

Name: _____

Lab #13: Biostratigraphy

The purpose of this lab is for you to gain a general understanding of biostratigraphy and to review some of the taxa we've seen throughout the semester. Examine the four mock stratigraphic sections, representing the recorded geological history of a hypothetical basin. Each section corresponds to a different area of the basin and contains 5-6 stratigraphic intervals. Overall, there are 9 stratigraphic intervals for our hypothetical basin with each possessing a characteristic faunal/floral assemblage. For today, assume plants & coal = Pennsylvanian.

1. For each section, identify the taxa in each interval to the taxonomic level used in previous labs. **If specimen labels are present, ignore them.**

Section #1

Youngest	Tetrapoda (snake, rodent)
	Ammonoidea
	Coal, plant material
	Nautiloidea (Endoceratida), Trepotomata, Rhynchonellida, Phacopida, Trinucleida
Oldest	Redlichiida, Edrioasteroidea, Archaeocyatha

Section #2

Youngest	Ammonoidea, Bivalvia (scallop)
	Ammonoidea
	Spiriferida, Terebratulida, Blastoidea, Cystoidea (Rhombifera), Trinucleida, Fenestrata
	Eumalacostraca, Trepotomata, Rugosa, Calcarea, Chondrichthyes
Oldest	Nautiloidea (Actinoceratida), Rhynchonellida, Phacopida

Section #3

Youngest	Tetrapoda (terrestrial mammals)
	Coleoidea (belemnite), Bivalvia (scallop)
	Ammonoidea
	Coal and lycopod plants
	Crinoidea, Cystoidea (Diploporita), Hexapoda, Spiriferida, Fenestrata
Oldest	Rugosa, Calcarea, Blastoidea, Chondrichthyes, Tubuliporata

Section #4

Youngest	Tetrapoda (terrestrial mammals)
	Ammonoidea, Neogastropoda, Malacostraca, Bivalvia (rudist)
	Coleoidea (belemnite), Cheilostomata
	Coal, Tetrapoda (frog)
	Crinoidea, Blastoidea, Spiriferida, Chondrichthyes
Oldest	Rhynchonellida, Phacopida, Nautiloidea (Endoceratida)

2. From the tables above, describe the faunal/floral assemblage of each of the 9 stratigraphic intervals and provide an abbreviated name for the assemblage (based on a common taxon). The abbreviated name will be used in the next question. You do not need to order the assemblages temporally in the table below.

[illegible]

3. Place the abbreviated names for the assemblages in the appropriate boxes in the four columns below. Correlate the four sections by drawing lines (as in the lecture).

Section #4					
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Section #3					
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Section #2					
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Section #1					
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4. Determine the age of each assemblage that you defined above to the **single period level** (e.g. Devonian- not “Ordovician to Permian”) on the geological time scale. Note that these ages should be determined by the stratigraphic ranges of taxa given in Prothero or in class (in some cases noting that ____ were very abundant in the ____ might help you narrow things down). **Assume that each assemblage is from a different geologic period (i.e., there are no doubles).** Again, if they are present, ignore the specimen labels. Place the assemblages in temporal order (**youngest on top**).

Assemblage Name	Age
	Cenozoic
	Jurassic/Cretaceous
	Triassic/Jurassic
	Permian
	Carboniferous
	Devonian
	Silurian
	Ordovician
	Cambrian

Phylogeny and Ranges

Phylum **Porifera**

Class Calcarea	Cambrian-Recent
Class Demospongia	Cambrian-Recent
Class Hexactinellida (Hyalospongia)	Cambrian-Recent
Class Sclerospongia	Ordovician-Recent
(including Superfamily Stromatoporoidea?)	Ordovician-Devonian (Cambrian?-Cretaceous?)

Phylum **Archaeocyatha**

E. Cambrian – M. Cambrian

Phylum **Cnidaria** (Coelenterata)

Class Hydrozoa	Cambrian-Recent
Class Scyphozoa	Cambrian-Recent
Class Anthozoa	Cambrian-Recent
Subclass Octocorallia	Cambrian-Recent
Subclass Hexacorallia (Zoantharia)	Cambrian-Recent
Order Actinaria	Cambrian-Recent
Order Rugosa (Tetracorallia)	Ordovician-Permian
Order Tabulata	Cambrian?-Permian
Order Scleractinia	Triassic-Recent

Phylum **Echinodermata**

*Subphylum Homalozoa	Cambrian-Recent
Subphylum Edrioasteroidea	Cambrian-Devonian
Subphylum Crinozoa	Cambrian-Permian
Class Crinoidea	Cambrian-Recent
Subphylum Blastozoa	Ordovician-Recent
Class Blastoidea	Cambrian-Permian
Class Rhombifera , a.k.a. Cystoidea	Ordovician-Permian
Class Diploporita , a.k.a. Cystoidea	Ordovician-Devonian
Subphylum Asterozoa	Ordovician-Devonian
Class Asteroidea	Ordovician-Recent
Class Ophiuroidea	Ordovician-Recent
Subphylum Echinozoa	Ordovician-Recent
Class Holothuroidea	Ordovician-Recent
Class Echinoidea	Ordovician-Recent

Phylum **Hemichordata**

Class Graptolithina	Cambrian-Recent
	Cambrian-Mississippian

Phylum **Chordata**

Subphylum Urochordata	Cambrian-Recent
Subphylum Vertebrata	Cambrian-Recent
Infraphylum “ Agnatha ”	Cambrian-Recent
Infraphylum Gnathostomata	Ordovician-Recent
Class Placodermi	Silurian-Devonian
Class Acanthodii	Ordovician-Permian
Class Chondrichthyes	Devonian-Recent
Class Osteichthyes	Silurian-Recent
Subclass Actinopterygii	Silurian-Recent
Subclass Sarcopterygii	Silurian-Recent

Phylum Brachiopoda	Cambrian-Recent
Subphylum Inarticulata	Cambrian-Recent
Subphylum Articulata	Cambrian-Recent
Class Rhynchonellata	Cambrian-Recent
Order Pentamerida	Cambrian-Devonian
Order Orthida	Cambrian-Permian
Order Atrypida	Ordovician-Devonian
Order Athyrida	Ordovician-Jurassic
Order Rhynchonellida	Ordovician-Recent
Order Spiriferida	Silurian-Jurassic
Order Terebratulida	Silurian-Recent
Class Strophomenata	Ordovician-Permian
Order Strophomenida	Ordovician-Mississippian
Order Chonetida	Ordovician-Permian
Order Productida	Devonian-Permian
Phylum Bryozoa	Ordovician-Recent
Class Phylactolaemata	(Jurassic?) Neogene-Recent
Class Stenolaemata	Ordovician-Recent
Order Trepostomata	Ordovician-Triassic
Order Tubuliporata (Cyclostomata)	Ordovician-Recent
Order Cystopora	Ordovician-Triassic
Order Fenestrata	Ordovician-Permian
Order Cryptostomata	Ordovician-Permian
Class Gymnolaemata	Ordovician-Recent
Order Ctenostomata	Ordovician-Recent
Order Cheilostomata	Jurassic-Recent
Phylum Annelida	Precambrian-Recent
Phylum Onychophora	Cambrian-Recent
Phylum Arthropoda	Cambrian-Recent
Superclass Trilobitomorpha	Cambrian-Permian
Class Trilobita	Cambrian-Permian
Order Redlichiida	E. Cambrian – M. Cambrian
Order Agnostida	Cambrian-Ordovician
Order Asaphida	Cambrian-Ordovician
Order Corynexochida	Cambrian-Ordovician
Order Ptychopariida	Cambrian-Ordovician
Order Trinucleida	Ordovician-Silurian
Order Harpida	Cambrian-Devonian
Order Phacopida	Ordovician-Devonian
Order Lichida	Ordovician-Devonian
Order Odontopleurida	Ordovician-Devonian
Order Proetida	Cambrian-Permian
Superclass Crustacea	Cambrian-Recent
Class Maxillopoda	Cambrian-Recent
Subclass Ostracoda	Cambrian-Recent
Class Malacostraca	Cambrian-Recent
Subclass Eumalacostraca	Cambrian-Recent
Superclass Chelicerata	Cambrian-Recent
Class Merostomata	Cambrian-Recent
Subclass Eurypterida	Cambrian-Permian
Subclass Arachnida	Cambrian(?) - Recent
Subclass Xiphosura	Cambrian-Recent
Superclass Uniramia / Tracheata	Silurian-Recent

Class Myriapoda	Silurian-Recent
Class Hexapoda / Insecta	Silurian-Recent
Phylum Mollusca	
Subphylum Amphineura	Cambrian-Recent
Class Aplacophora	Cambrian-Recent
Class Polyplacophora	??-Recent
Subphylum Cyrtosoma	Cambrian-Recent
Class Monoplacophora	Cambrian-Recent
Class Gastropoda	Cambrian-Recent
Order Archaeogastropoda	Cambrian-Recent
Order Mesogastropoda	Ordovician-Recent
Order Neogastropoda	Cretaceous-Recent
Class Cephalopoda	Cambrian-Recent
Order Nautiloidea	Cambrian-Recent
Order Ammonoidea	Devonian-Cretaceous
Order Coleoidea	Devonian-Recent
Subphylum Diasoma	Cambrian-Recent
Class Rostroconchia	Cambrian-Permian
Class Scaphopoda	Ordovician-Recent
Class Bivalvia / Pelecypoda	Cambrian-Recent