Names: **KEY** Score: _____/182

**Fossils SSSS-2020 KEY**

**Station 1:**

1. Name the phylum and subclass of this specimen: **[2 pts]**
    a. Phylum: Mollusca
    b. Subclass: Ammonoidea
2. Suture patterns are something characteristic of this subclass. What are they and what are the 3 different types of suture patterns unique to this subclass? **[4 pts; 1 pt for definition; 1 pt for each type]**

Suture pattern are the line that makes contact with the septa and the interior of the shell. The 3 types of ammonite suture patterns are: goniatitic, which occurred in ammonites during the Devonian to the Permian period, ceratitic, which occurred in ammonites during the Late Permian to Triassic period, and ammonitic, which occurred in ammonites during the Jurrasic and Cretaceous periods.

3. This specimen shows what kind of suture pattern? **[1 pt]** Ammonitic
4. Using the suture pattern of this specimen, what is the temporal range of the specimen **[1pt]**? Jurassic to Cretaceous

**Station 2:**

1. Name the clade that both of these specimens belong to **[1 pt]**: Dinosauria
2. Which orders do specimens A and B belong to? **[2 pts]**
    a. Specimen A: Ornithischia
    b. Specimen B: Saurischia
3. Which anatomical feature is used to tell these 2 orders apart? **[1 pt]**
   The pubis
4. What are the 2 evolutionary reasons this feature is different in both orders? **[2 pts; 1 pt for each reason provided]** The pubis could have been pointing backwards for the ornithischians to allow them to have more space for digestion and the 2 different hip configurations could have indicated different methods of respiration.
5. Which order are birds more closely related to? **[1 pt]** Saurischia
6. Name the genus of both specimens: **[2 pts]**
    a. Specimen A: Allosaurus
    b. Specimen B: Stegosaurus

**Station 3:**

Names: **KEY** Score: _____/182

1. What is the definition of a lagerstatte? **[1 pt]**
   A fossil site depicting extraordinary preservation.
2. What lagerstatte is this specimen from? **[1 pt]** Burgess Shale
3. What period does this lagerstatte date from? **[1 pt]** Cambrian
4. What is this lagerstatte famous for? **[2 pts; 1 pt for each reason]**

It is famous for the preservation of its soft parts and its record of Cambrian fossils.

5. What are some organisms typically preserved in this formation? **[3 pts; 1 pt for each organism]** Some organisms preserved are: arthropods, worms, crinoids, sea cucumbers, chordates, etc.

**Station 4:**

1. Name the genus of both specimens: **[2 pts]**
   a. Specimen A: Eldredgeops
   b. Specimen B: Calymene
2. What order do both of these specimens belong to? **[1 pt]** Trilobita
3. What mode of life characterizes this order? **[1 pt]** Benthic (Some were pelagic)
4. What type of eyes do both specimens have? **[2 pts]**
   a. Specimen A: Schizochroal
   b. Specimen B: Holochroal
5. Specimen A is the state fossil of Pennsylvania. **[1 pt]**

**Station 5:**

1. Name the genus of these specimens: **[3 pts]**
   a. Specimen A: Calamites
   b. Specimen B: Lepidodendron
   c. Specimen C: Glossopteris
2. What habitat was Specimen A found in? **[1 pts]** Wet, warm climate and swamps
3. Why did Specimen B go extinct? **[2 pts]**
   It went extinct when its habitat, swamps, disappeared.
4. Where was Specimen C found? **[3 pts; 0.5 pts per place]** South America, Africa, India, Australia, New Zealand, and Antarctica
5. What is the significance of Specimen C? **[3 pts]**

Since Specimen C was found on several continents, it was used to support the Theory of Continental Drift and to prove the existence of Pangea.

**Station 6**

Names: **KEY** Score: _____/182

1. Identify the modes of preservation of Specimens A-F **[6 pts]**
    a. Specimen A: Mold
    b. Specimen B: Cast
    c. Specimen C: Petrification
    d. Specimen D: Carbonization
    e. Specimen E: Pyritization
    f. Specimen F: Actual remains (also acceptable: amber)

**Station 7:**

1. Name the genus of these specimens: **[7 pts]**
    a. Specimen A: Atrypa
    b. Specimen B: Composita
    c. Specimen C: Lingula
    d. Specimen D: Rafinesquina
    e. Specimen E: Mucrospirifer
    f. Specimen F: Platystrophia
    g. Specimen G: Leptaena
2. What phylum do all of these specimens belong to? **[1 pt]** Brachiopoda
3. Which specimen is inarticulate? **[1 pt]** Specimen C
4. What are the differences between inarticulate and articulate specimens? **[2 pts]**

Articulates have a hinge between its valves, while inarticulates don't have a hinge.

**Station 8:**

1. Name the genus of these specimens: **[5 pts]**
    a. Specimen A: Conus
    b. Specimen B: Turritella
    c. Specimen C: Worthenia
    d. Specimen D: Cryphea
    e. Specimen E: Platyceras
2. What phylum do all of these specimens belong to? **[1 pt]** Mollusca
3. Which of these specimens are still extant? **[1 pt]** Specimens A, B, and D
4. Who discovered Specimen C? **[1 pt]** Amos Henry Worthen
5. Specimen E is sometimes found with crinoids. Why? **[2 pts]**

Platyceras had a symbiotic relationship with crinoids, which is why they are sometimes found together.

**Station 9:**

1. Name the genus of these specimens: **[6 pts]**
    a. Specimen A: Mammut

b. Specimen B: Mammuthus
c. Specimen C: Mesohippus
d. Specimen D: Dimetrodon
e. Specimen E: Lystrosaurus
f. Specimen F: Smilodon

2. Two of these specimens don't belong. Which specimens and why? **[2 pts]**

Specimens D and E don't belong because they aren't mammals. They are synapsids, which are mammal-like reptiles.

3. Why is Specimen E significant? **[3 pts]**

Specimen E was found on several continents, so it was used to support the Theory of Continental Drift and to prove the existence of Pangea.

4. What are some differences between Specimen A and B? **[2 pts; 1 pt for each difference provided]**

Specimen A was slightly smaller than Specimen B with lower, flatter heads and smaller legs. Specimen B had a hump which provided them extra nutrients in its colder habitats. Specimen A had cone-shaped cusps on its molars which helped it eat leaves, twigs, and branches, while Specimen B had ridged molars allowing it to eat like modern-day elephants and cut through vegetation.

5. What are 2 possible purposes for Specimen D's sail? **[2 pts; 1 pt for each purpose]**

Specimen D could have used its tail for courtship or temperature regulation.

**Station 10:**

1. Identify Specimens A-F: **[6 pts]**
   a. Specimen A: Burrows
   b. Specimen B: Trails
   c. Specimen C: Tracks
   d. Specimen D: Tubes
   e. Specimen E: Repair Scar
   f. Specimen F: Coprolite

**Station 11:**

1. Name the genus of this specimen: **[1 pt]** Archaeopteryx
2. What habitat did this specimen live in? **[1 pt]** Warm, dry archipelago near equator
3. What time period did this specimen live in? **[1 pt]** Late Jurassic
4. What were the eating habits of the genus? **[1 pt]** Carnivorous
5. This genus is considered a transitional fossil. What is a transitional fossil and why is this genus considered one? **[3 pts; 1 pt for definition of a transitional fossil, 2 pts for explanation: 1 pt for avian features, 1 pt for reptilian features]** A transitional fossil is a fossil with features from its ancestral group and its descendant group. This genus is a

transitional fossil between reptiles and birds. Archaeopteryx had avian features like feathers and the ability of flight. It also had reptilian features like jaws with sharp teeth and extendible second claws.

**Station 12:**

1. Name the genus of Specimens A-E: **[5 pts]**
    a. Specimen A: Favosites
    b. Specimen B: Halysites
    c. Specimen C: Heliophyllum
    d. Specimen D: Hexagonaria
    e. Specimen E: Septastrea
2. What class do all these specimens belong to? **[1 pt]** Anthozoa
3. Which specimens are rugose corals? **[2 pts; 1 pt for each correct specimen]** Specimens C and D
4. What is the difference between rugose and tabulate corals? **[3 pts; 1 pt for each difference]**

Tabulate corals are mostly colonial, while rugose corals are both colonial and solitary. Tabulate corals have weak or absent septa, while rugose corals have well developed septa. Tabulate corals have radial symmetry, while rugose corals have bilateral symmetry.

5. Which specimens were solitary? **[1 pt]** Specimen C
6. Which specimen is Michagan's state stone? **[1 pt]** Specimen D

**Station 13:**

1. Name the class of this specimen: **[1 pt]** Graptolithina
2. What is the temporal range of this class? **[1 pt]** Cambrian to Carboniferous
3. Was this animal colonial or solitary? **[1 pt]** Colonial
4. What was the mode of life of this class? **[2 pts; 1 pt for each mode of life]**

Cambrian: sessile; early Ordovician: pelagic

5. What was an individual of this class called? **[1 pt]** Zooid
6. What is the meaning of the name of this class? **[1 pt]** Pencil marks on rock (Graptos "written" & Lithos "rock")

**Station 14:**

Names: **KEY** Score: _____/182

1. Speed ID! Identify Specimens A-O to the most specific classification possible: **[15 pts]**
    a. Specimen A: Genus Astraeospongia
    b. Specimen B: Genus Archimedes
    c. Specimen C: Genus Coelophysis
    d. Specimen D: Class Echinoidea
    e. Specimen E: Genus Hydnoceras
    f. Specimen F: Family Mosasauridae
    g. Specimen G: Genus Pecopteris
    h. Specimen H: Genus Worthenia
    i. Specimen I: Genus Diplocaulus
    j. Specimen J: Genus Halysites
    k. Specimen K: Genus Velociraptor
    l. Specimen L: Genus Basilosaurus
    m. Specimen M: Species C. Megalodon
    n. Specimen N: Genus Titanis
    o. Specimen O: Genus Cryptolithus

**Station 15:**

1. Using relative dating, order events A-I chronologically: **[9 pts]**
   H, G, F, I, D, C, B, E, A

**Station 16:**

1. Name the genus of Specimens A-F **[6 pts]**
    a. Specimen A: Tyrannosaurus
    b. Specimen B: Triceratops
    c. Specimen C: Coelophysis
    d. Specimen D: Iguanodon
    e. Specimen E: Dilophosaurus
    f. Specimen F: Parasaurolophus
2. Which of these specimens are herbivores? **[3 pts; 1 pt for each correct specimen]**
   Specimens B, D, F
3. What are 3 possible functions for Specimen E's crest? **[3 pts; 1 pt for each correct function]**

Specimen E could have used its crest for species recognition, display, or for thermoregulation.

4. Specimen C was thought to be a cannibal. What evidence points to that? **[2 pts]**

A fossil of Specimen C with a juvenile inside an adult's gut points to cannibalism.

5. What are 2 possible functions for Specimen B's horns? **[2 pts; 1 pt for each function]**

The horns could have been used for fighting or for display.

**Station 17:**

Names: **KEY** Score: _____/182

1. Name the genus of Specimen A-D: **[4 pts]**
    a. Specimen A: Diplocaulus
    b. Specimen B: Tiktaalik
    c. Specimen C: Eryops
    d. Specimen D: Acanthostega
2. Which of these specimens are different from the others? Why? **[2 pts, 1pt for correct specimen, 1 pt for reason]** Specimen B, because it is a fish (in the class Sarcopterygii, lobe-finned fishes) while the other specimens are amphibians.
3. Why is Specimen B a transitional fossil? **[2 pts; 1 pt for fish-like characteristics, 1 pt for tetrapod-like characteristics]** Specimen B was a transitional fossil between fish and tetrapods. It had fish-like features, like scales and fins, and tetrapod-like characteristics, like wrists, elbows, and shoulders.
4. Which specimens coexisted with each other? **[2 pts; 1 pt for each pair]**

Specimens A and C (Late Carboniferous to Permian) and Specimens B and D (Late Devonian)

5. What was the purpose of the unusual shape of Specimen A's head? **[1 pt]**

The shape of the head could have generated lift and allowed Specimen A to move in the water.

6. How did Specimen C capture its prey? **[2 pts]**

Specimen C would grasp its prey while moving forward, forcing the prey into its mouth.

**Station 18:**

1. Name the genus of Specimens A-D: **[4 pts]**
    a. Specimen A: Exogyra
    b. Specimen B: Gryphaea
    c. Specimen C: Pecten
    d. Specimen D: Glycymeris
2. Which of these specimens has the nickname 'Devil's Toenail'? **[1 pt]** Gryphaea (Exogyra also acceptable
3. What class are these specimens in? **[1 pt]** Bivalvia
4. What defines this class? **[2 pts]**

Bivalves are characterized by 2 valves which are connected by a hinge.

5. Which specimens are still extant? **[2 pts; 1 pt for each specimen]** Specimens C and D.

Names: **KEY**

Score: _____/182