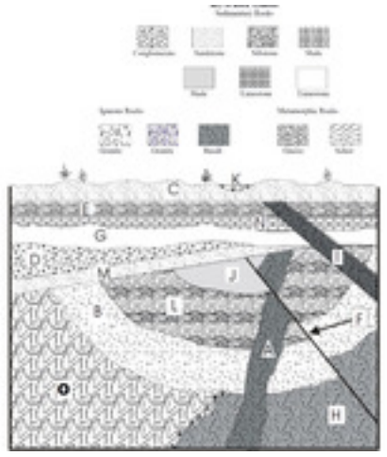
# Fossils Div C

This test will begin at 6:00pm. The first slide will ask you for your school, team and team members. 1 person should submit answers for the team. Once the section gets to 0:00, the test moves on but DOES record the answers you have clicked.

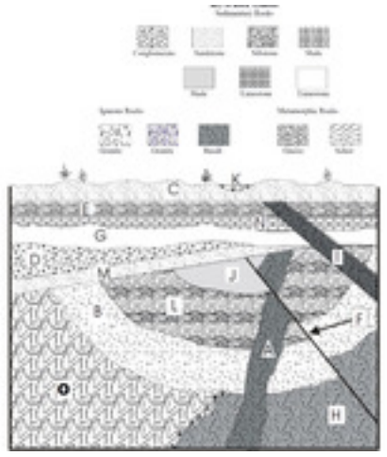
# Quiz

## Section 1



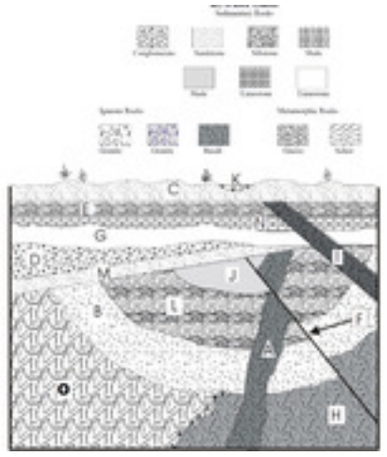
Use the picture to answer the following questions.  You can click on it to make it bigger.  Which layer of rock listed is the YOUNGEST?

- B
- C
- E
- F
- I



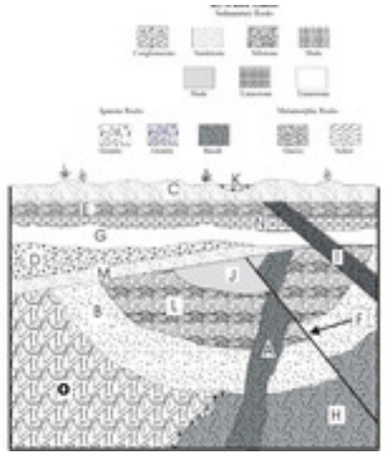
Use the picture to answer the following questions.  You can click on it to make it bigger.  Which layer of rock listed is the YOUNGEST?

- O
- F
- G
- H
- I



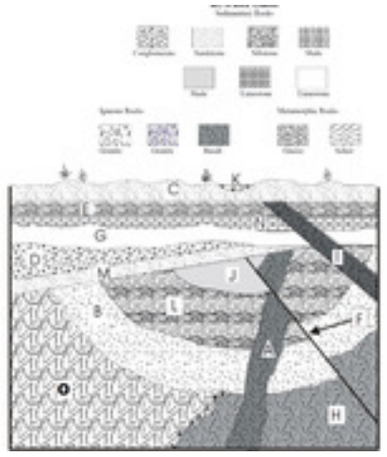
Use the picture to answer the following questions.  You can click on it to make it bigger.  Which layer of rock listed is the YOUNGEST?

- A
- D
- F
- G
- H



Use the picture to answer the following questions.  You can click on it to make it bigger.  Which layer of rock listed is the YOUNGEST?

- B
- E
- H
- L
- N



Use the picture to answer the following questions.  You can click on it to make it bigger.  What law or principle helps to determine the relative age of layer A?

- Law of Superposition
- Law of Crosscutting relationships
- Principle of Intrusive Relationships
- Principle of Lateral Continuity

# Quiz

## Section 2

## Which of the following happened FIRST in Geologic history?

- Coal-Forming Swamps
- **Appearance of Flowering Plants**
- Earth's Largest Extinction

## Which of the following happened FIRST in Geologic history?

- Breakup of Pangea
- Dinosaurs Diverse and Abundant
- Kellwasser/Hangenberg Events

## Which of the following happened FIRST in Geologic history?

- First Terrestrial Plants
- Age of Fish
- First Amphibians

Match the correct extinction event that corresponds to the correct description. Glaciation and ocean anoxia (i.e. depletion of ocean dissolved oxygen) are thought to have caused this mass extinction.

- **Quaternary Extinction**
- Ordovician-Silurian Extinction
- **Devonian Extinction**
- Permian-Triassic Extinction
- Triassic-Jurassic Extinction
- Cretaceous-Tertiary (or Cretaceous Paleogene) Extinction

**Match the correct extinction event that corresponds to the correct description.  Dinosaurs went extinct.**

- **Quaternary Extinction**
- Ordovician-Silurian Extinction
- **Devonian Extinction**
- Permian-Triassic Extinction
- Triassic-Jurassic Extinction
- Cretaceous-Tertiary (or Cretaceous Paleogene) Extinction

Match the correct extinction event that corresponds to the correct description.
Megafauna (e.g. wooly mammoths) went extinct.

- **Quaternary Extinction**
- Ordovician-Silurian Extinction
- **Devonian Extinction**
- Permian-Triassic Extinction
- Triassic-Jurassic Extinction
- Cretaceous-Tertiary (or Cretaceous Paleogene) Extinction

Match the correct extinction event that corresponds to the correct description. Evidenced in the geologic record by a thin layer of iridium in many marine and terrestrial rocks.

- **Quaternary Extinction**
- Ordovician-Silurian Extinction
- **Devonian Extinction**
- Permian-Triassic Extinction
- Triassic-Jurassic Extinction
- Cretaceous-Tertiary (or Cretaceous Paleogene) Extinction

Match the correct extinction event that corresponds to the correct description.
Greatest extinction event that wiped out the most marine genera out of all the major extinction events.

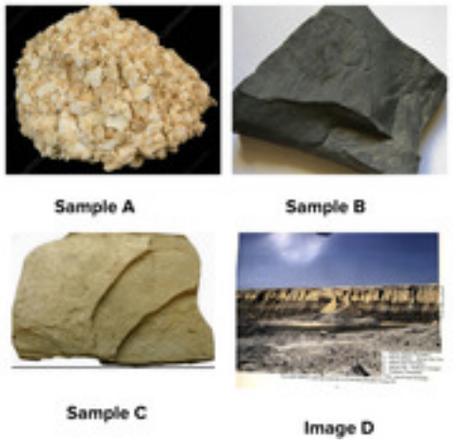
- **Quaternary Extinction**
- Ordovician-Silurian Extinction
- **Devonian Extinction**
- Permian-Triassic Extinction
- Triassic-Jurassic Extinction
- Cretaceous-Tertiary (or Cretaceous Paleogene) Extinction

**Match the correct extinction event that corresponds to the correct description.  Theorized to have been catalyzed by volcanic eruptions in the Central Atlantic Magmatic Province.**

- **Quaternary Extinction**
- Ordovician-Silurian Extinction
- **Devonian Extinction**
- Permian-Triassic Extinction
- Triassic-Jurassic Extinction
- Cretaceous-Tertiary (or Cretaceous Paleogene) Extinction

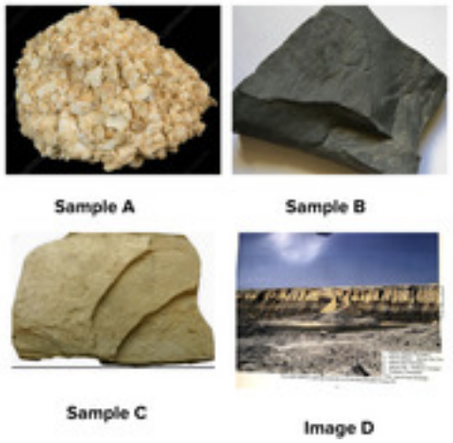
# Quiz

## Section 3



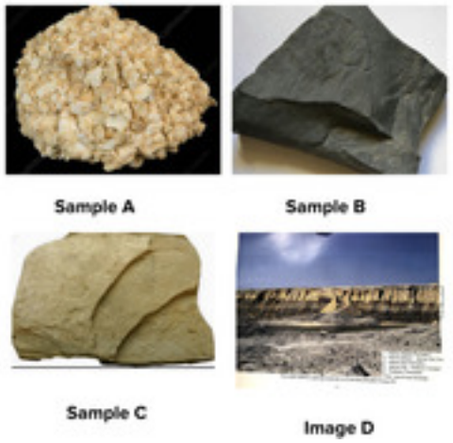

# Sample A is a picture of:

- Sandstone
- Coquina
- Shale
- Siltstone



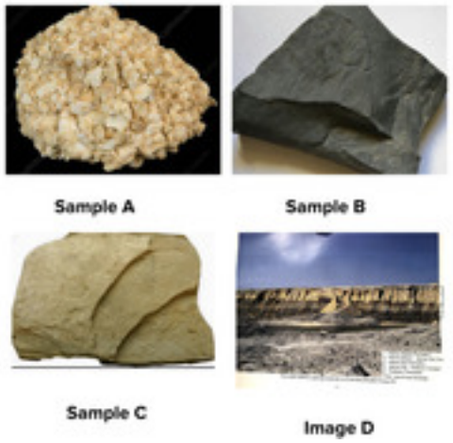

## Is sample A an example of a clastic or biochemical rock?

- Clastic
- Biochemical



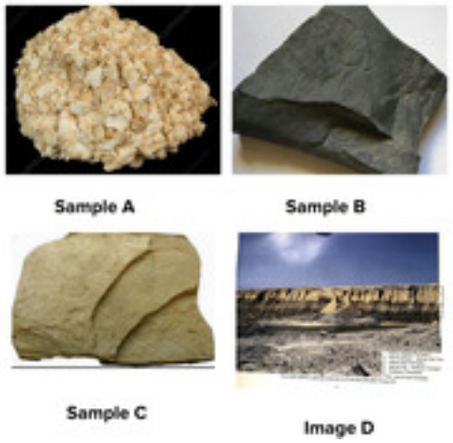

## Sample B is a picture of:

- Sandstone
- Coquina
- Shale
- Siltstone



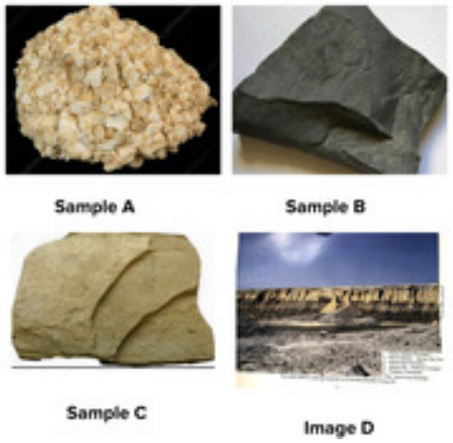

## Is sample B an example of a clastic or biochemical rock?

- Clastic
- Biochemical



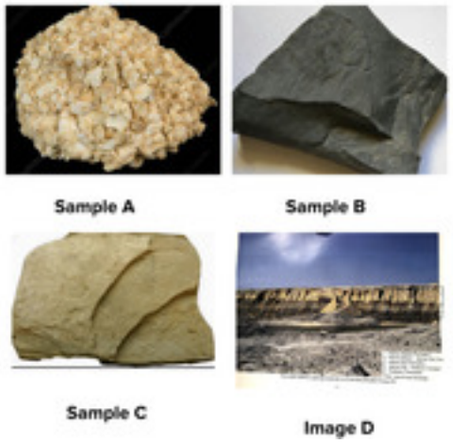

## Sample C is a picture of:

- Sandstone
- Coquina
- Shale
- Siltstone



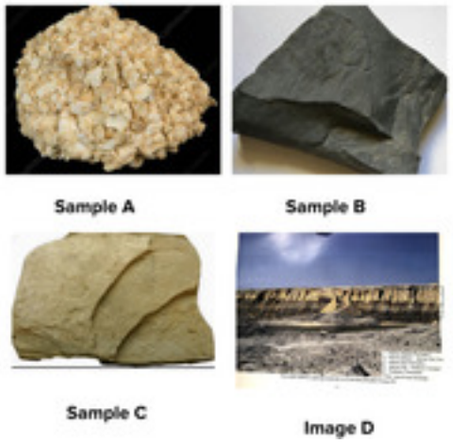

## Is sample C an example of a clastic or biochemical rock?

- Clastic
- Biochemical




# What is Sample A typically made of?

- small rocks and sand
- organic material from plants
- shells and sediments
- siliceous ooze from single celled organisms



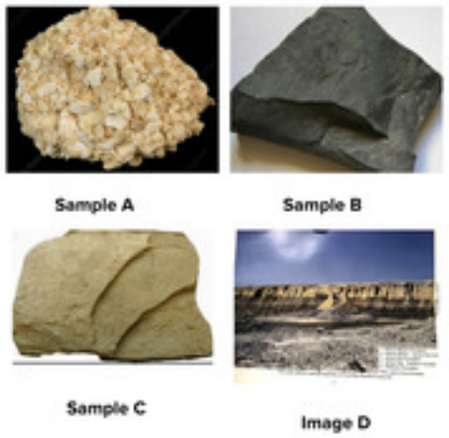

## Image D demonstrates the different layers called:

- bands
- strata
- horizons
- foliations

**Fossils are found in all three rock types.**

- True
- False

# Open Ended Question




1. Which one will most likely react with HCl? 2. What is the reaction called? Number your responses and be sure to hit Submit before the timer gets to 0:00.

# Quiz

## Section 4

Fossil A

Fossil B Fossil C

## What is the Genus for the specimen A?

- Otodus
- Carcharocles
- Carcharodon
- Lamnidae
- Otodontidae
- Cosmopolitodus

Fossil A

Fossil B Fossil C

## What is its Species for the specimen A?

- Megalodon
- Sokolovi
- Chubutensis
- Carcharias
- Hastalis

Fossil A

Fossil B Fossil C

**What is the common name for the modern counterpart for the specimen A shown in the bottom right?**

- Bull shark
- Hammerhead Shark
- Goblin Shark
- Great White Shark
- Whitetip Shark

Fossil A

Fossil B Fossil C

## What time period was this specimen A most likely present?

- Early Pliocene
- Early Miocene
- Late Pliocene
- Early Pleistocene
- Late Miocene

Fossil A

Fossil B Fossil C

## Which specimens are in the same Genus?

- A & B
- A & C
- B & C

Fossil A

Fossil B Fossil C

## What genus do they both belong to?

- Otodus
- Carcharocles
- Carcharodon
- Lamnidae
- Otodontidae
- Cosmopolitodus

Specimen A  was initially classified as what Genus when it first discovered in the middle of the nineteenth century?

- Otodus
- Carcharocles
- Carcharodon
- Lamnidae
- Otodontidae
- Cosmopolitodus

Fossil A

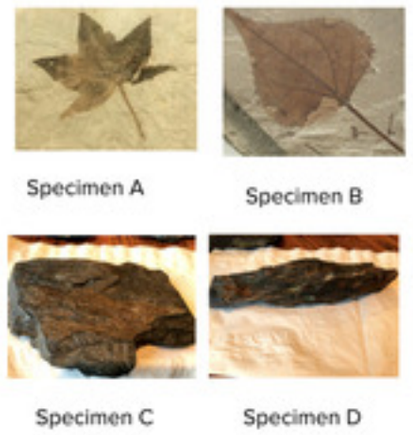
Fossil B Fossil C

**What scientist orginally made this misclassification?**

- Agassiz
- Buckland
- Ostrom
- Osborn

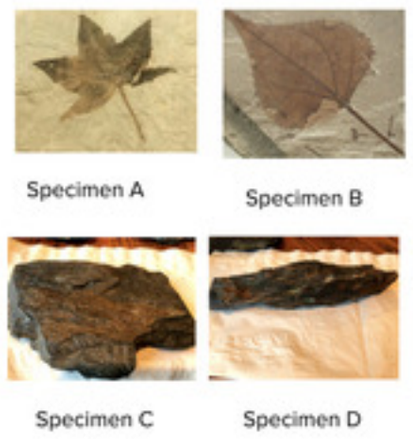
# Quiz

## Section 5



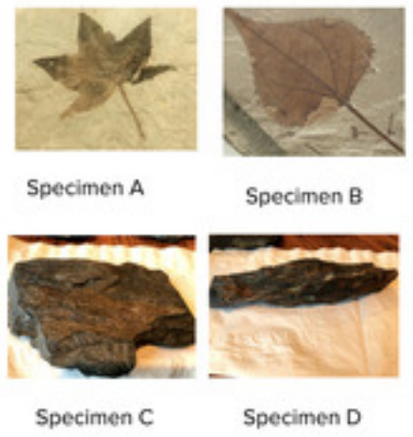

What is the genus of Specimen A?

- Acer
- Lepidodendron
- Platamus
- Populus



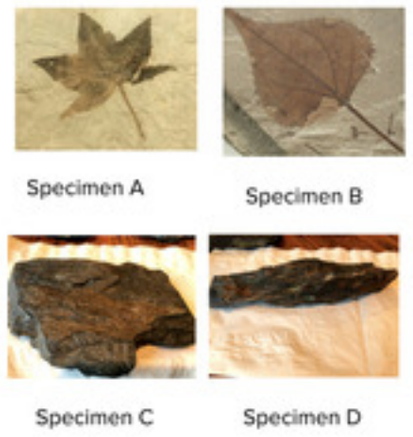

**What type of leaf arrangement is the genus of specimen A distinguished by?**

- Alternate
- Opposite
- Spiral
- Whorled



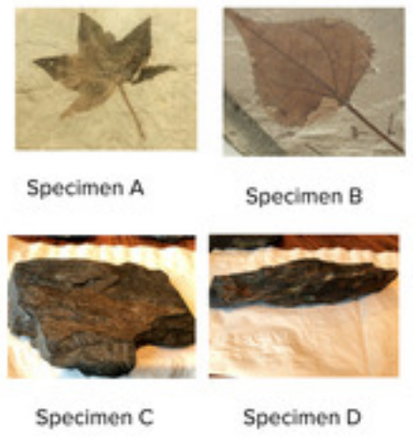

What is the genus of Specimen B?

- Acer
- Lepidodendron
- Platamus
- Populus




Specimen B’s genus has been separated into 6 separate sections based on leaf and flower characteristics.

- True
- False




Specimen D can be classified as:

- Burrow
- Coprolite
- Petrified Wood
- Trail

**Match each phylum to the correct derived trait (a derived trait is a trait that is present in this phylum but not in its ancestors).  Pinophyta**

- Seeds enclosed in fruit
- Seeds
- Vascular Tissue

**Match each phylum to the correct derived trait (a derived trait is a trait that is present in this phylum but not in its ancestors). Anthophyta**

- Seeds enclosed in fruit
- Seeds
- Vascular Tissue

**Match each phylum to the correct derived trait (a derived trait is a trait that is present in this phylum but not in its ancestors).  Pteridophyta**

- Seeds enclosed in fruit
- Seeds
- Vascular Tissue

# Quiz

## Section 6

Specimen A (two pictures)

Specimen A is a coral with many barnacles attached. While the barnacles can capture passing detritus thanks to their position on the coral, the corals are not affected at all by the barnacles' presence. This relationship is called:

- Mutualism
- Commensalism
- Parasitism
- Leeching
- Seeding

Specimen A (two pictures)

Which of the following is FALSE about trilobites?:

- They could have been carnivores
- They could have been scavengers
- They could have been detritivores
- They could have been decomposers

Specimen A (two pictures)

# Which mode of life BEST characterizes Porifera?

- Sessile benthic
- Sessile infaunal
- Sessile pelagic
- Sessile motile

Specimen A (two pictures)

Sponges can only reproduce asexually.

- True
- False

Specimen A (two pictures)

Typical adult members of Phylum Asteroidea have tetra-radial symmetry.

- True
- False

Specimen A (two pictures)

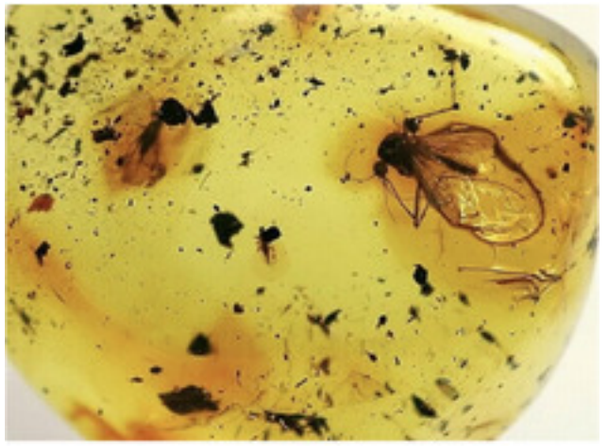
Invertebrate life appeared on Earth before vertebrate life did.

- True
- False

**Bryozoans and Brachiopods have this structure in common (they both have this structure):**

- Brachidium
- Carbonate Teeth
- Circulatory System
- Excretory System
- Lophophores

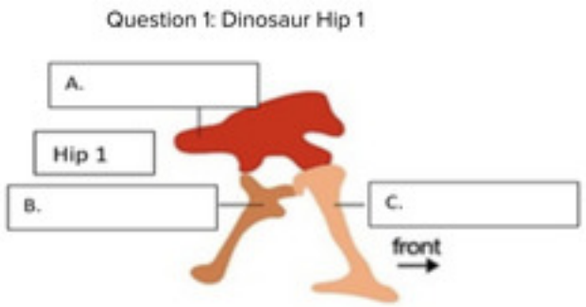
# Open Ended Question



(2pts) 1. What is the pictured material that this organism is trapped in called? 2. Identify the class of the organism trapped in the material of the Specimen. Number your answers and don't forget to hit submit before the timer gets to 0:00.

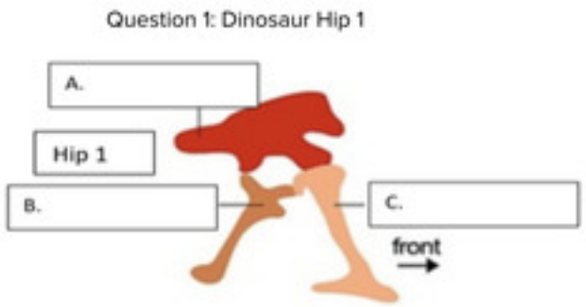
# Quiz

## Section 7



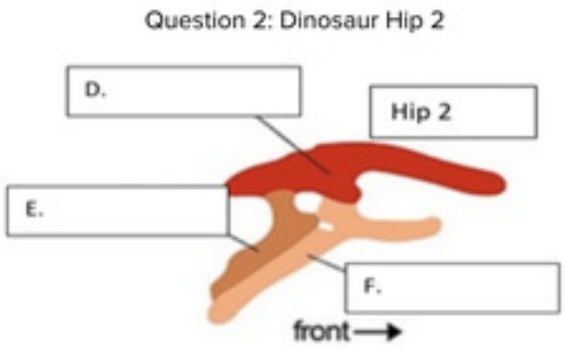

# What anatomical part is shown at A?

- Ilium
- Scapula
- Pubis
- Ischium



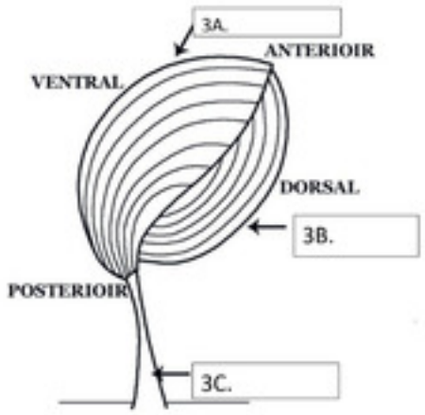

# What anatomical part is shown at C?

- Ilium
- Scapula
- Pubis
- Ischium



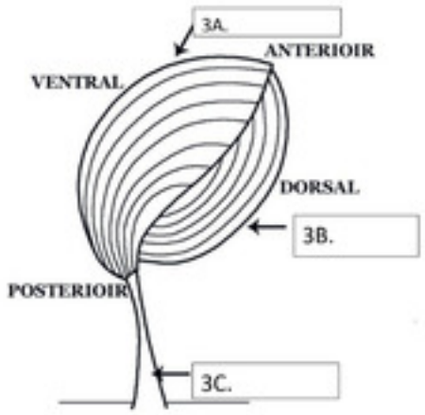

## What anatomical part is shown at E?

- Ilium
- Scapula
- Pubis
- Ischium



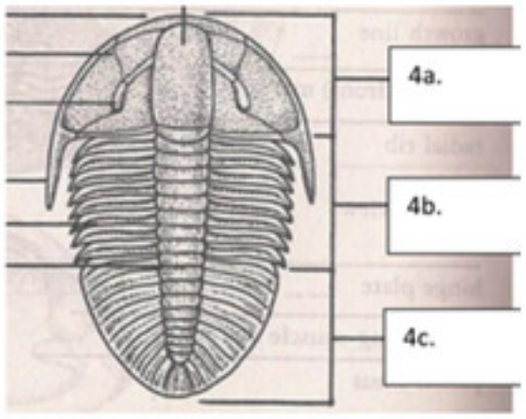

## What anatomical part is shown at 3A?

- Pedicular Valve
- Pedicle
- Brachial Valve
- Socket Wall



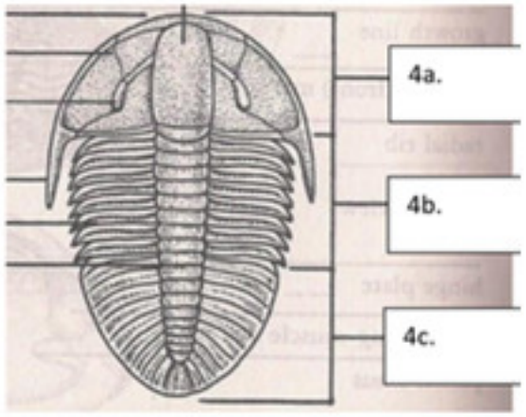

## What anatomical part is shown at 3B?

- Pedicular Valve
- Pedicle
- Brachial Valve
- Socket Wall




## What anatomical part is shown at 4A?

- Cephalon
- Thorax
- Pygidium
- Nephridium

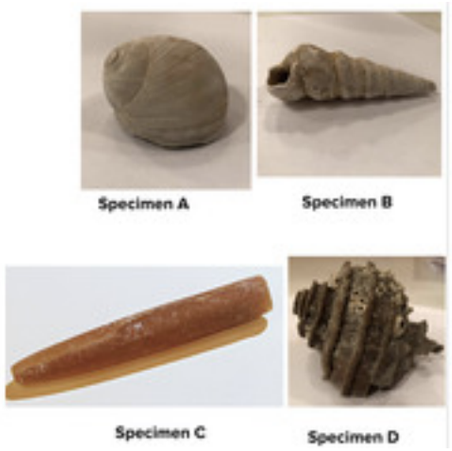



## What anatomical part is shown at 4B?

- Cephalon
- Thorax
- Pygidium
- Nephridium

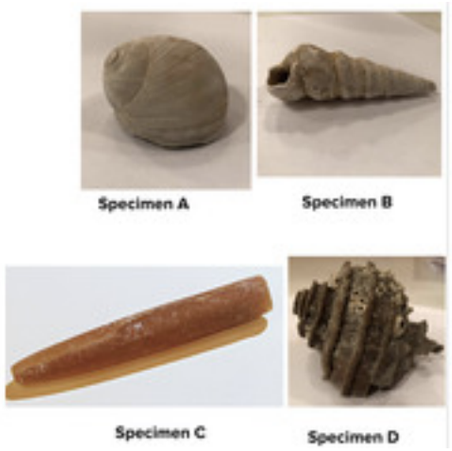
# Quiz

## Section 8



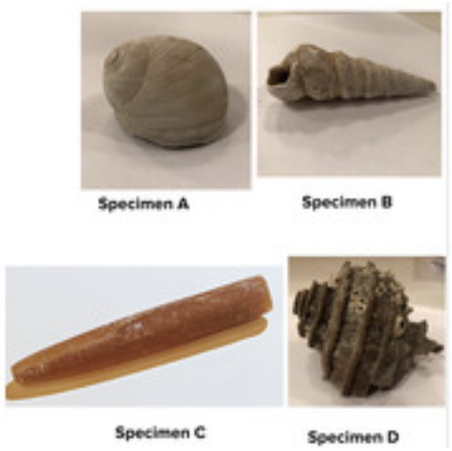

# What is the Class of Specimen A?

- Articulata
- Bivalva
- Cephalopoda
- Gastropoda



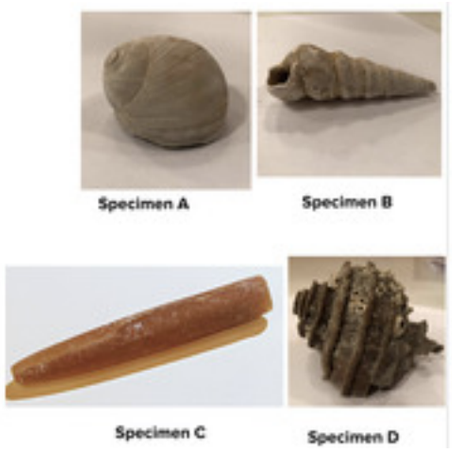

# What is the Genus of Specimen B?

- Conus
- Cypraea
- Turritella
- Worthenia



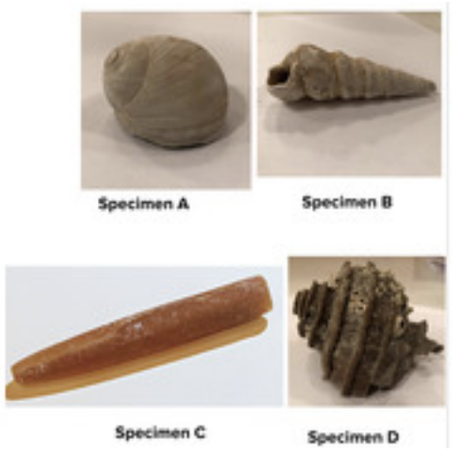

# What is the Genus of Specimen C?

- Baculites
- Belemnitella
- Pecten
- Worthenia



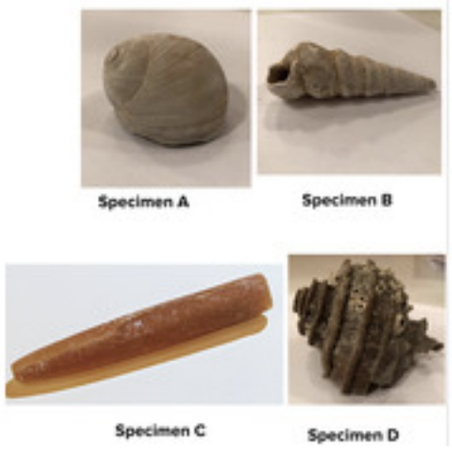

## What Phylum do all four species belong to?

- Gastropoda
- Invertebrata
- Mollusca
- Non-Chordata



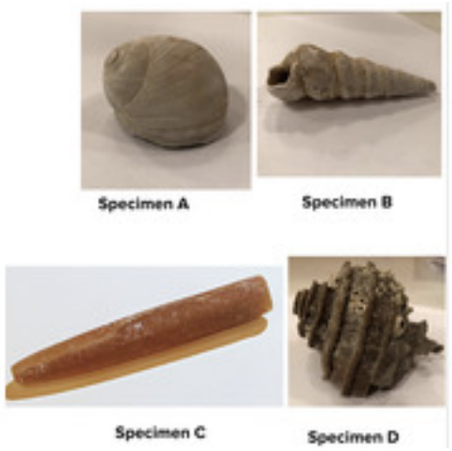

## Species D is the state fossil of which state?

- Georgia
- North Carolina
- South Carolina
- Virgina




**The part of the organism that fossilized into Specimen C is called the rostrum.**

- True
- False




## What is the purpose of the siphuncle in cephalopod mollusks?

- It works as a digestive system.
- It holds the ink sac used for protection against predators.
- It is needed to adjust buoyancy.
- It is the reproductive organ of the organism.

# Quiz

## Section 9

## Match the following types of preservations to its definition:  Carbonization

- Cavity is filled with the mineral remains
- Converting organic matter into carbon
- Impression of organism in rock
- Organic matter replaced by minerals

## Match the following types of preservations to its definition:  Cast

- Cavity is filled with the mineral remains
- Converting organic matter into carbon
- Impression of organism in rock
- Organic matter replaced by minerals

## Match the following types of preservations to its definition:  Petrification

- Cavity is filled with the mineral remains
- Converting organic matter into carbon
- Impression of organism in rock
- Organic matter replaced by minerals

Sample 1

Sample 2

## In Sample 1, which fossil is an example of a CAST?

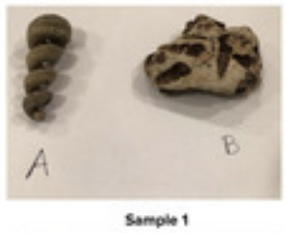
- A
- B

Sample 1

Sample 2

## In Sample 2, which fossil is an example of a MOLD?

- A
- B

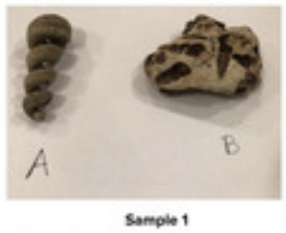



Sample 1

Sample 2

# Identify the genus of Specimen A in Sample 1.

- Turritella
- Conus
- Cypraea
- Platyceras




Sample 1

Sample 2

## Which of the pictured specimens is a steinkern?

- Specimen A in Sample 1
- Specimen B in Sample 1
- Specimen A in Sample 2
- Specimen B in Sample 2

# Open Ended Question

(3pts) What is the difference between filter feeders and suspension feeders? Don't forget to hit Submit before the timer gets to 0:00 to record your answer.

Many active suspension feeders are often referred to as 'filter feeders' because they pump water through a structure that functions as a filter, removing particles from suspension

# Quiz

## Section 10

**Trilobites that could secrete explosive nitroglycerin gel into the water to deter predators were more successful in surviving than trilobites that rolled up.**

- True
- False

During the Cretaceous, gymnosperms and insect pollinators coevolved to have a mutualistic relationship.

- True
- False

Cnidarians had stinging cells called cnidocytes to capture prey and ward off predators.

- True
- False

**Mastodon teeth had flat chewing surfaces, which allowed them to become herbivorous browsers.**

- True
- False

**Ginkgo and the Coelacanth are examples of living fossils.**

- True
- False

**Conus (cone snails) have venomous barbed stingers that can inject toxic peptides into prey or as a defense against predators.**

- True
- False

**Soft part preservation indicates that extinct ammonites had the ability to shoot ink, like some modern cephalopods.**

- True
- False

**Dimetrodon, an apex predator during the Early Permian, had neural spines could be ejected like a harpoon to capture fish and small tetrapods for food.**

- True
- False

Velociraptor’s small size allowed it to adapt and avoid going extinct in the K-T extinction.

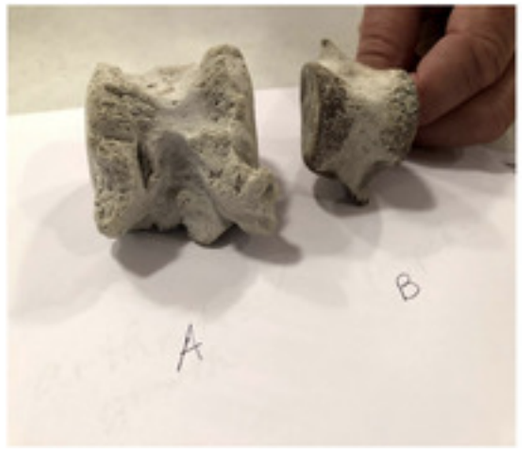
- True
- False

Halysites corals utilized stinging tentacles to catch plankton for food.

- True
- False

# Quiz

## Section 11

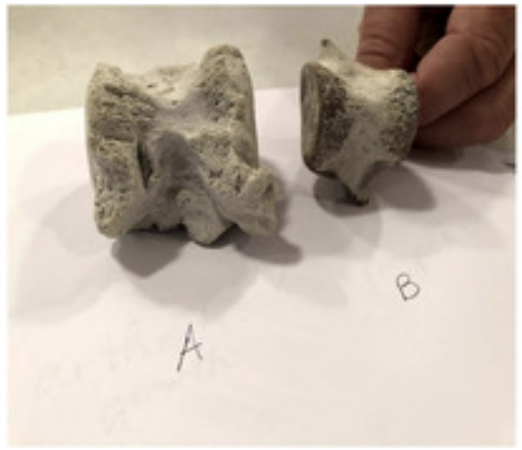



## What is the Phylum for this sample?

- Chordata
- Arthropoda
- Cnidaria
- Anthophyta

The fossils in the first question could have come from this species.  What is the class of this species?

- Agnatha
- Placodermi
- Osteichthyes
- Sarcopterygii




Both items are from the same species.  Why is image A different from Image B, which is a normal sample?

- Sample A was crushed in a fight or accident
- Sample A had a disease or arthritis
- Sample A was smashed in the fossilization process

**What type of consumer is this species?**

- Filter feeders
- Grazers
- Scavengers
- Suspension feeders

## In what habitat did this species live?

- Benthic
- Littoral
- Pelagic
- Terrestrial

## Which mode of life best fits this species?

- Benthic
- Nektonic
- Planktonic
- Infaunal

# Quiz

## Section 12

**Which one of these options is the correct definition for an index fossil?**

- **A fossil that can give the exact numerical age of a rock sample.**
- **A fossil that is useful for dating and correlating the strata in which it is found.**
- A genus that has been cataloged, hence “indexed,” by the US government’s paleontological database.
- **A rare type of fossil that can only be found at Lagerstatten.**

## Which of these features would make for a good index fossil?

- It lived during many time periods
- It's difficult to identify and rare to find
- It had a cosmopolitan distribution
- It lived in acidic water
- It was a scavenger

Ammonites are good index fossils.

- True
- False

Which one of these fossils would be the best choice for an index fossil for identifying marine rock from the Paleozoic Era?

- Ammonites
- Gastropods
- Scallops (Pecten)
- Trilobites

## Which one of these fossils would be the best choice for an index fossil for identifying marine rock from the Mesozoic Era?

- Ammonites
- Graptolites
- Mucrospirifer
- Trilobites

# Open Ended Question

(2pts) What specific traits are common to all extinction events, both during and after the event occurs? Don't forget to hit Submit before the timer gets to 0:00.

# Quiz

## Section 13

## Which mineral replaced the original parts in this ammonite (specimen A)?

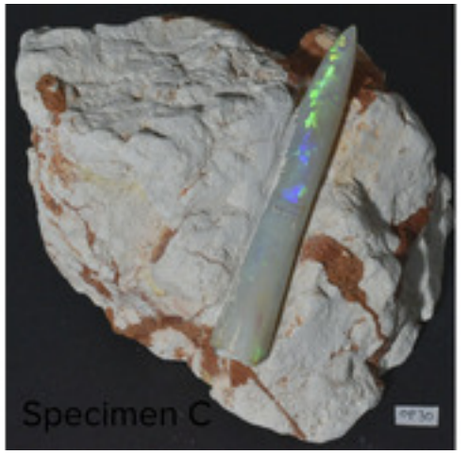
- Brass
- Bronze
- Copper
- Gold
- Pyrite

**Some sponge spicules, corals, and forams are all composed of this substance.**

- Biological Apatite
- Calcium Carbonate ($CaCO_3$)
- Cartilage
- Collagen
- Iron (Fe)

**The corals (specimen B) fossilized via this process:**

- Agatization
- Aragonitization
- Carbonization
- Opalization
- Pyritization




**The mollusk (specimen C) pictured fossilized via this process:**

- Agatization
- Carbonification
- Iridescence Permeation
- Opalization
- Quartz Permeation

**Vertebrate teeth enamel naturally contain this substance:**

- Aragonite
- Calcium Carbonate
- Hydroxyapatite (Calcium Phosphate)
- Silica

# Quiz

## Section 14

Match the Lagerstatten to the correct description.  Fossil deposits correlate to the Cambrian-age Stephen Formation, composed of dark shale.

- Beecher's Trilobite Bed
- **Burgess Shale**
- **Ghost Ranch**
- **Green River Formation**
- **Mazon Creek**
- **Yixian Formation**

Match the Lagerstatten to the correct description.  A large “graveyard” of Coelophysis was discovered at this site, and this site is overall known for a notable concentration of preserved Coelophysis

- Burgess Shale
- Ghost Ranch
- Green River Formation
- La Brea Tar Pits
- Mazon Creek
- Solnhofen Limestone

Match the Lagerstatten to the correct description.  You could find the fish fossil pictured to the right, and other fish fossils, at this site's high yield split fish layer.

- Beecher's Trilobite Bed
- **Ghost Ranch**
- **Green River Formation**
- **La Brea Tar Pits**
- **Mazon Creek**
- **Yixian Formation**

Match the Lagerstatten to the correct description.  Notable for discoveries of non-avian feathered theropod dinosaurs.

- Beecher's Trilobite Bed
- **Ghost Ranch**
- **Green River Formation**
- **Mazon Creek**
- **Solnhofen Limestone**
- **Yixian Formation**

Match the Lagerstatten to the correct description.  Archaeopteryx was discovered here, and exceptional preservation contributed evidence to suggest that Archaeopteryx was a feathered dinosaur.

- Beecher's Trilobite Bed
- **Burgess Shale**
- **La Brea Tar Pits**
- **Mazon Creek**
- **Solnhofen Limestone**
- **Yixian Formation**

Match the Lagerstatten to the correct description.  Known for fossils that are preserved by pyrite replacement (pyritization). This site has low organic content and a high dissolved iron concentration.

- Beecher's Trilobite Bed
- **Burgess Shale**
- **La Brea Tar Pits**
- **Mazon Creek**
- **Solnhofen Limestone**
- **Yixian Formation**

Match the Lagerstatten to the correct description.  Located in modern-day Los Angeles, California. Asphalt deposits trapped and preserved very unlucky animals.

- Beecher's Trilobite Bed
- **Ghost Ranch**
- **Green River Formation**
- **La Brea Tar Pits**
- **Mazon Creek**
- **Yixian Formation**

**Match the Lagerstatten to the correct description.  You could find the fossils preserved in concretions like the one pictured to the right at this site.**

- Beecher's Trilobite Bed
- **Ghost Ranch**
- **Green River Formation**
- **Mazon Creek**
- **Solnhofen Limestone**
- **Yixian Formation**

# Quiz

## Section 15

**Of the following options, which one are modern humans most closely related to?**

- Megalodon Shark
- Starfish
- Lobster
- Bacteria

## Triceratops was:

- A browser
- An herbivore
- A scavenger
- A carnivore

**Stromatolites form in part due to biofilms secreted by zooplankton.**

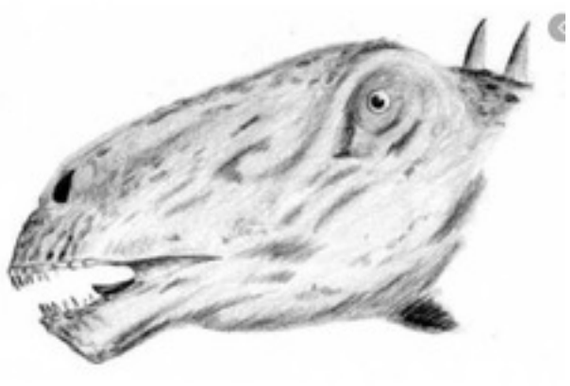
- True
- False

**Identify the genus of this specimen.**

- Parasaurolophus
- Spinosaurus
- Maiasaura
- Diplodocus

**Identify the genus of this specimen.**

- Parasaurolophus
- Spinosaurus
- Maiasaura
- Diplodocus



**Identify the genus of this specimen.**

- Parasaurolophus
- Spinosaurus
- Maiasaura
- Diplodocus

**This species had an excellent sense of smell.**

- True
- False

Herbivorous dinosaurs with long necks, such as Brachiosaurus, were grazers.

- True
- False

# Open Ended Question

(2pts) What are the anatomical advantages of a bilaterally symmetrical body plan? Don't forget to hit submit before the timer gets to 0:00.

Bilaterally symmetrical animals can move more quickly than animals with other body plans. Animals can see and hear more. There is more thorough nervous system being developed. It forms a head and tail so everything does not have to use the same opening.

# You are done!