Team members: _____

Fossil lab

Background: Fossils are traces of organisms that lived in the past. When fossils are found, they are carefully excavated and then analyzed. Most fossils form by one of three methods. Sometimes the hard structures such as bones, teeth or shells create an imprint in rocks. Another way fossils are formed is by the replacement of structures in the organism with minerals in a process known as petrification. The third procedure resulting in the creation of a fossil is simply when the body part is preserved when sediment covers it. Analysis of fossils includes dating and careful observations of morphology, or the changes in physical characteristics, so that relations to other fossils or existing organisms can be determined.

In this lab you will be working with the a fictitious organism of the genus *Adventurian*, You will categorize *Adventurian* fossils by similarities in morphology and age in an attempt to give specific evidence that organisms of the genus *Adventurian* evolved.

Hypothesis: If *Adventurian* has evolved, then… (tell me if it will be possible to observe differences in morphology by examining its fossil record.)

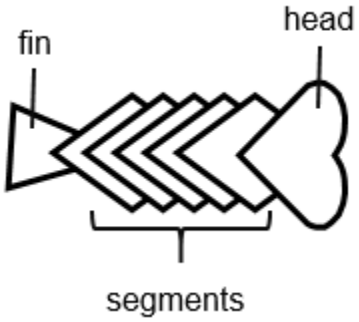
_____

_____

_____

Procedure:

1. Cut out the table found on pages 2-4 of these instructions AND tape together IN CORRECT ORDER.
2. Calculate the duration (in millions of years) for each era/epoch, and fill it your answers is the correct column.
3. The group of "fossils" you will work with are fictitious animals. Each fossil on your sheet is marked with a time. Cut out each fossil making sure **you include the time period** marked below it.
4. Set the “mystery fossil” aside
5. Arrange the fossils by age. On your chart, place each fossil in the period from which the fossil came from. As is true in the real fossil record, some fossils are “missing”.
6. While keeping the fossils in the proper age order, arrange them by morphology (appearance). To help you understand the morphology of the specimen, view the diagram.
7. Arrange the fossils using the following steps.
    a. Center the oldest fossil at the bottom of the fossil column (toward the oldest layer)
    b. Through the chart, those fossils that appear to be the same (or close to the same) as the fossils preceding them should be placed in a **vertical** line
    c. During a certain period, **the fossils will split into two branche**s. In other words, one fossil from that period will show one type of change, and another fossil will show a different change. When this happens, place the fossils **side by side in the appropriate time period**. From this point on you will have two lineages.

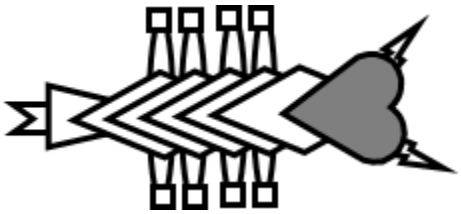
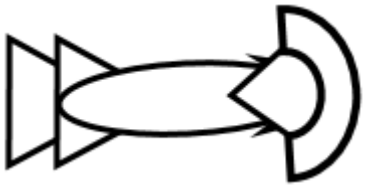
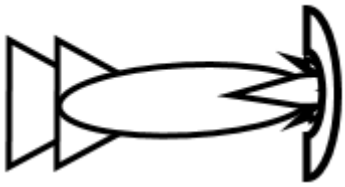
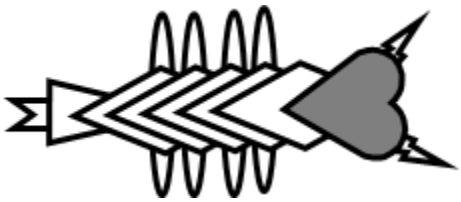
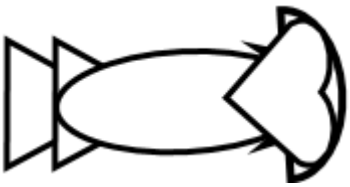
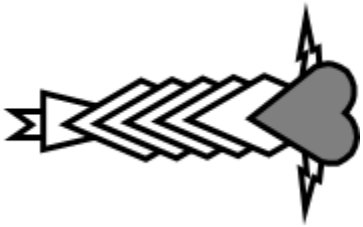
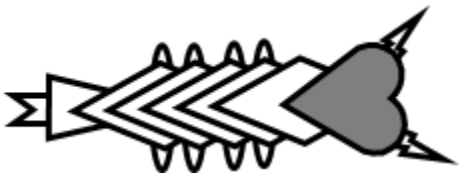
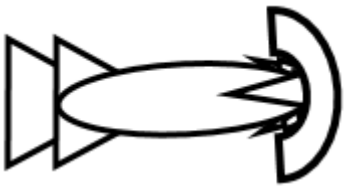


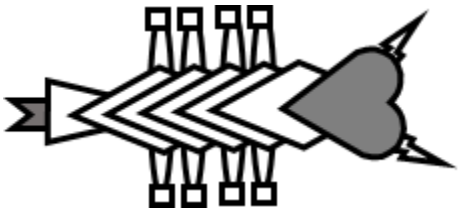
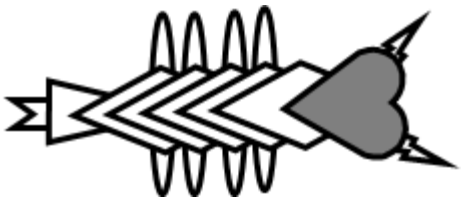
8. Once all the fossils have been placed correctly according to time and morphology, tape or glue the fossils in place.

Organism	Eras/Epochs	Began (million years ago)	Duration (in million years)
	Tertiary / Miocene	21 MYA	18.5
	Tertiary Californian	23.8 MYA	
	Tertiary / Oligocene	33.7 MYA	
	Tertiary / Eocene	54.8 MYA	
	Tertiary / Paleocene	65 MYA	

	Cretaceous	142 MYA	
	Jurassic	205.7 MYA	
	Triassic	248.2 MYA	
	Permian	290 MYA	
	Pennsylvanian	323 MYA	
	Mississippian	354 MYA	

	Devonian	417 MYA	
	Silurian	443 MYA	
	Ordovician	495 MYA	52 MY
	Cambrian	545 MYA	50 MY

 Californian	 Cambrian	 Cretaceous
 Devonian	 Devonian	 Eocene
 Eocene	 Jurassic	 Mississippian
 Mississippian	 Mystery fossil	 Permian
 Pennsylvanian	 Pennsylvanian	 Permian
 Paleocene	 Jurassic	 Paleocene
 Silurian	 Triassic	 Ordovician

 Miocene	 Oligocene	