

MP3, Grade 3/4

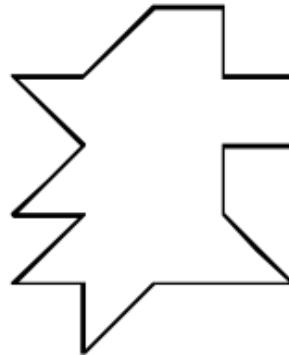
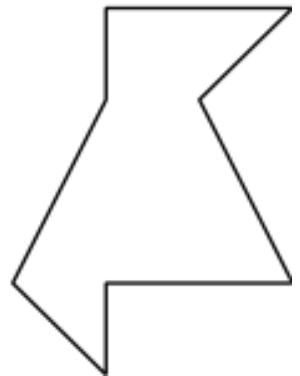
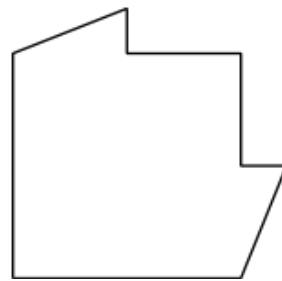
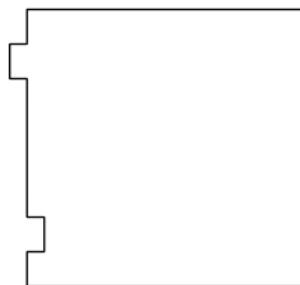
Task: Crazy Cakes

Practice standard focus: MP3. *Construct viable arguments and critique the reasoning of others.* Mathematically proficient students at the elementary grades construct mathematical arguments—that is, explain the reasoning underlying a strategy, solution, or conjecture—using concrete referents such as objects, drawings, diagrams, and actions. . . . Mathematically proficient students can listen to or read the arguments of others, decide whether they make sense, ask useful questions to clarify or improve the arguments, and build on those arguments.

Content standard focus: 3MD5. Recognize area as an attribute of plane figures and understand concepts of area measurement. 3MP7. Recognize area as additive.

Introduction

Students in a fourth grade class¹ worked in pairs to divide shapes such as those shown below, "crazy cakes," into two parts of equal area².



¹ This lesson was filmed prior to publication of the Common Core. The content of this lesson now appears as content in the standards for grade three.

² "Crazy Cakes" activity from: Russell, S.J., Economopoulos, K., Wittenberg, L., et al. *Investigations in Number, Data, and Space®*, Second Edition. Glenview: Pearson, 2008.

The task calls upon a number of skills: Students must recognize area as an attribute of plane figures and recognize that area is additive. They must be able to decompose figures and identify congruent shapes within the figure. Some of the students' methods might depend on identifying square units, using symmetry, and/or finding pairwise congruent shapes.

Precisely because students might base their solution strategies on different basic principles, this is an ideal context in which students can present arguments to justify their solutions and strategies.

Video: *Crazy Cakes*³ <http://vimeo.com/66201779>

Commentary

When students develop arguments to justify their solutions, it is their responsibility to explain it to classmates so they understand. Similarly, it is the responsibility of the classmates to try to make sense of the argument and to ask questions until they do.

In this video segment, a student, Aneschka, presents her solution to the class and offers her argument to justify it, but her classmates don't understand. The teacher recognizes the soundness of the reasoning and offers suggestions to help Aneschka clarify her argument to the class. Aneschka keeps working to convince her classmates until they recognize that she is correct. Students then comment on what helped them understand.

The class also recognizes that Aneschka's partner, Kayla, is not yet convinced. Kayla has presented an objection which the teacher and Aneschka recognize is not relevant to the argument. The teacher acknowledges that Kayla will need some time to think about the strategy. The teacher registers Kayla's conceptual misunderstanding and can also take some time to think through how to help her clarify her thinking at a later time.

³ From *Measuring Space in One, Two, and Three Dimensions* by Deborah Schifter, Virginia Bastable, and Susan Jo Russell. DVD, Session 2, "Crazy Cakes." Copyright © 2008 by TERC. Published by Pearson Education, Inc. Used by permission. All rights reserved.