Tuesday Introduction

Part C:

CATHY HUMPHREYS: ...still work. Okay, just another minute. Would you finish whatever quadrilateral you're working on right now? And as soon as you are done with that, would you please wait until everyone in your group is done? Okay, I see this table is done, this table is just about done and okay, this table is done, thank you. Let's go around the table in a circle taking turns, but before you do that, I want us to review this investigative process; and we have our question and you are at this stage right now. So just remember all the different places you can go individually or as a group. I am actually going to put this arrow right here at systematic tinkering because we haven't talked too much about that. But I want you to be thinking about how you tinker with a system rather than just arbitrary choices. So um, tell each other what you know so far and then I'll talk to you about what you will need to turn in at the end of the period. Alright? So go ahead.

STUDENT: What did you guys find out about...?

STUDENT: That if you put these two equally and kind of at an x, this works.

STUDENT: Okay, so if you keep them the same distance from one point...

STUDENT: You see how it is a cross.

STUDENT: So it's a cross. Yeah. (Inaudible). So that's how you make a square. I don't think it's a perfect square because the opposites of the holes aren't exact distance away from each other; and the points aren't exact.

STUDENT: And this still moves around. It's not going to be a perfect square but...

STUDENT: It is not stable enough. So it represents a square.

STUDENT: This one, I did two random holes and then I got this.

STUDENT: So you got a trapezoid. So what are the diagonals for that trapezoid?

STUDENT: Here and here.

STUDENT: And can you make them all with a big one?

STUDENT: So was it something like that or...like this right?

STUDENT: Yeah, it was like that. I didn't put it in yet.

STUDENT: So you used the holes as markers for your...

STUDENT: Yes in circles. Tell me what you did up there?

STUDENT: I used the end points. I think that made it a little sloppier. So Javier, what did you find out?

STUDENT: If you take a small one and a big one and you put them like a cross, you'll get a rhombus or a kite. They're all the same.

STUDENT: So you can see they are the same distance from each mid-point of the largest diagonal. I did the same thing and I also got a kite. You got a rhombus because it was...

STUDENT: You put one kite right?

STUDENT: Yeah, I put one higher than the midpoint of...

STUDENT: So if you were to put one lower then you'll get that.

STUDENT: It would still be a kite.

STUDENT: Yeah but...

STUDENT: Yes but it goes exactly in the middle then it would be a rhombus.

STUDENT: I found five of them and the rectangle you could make pretty much any size if you go outward with these two; if you put it right in the middle. And the square if you put...I'll show you. So if you put it right in the middle like that then it makes a square. And if you turn it just like that then it makes a rectangle and you can change it to be however you want.

STUDENT: But did you notice this? But the small stick at ninety degrees angle, right in the middle makes a kite. So if you use...

STUDENT: Yeah, but it makes a diamond. So if you put it right in the middle...

STUDENT: So not just these two long ones but if we make... Let's say if we put the pink at the top or something... Oh, it makes a triangle. You know what I mean.

STUDENT: If you put these two right in the middle, I get a parallelogram.

STUDENT: Yeah, that's what I got.

STUDENT: A parallelogram?

STUDENT: Yeah.

STUDENT: I got the kite but if you move it up...if you don't put it exactly in the middle.

STUDENT: I didn't get any regular sticks.

STUDENT: I got this parallelogram.

STUDENT: How did you get that one?

STUDENT: That was this one and like this.

STUDENT: Oh, I just put that straight. I got the trapezoid but…

STUDENT: So then what did we notice?

STUDENT: Anything like that is a trapezoid.

STUDENT: So what do we notice about this…what patterns do we get?

STUDENT: If you keep both of the points centered then you can get parallel lines.

CATHY HUMPHREYS: Because this is what everyone is going to turn in, their individual investigative work. So all the quadrilaterals that you did and I would like you put them in order. So that I...when class is over today I am going to go through your work and see what order you were doing. It's going to give me an idea of what you're testing and how you're testing it. And then as you work today, keep evidence along the way of what you observed. And remember I showed you that piece of work from our class about how someone had actually written the comments um, about what they noticed, what they observed, a question they had. Those things I would actually like you to write out in words. If you have a conjecture like I think that this is true then please write that down. If you get stuck, like something is not working please write that down. Ah, if you get an AHA, a mathematical AHA then write that down. And any system of tinkering that you are doing, if you think it won't be obvious to me by reading it, if you can write down what your system is; what are you testing for? So those are the things that I'm looking for because that's going to help me see your process. Remember how we talked after the polygon investigations about how it's not just the end product that I want? I am really interested in your process.

Alright, so now the question is how will the manufacturer know what particular arrangement of sticks will guarantee, guarantee the quadrilateral that he or she needs to make? Um, the facilitators, you are going to coordinate your group, make sure everyone has something important to do…a part of the group task. Resource managers you are going to make sure your group has the materials you need and that the materials are also put away at the end of the period. That does not mean you have to do it but it means that you have to coordinate that. Team leaders make sure your group members are on task because sometimes it gets discouraging and people kind of drift off, so make sure that doesn't happen. Oh, resource managers also call me over if you've got a question for your team. And then recorder, reporters your job is going to be more on Thursday instead of today; I think depending on how the investigation goes. Okay. So your first job – you have done some individual work so now as a team I would like you to talk to each other as a group. I would like you to talk to each other about how you are going to organize yourselves for the investigation as a whole group because you are going to have a group product as well. So would you talk that over for a few minutes? I am going to walk around eavesdropping and then when your group knows how you are going to proceed and everyone knows how you are going to proceed then you can get your materials and get started. Are there any questions? Alright, I am not going to interrupt you for awhile. Yay!