

In my courses, I emphasize the importance of science process skills and include them as learning objectives for the course as well as for individual activities or assignments. One skill I particularly value is the ability to effectively communicate scientific concepts and research findings. To develop this skill and evaluate students' conceptual understanding, I have started using 'Not Exams' (also referred to as 'unessays') in my 500-level biology electives: BIOL 506 - Ornithology and BIOL 515 - Animal Behavior. These courses are divided into five modules each with a corresponding module assessment. For three modules, students complete a 'Not Exam' rather than a more traditional test or paper. For these, students develop a project that communicates a topic of their choosing from the module. Students can be as creative (or traditional) as they like and I provide some examples of things they might create to help get them started. The objective is for students to engage more deeply with a topic and build science communication skills.

To prepare students for this type of assessment, we discuss Bloom's Taxonomy (fig. 1), emphasizing that to achieve higher order thinking, students must first be able to remember and understand a concept. As students in a 500-level course, they should be able to achieve remembering and understanding of the content, thus I am assessing them on their ability to achieve higher order thinking as demonstrated through creative projects. Along with their project, students submit a brief (500 words or less) academic summary of the topic and a statement indicating who their target audience is. This allows me to evaluate their mastery of the concept and whether their project communicates the concept in a way that is appropriate for their target audience.

Most students rise to this challenge and I have been incredibly impressed by their creativity and ability to translate knowledge and understanding into a project that can teach and engage a general audience. Some examples include:

- Original art demonstrating exaggerated plumage characteristics used for attracting a mate in birds
- Table-top game illustrating competitive interactions between species
- Tik-Tok video in which the student demonstrates different foraging strategies in birds
- Twitch stream of a video game in which the student built and explained the avian digestive system
- Crocheted mobile depicting a scientific study of the impacts a bird's foraging behavior has on its forest habitat
- Poems and original or rewritten songs about various concepts
- Choose-your-own adventure book that allows the reader to see the outcomes of different decisions about foraging and habitat
- Planetarium show about bird migration

Student perceptions of these assessments are mixed. Some students really enjoy developing their projects and report less anxiety related to these assessments. Additionally, they report remembering the concepts they covered in their projects better than concepts assessed on exams. Others indicate that they do not understand the point of the Not Exams, or they find them too easy or inadequate at assessing their knowledge. I am using student feedback to refine my prompt and rubric to better communicate expectations.

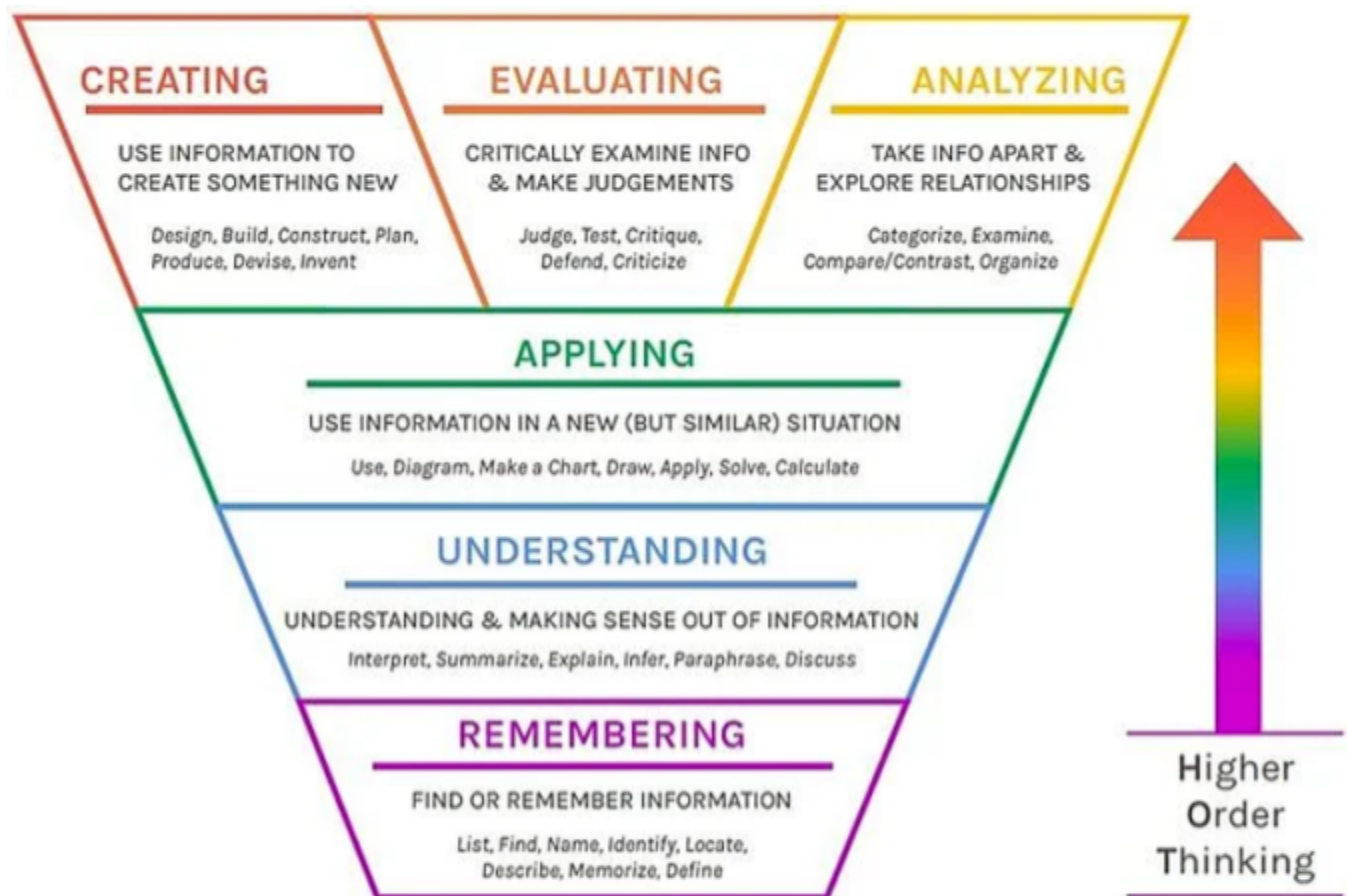


Figure 1. Diagram of Bloom’s Taxonomy that I share with students to discuss higher order thinking. I explain that their Not-Exams should be at the level of creating, evaluating, and analyzing. Not Exams that are at the applying level are acceptable, but will receive a lower grade.