EAES/BIOS 360 EXTRA CREDIT ASSIGNMENT!
OSTEOLOGY OF DINOSAURS AT THE FIELD MUSEUM

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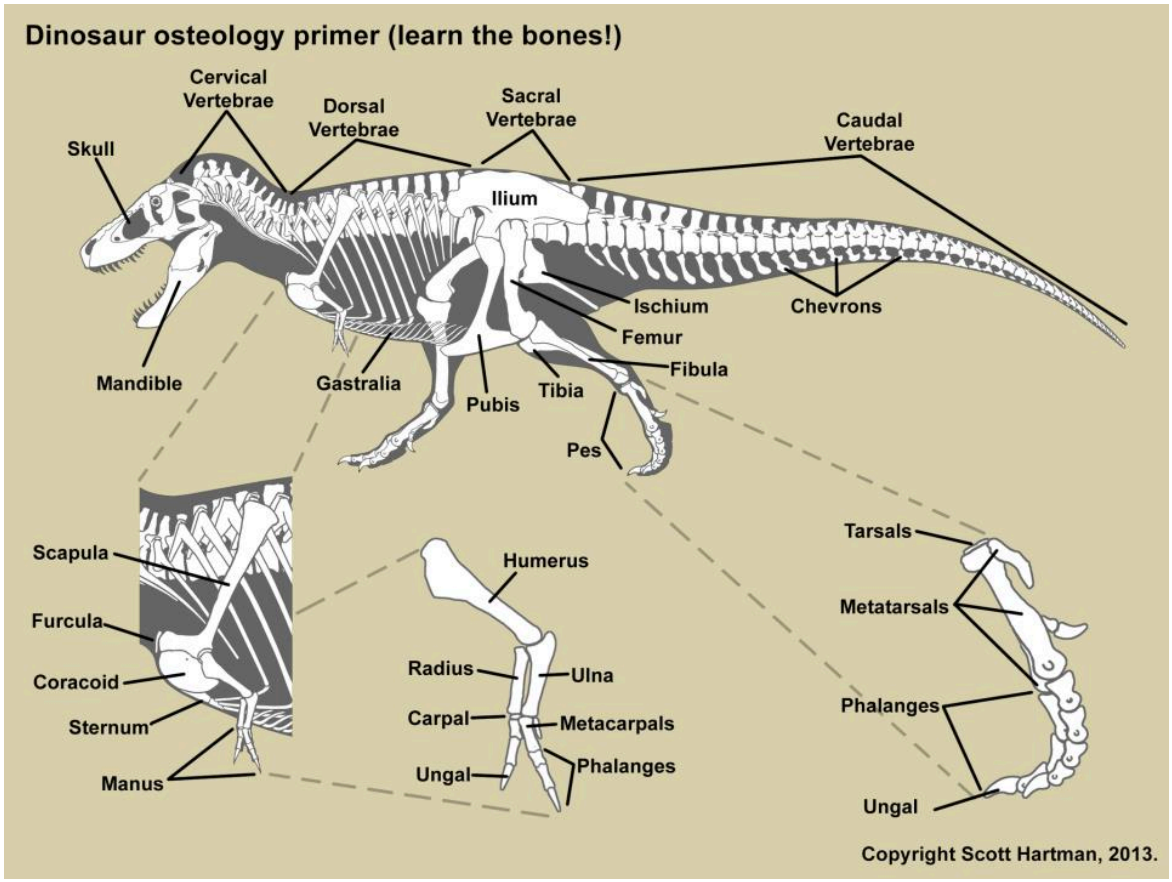
Worth 2 points.

- This exercise will work best if you go to the museum together with some of your fellow students. Your goal is to determine answers to the questions below. These are not easy—they require focus, careful observation, and discussion with other students (because each person's eyes will likely pick up different things).
- Record notes, and (if you wish) make sketches. Bring your textbook along to help.
- As homework, you will compile your notes into clear, organized typed answers, which you will turn in on online by Nov. 23. Use appropriate anatomical and directional terminology in your descriptions. You will not be turning in your sketches. (Those are your own study aids).

Note: except for *Tyrannosaurus* ("Sue") the dinosaurs are part of the Evolving Planet exhibit on the 2nd floor.

Questions:

1. What are the ways in which you can distinguish vertebrae from different regions of the axial skeleton (cervicals vs. dorsals vs. caudals)? Use *Dasplesosaurus (or Tyrannosaurus), Triceratops*, and *Parasaurolophus* for this question. I am interested in how you would distinguish bones from different regions in the same animal. Don't worry about comparing the animals to each other (yet).
2. What are the ways in which you can distinguish caudal vertebrae of hadrosaurs (use *Parasaurolophus*) from caudal vertebrae of ceratopsians (use *Triceratops*)**?**
3. What are the ways in which you can distinguish caudal vertebrae of theropods (use *Allosaurus*) from caudal vertebrae of ornithischians (use *Parasaurolophus*)?
4. Discuss how the morphology of ribs differs in the different regions of the axial skeleton (cervical vs. dorsal vs. caudal). Consider both the morphology of the ribs themselves and the ways in which they articulate with the vertebrae. Use *Triceratops* for this question.
5. What are distinguishing features of each of the six major limb bones ("the long bones": femur, tibia, and fibula in the hindlimb; humerus, ulna, radius in the forelimb) that allow you to tell them apart? Consider both proximal and distal ends, as well as any prominent features on the shaft. In this question I want you to focus on general patterns that you can observe in all of the dinosaurs listed. Regardless of lineage or posture (quadrupedal vs. bipedal) there are commonalities. Use *Daspleosaurus, Triceratops,* and *Apatosaurus*
6. Describe the difference between the saurischian (*Allosaurus*) and ornithischian (*Triceratops)* pelvis.
7. Is *Stegosaurus* a saurischian or an ornithischian, and how can you tell?
8. Compare the teeth in the skulls of *Tyrannosaurus* (Sue) and *Triceratops*. How do the shapes of the teeth correspond to the animals' diets?



Classification of the FMNH Dinosaurs (full skeletons only)

Dinosauria
- Ornithischia
  - Stegosauria
    - *Stegosaurus*
  - Ornithopoda
    - *Parasaurolophus*
    - *Maiasaura*
  - Ceratopsia
    - *Triceratops*
    - *Protoceratops*
- Saurischia
  - Sauropodomorpha
    - *Apatosaurus*
    - *Rapetosaurus*
  - Theropoda
    - *Tyrannosaurus*
    - *Daspletosaurus*
    - *Herrerasaurus*
    - *Deinonychus*
    - *Buitreraptor*