PPAT® Assessment

Library of Examples – Science

Task 3, Step 1, Textbox 3.1.1: Standards and Learning Goals

Below are two examples of written responses to Textbox 3.1.1 as excerpted from the portfolios of two different candidates. The candidate responses were not corrected or changed from what was submitted. One response was scored at the Met/Exceeded Standards Level and the other response was scored at the Does Not Meet/Partially Met Standards Level. This information is being provided for illustrative purposes only. These excerpts are not templates for you to use to guarantee a successful score. Rather, they are examples that you can use for comparison purposes to see the kinds of evidence that you may need to add to your own work.

The work you submit as part of your response to each task must be yours and yours alone. Your written commentaries, the student work and other artifacts you submit, and your video recordings must all feature teaching that you did and work that you supervised.

Guiding Prompt for Task 3, Textbox 3.1.1

a. What learning theory/method will guide your planning process? Provide a brief description of the theory/method. How will you make use of it?

b. What learning goal(s) and content standards, state and/or national standards, did you identify for the lesson? How will they guide the planned learning activities?

c. What is the content focus of the lesson? What related content that the students have previously encountered will support the learning in this lesson?

d. What are some difficulties students might encounter with the content? How will you address the difficulties?

Example 1: Met/Exceeded Standards Level

a. The main theory that will help guide the planning process is that of Cooperative and Collaborative Learning Theory. This theory, laid out by Mark May and Leonard Doob, states that by working in groups of two or more, students are more likely to be successful in achieving the learning goals set forth, through utilization of one another's skills and knowledge. Using specific grouping based on learning levels, this method helps to address Vygotsky's Zone of Proximal Development, by allowing students stronger in the subject to provide a structure and "backbone" for the content, while also seeing and hearing different methodologies from other students.

b. The standards used, the Science CLE's according to the DESE website, are for Strand 1 which refers to the properties of matter and energy, but more specifically concept I that refers to the conservation of mass during a physical or chemical change. Strand 1-I: a) Compare the mass of the reactants to the mass of the products in a chemical reaction or physical change as support for the Law of Conservation of Mass. Recognize whether the

number of atoms of the reactants and products in a chemical equation are balanced The Missouri standards for chemistry are focused on large concepts that may take multiple lessons, such as the Mole concept in chemistry, to reach the desired Missouri standard such as this one. These standards guide the learning activities by having students convert moles to mass, representative particles, and liters in flexible groupings. With this day being primarily a review day, it is crucial for students to have plenty of practice before they test and, through a "low-stakes" formative assessment, where they stand on the knowledge accumulated over the past lessons. Students will know that the Law of Conservation of Mass refers to matter being neither created or destroyed, but instead constant throughout a reactions beginning and end. In order to prove it to the students as Standard 1-I-A asks, they must have a common SI Unit to tie this concept to, which in chemistry is the Mole, and an understanding of that accumulated in 1-I-B. In order for Standard 1-I-B to be met the students must understand that the coefficients in front of a chemical reaction refer to both the moles and atoms, which can then be converted to mass in a later lesson.

c. The content of this lesson will focus on the concept of the Mole in chemistry and the empirical formula. A mole can very easily confuse kids due to the wide range of uses, whether it be conversion of liters, representative particles, or mass, and because of the previous knowledge that is required for students to pull from to fully understand the ideology behind it. For this lesson the students will be using the concept of dimensional analysis (unit conversion) that they learned in the first semester to help convert back and forth between the desired units. Students must also be able to use the Periodic Table to acquire the atomic mass, along with understanding what it tells us about each element. The last bit of information students will pull from previously is the concept of compounds, whether they be Ionic or Covalently bonded, and how they differ from one another.

d. One of the biggest issues students will struggle with is organizing what specific problems are asking for, and then proceed to confuse the steps of the processes to get to the desired product. This is very likely due to the emphasis put on knowing Avogadro's number, which is the number of representative particles in a mole, that could likely lead to them feeling the number should be put everywhere in order to produce an answer they feel is correct. To address these difficulties to the students it is crucial to stress that we only use Avogadro's number when referring to that of representative particles, such as atoms, molecules, or formula units. To aid in clearing up confusion I will re-introduce that concept of the Mole Road Map diagram. This diagram shows students that the mole converts to three different things: liters, representative particles, and mass. The diagram will also show that there are 22.4 liters in a mole, 6.02x10^(23) rep. particles in a mole, and the specific molar mass of a compound/atom in grams. Guiding students with what each conversion looks like, and when to use them is crucial for them to understand future material.

Refer to the Task 3 Rubric for Textbox 3.1.1 and ask yourself:

What evidence does the candidate provide to show how the lesson plan has been guided by

- A learning theory/method
- State/national standards and learning goals
- Related content that students have previously encountered
- Ways to address the difficulties students may have with the learning

Why is the analysis of standards and learning goals thorough?

Example 2: Did Not Meet/Partially Met Standards Level

While building interdependency by having students work in small groups is great in theory, with this class, it allows students to get off task and then copy answers from their peers. For that reason, students will be asked to work individually on their Pre-Quiz and quiz and answer the questions to a 75% accuracy. The lesson goals relate to standard 1.1.B.b which states, "Compare and contrast the properties of acidic, basic, and neutral solutions." Students will be focusing on how to determine the molarity of a solution given grams of an acid or base and to find the grams of an acid or base given the molarity. Students will also be asked to dilute a solution and correctly identify the rationale that scientists use when classifying an acid or a base. Students may struggle with the critical thinking and the algebra needed in order to complete these problems, so the quiz is differentiated in order to assist those who struggle with thinking critically.

Refer to the Task 3 Rubric for Textbox 3.1.1 and ask yourself:

What evidence does the candidate provide to show how the lesson plan has been guided by

- A learning theory/method
- State/national standards and learning goals
- Related content that students have previously encountered
- Ways to address the difficulties students may have with the learning

Why is the analysis of standards and learning goals uneven?

Suggestions for Using These Examples

After writing your own rough draft response to the guiding prompts, ask the question, "Which parts of these examples are closest to what I have written?" Then read the 4 levels of the matching rubric (labeled with the textbox number) and decide which best matches your response. Use this information as you revise your own written commentary.

Lastly, using your work and/or these examples as reference, consider what you believe would be appropriate artifacts for this textbox.