VIDEO NOTES: *4th Grade Math Lesson on Multiplying Fractions by Whole Numbers*

Video Links: 4th Grade Math Lesson on Multiplying Fractions by Whole Numbers
Common Core State Standard: Number and Operations - Fractions
CCSS.Math.Content.4.NF.B.4b; CCSS.Math.Content.4.NF.B.4c
Compass Component and Rating: Questioning and Using Discussion Techniques (3b), *Effective Proficient;* Engaging Students in Learning (3c), *Effective Proficient*
Lesson Objective: Extend understanding of multiplication as repeated addition

Common Core State Standard(s)
CCSS.Math.Content.4.NF.B.4b: Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number. *For example, use a visual fraction model to express 3 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.)* **CCSS.Math.Content.4.NF.B.4c:** Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. *For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?*

Compass Component 3b: Questioning and Using Discussion Techniques (Rating: *Effective Proficient*)		
Indicators	**Evidence**	**Common Core Connection**
Teacher uses open-ended questions, inviting students to think and/or have multiple possible answers.	• Teacher uses open-ended questions to initiate a discussion around the skills and processes they are using. She asks, *"Why do you think they put a four there? What strategy were they trying to use?"* (5:27) this encourages students to think critically about the academic content.	This lesson is an example of students working towards understanding multiples of 1/b. Students are provided cards of sample solutions to the stated problem, which they analyze and determine the accuracy of the answers. Students begin to connect the process of adding several fractions to multiplying a fraction by a whole number. (CCSS.Math.Content.4.NF.B.4b)
The teacher builds on uses student	• Teacher builds on a student response to help the student	

responses to questions effectively.	(and others in the group) see the connection between adding a series of fractions and multiplying a whole number by the fraction. The student says, *"This one is correct because they do add two thirds and two thirds, and two thirds, and two thirds and they have eight thirds right there."* Teacher then asks, *"How did they figure out the eight?"* Student: *"They did four times two equals eight."* Teacher: *"Why do you think they did that?"* Student: *"Because if you cover up the three in the line, its four twos"* (6:31)	As students analyze the sample solutions, they must critique the work of others and provide justification for their thinking. (CCSS.Math.Practice.MP3)
Discussions enable students to talk to one another, without ongoing mediation by the teacher.	• Students are given an opportunity to discuss their solutions within small groups, with no mediation from the teacher. This process is important because they can discover and correct their own errors, and explain their thought processes to classmates. (3:10)	

Compass Component 3c: Engaging Students in Learning (Rating: *Effective Proficient*)

Indicators	Evidence	Common Core Connection
Most students are intellectually engaged in the lesson.	• Students show that they are intellectually engaged when identifying their own errors (2:45) and discussing the processes they have used and point out the errors of others (5:08).	Teacher provides students with a word problem/story in which they must determine how much total ribbon they need for the four corners of their garden, if each piece of ribbon is 2/3 of a yard. (CCSS.Math.Content.4.NF.B.4c)
Lesson tasks have multiple correct responses or approaches and/or demand higher-order thinking.	• In this lesson, students are asked to find a solution to a problem, but the teacher does not tell them how to solve it. This engages higher order thinking skills, as students must apply what they have	Teacher provides students with a problem, which they solve individually and discuss in small groups. Despite varying answers, students diligently work together to determine the correct answer and

	previously learned to a new problem. (1:42)	understand the process used to arrive at the answer. (CCSS.Math.Practice.MP1)
Materials and resources support the learning goals and require intellectual engagement, as appropriate.	• Teacher uses cards with previously solved problems (correct and incorrect) to help students see that adding multiple sets of fractions is in essence multiplying a fraction by a whole number. (5:05)	
There is a mix of different types of groupings, suitable to the lesson objectives.	• Students work on the problem individually (1:47) and in small groups (1:55), then discuss as a whole class (3:41). These groupings are valuable because students can investigate the responses of their group members in depth while still having an opportunity to learn from everyone in the class.	

WHAT COULD THIS TEACHER DO TO IMPROVE?

What did the teacher do in this lesson?	*Highly Effective* Indicators	What could the teacher do to move to *Highly Effective*? (example actions)
During the group presentations to the class, the teacher is asking the questions and driving the whole class conversation.	Students invite comments from their classmates during a discussion. (Questioning – 3b)	Allow the presentations to be student-driven by asking each group to prepare two or three questions for the class before they present. An example of a question could be, "Does anyone see a different way that we could have solved this?" This allows the students to ask and answer questions that they have developed, transforming the presentations into student-centered discussions.
At the end of the lesson, students are working in small groups to discuss problems and create posters.	Students have an opportunity for reflection and closure on the lesson to consolidate their understanding. (Engaging – 3c)	Provide students with five minutes to create a written reflection on the lesson in order to consolidate their learning. Ask students to solve and explain a problem (which can be used to assess any remaining misunderstandings),

		then outline what strategies they learned during the day's group work activities.