**Instruction Commentary**

1. **Identify** the number of the lesson or lessons from which the clip(s) were recorded (e.g., Lesson 1, Lesson 2).

Video clip #1 was recorded during lesson #1 (day 1 )of this learning segment.

Video clip #2 was recorded during lesson #2 (day 2) of this learning segment.

1. If relevant, describe what you did to ensure the safe use of any hazardous materials or equipment used during the inquiry seen in the clips.

No hazardous materials were used during this learning segment.

**3. Engaging Students in Learning**

a) Explain how the instruction (tasks, activities, discussions, and/or teaching strategies) depicted in the clip(s) motivated and intellectually engaged students in 1) attending to science concepts and data quality while they are collecting and recording data; and b) analyzing and interpreting the scientific data collected to construct and evaluate explanations of a phenomenon. Cite specific examples from the clips of what students said/did to support your explanation.

I think that students were engaged in part because we were doing a lab in a format that they had done before: four different experiments happening at once. Students in this class are have always been motivated by hands-on activities, and these were no exception. I also think that students were motivated because they knew they were going to be responsible for describing their experiment and teaching their concept to the rest of the class.

Each laboratory experiment was designed to portray the specific concepts assigned to each group. This ensured that students accurately collected data and analyzed their results (in order to explain their concepts). Constructing and evaluating explanations is something that students in this class have not done a lot of in the past. This is something that is difficult for them, but I think that pushing them to do this creates a deeper level of understanding and develops higher level thinking skills. It causes them to take control of their own learning and to ask the questions “why?” and how?”

Something I noticed in video clip #1 were that students appeared to be listening and looking at me while giving directions, with the exception of one student in the front (who is frequently off task). He did, however, ask a relevant question, which indicates he was actively listening at least some of the time. I would also have liked to see more questions asked while giving directions. I also noticed that I often talk when I am not making eye-contact with students. While this would be impractical to completely eliminate, I definitely need to work on making eye-contact *most* of the time. Also, I should never talk while facing away from students, as this makes it difficult to hear me.

In video clip #2, students were definitely engaged as shown by their laughter and comments. They were also getting the key idea- that large particles can not cross the plasma membrane. This was shown by their responses to my question, “Why couldn’t L get in?” “Because he is too big.” It was also clear that most of the group members understood the definition of diffusion, “the movement of molecules from high concentration to low concentration.”

b) Using examples from the clips, describe how your instruction (tasks, activities, discussions, and/or teaching strategies) linked students’ preconceptions, prior learning, and experiences with new learning. Prior learning and experience takes into account students’ **academic content knowledge, language development, social/emotional development, family/cultural assets, interests, and lived experiences.**

We had previously done a lab, where we tested for the presence of polysaccharides (such as starch) using iodine, so students were able to apply the visual of what happens when starch and iodine mix to the dialysis tubing procedure during this learning segment. Many of the materials used in the laboratory experiments were items that students were familiar with both from classroom (elodea plant) and home (eggs, vinegar, food coloring) experiences. In video clip #2, students connected their ideas of what they think a nightclub is (as portrayed by the media) with the process of diffusion.

I tried reminded students of the presence of a semipermeable membrane in 3 out of 4 of the procedures as this was our most recent topic, as students seemed to have a good understanding of it to build on.

4. **Deepening Student Learning During Instruction**

a) Explain how you elicited student thinking though questions or materials and facilitated responses that supported students’ in understanding how to collect, analyze, and interpret scientific data.

I aimed to give students a clear understanding of how to collect their data by giving them oral instructions in addition to detailed (yet easy to read) instructions for the laboratory procedures.

All 4 of the written laboratory procedures asked students to predict the outcome of their experiments. I also reminded them of this orally. Making predictions forces students to actively think about what will happen. Without making predictions it is common for students not to do any thinking about the underlying concepts until *after* the experiment is completed.

I aimed to deepen student learning by asking questions after each presentation in order to clarify or strengthen the concept being taught. I also frequently asked presenters to repeat important information. In video clip #2, I asked:

“Why couldn’t L get in the door?”

“What did it [your experiment] tell us about the size of the molecule?”

“Why did the iodine move? Why wasn’t it content where it was?”

“Which molecules?” (clarification)

“Why didn’t starch move across the membrane?”

Pausing between presentations also gives students time to finish taking notes, and to process the information they were just presented with.

One thing that varied from group to group was the amount and level of questions asked after presentations. When students ask questions, it shows me that they are paying attention and are taking personal responsibility for their learning. In the video clip submitted (#2), the questions asked were mostly, “what is the answer?” In other presentations there were better, higher level questions. It would have been nice if students were consistently asking higher level questions for all presentations. I am not sure what I can do to make this happen.

b) Cite evidence from the clips of what you and your students said/did to support your explanations.

The part where students carried out their experiments and analyzed their data is not shown (as it is difficult to see and hear what is happening during this type of activity). However, during this time, there were generally few questions asked about what to do for their laboratory experiments. All students wanted to participate in the execution of the experiment. This is most likely because they knew they would be responsible for explaining it to their classmates and because most students in this class enjoy hands on activities.

After completing their experiments, students talked with their group members about possible explanations for their results. This definitely required students to think harder than they are used to. The discussions occurring in each of the groups showed me that they were actively involved in making sense of their experiments. I could also tell that they were engaged by how many questions they asked me and each other. Many of them also consulted their textbooks and research online to help with their explanations, as they were encouraged to do.

5. **Evidence of Academic Language** (NOTE: You may provide evidence for academic language with your video clips OR through student work samples in Task 3. If evidence of student understanding and/or use of the key language demand are well represented in the clips, then respond to the prompts below. Otherwise, omit this prompt and respond to prompt 4 in the Assessment task.)

a) Describe evidence in the clip(s) that demonstrates the extent to which students are able to understand and/or use the language associated with the identified language demand (vocabulary, function/form, and/or instructional language) in ways that develop understandings of the nature of science and scientific inquiry.

 Part of the benefit of having students present to each other is having them *use* the vocabulary instead of just hearing, reading, and writing it. However, it definitely took some prompting from me to get students to use *all* of the vocabulary and to get them to clarify when they used words like “stuff.” One thing that could be improved was if I made sure that different group members answered the questions I asked after their presentations, as one member tended to respond to all questions.

 It is clear in video clip #2, that the students of the group presenting were able to apply the vocabulary terms (diffusion, concentration, selectively permeable) to a real-life situation, as shown by their nightclub metaphor.

b. Using this evidence, how well did your language supports or instruction promote academic language development for students with varied language levels?

 This class is very homogenous, but there are still some students with lower reading and language levels. It is clear that at least one of these students did not understand the majority of the language taught in this learning segment (see Natalia’s student work). This is even more disappointing because she was one of the members of the group in the video clip. It is clear that she was *not* engaged in learning during or after the laboratory experiment. If is frustrating that she did not ask for help during this learning segment (or during any other unit). I am sure that finding ways to encourage students to ask for help is something I will continually be working at throughout my career.