HOT Lesson #9
Grade 5
Finding a Fraction of a Fraction

Learning Objectives:
Students will be able to…
1) Model finding a fraction of a fraction
2) Find the value of a fraction of a fraction using pictorial models (possibly multiplication also)
3) Write a word problem to model finding a fraction of a fraction
4) Rename resulting fractions as equivalent fractions

Language Objectives:
Students will be able to…
1) Explain what a fraction of a fraction means
2) Explain visual models of fractions of a fraction
3) Use vocabulary: numerator, denominator, intersection, horizontal, vertical

Materials:
Math message
Folding paper
Colored pencils or crayons
Worksheets
Graph paper
Index cards with *fraction of fractions problems* written on them (for part 3 – with or without worksheet)
(perhaps also scissors, glue, bigger paper, etc. if students are going to make a poster of their problem—rather than use the worksheet)

Modifications:
For part 3, give groups cards based on readiness level – some harder vs. easier fraction problems
Encourage ALL students to simplify their results

Math Message:
Write: Fold a piece of paper to show ½ of ½. Be ready to explain your work
Work through showing how they can color to further represent the idea, talk about the thinking, the mathematical language, etc.

(Fold the first fraction, color in the first fraction one color, fold the second fraction and then color that in using a different color. The intersection would be the fraction of the fraction.)

Procedures:
1ˢᵗ day -
1) Math message
2) Kid friendly objectives
3) Remind about group norms

4) Explain directions
5) Work in groups on garden (paper folding) worksheet (attached)
6) Discuss garden sheet – what strategies they used, the pictures they drew, share an explanation – draw a picture on the board and label it!
7) Work in Everyday Math book p. 266-267
8) Discuss/Closure
   a. Written- Choose one of the problems on page 266-267 and explain what you did and why it works.
   b. Summarize this method of finding a fraction of a fraction and why it works
   c. Do you notice anything that is the same for each fraction of a fraction problem? Do you see any relationship between the numerators and denominators in the problem and then in the result? (potential for movement toward the area model and movement toward more "formal" multiplication of fractions.)

2nd day -
1) Math message – same objectives
2) Work in groups on fractions of fractions worksheet (attached).
3) (possible) Brief group discussion about any observations they have about finding a fraction of a fraction. Discuss how order of folding does not matter (commutative property of multiplication)
4) Give groups problems and graph paper and have them represent as a model, explain it, and for a challenge, write a word problem that would accompany it. For this last part, I think we would just need some fraction of fraction problems written on index cards to distribute if groups have time. If they do, then we give them that, some graph paper (maybe scissors, glue stick, colored pencils so they can cut out the exact number of squares)
5) Closure: Review objectives – ask students to share one or two word problems and summarize how to find a fraction of a fraction.

Assessments:
Worksheets
Checkpoints
Whole-class discussion

Resources:
Chapin, S. & Johnson, A. (2006) Math Matters: Understanding the Math You Teach, Grades K-8, 2nd Ed. Math Solutions, Sansalito, CA.

Notes:
I could see this going across a couple of days.
Perhaps day 1 includes #1, 2 and part of 3; day 2 completes #3 and then has students build models and word problems of their own. The word problems could be typed up for the rest of the class to attempt. (I'm thinking problems like "I had 2/3 of a pizza. I shared ½ of the 2/3 that I had with my friend. How much did I give my friend get?"

Name _____

Choose one of the problems from pages 266-267 and explain **what** you did and **why** it works.

Problem: _____

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Name _____

Choose one of the problems from pages 266-267 and explain **what** you did and **why** it works.

Problem: _____

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