

## Grade 6 – A Model for Multiplication

<https://connectedmath.msu.edu/cmp-classroom-videos/watch-videos/grade-6/a-model-for-multiplication/a-model-for-multiplication-full-length/>

These resource sheets utilize the framework to unpack instances of formative assessment from CMP classroom videos. These video resources can be used for planning for and reflecting on formative assessment seen in daily practice. The completed tables are not exhaustive; they provide examples of the enactment of formative assessment practices in the CMP classroom.

	<b>Anticipating Student Thinking</b> <i>Setting Up a Plan</i>	<b>Gathering and Analyzing Evidence</b> <i>Making Sense of What Students Know</i>	<b>Adapting Based on Student Thinking</b> <i>Acting on the Evidence</i>
<b>Launch</b>	(:20-1:10) The teacher discusses how she knows students will struggle with multiplying fractions. She bases this on her past experiences with students connecting multiplication to the idea of getting larger.	(1:20-4:50) In the Launch, Teri introduces the brownie pan problem. She asks for a student volunteer to demonstrate her reasoning to the class. Teri encourages students in the class to react to the student's thinking. For this part of the lesson, the teacher uses full-class discussion. She continues to question students to make sense of their thinking.	(4:23-4:50) One of the students, Nicky, introduces an interesting idea that it looks like only the denominator changes in these types of problems. The teacher pushes the student's thinking by asking if one case would be representative of all. The student clarifies that her conjecture is for multiplying with $\frac{1}{2}$ , only the denominator changes. The teacher gives in-the-moment feedback to the student encouraging that all the students keep thinking beyond the one example.
<b>Explore</b>	(4:53-6:24) Knowing the struggles of previous students when making sense of multiplying fractions, Teri makes clear connections between the student drawing on the board and what is being represented by the drawing. The teacher has prepared extra problems to extend the practice of the students in the Explore.	(6:10-6:25) When working with an individual group, Teri questions students to help them get started on the task. (20:14-20:52) The teacher works with an individual group and questions students as they work through solving parts C and D of the Explore.	(7:04-7:17) While walking around and interacting with student groups during the Explore, the teacher notices students approaching part A of the task in three different ways. The teacher decides to focus on these differences in the Summarize.

<p><b>Summarize</b></p>	<p>(7:04-7:17) Instead of waiting until the end of the Problem, the teacher decides to Summarize after parts A and B.</p>	<p>(7:18-12:12) Student groups present their work for part A to the entire class. Students interact with the presenter by asking questions. The teacher encourages students to make sense of the thinking of other students. The teacher also asks clarifying questions. The teacher questions focus on how the values are getting smaller. She asks students why this could be happening. (9:20-10:04) A student asks a clarifying question of other students presenting their work saying, "Why didn't you just keep in two thirds because it never talked about sixes?" The students presenting their work were able to justify their method because it allowed them to find out how much the buyer would have to pay. (16:10-20:05) Teri presents a new task to students to push the students' thinking. She has a student utilize the brownie pan diagram on the front board in order to make connections to the algorithm created by the class. (20:53-22:19) The teacher has groups of students present and explain their solutions to parts C and D. The teacher asks questions of the class to gain clarification of students' sense making and to push students to see connections across the examples of presented in class.</p>	<p>(7:18-12:12) The teacher also makes connections between students' strategies and the formal mathematics that students will look at later on. Teri describes this as "writing what I heard you saying" so they can see what it "looks like with numbers". The teacher helps make students thinking visible by adding to their drawings and also including numerical expressions and equations. (13:03-16:05) Using the student generated examples, Teri begins to shift students thinking from the diagram model of multiplying fractions to thinking about why the 'of' can be thought of as a multiplication symbol. She utilizes all the student examples on the board and questions students about their thinking to make sure they understand why the multiplication symbol works. (22:30-24:47) Based on the Explore of example problems, the students create an algorithm for multiplying fractions. The class works through whether or not this algorithm will always work. The teacher foreshadows how students will connect multiplying proper fractions to multiplying with more than proper fractions.</p>
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