

# Utica Grades 5 - 6 Lesson Study Team 2004 / 2005



Michael Griskie - Utica

Andrea Marble - Utica

Tom McDonald - Utica

Kathy Muza - Utica

Daniel Roraff

Staci Timmins-Puzio - Oakland - Facilitator

Melissa Butki - Clarkston - Knowledgeable Other

### **Individual Team:**

**Michael Griskie** is a fifth grade teacher at Oakbrook Elementary. He has also taught fourth and sixth grade in his eight years of teaching.

**Andrea Marble** is a sixth grade teacher at Schwarzkoff Elementary. This is her fifth year teaching.

**Tom McDonald** is a fifth grade teacher at DeKeyser Elementary. He has also taught third and sixth grade during his 12 years of teaching.

**Kathy Muza** is a sixth grade teacher at Schuchard Elementary. She has been teaching for six years.

**Dan Roraff** is a sixth grade teacher at Roberts Elementary. He has also taught fourth and fifth grade during his six years of teaching.

**Staci Timmins-Puzio** is the K-12 math coordinator and Math specialist for Middle School for the Clarkston Schools. She is the facilitator for our team.

**Melissa Butki** is a seventh grade math teacher in the Clarkston Schools. She has been teaching for seven years and is serving as our knowledgeable other.

### **Why are we involved in Lesson Study?**

- Participating in math grant through MISD and Oakland
- Wanted to bring in more non-traditional teaching ideas
- Wanted to improve teaching and student learning

### **School District:**

Utica Community Schools is located in Macomb County, Michigan. The district serves approximately 28,000 students. We are a suburban district that serves families ranging from lower to upper-middle class socio-economic levels. In Utica Schools, sixth grade is located in the elementary buildings.

## **Planning the Lesson:**

### **December 7, 2004 Notes**

At our first meeting we decided that problem solving would be our Global Topic. We were concerned that students had trouble solving problems and would like them to use a four step problem solving process. The process is to understand the problem, choose a strategy, try it out, and look back.

We decided this because it ties in with North Central Accreditation (NCA) goals. MAT8 scores also show students are deficient in problem solving.

At our first meeting we discussed what topics we felt our students were weak in. Fractions was overwhelmingly the topic we thought students needed reinforcement with.

### **January 6, 2005 Notes**

We met and worked on the goals and objectives of the unit and the specific lesson. The group decided on the lesson flow and specific components of the lesson. Teacher activities, student activities and responses, and details to observe were also decided. It was agreed that Tom would teach the lesson on Feb. 24<sup>th</sup>, and Mike would reteach on March 15<sup>th</sup>. The unit lessons were briefly discussed and Tom agreed to put the unit lessons together. Kathy had already rewritten the extension for the activity. Andrea will create check list for observations and e-mail to group members. Tom will have seating chart for observers and students will have name tags. Observers will get copy of lesson on Feb 24<sup>th</sup>. We will meet at DeKeyser and debrief there until lunch. After lunch we will move to IRC.

Multiply and divide with fraction and whole number (must be able to use model for multiplication)

Our lesson will come at the end of the unit for 5<sup>th</sup> grade. We will have students working in groups of four to five.

The lesson will be used as an assessment at the end of the fraction unit.

### **February 24, 2004 Notes**

Tom McDonald presented the lesson to his 5<sup>th</sup> grade class. Other group members observed and took notes. After the lesson presentation the group met and reflected on the lesson's effectiveness in meeting the goals that were previously established. The lesson was revised to make it more successful. The lesson will be retaught on March 15 by Mike Griskie at Oakbrook Elementary. Lesson revisions are included at the end of this document.

**Date:** March 15, 2005

**Grade:** 6  
**Subject:** Math  
**School:** DeKeyser/Oakbrook  
**Instructor:** Tom McDonald/Michael Griskie  
**Planning Group:** Michael Griskie,  
Andrea Marble, Tom McDonald, Kathy Muza,  
Daniel Roraff, Staci Puzio, Melissa Butki

## Unit Name: 5<sup>th</sup> Grade Fractions

### Unit Objectives:

Students should be able to:

- Identify regions and parts of a whole
- Form equivalent fractions and find common denominators N.ME.05.11
- Compare and order fractions N.MR.04.22
- Add and subtract fractions with like and unlike denominators N.FL.05.14
- Solve for the unknown in  $\frac{1}{4} + X = \frac{7}{12}$  N.MR.05.21
- Multiply fractions using an area model N.FL.05.12
- Divide fractions by a whole number and a whole number by a fraction N.FL.05.13

### Research Theme of Lesson Study:

The students will make connections between mathematics and the world around them by developing their problem solving skills.

### Current Characteristics of Students:

Students at DeKeyser Elementary come from primarily middle class suburban homes. Students come from varied cultural backgrounds.

Students at Oakbrook Elementary come from primarily middle to lower class suburban homes. Students come from varied cultural backgrounds.

Both schools are Schools of Choice which accept out of district students.

## Learning Plan for Unit:

### ❖ **Unit Goals or Outcomes (Connections to Standards and Prior and Subsequent Learning, if appropriate)**

#### 4<sup>th</sup>

- Factors and multiples
- Fractions as part of a set of objects

#### 5<sup>th</sup>

- Understand a fraction as a statement of division (e.g.,  $2 \div 3 = \frac{2}{3}$ ) and represent simple fractions with pictures
- Express two fractions as equivalent fractions with a common denominator
- Find the product of two unit fractions with small denominators using area model
- Add and subtract fractions with unlike denominators
- Solve word problems that involve finding sums and differences of fractions with unlike denominators using knowledge of equivalent fractions

#### 6<sup>th</sup> connections

- Understand division of fractions as the inverse of multiplication
- Write a mathematical statement to represent an applied situation involving dividing fractions
- Multiply and divide any two fractions fluently including mixed numbers

- **Sequence of Lessons in the Unit:**

<b>Number of Lessons</b>	<b>Content</b>	<b>Points to Note and Evaluate</b>	<b>Materials, Strategies</b>
1. Fraction awareness	Naming parts of a whole	Concept of a whole. Equal parts only.	Manipulative (fraction circles, bars, tangrams, etc.)
2. Equivalent Fractions	Naming equivalent fractions	Different size parts, same region	Manipulatives from above
3. Comparing and ordering	Understanding relationships between fractional parts	Greater than, less than	Same manipulative available, interactive websites
4. Addition of benchmark fractions	Adding fractions to create a new region	Common denominators	Same as above
5. Subtracting fractions	Subtracting fractions to create a new region	Common denominators	Same as above
6. Multiplication of fraction	Multiplication	Area model	Graph paper
7. Problem solving with fractions	All operations with fractions	Problem solving strategies	All of the above

**❖ Explanation of Unit “Flow” That Will Enable Students to Move from Current Understanding, Motivation, and Skills to Desired Outcomes:  
CONCRETE TO ABSTRACT - ETC**

**Plan for the Research Lesson:**

Teacher Activity	Anticipated Student Thinking and Activities	Points to Note and Evaluate	Materials, Strategies
<p>This activity will be done in predetermined groups of 4 or 5 students</p> <ul style="list-style-type: none"> <li>• Teacher will distribute “Fractions of a Square” activity</li> <li>• Teacher will give directions to groups: *Do 1&amp;2 *Present to the class</li> <li>• Instruct students that it is time to share – in order predetermined – instruct students to share all ideas and choose one to try</li> <li>• Teacher will observe, answer questions students ask, monitor progress, and redirect students where necessary</li> </ul>	<ul style="list-style-type: none"> <li>• Reader will read activity to group</li> <li>• approximately 2 minutes of individual thinking time *draw lines on square *jot notes *fold paper *cut or tear paper *using tools (i.e. Scissors, rulers, etc)</li> <li>• Quick share * Most students have an idea to share * Strategies               <ol style="list-style-type: none"> <li>1. Cutting</li> <li>2. Folding</li> <li>3. Drawing lines</li> <li>4. Visualizing</li> <li>5. Measuring</li> <li>6. Comparing</li> <li>7. Counting?</li> <li>8. No strategy</li> </ol> </li> <li>• Groups to decide on strategy to try first and use it to solve questions 1 and 2 *Groups may all choose the same strategy *Groups may choose different strategies</li> </ul>	<ul style="list-style-type: none"> <li>• Note students who seem to be uninvolved in thinking process or confused</li> <li>• Math Vocabulary</li> <li>• Strategies suggested</li> <li>• Strategies chosen</li> <li>• Changes in strategy</li> <li>• Questions to peers</li> <li>• Questions to teacher (Number and type of question)</li> <li>• Are students using equivalent fractions?</li> </ul>	<ul style="list-style-type: none"> <li>• Have supplies available: *scissors *rulers *extra copies of squares *grid paper</li> <li>• Supplies are always accessible</li> </ul>

Teacher Activity	Anticipated Student Thinking and Activities	Points to Note and Evaluate	Materials, Strategies
<ul style="list-style-type: none"> <li>• Teacher will observe strategies used by groups and assign part(s) to be presented and order of presentations</li> <li>• Teacher will ask questions of individuals in the groups during presentation and may prompt groups to more fully explain strategies</li> </ul> <p>Questions teacher will ask of all groups:  *Which was the easiest piece for you to find? Why?  *Which was the hardest piece for you to find? Why</p> <ul style="list-style-type: none"> <li>• Teacher will have students note that different strategies are equally valid</li> </ul> <ul style="list-style-type: none"> <li>• Teacher will summarize learning that took place</li> <li>• Discuss the relationship of the whole.</li> </ul>	<ul style="list-style-type: none"> <li>• Groups are assigned parts to present</li> <li>• Groups present results to class using overhead <ul style="list-style-type: none"> <li>*Students will start by using fourths</li> <li>*Students will then move to A &amp; B</li> <li>*Next students will do F &amp; G</li> <li>*C, D, E &amp; H, I will be last as they are the most difficult</li> <li>*Students may look at the relationship of each piece to the whole to decide value of parts</li> <li>*Students may reduce entire square to lowest common denominator</li> <li>*Students may cut square and cover with cut parts</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Are students adding fractions?</li> <li>• Are students realizing the large square is the whole?</li> <li>• Are students noticing relationships between parts of the whole?</li> <li>• How are groups reasoning about C, D, E and H, I?</li> </ul> <ul style="list-style-type: none"> <li>• Does each member of the group understand the solution?</li> <li>• Is the group able to correctly explain the solution they came up with?</li> <li>• Did groups use common denominators?</li> <li>• Did groups use equivalent fractions?</li> </ul> <ul style="list-style-type: none"> <li>• Are the goals of the lesson clear to students from the summary given?</li> </ul>	

Teacher Activity	Anticipated Student Thinking and Activities	Points to Note and Evaluate	Materials, Strategies

**a. Aims of the Lesson**

- To assess students understanding of fractions and fractional parts.
- Student’s use of problem solving to find the fractional parts of a whole.

**b. Learning Process for the Lesson (What “Drama” of Activities and Experiences Will Help Students Move from their Initial Understanding to the Desired Aims?)**

- Discussed problem solving
- Listed strategies
- Reviewed previous activity
- Peer collaboration

**c. Evaluation of This Lesson (Major Points To Be Evaluated)**

- Understanding parts of the whole
- Apply the steps of problem solving in a group
- Come to a reasonable solution

**d. Copies of Lesson Materials (e.g., Blackboard Plan, Student Handouts, Visual Aids)**

- Attached

**Background Information and Data Collection Forms for Observers (e.g., Seating Chart, Prior Student Work, Note-taking Forms, Information of Particular Students to Be Observed)**

Data collection form attached

**2-24-2005 - Lesson Study Reflection**

*Tom's view: It went okay. There are some low kids and each table group has one high student. Tom wanted to make sure no one took over the group. Staci: What would you do different? Tom: Be more strict with roles. But if they are not going to do it they just aren't. With problem solving series the kids are moving along but fractions are still abstract. Tom was surprised no one wanted to use manipulatives. Maybe change would have to be in preparation. Tom thought they worked well together.*

*Debbie: Is there something we can do to make this not so difficult?*

*Others: We thought it went well. They did a great job.*

*Staci: Maybe lower groups need more instruction instead of just come up with your own ideas.*

*Missy: Thought all went well except #3 which we agreed was not part of the lesson. We all agreed that the  $\frac{2}{3}$  was the hardest one.*

*Missy: Kids were sticking to benchmark fractions.*

*Dan: TJ had whole thing done but no one would believe him. When Jacob agrees with the idea they accepted it.*

*Missy: They didn't show the addition of fraction*

*Andrea: Shane said, "It's all multiplication"*

*Debbie: Beware of shortcuts we give kids. Tom prompted kids about " $\frac{1}{2}$  of" and doubling the denominator. This might cause misunderstanding. Also, we should show that it all adds up to one in the summary.*

*Staci: It helped when you put it on board (circles) for number 3.*

*Debbie: Great language, Jacob, "proving by picture"*

*Missy/Staci: "I don't know what I just did" – this shows lack of understanding.*

*Debbie: What other activities do they need to have prior to this?*

*Tom: One other thing I would have done, written another problem solver with the square.*

*Mike: What manipulative activity worked best to prepare kids for the activity?*

*Tom: The tangram activity allowed kids to see that they could make parts of different sizes. Kids also need to see fractions circles and fraction bars – not all just get one or they other – they need experience with both.*

*Dan: No one rotated triangle.*

*Tom: Interactive bulletin board – with fraction circles might help.*

*Debbie: Good language – 1/2 of 1/4*

*Staci: Good language - As denominator gets bigger fraction gets smaller.*

*Andrea: Could we give them a list of strategies?*

*Mike: Maybe we should make a common list of strategies on board. Then we can review at the end which ones we used.*

*Staci/Kathy: Maybe do general problem solving strategies and then let them look at problem and then see if there are other strategies that would be more appropriate for this problem*

*Andrea: We want to make it easier – coming up with strategies as group might do that.*

*Debbie: End of lesson study questions – What have I learned? (Moving students along and letting them learn it on their own). How difficult it is to “see” all your students.*

*Kathy: You can't catch all that when you are teaching.*

*Tom: Where is the line between giving info to bring along and ...?*

*Debbie: Maybe we want to stagger groups differently? Maybe pairs should have discussions.*

*Kathy: Pairs work well.*

*Dan: Pairs meet with another pair to share work.*

*Debbie: Maybe collect data on groupings.*

*Debbie: Liked that Tom reviewed problem solving process. Maybe they need okay to jot ideas or notes at the beginning.*

*Tom: If you allow them to do that the kids that are too quick would be done by then.*

## Lesson Revision:

### *Grouping*

- Pairs then Pair Share
- A/C paired (high/low)
- B/B paired (med/med)
- Partners work together and if they get stuck they can go to their pair partners.

### *Order of Lesson*

- Review partner work
- Review four step problem solving process
- Remind students about previous tangram activity
- Review Lesson
- Read Individually
- Discuss with partner and solve
- If they get stuck talk to partner pairs

Students stopped working so teacher could give additional instructions.

- After completing number 1, give students specific directions on how to complete number 2. They will need to use math sentences, for example,  $1/2 + 1/2 = 1$   
OR  $1/2 * 1/4 = 1/8$

Students stopped working so teacher could give additional instructions.

- Make manipulatives available for number three
- Number three should be answered in math sentences

### *Presentations*

- All groups will prepare transparency with strategies used for #1
- Discussed how they determined fractional parts for letters in #2
- Ask if other groups used a different strategy – present only different strategies

### *Summary*

- Teacher will lead students to show that all parts actually add up to one whole

**\*\*\*All else remains the same\*\*\***