Triangle Lesson

Teacher: Kelly Polosky

District: Wilkinsburg School District

Grade: 5

Teacher: Okay. I'm going to redirect you guys. I need your attention up here a little bit. And I'm looking at all these findings that you came up with and I'm finding I heard all of you say these things. With all…everything that we did, I need someone to share with me a rule or formula that they came up with to find the area of a triangle. Sheena.

Student: *(inaudible)* …when we got, we had two of them here. We had length times width divided by two.

Teacher: *[Teacher records l x w ÷ 2].* Where are you coming up with this?

Student: Because when we, when you cut the square in half, that's half and like when you get, like 36, 'cause that's a whole square and half of it's 18, so like, if you had another, any square, any square and you did, um, the length times the width and then you divided that in half you'd get your answer.

Teacher: How do you know to divide? Where are you getting this dividing by two? I'm curious of where you're coming up with that.

Student: When we started with a whole square, it was 36. But then you have to cut it in half for a triangle.

Teacher: Why do you…I'm wondering why you need to do that?

Student: 'Cause, it, um, so we could have a triangle. So we know how many halves. And in each one we had 18 in each of our squares.

Teacher: Okay. Is there another way that…can someone tell me or share with me another way that we could write the same formula to see if it would still work? Patience.

Student: Um, um.

Teacher: Without changing what you're saying.

Student: Um, half times…um, half of length times width.

Teacher: Is that the same thing?

Student: Yeah.

Teacher: Why? How is…how do you know? How can you prove that that's the same thing? *[Teacher records ½ of l x w].*

Student: Well, like, um, when like, when you're dividing by two, well, um…'cause dividing two there's two, um, parts of a square and halves, that's two halves, um, that's two parts and that's half of a square.

Student: I think they're the same thing because, um, one times, I mean, I mean, um, length times width divided by two and half of length times width, um, is, I think it's the same thing because, um, 'cause two divided by the length and width it's like, um, it means, 30, it's 36 and half of um, length times width is 36, too.

Teacher: How do you know that?

Student: Because, um, the length and width altogether is 36 and half of it is 18.

Teacher: Chase.

Student: Yeah, because when you write 2 it's just another way of saying half.

Teacher: Oh, when I say 'two'…anytime that I say 'two', it's the same as saying half.

Student: No, when you say length times width divided by two…

Teacher: Oh, divided by two.

Student: ..Is just like saying divided by half.

Teacher: What if I did this? I'll use it in red so you can see it. What if I did… do those mean the same things? *[Teacher records (l x w) ½].*

Student: It's two like, parent…what is…? I don't know.

Student: Parentheses.

Student: Yeah, parentheses that covered that one, that's probably why people are saying they're different.

Teacher: But are they?

Student: No.

Teacher: I need some people that haven't participated to help me out. Do you think that means the same thing? Kevin Scott.

Student: I think you could come up with 18 with that 'cause that's the same thing as the other one. It's just a turn-around fact.

Teacher: How do you know that?

Student: Because, like it's one times the width equals one half, but the other one was one half times one equals the width. *[Student appears to be reading the lowercase l as a 1].*

Teacher: Patience.

Student: I think it's the same because, um, on the, um, one, the um, half of length times width equals 18, half of 36 is 18. I think it's the same because, um, it's the, kind of ah, like it's turned around or it's just like, um, it doesn't have the 'of' in it. I think it's the same thing, too.

Teacher: Sheena.

Student: Well I think it's the same thing as the two up there, it just doesn't go like the first, like how we have the second one. We have it like half of length times width. It's just the opposite. It just has length times width and then you have the half.

Teacher: Chase.

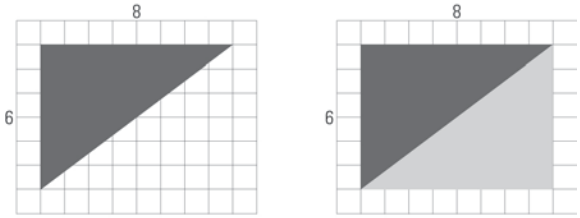
Student: I think that's just like what we did. 'Cause we're cutting in half one of ours, and leaving the other one. And they're cutting in half one of theirs, but they're just using length times width, and so are we, but we're using numbers.

Teacher: Patience.

Student: Well, um, Chase, when you say like, um, it's kind of the same, but you're just using numbers, I disagree with you because um, 'cause um, when Ms. Polosky said that, um, we got to make, um, like formulas that we're always going to use when we, um, when we do triangles, 'cause, um, we're not always going to use like the six and the threes and all that stuff.

Teacher: You know what, that brings me to a good point. Are these two formulas? Can we use them universally with all right triangles? How can we do half times length times width? I'm wondering how that one would work for here.

Student: Well, when you have, um, two triangles *[Student refers to the drawing on right below.]* and then you like, do six times eight in it, that equals, um, that equals like the whole triangle [rectangle] or something else that a different number. Then, but then, when you do half of it and then you take this one away *[Student removes one of the triangles and ends up with the drawing on the left.]*, and then you just have this half of length times width 'cause when you put, when you put these two together.



Teacher: So, now you're saying that I can do half of length times width. What about half of length, I'm still confused where that parentheses in the multiplication, half of length. If my length was eight, half of my length *[Teacher refers to the triangle shown in the picture on the left below, and draws a vertical line that cuts the base of the triangle in half.]* was…

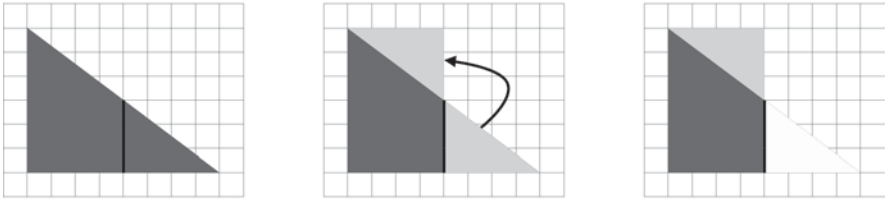
Student: Four.

Teacher: Times my width.

Student: Six.

Teacher: Which gives me? *[The teacher rotates one portion of the triangle as shown in the middle picture below to form a rectangle that results in the picture on the right].*

Student: 24.



Teacher: Or, can I do my length times my width and then I'm going to multiply times half which is going to give me…*[Teacher cuts the length of the triangle in half and rotates the triangle at the hypotenuse to form a rectangle that is half the size of the original rectangle].*

Student: 24.

Teacher: So, are these two formulas…can we use them universally with all right triangles?

Student: Yes.

[End of Audio]