## VIDEO NOTES: 5th and *6th Grade Math Lesson on Surface Area*

**Video Links:** **5th and 6th Grade Math Lesson on Surface Area**
**Common Core State Standard:** Geometry (CCSS.6.G.A.4)
**Compass Component and Rating:** Questioning and Using Discussion Techniques (3b), *Effective Proficient*
Engaging Students in Learning (3c), *Effective Proficient*
**Lesson Objective:** Construct an understanding of surface area.

| **Common Core State Standard(s)** |
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| **CCSS.Math.Content.6.G.A.4:** Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems. |

| **Compass Component 3b: Questioning and Using Discussion Techniques (Rating: *Effective Proficient*)** | | |
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| **Indicators** | **Evidence** | **Common Core Connection** |
| Teacher uses open-ended questions, inviting students to think and/or have multiple possible answers. | • The teacher invites students to explain the differences between shapes and how they broke down the complex shape by asking questions such as, *"What do you think?" (4:28)* and *"Why am I doing that?" (4:56)* | Since this is an introductory lesson on surface area, the content is aligned to the 6th Grade Common Core standard for Geometry (CCSS.6.G.A.4). However, since this is a 5th/6th grade class, the lesson is focused on the first part of the standard and building on students' prior knowledge regarding area of simple shapes. |

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| The teacher builds on and uses student responses to questions effectively. | • During group discussion, students are asked to build on each other's answers and encouraged to call on each other. For example, the teacher says, *"Oh, so maybe I'm hearing it could be folds. And who can build? Like Nialie was saying…Nialie, you got us off to a great start. Can you call on another member of our class?"* (2:18)<br>• Although students respond with correct information, the teacher builds on student responses to reinforce "precision" in mathematical language and requires other students to add more clarification. The Teacher says, *"That was a great example of precision [to Juan]… but Jesus was building on it with precision of language and saying not a cube, because the sides aren't equal." (3:07)* | Students construct viable arguments and critique the reasoning of others (CCSS.Math.Practice.MP3) as well as attend to precision (CCSS.Math.Practice.MP6). |
| Many students actively engage in the discussion. | • Most students voluntarily participate in class discussion. The Teacher calls on a variety of students to respond to questions; all are able to respond quickly and effectively.<br>• Students who are not answering questions contribute to the conversation through hand signals to agree/disagree. | |

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

| Indicators | Evidence | Common Core Connection |
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| Most students are intellectually engaged in the lesson. | • Even when students are not directly answering a question, they are engaged in the discussion through the use of silent hand signals to agree or disagree with the statements made by classmates and the teacher. | |
| Learning tasks have multiple correct responses or approaches and/or demand higher-order thinking. | • Students are required to compare and contrast two shapes.<br>• There are multiple possible responses as students hypothesize about the meaning of the dotted lines.<br>• Students have to justify their responses, no matter if the answer is correct. | This lesson allows students to explore the process of finding area of complex shapes, without directly being taught the process. The teacher also allows for multiple explanations to find the area of complex shapes. This develops students' conceptual understanding of surface area, helping them as they work to meet CCSS.6.G.A.4. |
| The pacing of the lesson provides students the time needed to be intellectually engaged. | • The momentum of the lesson and timing of activities allow students to contribute to the discussion, as well as find as solution to the problem as a group. For example, in the time allowed for the group discussion, students were able to discover the process for finding surface area. | |

**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) |
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| In this lesson, the teacher asks the higher-order questions and the students respond to them. | Students initiate higher-order questions. (Questioning – 3b) | In small groups, ask students to use their prior knowledge of area to discuss how it could apply to the new, complex shape that is presented. Through this discussion, they should craft questions they need answered to be able to identify the area of the complex shape. Afterwards, the small groups can pose those questions to the whole group. This will allow students to self-identify the gaps in their understanding that are preventing them from finding the final solution. As students answer each other's questions, they are becoming their own facilitators and increasing the amount of cognitive work they are completing. |
| At the end of the video, students move back to their desks to begin the next learning task without any closure activity on the previous task. | Students have an opportunity for reflection and closure on the lesson to consolidate their understanding. (Engaging – 3c) | Provide students the opportunity to synthesize the lesson before leaving the rug. Ask students to share what they learned about surface area during the lesson or how their knowledge of area of simple shapes has changed with the addition of surface area and complex shapes. This will reinforce the simple shape content knowledge they have already mastered and then show how it has expanded to incorporate complex shapes. Simultaneously, this will provide the teacher with an opportunity to assess student understanding. |