

Running Title: REFLECTIONS ON TPE DOMAIN B

Reflections on Teaching Performance Expectation B

Monitoring Student Learning During Instruction

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The Unit Plan for Physiology Content was one of several considered for demonstrating monitoring of student performance (TPE2) but I believe it is superior to most for interpretation and use (TPE3). I have since adopted a rubric to accompany discussions and group work and will attach an example as an Appendix. The principles in Domain B are complex, and a Unit Plan has more opportunities for continual formative and summative assessments than a Lesson Plan or other artifact. Many of the informal assessments take the form of discussions and group problem solving. The formal summative assessment at the end is more standard for teaching science and prepares the student for standardized testing.

Students are fascinated when they can experience biological principles directly, and Physiology allows for many opportunities for self discovery. Day 1 homework, for example, is to watch yourself breathe while lying flat on your back. This leads directly to discussion of diaphragmatic breathing and can lead to discussion of singing, marathon running, or meditation.

Students are also usually acutely aware of their heart and circulation, so allowing them to collaborate to draw (or model) how the heart and lungs fit in the chest cavity, as well as the pathway of blood through the lungs, is instructive. A diffusion demonstration or laboratory would have been a powerful addition. Nutrition and digestion, as well as excretion also lend themselves to determining and understanding pathways in the body. Modeling the digestive and urinary systems with tubing is more instructive, but is also more time and resource intensive. All lead to excellent discussions and opportunities to assess student diagrams and modeling. Of course there is also ample formal assessment of vocabulary, using word finding, crossword puzzles, and other standard assessments.

The end of Unit formal assessment is a test that allows for practice taking standardized tests as well as answering some thought questions, such as why a bird would not have a urinary bladder (answer: to conserve weight because it makes no sense to store urine internally if you need to fly).

I have taught this unit several times to several age groups. Clearly it is not ideal to cover all of respiratory and digestive Physiology in one week, but it can be done. However, the way California Content Standards are written, there are many other subjects that must be covered, and so brevity is essential. Also, many schools offer Advanced Biology which is almost entirely human Anatomy and Physiology.

I have very strong feelings about how Biology in general, and Physiology in particular, are taught. To me, the concepts are essential and the vocabulary is often confusing. However, since standardized tests are better suited to test vocabulary, students spend enormous amounts of time memorizing terms that are either outdated or overly vague. Standardized terminology for High School Physiology, perhaps provided by the State Office of Education, would be helpful.

My personal experience with teaching this material is considerable, and I always find it useful to bring in examples of health problems from famous people. I can spend several hours just teaching how the knee works, since many students have heard of torn ACLs, medial meniscus injuries, and synovial fluid drainage just from their track, cross-country, and football teammates. When a subject strikes close to home, High School students are interested. When they are interested, they readily learn.

Most exciting, these students may be the physicians, pharmacologists, and therapists of tomorrow. Teaching them Physiology in an exciting way, with interesting informal assessments along the way, may steer some students toward careers in health care.

Appendix

Rubric

Adapted from journeytoexcellence.org/practice/assessment/rubrics/project.phtml

	Understanding Of Subject	Quality & Completeness	Cooperation In Groups	Demonstration Of Knowledge
1	Unable to see Epithelium as a sheet of cells	Worksheets Incomplete or Missing	Lack of, or Little contribution To group	Inability to identify Any cell types on final assignment
2	Unable to explain How organs are made Up of tissues	>3 Inaccuracies on any worksheet	Halfhearted Contributions	Inability to define >5 cell types in The stomach
3	Can define cell types Found in Appendices B-D	Worksheets Complete and Accurate	Contributed items On worksheets And final project	Can predict some Roles and cell types for small intestine
4	Understands common Theme in organization Of all organs	Worksheet Complete and Includes extra Information	Demonstrates leadership and Contributes to All products	Demonstrates Facility with Additional Information.

This example is from a lesson on arrangement of cells into tissues, but the application should be clear.