

## **Tuesday Closure:**

### **Part B:**

CATHY HUMPHREYS: Which one are you trying to prove first, which shape?

STUDENT: Just...well, I don't know. We just finished the kite and we were going to do it on Thursday. We were going to bring in compasses and do the...

CATHY HUMPHREYS: The compasses are up there. You actually could do it.

STUDENT: No, no, not right now. We're going to do it on Thursday because we still have to...

CATHY HUMPHREYS: So are you going to use the compasses to verify that it's congruent or prove that it's congruent?

STUDENT: Verify.

CATHY HUMPHREYS: Verify. And then once you've verified it yourself...

STUDENT: Then we can verify it to others.

CATHY HUMPHREYS: Ah, okay. Very good. So that in other words, the compasses are going to help you convince yourselves and then you're going to prove it. Are you kind of in a stall Julie? See, what could we...we've been working a really long time. Is there anything I could ask you to un-stall you?

STUDENT: Ah, we still haven't figured out how to make a right non isosceles triangle.

CATHY HUMPHREYS: Yeah.

STUDENT: How about you Sara?

STUDENT: I don't know how. I don't think you can do it with these lengths.

STUDENT: With these things, probably not but...

CATHY HUMPHREYS: You don't think you can do it with two...

STUDENT: What if, what if you use this instead of this one?

CATHY HUMPHREYS: Are you saying that you don't think you can do it with two same length diagonals? Okay, do you think you can do it with two different length diagonals?

STUDENT: I don't know.

CATHY HUMPHREYS: Why don't you try it? That's a good thing to work on.

STUDENT: Let's do it!

CATHY HUMPHREYS: Okay, it seems like when I stopped the group it kind of stalled everybody. What are we working on here?

STUDENT: Well, we just tried to prove why a rectangle doesn't work.

CATHY HUMPHREYS: Tried what?

STUDENT: Tried to prove why a rectangle doesn't work with a long one and a short one.

CATHY HUMPHREYS: Oh!

STUDENT: Yeah, we just proved that...

CATHY HUMPHREYS: Oh, you know what, that's really interesting! Proving that something doesn't work is hard and proving that something does work is a little bit easier. So what you're saying...what is your conclusion about rectangles?

STUDENT: Rectangles we think...

CATHY HUMPHREYS: Actually Ryan, you've done so much already, I want to hear from somebody else okay?

STUDENT: Okay.

CATHY HUMPHREYS: Brianna or Maria, I don't want to put you on the spot but do you know for sure what would make a rectangle?

STUDENT: Two pairs of parallel lines – sides and the top line and the bottom line are congruent and then the side lines are.

CATHY HUMPHREYS: Ah, okay. So that's the definition of a rectangle. What about the – what kind of diagonals would it take? Like, I'm the manufacturer, I want to make a rectangle, and I don't want to think about it; I just want somebody to tell me what to do. Do you know what kind of diagonals it would be?

STUDENT: Well, for the, for the long one and the short one it wouldn't work but we found out that um, the two long ones, it worked.

CATHY HUMPHREYS: What's the "it" that works?

STUDENT: The diagonals...

CATHY HUMPHREYS: Sorry?

STUDENT: For the diagonals to form a rectangle you can use two long ones.

CATHY HUMPHREYS: Could you use two long ones in any configuration?

STUDENT: Um, we wrote it down.

CATHY HUMPHREYS: Could you read it Brianna, to us?

STUDENT: For the rectangle?

CATHY HUMPHREYS: Yes.

STUDENT: Um, two long sticks work and then the short stick and the long stick don't work.

CATHY HUMPHREYS: Ah, alright. So I'm going to take the long sticks and I'm going to try um, I'm going to try and give you a counter example. So I have two long sticks and I'm going to put them together like that. Is that going to make a rectangle? But you said two, but you said two sticks work; two long...same size.

STUDENT: It depends where you put it.

CATHY HUMPHREYS: Alright, it depends on where you put it. So if I'm the manufacturer, I don't – I mean there's all these places I could put it and if the kite is big it could be infinite. So you'll need to tell exactly how to make the rectangle with two same length diagonals. Alright, would you please work on that so that you are specific about each one of those things?

CATHY HUMPHREYS: What is the "it" that you've figured out?

STUDENT: We figured out why they're parallel.

STUDENT: We can't assume...

CATHY HUMPHREYS: Shhh, wait a minute. What...you measured them?

STUDENT: You gave us this so we assumed that we could.

STUDENT: We did assume actually.

CATHY HUMPHREYS: Ah, okay. So it works for this particular case.

STUDENT: We can do all the cases.

CATHY HUMPHREYS: Do you think you can do it, so the "it"...there I am using that word. Um, you measured and you found that they were true so you are convinced that you are at that stage.

STUDENT: So what happens is that you see the bigger rectangle; it becomes a parallelogram because you can't do that. This stick isn't long enough to connect to this without it being a parallelogram. Something like that, I can't explain it exactly.

CATHY HUMPHREYS: Let's put these together exactly like they were – when they started I think that they were...the brad was up here and there were two longs and a short in every set, so let's do that. I should call the resources managers up. Resources managers I need to talk to you; there are a lot of directions. Resources managers come on down. Every person needs to put their shapes back together like this. So the brad is on the top so the next class can use

them. And there are two longs and a short. Then just make sure that each person has all their names on their papers and they are stapled together. There is a stapler over there and if you want to clip your group um, your whole groups' papers together, I'll put paper clips out there as soon as I'm done here. So everything needs to be cleaned up in like within two minutes alright? Okay, there you go.

STUDENT: Look, I was tinkering and I made a different trapezoid.

CATHY HUMPHREYS: You... Thank you for cleaning up so quickly; keep cleaning up while I'm talking.