VIDEO NOTES: *5th Grade Science Lesson on Conducting Group Experiments*

Video Links: 5th Grade Science Lesson on Conducting Group Experiments
Common Core State Standard: see "What Could This Teacher Do To Improve" section
Compass Components and Ratings: Managing classroom procedures (2c), *Effective Proficient*
Questioning and using discussion techniques (3b), *Effective Emerging*
Engaging students in learning (3c), *Effective Emerging*
Lesson Objective: Students conduct group experiments to determine the presence of starch.

Compass Component 2c: Managing Classroom Procedures (Rating: *Effective Proficient*)	
Indicators	**Evidence**
Students are productively engaged during small group work.	• Students remain engaged in the process of determining the presence of starch and making observations throughout the lab --"Everybody is busy all of the time" (2:47). • Teacher incorporates a song to remind students of the expectations -- "shake, shake, shake your cornstarch" (2:28).
Routines for distribution and collection of materials and supplies work efficiently.	• Students execute lab routines efficiently and effectively, allowing them to spend the majority of time on documenting evidence and findings from the lab. • Teacher uses email to send materials to students; students work on laptops to access procedures and record evidence. • Teacher reviews the procedures and expectations prior to the start of the lab. • Teacher introduces the expectations for each of the group roles: Scribe, Material Handler, Set Up/Clean Up. These students collect their lab supplies quickly, set up the lab, and then work efficiently.

Compass Component 3b: Questioning and Using Discussion Techniques (Rating: *Effective Emerging)*	
Indicators	**Evidence**
Teacher frames some questions designed to promote student thinking, but only a few students are involved.	• Teacher asks students to access their prior knowledge. For example, the teacher says, *"Our indicator is iodine. What do we mean by indicator? Let's review that term. What does an indicator do?"* (0:59). • These questions are exclusively framed at the recall level, with no potential for higher-order thinking. Only a few students participate in answering these questions.

Teacher invites students to respond directly to one another's ideas, but few students respond.	• Students have limited opportunities to respond to each other's ideas. Even when asked to form a hypothesis, students are discouraged from discussing. For example, the teacher says, *"Remember on our hypotheses, it's not a discussion time. It's strictly just giving your educated opinion."* (2:58)

Compass Component 3c: Engaging Students in Learning (Rating: *Effective Emerging*)	
Indicators	**Evidence**
Student engagement with the content is largely passive, learning primarily facts or procedures.	• Students perform a teacher-determined procedure and use positive or negative observation skills to determine the presence of a starch (1:18).
Students have no choice in how they complete tasks.	• To conduct a lab like this, there is often a protocol that must be followed. The teacher provides direction such as, *"Alright, you're going to place three drops of each liquid in the trays. After you've done that, going one liquid at a time, you're going to place one drop of iodine, mix it with your toothpick, observe, everybody moves back to the scribe, records your observations…"* (3:08). However, the teacher could have given students the choice in other ways, such as how they divided up lab responsibilities or recorded the data. This would increase student engagement in the lab activity, allowing students more ownership of their learning.
The materials and resources are partially aligned to the lesson objectives, only some of them demanding student thinking.	• The six different liquids, starch indicator and data sheets are appropriate for the lesson, and the materials require some thinking from students. • Students discuss their reactions and observations with each other and the teacher using phrases such as, *"I was surprised…"* and *"It's a tiny drop"*.

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 questions asked during this class are recall-based, with one correct answer, providing students with limited opportunities to think.	Teacher uses open-ended questions, inviting students to think and/or have multiple possible answers. (Questioning – 3b)	Focus the lesson on a scientific question to provide students with greater opportunities to think, as well as to apply their knowledge to the scientific method. For example, with the scientific question: "Which liquids contain starch?" students could have expanded their thinking and experiment beyond the six liquids provided by the teacher. The students could use liquids of their choice, found within the school building, thus increasing	The content of this lesson is not aligned to the ELA/Literacy Common Core State Standards. In order to align with CCSS, the teacher could have asked students to read an excerpt from a scientific text at the beginning of the lesson in place of his lecture. They could then use that text to form a hypothesis for the lab and then

		the quantity of correct answers and students use of inquiry.	recorded measurements or performed technical tasks in order to meet RST.6-8.3. Following the lab, the teacher could have asked students to write down their reflections. They could have drawn evidence from the text read at the beginning of class to compare or contrast with the results from the experiment. The evidence would be used to explain whether their hypothesis was proven or disproven and whether the results corroborated or provided contradictory evidence to the text read at the beginning of class (RST.6-8.9 and WHST.6-8.9).
Outside of reviewing what a starch is, students have limited time to discuss their work with each other.	Discussions enable students to talk to one another without ongoing mediation by the teacher. (Questioning – 3b)	Allow students to discuss their hypotheses with each other. This would encourage students to use their small groups to plan for the lab and how they could potentially design the experiment.	
Students are provided with a procedure by the teacher, which requires no higher order thinking.	Lesson tasks have multiple correct responses or approaches and/or demand higher-order thinking. (Engagement – 3c) AND Students have some choice in how they complete learning tasks. (Engagement – 3c)	Give students options such as what responsibility they take on in the lab, how they record data, and how they conduct the experiment. By providing students with the scientific question: "Which liquids contain starch?", the materials, and the steps of the scientific method, students could have designed their own method for testing the six liquids. Allowing students to independently work through the steps of the scientific method increases the level of inquiry within the lesson and requires higher-level thinking.	
Teacher chooses the six liquids provided to students , which required minimal intellectual engagement.	Materials and resources support the learning goals and require intellectual engagement, as appropriate. (Engagement – 3c)	Allow students to test industrial liquids, potable liquids, etc. to promote more intellectual engagement with the experiment. Using a variety of liquids would also further discussion as students compare and contrast the results of the liquids and apply their understanding of starch to different groupings of liquids.	