

 VIDEO
6:18 min

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Multiplication of Fractions Problem

Patriot Elementary School, Nebraska
November 2011

Topic IMPROVING MATHEMATICAL PROBLEM SOLVING IN GRADES 4 THROUGH 8

Practice PROBLEM-SOLVING INSTRUCTION

- Highlights**
- » Sixth-grade teacher Jennie Logan gives students a scenario and problem to solve involving multiplication of fractions.
 - » She prepared for problem solving by considering a scenario familiar to students and planning the problem to address her goals for the lesson.
 - » Students work in pairs to find a couple different ways to solve the problem and then to prepare to present a solution to the class.
 - » Ms. Logan talks about strategies she expected to see and ones that surprised her. She discusses how she chose strategies to highlight during student presentations. Two students present an area map solution, another pair of students demonstrates using benchmark fractions, and a third pair uses a common denominator in their method.

About the Site

Patriot Elementary School Papillion, Nebraska

Demographics


- » 89% White
- » 4% Hispanic
- » 3% Black
- » 1% Asian
- » 1% Native American
- » 5% Free or Reduced-Price Lunch

Patriot Elementary School in the Papillion-La Vista School District strives to meet all students' needs through a rigorous district math curriculum focusing on:


- » Problem solving;
- » Using math in everyday situations;
- » Communicating mathematical solutions and explaining the reasoning behind these solutions;
- » Hands-on experiences using a variety of manipulatives to build math understanding; and
- » Asking questions and investigating solutions so students explore and discover in problem situations.


Full Transcript




 **00:04 Jennie Logan:** My name is Jennie Logan, and I teach sixth grade at Patriot Elementary in the Papillion-La Vista School District.

The lesson for today, I had two main goals, and those goals were for students to really develop an understanding of what it means to find part of a part. And then I also wanted to have a problem that they could work through where they could use multiple strategies to solve a problem that involved finding part of a part.

Logan (to class)  00:33 My scenario is that Mrs. Logan went to the Pride Council Bake Sale to buy some brownies. All of the pans of brownies are square. A pan of brownies costs \$12. Customers can buy any fractional part of a pan and pay that fraction of \$12. For example, half a pan costs half of \$12. Mrs. Logan bought $\frac{3}{4}$ of a pan that was $\frac{2}{5}$ full. How much did she pay?

Logan  01:05 There are several things that I considered. The first thing is I wanted it to be a real-life problem and something that the students could relate to. So we had just had a bake sale—our student council had sponsored a bake sale. So I used that context of purchasing something from the bake sale. And then I had the goal, I wanted a problem that would lend itself to multiple strategies for the students to work through and to see.

Student 1  01:30 Well, I am thinking is, if you find the power of 10, you multiply this you get $\frac{40}{100}$.


Student 2 Yeah.

Student 1 And then what's $\frac{3}{4}$ of $\frac{40}{100}$?


Student 2 $\frac{3}{4}$ would be 30. 30 percent.


Student 3 There are 20 pieces, and each one, each piece . . . and \$12.


Student 4 And 12 divided by 20. So, this is how we got that it was 60 cents each.


Logan  02:08 When I was planning out the lesson, I listed the strategies that I thought would emerge. And we had done a lot of work with area maps, so I knew that that would be a strategy that would emerge. The students that used their benchmark fractions and converted it to fractions over 100 was a strategy that I had not thought of. I did think that a number line strategy would emerge; it didn't, and so my next step will be to come up with a similar problem and kind of facilitate


that number line, and how could we have used a number line to solve a similar problem.

 02:47 I think it's really important to expose students to multiple problem-solving strategies, and that's why every day in our workshops, students are working with a partner or with a small group, and they're discussing the strategies that they use. And then a majority of my math time is spent summarizing those strategies and calling up the different students and having them explain to the class what they did, and then asking the other students, "Can you repeat what they did?" or "Can you explain to me what your classmate did?" so that they can see that there are so many different ways to solve one problem.

Student 5  03:22 First we made an area map, and we cut it into fifths vertically since that was the denominator of the second fraction, and then we colored in two of those since it was $\frac{2}{5}$. Then we divided it into fourths horizontally and then we colored in three of those because that was a fraction, $\frac{3}{4}$. And then we counted how many pieces we double-shaded in, and then we counted how many total squares there were, and then we figured out that how many total squares there were was the denominator and how many squares were double-shaded was the numerator. So we figured out that it was $\frac{6}{20}$, and then we simplified it to $\frac{3}{10}$, and then we divided \$12 by tenths and got \$1.20 and then multiplied it by 3 because it was $\frac{3}{10}$, and then we got our answer \$3.60.

Student 2  04:20 What we did was made $\frac{2}{5}$ the denominator of 100, which is $\frac{40}{100}$. And $\frac{3}{4}$ of $\frac{40}{100}$ is 30 because $\frac{1}{4}$ is 10, and if you multiply it by 3, you get 30. Then we knew we had to make it out of the whole, not just $\frac{3}{4}$, so we made it $\frac{30}{100}$, and then we simplified it to $\frac{3}{10}$. We knew \$1.20 was $\frac{1}{10}$ of \$12, and we multiplied it by 3 to get \$3.60.

Logan  **05:05** I choose strategies to highlight during my summary. I usually look for a strategy that most of the students have used because I know that's a very familiar one and obviously a very important one. I try to choose strategies where students have maybe used something that we've learned in the past and applied it. So with this brownie pan problem, we had spent a lot of time talking about benchmark fractions. When I had a group that used that strategy that had taken that knowledge and transferred it over this problem, I definitely wanted to highlight that strategy.

 **05:44** I try to choose a strategy that sometimes I'm a little confused with and maybe I don't quite understand. The last group of boys that used the common denominator of 20 and 12, that strategy threw me for a little bit. I wasn't quite sure what they had done, so I wanted them to explain that strategy so it could be clear to me and then to their classmates. So I just try to use a variety of different, make sure I highlight a variety of different strategies.

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