CATHY HUMPHREYS: It can be a square. It's a non square rhombus, yes. So if you want to do a square then that's different. So in other words, we're doing the most generic one. It's true that a square is a rhombus but what you're going to try and do, if you're doing a rhombus then do a rhombus that's not a square. Alright? So think about all the things that have to be... Do you have a list somewhere? See, I think maybe yesterday you didn't write down enough stuff as you were going along. Yeah, alright. Excuse me, which one are you going to do?

STUDENT: We just proved it.

STUDENT: Rhombus.

CATHY HUMPHREYS: You're going to do a rhombus? And do you understand that it's a not square rhombus? Okay. You just got it?

STUDENT: We just got it. Yay!

CATHY HUMPHREYS: You're excited? Okay.

STUDENT: Do you guys want to do a two column proof or…

STUDENT: Write A, B, C, D.

STUDENT: Paragraph.

STUDENT: But what if she tells us that we don't know what a parallelogram is? Whatever, just say that we know what a parallelogram is. So a rhombus is a quadrilateral that is a parallelogram with all congruent sides.

STUDENT: Yeah.

STUDENT: Exactly. There we go. So then now let's prove it. Jerry. Wait, we need to name them first; name each side – A, B, C, D and then the midpoint. A two column proof...do we have given? What's given? That angle...that they are congruent to each other right? That's all that's given? That BEC is a right angle?

STUDENT: Wait, hold on. AB is congruent to BC is congruent to CD is congruent to BA.

STUDENT: No, I think we need to prove that. We don't know that yet.

STUDENT: No, but that's…

STUDENT: No, we are proving that it is a rhombus. If we already know that these are all congruent then it's already proved; and all we have to do is prove that they're parallel.

STUDENT: Wait, what's given?

STUDENT: Given, I think the only thing that's given is these two diagonals. We said the diagonals are only…

STUDENT: Oh, oh, oh.

STUDENT: So, so you say AC is perpendicular to BB; that's given.

STUDENT: So AC is perpendicular to BB by given.

STUDENT: And two AB is congruent to EC and that BB is congruent to...

STUDENT: And then BE is congruent to ED. So now let's prove that it's a triangle. Do we have to prove…yeah, let's prove the triangle...

STUDENT: Wait, so we have side angle side right?

STUDENT: Side angle side. So we know that all triangles are congruent.

STUDENT: So they should be all like perpendicular.

STUDENT: So all the triangles are congruent?

STUDENT: All triangles should be congruent.

STUDENT: Wait, do we know that…

STUDENT: So if they are perpendicular, if they're perpendicular then yeah. You said that AC... If they're all perpendicular then they're all right angles. So I say BEC, triangle BEC is congruent to triangle DEC. Yeah because of side angle side and then if triangle BDC... So then BDC is congruent to BAD by side, side, side. Right?

STUDENT: Yeah.

STUDENT: So there we go. So it would be triangle BDC is congruent to triangle DEC and that's because of side angle side. And then five is triangle BDC – no wait, wait. Can we just jump to that conclusion; that this whole…?

STUDENT: We know that these two are congruent right? So these sides have to be congruent and then they share this side right? So how would we write that?

STUDENT: Let's write EC bisects...no. We already know EC bisects ED.

STUDENT: Yeah, so it'd be like... How do we say that BC is congruent to DC?

STUDENT: Because we already…okay, say that BC is congruent to DC.

STUDENT: Or should we just write over here…

STUDENT: Right? CPCTC right?

STUDENT: Wait, BC is congruent to DC because of CPCTC and then…

STUDENT: Wait, first let's say we proved these.

STUDENT: So number six is triangle BEA is congruent to triangle DEA because of side angle side. And then BA is congruent to DA because of CPCTC.

STUDENT: And now how do we prove that all the sides are congruent to each other? No. Then we'll say that the triangles…

STUDENT: These two triangles are congruent because of side, side, side.

STUDENT: Okay, let's prove this first. So triangle BAD is congruent to triangle BCD.

STUDENT: Wait, which are we proving first, the sides or the parallel?

STUDENT: The triangle.

STUDENT: Wait, how do we know that these sides are congruent to each other?

STUDENT: We have to prove it like this. Oh, oh wait.

STUDENT: I thought we were going to prove alternate interior angles first?

STUDENT: First or second?

STUDENT: First because it's easier.

STUDENT: So these are not necessarily parallel?

STUDENT: Yeah.

STUDENT: So there can't be alternate interior angles.

STUDENT: No, these are supposed to be parallel; it's supposed to be like this. It's supposed to be a parallelogram.

STUDENT: Not necessarily.

STUDENT: But it's supposed to be…listen.

STUDENT: Because a rhombus could also be like this.

STUDENT: But are these parallel? A rhombus has to be...look at the definition – a quadrilateral that is a parallelogram. What is a parallelogram? Two pairs of opposite parallel sides and it's all congruent. So that's why a square can also be a rhombus because they're all congruent sides and they're both two sets of parallel sides. That's why! Wait, how are we going to approach it? We have to change...we have to get...okay, what do we have to do? We have to prove that all sides are congruent and we have to prove that alternate interior angles are congruent too. So how do we...?

STUDENT: Wait why do we need to prove…

STUDENT: To prove that the lines are parallel; to prove two sets of lines are parallel.

STUDENT: But we already know that it's a parallelogram.

STUDENT: That's the definition. We just need to prove it.

STUDENT: How do we do that?

STUDENT: Where are we at right now? Wait, BA and DA so then…BA and DA.

STUDENT: So we've proved that these two are congruent and these two are congruent.

STUDENT: A quadrilateral has four congruent sides then opposite sides are parallel...diagonals are perpendicular to the sides.

CATHY HUMPHREYS: Congruently angles…um, so let me look at this. You know, since you have barely started, I would really love it if someone would do a kite. Would you mind? So a kite is um…

STUDENT: Okay. It's pretty much the same thing.

CATHY HUMPHREYS: It just doesn't have as much – it has…it doesn't have the parallel it has in which two pairs of adjacent sides are equal and so I think...I would love – we don't have anyone with a kite. So a convex quadrilateral in which two pairs of adjacent sides are equal – what does that mean?

STUDENT: It means that these two sides are equal and these two sides are equal but all four sides aren't equal.

CATHY HUMPHREYS: Okay, now do you have notes on what the diagonals look like?

STUDENT: Um...

CATHY HUMPHREYS: You guys are so disorganized what am I going to do with you?

STUDENT: Oh, here is a kite.

CATHY HUMPHREYS: Oh you got it? Okay, good Tianna. Oh that's good! Okay, so what do we have here?

STUDENT: We have one long or two long ones…

CATHY HUMPHREYS: Okay, the diagonals are perpendicular? Okay, so why don't you think about how those are different from that.