter and had five hooves while the rear limbs had four hooves.

4. *Plateosaurus*: Living in the late Triassic period (about 210 to 195 million years ago), this dinosaur was one of the first of the large plant eaters. With its long neck and strong hands, it could graze the tops of trees and pull limbs down.

5 The crest of this 33-foot long duck-billed dinosaur measured almost six feet in length and was made of a strong but hollow tube filled with nasal passages. These nasal passages connected the creature's nostrils back to the very tip of the crest.

6. This dinosaur had an especially prominent head, some of the anatomical features such as the distinctive ridges over its eyes may have been meant to attract the opposite sex, not to intimidate smaller dinosaurs.

7. The dinosaur tooth at this station is sometimes called a "spitting tooth." The spitting teeth were located in large batteries which resembled the gums found in the mouths of numerous creatures. When a spitting tooth was nearly worn down, it was spit out and replaced by a new one. The spitting tooth at this station is a real tooth that was ejected from the mouths dinosaurs collectively known as duckbills. Identify the only duckbill dinosaur in the group of dinosaurs at this station.

STATION K

Five hard fossilized parts from two different mammals are found at this station. Your task is to identify both mammals by genus and determine which of the five fossilized parts belong to each creature. Do not open the plastic bag!

1. Which of the two mammals was physically the largest?

2. Which of the five fossils belonged to the animal you identified as being the largest?

3. Which of the two mammals was physically the smallest?

4. Which of the five fossils belonged to the animal you identified as being the smallest?

5. Both these mammals were indigenous to what is now North America, as well as other locations around the world. Were you to dig down through an undisturbed stratigraphic column and find one each of these creatures, evidence of which of these mammals would have been discovered first?

6. There are two different kinds of hairs in the small plastic bag. Identify each and explain the function of each.

STATION L

 Specimen 1	 Specimen 2	 Specimen 3	 Specimen 4

1. Identify specimen # 1.

2. The presence of specimen 1 suggests that the climate where it grew was very hot and humid. On which portion of a world globe is such an environment dominant?

3. Specimen 1 is a lycopod. What is a more common term for this kind of plant?

4. Identify specimen # 2.

5. What is the relationship between Specimens # 2 and # 3?

6. Which of the plants above had hollow trunks and stems which, when dead, filled with sediments which increased the likelihood that the plants would be preserved as fossils?

7. Identify the fossil leaf shown as Specimen # 4.

8. *To which modern tree is Specimen # 4 related?

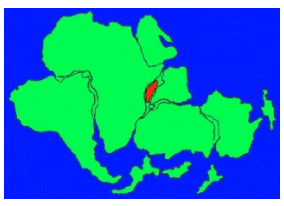
STATION M

			
Specimen 1	**Specimen 2**	**Specimen 3**	**Specimen 4**

1. *Which of the leaves above inspired Charles Darwin to coin the phrase “living fossil” due to this leaf having undergone few changes?

Plant classification is a bit complex, but in evolutionary order, after the mosses and worts (no proper roots or water transport), and ferns, horsetails, and club mosses (proper roots, bear spores), we get the two big divisions, the gymnosperms ('naked seeds') and angiosperms ('covered seeds').

2. Since Gingkos have naked seeds, what is their classification?



3. What is the name of the ancient continent in the illustration above?

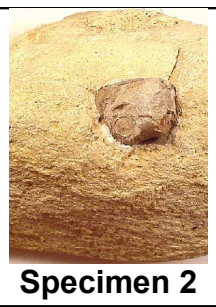
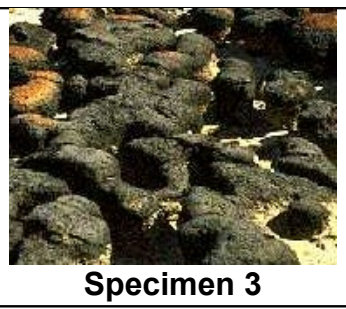
4. Which of the plants above evolved on the land mass in the illustration above and is now found as fossils on the continents resulting from the splitting of this huge land mass?

5. In addition to the Indian peninsula, on what four present-day continents are fossils of the plant identified in number four naturally found?

6. Identify Specimen # 3.

7. Generally, deciduous trees drop their leaves in the fall, and coniferous trees do not. The cone shown as Specimen # 4 is similar to those that grow on trees that bore the leaf in question # 6. How does the tree that bore the leaf identified as # 3 differ from most other coniferous trees?

STATION N

				
Specimen 1	**Specimen 2**	**Specimen 3**	**Specimen 4**	**Specimen 5**

1. Identify the <u>type of preservation</u> illustrated by Specimen # 5.

2. What ingredient is lacking inside amber that permits insects entombed within it to be perfectly preserved?

3. Identify the <u>type of preservation</u> illustrated as Specimen # 1.

4. *Which specimen is that of Earth's oldest fossils, our singular visual portal into deep time on earth, the emergence of life, and the evolving of the beautiful forms of life of modern time?

5. Specimen 3 was produced by the activity of ancient cyanobacteria. What atmospheric component, essential to life, was produced by cyanobacteria?

6. Specimens # 2 and # 4 are coprolites. Explain how one can determine which one was deposited by a carnivore and which was deposited by an herbivore.