

Directions

So this is your final exam! Unlike previous exams, this one (and the lab practical, also posted) is entirely online. As I've said a few times in class, I **expect and encourage** you to collaborate, and to use every resource at your disposal to answer these questions. Your “weekly question” and participation grades for this last week will be based solely on your contributions to discussions regarding these questions.

Presentation

1. (10 points) Frequently over the course of this semester, I lamented not being able to go into more detail about pretty much every group of vertebrates we covered, as they're all great. Now is an opportunity to ameliorate that somewhat. For these **10 points**, I want you to make a 10-slide presentation on some **specific** vertebrate group of your choice, focusing especially on their anatomy and how it links to their ecology and evolutionary history. You should focus at the level of genus, although for some small groups a higher level clade (like a "family") might be appropriate.

Each of you must do a different group. "Claim" your group by posting a reply to this thread declaring what group you want to research. You may change this one time. This will be first-come, first-choice.

I would like for you to make your slides primarily from primary research paper figures. The journals of Anatomy & Morphology (Journal of Morphology: <https://onlinelibrary.wiley.com/journal/10974687>; Journal of Anatomy: <https://onlinelibrary.wiley.com/journal/14697580>) will be particularly helpful, although you're free to use articles from any similar journal you find. You may need a VPN to access these, since we're all off-campus, but you may find free & legal access to the articles via ResearchGate, Academia.edu, the Unpaywall Chrome extension (<https://unpaywall.org/>), or even on the first author's personal webpage.

The website Sci-Hub is a safe but illegal way to quickly and easily access copy-righted papers. I am legally compelled to discourage those of you who may have found the website Sci-Hub (from a simple google search of the name "Sci-Hub") from using this safe & easy way of accessing papers quickly, as it does infringe on copyright. So do not google "Sci-Hub" to find a mirror to that website, and do not use Sci-Hub to quickly and safely access papers you cannot get off-campus, as it infringes copyright and I must discourage it.

If you try but absolutely cannot find an off-campus way to access a paper you think you need, let me know and I will access it for you from campus.

The notes on the slides should help clarify the major aspects of the figure, and you can cite your sources by putting links to the papers in the lecture notes of each slide.

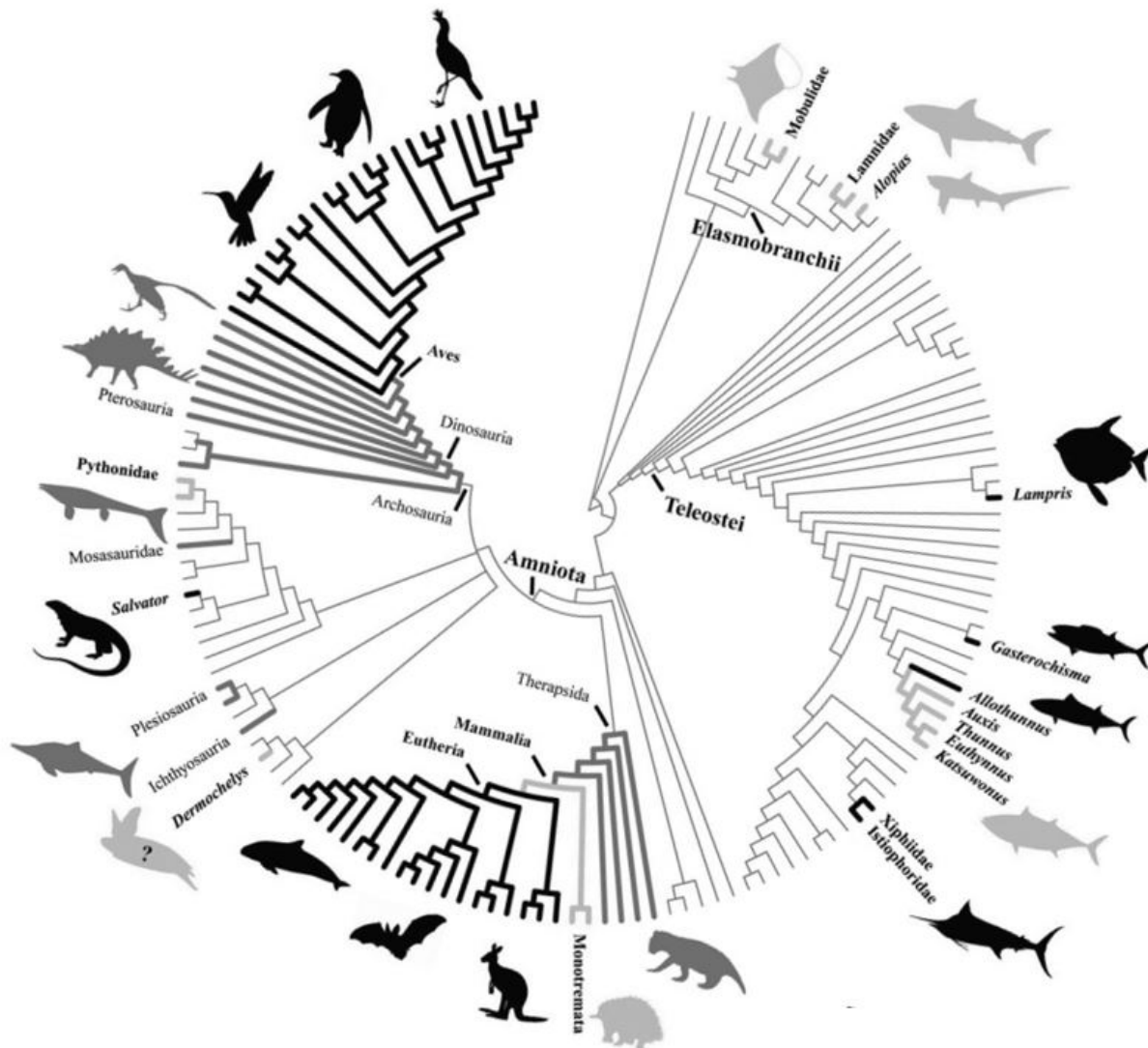
To turn this question in, create a new thread on the forum and post a Google Drive link that is set to allow anyone with the link to access there.

2. (2 points) Please review your fellow student's presentations, and ask them two questions about their chosen group's anatomy and ecology. The harder the question you ask, the better I will view this. If a student has already been asked three questions, please choose someone else to ask.

3. (3 points) Please answer all questions your fellow students ask about your group.

Questions

For the following questions, please send me an email with your answers and any necessary attachments. You're free to discuss these on the class forum. Note that the four extra credit points are "easy" in that they should be readily determinable from our lectures or from simple searches.



4. (3 points) (a) What trait or traits unite all of the bold branches on the phylogeny above (note: some extinct taxa are shown here also bolded; you can ignore those as the basis for linking this trait to them is not something we covered and I don't want them to distract you). (b & c) Please choose *three* of these groups and write a short explanation comparing and contrasting how this trait / these traits manifest in those clades.



5. (2 points) This photo was taken in the Neuquen province of Argentina, not far from Villa El Chocon. Please identify the creature shown as precisely as you possibly can, and give your anatomical justifications for any identifications you provide (e.g., if you think it's a rare species of Alaudidae, you'd probably want to say why you think it's a tetrapod, why you think it's an amniote, why you think it's in Aves, why you think it's in Passeriformes, and why you think it's in Alaudidae).

Extra Credit

6. (1 point) What's the largest (in terms of species number) tetrapod clade to have never evolved any form of viviparity?
7. (1 point) We've mostly focused on species diversity in lecture, but abundance is a key factor in vertebrate ecology. Biomass refers to the total mass of all living individuals of a species or clade within a region. Within our region, the Appalachian Mountains, which major vertebrate clade (Anura, Caudata, Gymniophiona, Mammalia, Aves, Testudines, Crocodylia, or Lepidosauria) has the largest **biomass** (include links to any sources you used for this one).
8. (1 point) Living alongside my family, I have a number of pets, including a *Canis familiaris*, a *Salvator merianae*, and four *Neurergus crocatus*. Please email me a hand-drawn phylogeny of the vertebrate species living in my home.
9. (1 point) What vertebrate is best, in your mind, and why?