VIDEO NOTES: ***9th Grade Science Lesson on Designing Biology Lab Experiments***

Video Links: 9th Grade Science Lesson on Designing Biology Lab Experiments
Common Core State Standard: Writing in History, Science, and Technical Subjects (WHST.9-10.1a), (WHST.9-10.7) and (WHST.9-10.10)
Speaking and Listening (SL.9-10.1a) and (SL.9-10.1b)
Compass Component and Rating: Setting Instructional Outcomes (1c), *Effective Emerging*
Lesson Objective: Design and conduct your own biology lab to examine carbon cycling.

Common Core State Standard(s)
Writing in Science and Technical Subjects (WHST.9-10.1a): Write arguments focused on discipline-specific content: Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence. **Writing in History, Science, and Technical Subjects (WHST.9-10.7):** Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. **Writing in History, Science, and Technical Subjects (WHST.9-10.10):** Write routinely over extended time frames (for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. **Speaking and Listening (SL.9-10.1a):** Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas. **Speaking and Listening (SL.9-10.1b):** Work with peers to set rules for collegial discussions and decision-making (e.g., informal consensus, taking votes on key issues, presentation of alternate views), clear goals and deadlines, and individual roles as needed.

Compass Component 1c: Setting Instructional Outcomes (Rating: *Effective Emerging*)		
Indicators	**Evidence**	**Common Core Connection**
Some outcomes reflect important learning in the discipline.	• Teacher asks students to design and carry out their own experiment which requires teamwork, critical thinking, data collection, synthesis of data and observations, and written explanation.	As students work in groups to design and carry out the lab procedure, they address the Speaking & Listening standards (SL.9-10.1a and SL.9-10.1b). They must come to the group prepared with prior information they read in the text, come to consensus regarding the procedure, and respond appropriately when discussing disagreements.
Outcomes are suitable for most of the class.	• Given that students have a choice in how they conduct the experiment (*"It's really up to the students to design the experiment and carry it out."* 0:04), the outcome of writing an investigation article is suitable for most learners.	Conducting the experiment addresses WHST.9-10.7 as students use data as a source and synthesize that data with information provided in their text.
Outcomes represent high expectations and rigor. *(Effective Proficient indicator)*	• Students are expected to design an experiment, then create a written evaluation of the work, including evidence based arguments, determining if their evidence supports the claim, if the evidence is strong, and where it needs improvement (3:09).	While students are writing their investigation article, they are addressing the Writing standards WHST.9-10.1a and WHST.9-10.10. The "claim" that students write about is their experiment and their prediction for the scientific question presented.

WHAT COULD THIS TEACHER DO TO IMPROVE?

What did the teacher do in this lesson?	*Effective Proficient* Indicators	What could the teacher do to move to *Effective Proficient*? (example actions)	How could this lesson be improved for students to meet Common Core standards?
The learning outcome of this lesson focuses on the creation of an experiment and the investigation article that follows.	Teacher writes outcomes in terms of what students will learn rather than do.	Shift the focus of the outcome to what students will learn about the scientific method, inquiry, and carbon cycling.	Although this lesson is aligned with the CCSS mentioned above, it could be improved by strengthening the alignment to WHST.9-10.1a. Students could increase the connections they make back to the text or use additional texts to serve as support for their sources or as opposing arguments.
This outcome is treated as a solitary event which students are completing to learn about carbon cycling.	Teacher connects outcomes to previous and future learning. *(Highly Effective indicator)*	By connecting this experiment to future learning, specifically the skills embedded within the scientific method, students will deepen their understanding of the importance of inquiry and literacy within science.	