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Transcript for October 23- 27, 2006

"Teacher Questions: Examples of Classroom Interchanges."

The teacher is seen questioning students, who are working on *Bits and Pieces II, Using Fraction Operations*, Investigation 3: Problem 3.1, "How Much of a Pan Have we Sold", and Problem 3.2, "Finding a Part of a Part," and Problem 3.3, "Modeling More Multiplication Situations."

The video was shot in real time and edited to 14 minutes.

Bits & Pieces II, Investigation 3
Class: 6th Grade
Date: October 23-27, 2006

Chapter 1: Student is Working on 3.1A
Approximate time 00 – 03:14 (Times from start of video)

Slide:

The class shown here is working on Bits and Pieces II, Investigation 3.

Slide:

The teacher tailors her questions to different situations: small group or large group, exploration or summary.

The clips shown here form a selection of questioning techniques Teri uses. She makes this look effortless and natural; we can only infer the planning and practice behind the scenes.

Slide:
Showing Problem 3.1A

•Line 1, 00:43 T: So what is this first one? Talk me through what you're doing with this first one.

S__ [Brett]: Well, I'm making like a half of it and then I'm -

T: Okay, why are you making a half?

S__ [Brett]: Because he wants to buy one half the pan that is two thirds full.

T: So what does the pan look like before he buys anything?

Line 10, 1:04 S__ [Brett]: It's got his, uh, two thirds --

T: Are you showing that anywhere in your drawing?

T: So what does that pan look like before he buys half of it?

S__ [Brett]: Uh, it's going to be two thirds full.

T: Could you show that?

S__ [Brett]: Yup.

T: How are you deciding how to color in two thirds?

S__ [Brett]: Well, two thirds is pretty much almost half, so --

Line 20, 1:32 T: It's almost half?

S__ [Brett]: Uh, it's past half.

T: So how are you deciding how much past half to make it?

S__ [Brett]: Well, it has to be at least, make sure that one of that goes over just a little.

T: Is there a way we could be more accurate than that even? To show two out of three pieces?

S__ [Brett]: [Unintelligible] ruler?

T: What would you do with a ruler?

Line 30, 1:55 S__ [Brett]: [Unintelligible], like, how much this is, like, say it's three inches, and then color two inches of it, one inch is still left -

T: You'd split it into three parts and color in two of them. So could you do that without a ruler? Split it into three parts and color two of them, or no?

S__ [Brett]: Yeah.

T: Would that be more accurate than just coloring in what we think? Why don't you come down here and try
Line 40, 2:16 that?

S__ [Brett]: Okay.

T: How could I show two of three pieces?

S__ [Brett]: [Unintelligible], ummm.

T: How can you show thirds?

S__ [Brett]: Color in thirds, with the candy bar -

T: How can you show thirds on that square?

[Brett drawing/coloring on pan]

T: Brett, can you split it into three pieces, that whole brownie pan, can you split it into thirds, into three pieces?

Line 50, 2:48 S__ [Brett]: Umm. If I, sorry, just drawing what I think of --

T: How would I split this into four pieces? How would you do that?

S__ [Brett]: Split this into four pieces?

T: Um huh.

S__ [Brett]: Like, just, cut that into like four pieces, like the candy bar.

T: Okay. Okay. So if I pretend like this is a candy bar, could I get three, could I split it into
Line 60, 3:08 three, let's say you and I and Caleb want to share this candy bar. Could you split it into three pieces so we could each share it?

S__ [Brett]: [Unintelligible] drawing -

Chapter 2: Student is Working on 3.1B
Approximate time 03:14 – 05:55 (Times from start of video)

Slide
Grade 6 Clip 2 coming up.

Slide:
Showing Problem 3.1B.

Line 1, 3:38 S__ [Caleb]: Three eighths -

T: Of the whole pan?

S__ [Caleb]: That she buys -

T: Okay. Are you stuck on something?

S__ [Caleb]: I can't figure out how much that would be she pays.

T: How did you figure out how much she was going to have to do up here? What'd you do? Looks like you
Line 10, 3:52 have four dollars. How'd you get four dollars for that one?

S__ [Caleb]: That's two sixths of the pan --

T: Right.

S__ [Caleb]: And two sixths of twelve dollars is, how did I do that?

T: So if you got four dollars, how did you get four dollars?

S__ [Caleb]: I don't remember.

T: What's that?

Line 20, 4:16 S__ [Caleb]: I don't really remember how I got that.

T: Hmm. So what could we do here? You're saying three --

S__ [Caleb]: Oh, wait, yeah. Now I remember.

T: Um, huh.

S__ [Caleb]: 'Cause if you divide twelve by six --•

T: I'm just going to write down what I hear you saying --

S__ [Caleb]: And then you took --

T: You took twelve and divided by six -

Line 30, 4:30 S__ [Caleb]: And then that's two.

T: So two, what does this mean, two what?

S__ [Caleb]: It means that each piece is worth two dollars -

T: Oh. This is worth -

S__ [Caleb]: Two

T: Two dollars and this is worth two dollars?

S__ [Caleb]: Yeah. So then -

T: Okay. Could I use that same idea here?

S__ [Caleb]: Not really, 'cause -

Line 40, 4:45 T: Why?

S__ [Caleb]: You can't divide twelve by eight.

T: Why not?

S__ [Caleb]: You'd get a negative.

T: Do you? Why can't I divide twelve by eight?

S__ [Caleb]: Because it just won't go into twelve.

T: Hmm. It doesn't?

S__ [Caleb]: Would be… one and a half.

T: Is that, why couldn't we use that? Is it exactly one and a half?

Line 50, 5:09 S__ [Caleb]: Yeah.

T: So what does this tell me?

S__ [Caleb]: That each piece is worth a dollar and a half.

T: So if this is a dollar and a half, and this is a dollar and a half, and this is a dollar and a half, could I get my total cost?

S__ [Caleb]: Sweet.

T: How did you decide this was one and a half? How did you do that?

Line 60, 5:41 S__ [Caleb]: 'Cause eighths, a half of eight is four, eight and four would be twelve.

T: Okay. So I can do twelve divided by eight.

S__ [Caleb]: Yeah.

T: I just might not get a nice even dollar amount.

S__ [Caleb]: Yeah.

Chapter 3: Trying to Explain the Algorithm
Approximate time 05:55 – 08:13 (Times from start of video)

Slide
Grade 6 Clip 3 coming up.

Slide:
The class has been working on Bits and Pieces II, Problem 3.1. A student has just suggested that to multiply two fractions together you just have to multiply the denominators and multiply the numerators.

Line 1, 6:16 T: So why, why does that work?

S__ [Taylor]: It helps you figure it out easier.

T: Okay, but why?

S [Taylor]: Because you just know that denominators are equal to what the answer is going to be.

T: Why, though?

Nikki: [Unintelligible], like
Line 10, 6:40 groups of that number so you had for number three ten groups, and six in each group.

T: Do I have ten groups of six? Where do I have ten groups of six?

S__: [Unintelligible response]

T: Oh, you're thinking, you're thinking…. why, why

S[Allie]: When she says ten groups of six, she means, she says like, um, like, like you're, you're adding six ten times basically.

S__ [unidentified]: It's like --

Line 20, 7:14 T: Are we doing that in this picture, adding six ten times in any way? Kristen?

Kristen: Like in one of the sixths, you have ten pieces, and then you have six sixths, so you have tenths and . . .

T: So in each one of those sixths, did I put ten pieces?

Kristen and class: Yeah, yes.

T: Is there six groups of ten instead of ten groups of six?

Line 30, 7:34 Class: Yes.

T: So I took every sixth and I split it into ten pieces. Let's check and see if we did that. In every one of these thirds, did I split them into seven pieces?

Class: Yes.

T: One, two, three, four, five, six, seven. Hmmm. In each half, did I split it into three pieces?

Class: Yes.

Line 40, 7:56

T: Huh. How about over here? In this half, did I split it into four pieces?

Class: Yes.

T: Okay. So that sort of explains the denominator. So why do I multiply the numerator. Is that what you said. Who said - Hayden, was it you who said you multiply these two and then you multiply those two? So why, why?

Chapter 4: Trying to estimate 2 ½ x 4/7
Approximate time 08:13 – 09:08 (Times from start of video)

Slide:
Grade 6 clip 4 coming up

Slide:
Showing the Getting Ready Problem 3.3

Line 1, 8:33 T: Kristen, do you have any ideas about how to estimate that one?

Kristen: Well, um, I think it might be, um, well, 'cause if it was four, um, four sevenths, um, times two and one half it would be like four sevenths of two and a half --

T: Okay. So you're thinking about it like this?

•Kristen: Yeah, so --

T: Okay.

Line 10, 8:55 Kristen: Four sevenths is about half so I think it would be like two.

T: So you're thinking of half of two and a half?

Kristen: Yeah.

T: So what would a half of two and a half be?

Kristen: Oh, wait, it would be, um, one and one fourth.

Chapter 5: Student Tries Rewriting 2 1/12 x 4/7
Approximate time 09:09 – 10:23 (Times from start of video)

Slide:
Grade 6 clip 5 coming up

Line 1, 9:19 **T:** What do think?

Kaylie: To make it less confusing, maybe you could change the two wholes into halves. Like, for, five halves --

T: Oh.

Kaylie: So maybe --

T: Would that help us? What if we called this five halves of four sevenths?

Class: [Unintelligible responses]

Line 10, 9:38 T: But could you multiply that using our algorithm?

Class: Yeah.

T: Let's do it just to see what we get. Could we do five halves of four sevenths? What would we end up with?

Class: Fourteen twentieths, twenty fourteenths.

T: Actually, twenty fourteenths, right? And what is that the _____?

Class: One whole and six fourteenths.

Line 20, 10:06 T: One whole and six fourteenths. Hmmm. Is that about, now these are estimates. Is that close to this estimate? Or no.

Class: Yes. No.

T: No.

Class: Not really.

T: No. Isn't it about, almost one and a half, and that's one and a fourth.

T: Nope. Not even close.

Chapter 6: Students Discuss 10 ½ x 2 1/3
Approximate time 10:23 – 11:28 (Times from start of video)

Slide:
Grade 6 Clip 6 coming up

Slide:
Showing Problem 3.3D

Line 1, 10:44 Rebecca: Two and one third, two and one third, and then you add'em all up? But what would you do for the half? …… We need to figure out the half day.

T: Can you do this in a whole day, so how could you figure out what you do in half of a day?

Rebecca: Would you split it in half?

T: Does that make sense to you?

Rebecca: Yeah.

Line 10, 11:11 T: What do you think that they can accomplish? If they could do two acres in a whole day, what do you think they could do in half a day?

Rebecca: Half of two and one third?

T: Could you figure that out?

Rebecca: It would be…… Or one and one third.

Student in white shirt: Split the third in half.

Chapter 7: Summary of Strategies for 2/3 x 16
Approximate time 11:28 - 13:00 (Times from start of video)

Slide:
Grade 6 clip 7 coming up

Slide:
The class is summarizing their ideas about multiplying mixed numbers. They are looking at a solution for 2/3 x 16.

Line 1, 11:49 T: Is it okay if I write on one of your drawings? Is it okay if I write here 'cause there's some room here? Is it okay? Okay. So when I heard you say two thirds of sixteen, you ended up with thirty two thirds. Yes? Yeah?

Kristen: It looks like, um, it was sixteen times two. Sixteen times two is thirty two.

T: Oh.

Taylor: Three times sixteen is thirty __

Line 10, 12:16 T: Three times sixteen is three???

Jesse: Oh, the denominator stays the same. The numerator --

T: Hmmm. Did you guys notice that?

Class: Yeah.

Ellie: Yes, I just noticed that.

T: What?

Ellie: It would be sixteen over one because --

Line 20, 12:30 T: I can write sixteen as sixteen over one?

Ellie: Yeah, because three times one is three and then two times sixteen is thirty two.

Class: Yeah, oh.

Student [unidentified]: 'Cause you have sixteen wholes.

T: Should I write this a little bit so you can see it a little bit better? So I can take any whole number and write it as as fraction by just putting it
Line 30, 12:51 over one? Sixteen oneths?

Class: Yeah, yes.

T: Well, that's kinda cool

S__: Awesome.

Chapter 8: Analyzing a Common Error
Approximate time 13:00 – 14:10 (Times from start of video)

Slide
Grade 6 clip 8 coming up

Slide:
The class is summarizing their ideas about multiplying mixed numbers and the teacher wants to use two student solutions to talk about an error.

Line 1, 13:21 T: I want to use that picture to think about why it doesn't work. So look up here for a second, okay? If I have ten and one half groups of two and one third, I saw some people trying to do ten times two is twenty, right? And then a half times a third equals one sixth, putting them together and getting twenty and one sixth. Okay? Why can we not just do that? Why does that not work? That doesn't give us enough. Why not? Ellie, why not?

Line 10, 13:57 Ellie: Because you have to multiply both numbers. Like, you'd have to multiply ten times, um, a third and ten times two and then a half, um, a half by a third and a half by a two.