



ASCD STUDY GUIDE

UNPACKING FRACTIONS

Episode 1: The Meanings and Representations of Fractions

Pre-Viewing Reflection

Fractions transition students from whole number arithmetic in the primary grades to work with rational numbers in middle school and real numbers in high school. Fractions are used in everyday life: measurement—telling time, cooking, naming shoe sizes—and probability are two examples.

Historically, the approach to fractions has focused on teaching rules, procedures, and algorithms rather than on cultivating a deep understanding of the topic. The well-known adage, “Ours is not to reason why, just invert and multiply!” caricatures this approach. Consequently, when students cease to make sense of the mathematics they’re learning and yield to senseless memorization, they begin to dislike mathematics or experience a sense of failure.

Reflect on the following questions before watching how Dr. Monica Neagoy introduces fractions to a group of third grade students.



1. How would you define a fraction for a young student who has never heard of one? What examples might you use?

2. What tactile or visual models might you use to convey the basic meaning of a fraction? What is your rationale for selecting one model or representation over another?

3. Reflect on the different meanings of $\frac{a}{b}$ that students learn, from roughly grade 3 to grade 7 or 8.



Teaching the Meanings and Representations of Fractions

As you watch the video, observe the teaching strategies that Dr. Monica uses to develop the meanings of fractions with her students. What specific questions, tasks, and representations does she use to engage students in thinking about fractions? How does each strategy contribute to the students' understanding of the meaning of a fraction? What is the importance of the language she uses? Finally, what misconceptions does she anticipate and address in the video?

In the chart below, record your observations. In the left column, jot down any aspect of the teaching that drew your attention (question / language / task / model / representation / strategy / attitude) and explain on the right how you think it contributed positively to students building their knowledge of fractions.

Your Observation	Development of Fraction Meaning
Questions posed / Language used	
Task	
Model / Representation	
Strategy / Attitude (toward students or math)	
Other	



Post-Viewing Reflection

1. What specific teacher practices were consistent and effective throughout the lesson? How did each practice contribute to developing the students' understanding of fractions?

2. In what ways did using three different representations / strategies engage students and enhance their understanding of fractions? Which resonated with you most? Would you use all three in one lesson? Why or why not?

3. How did Dr. Monica anticipate and address student misconceptions?

4. What foreshadowing of future fraction topics did Dr. Monica integrate?

Suggested Reading

Chapter 1 of Dr. Monica's book *Unpacking Fractions* (ASCD, 2017) addresses the six meanings of $\frac{a}{b}$ many students encounter by grade 6. Chapter 2 describes the various visual and tactile models used in teaching fractions to help children understand the concept. The models get more sophisticated as students progress through the grades. As in all chapters, Dr. Monica first identifies students' common misconceptions, then explains the underlying mathematics in depth, and finally offers challenging questions to help students tackle their misconceptions. If you don't have time to read the first two chapters, at least read the Introduction!