**Monique Cubes and Surface Area**

Monique: It says, for a given number of cubes, what arrangement will give a rectangular prism with the least surface area? What arrangement will give a rectangular prism with the greatest surface area and use examples. I want you to do this right now. I want you to take one minute to discuss it with your partners and at your table groups. How do you, how can you tell if it’s going to have the least surface area and the most surface area? For example, if I gave you 20 cubes what would you know about it?

[Students work quietly for approximately one minute].

Monique: Why is there this space? This space. I don’t understand this space. Next to each other. Please move it over.

Monique: All right, who can summarize what they know about when it’s going to be the most and when it’s going to be the least surface area? Huango?

Student: When it’s going to be the most is when they’re all going to be in a straight line.

Monique: They’re all in a nice, straight line. Why is that the most surface area?

Student: Because it’s spread out.

Monique: It’s spread out, there’s no, the fewest number of hidden faces. Okay. When would I have the least surface area?

Student: When you have a box that’s really compacted and you can only see the face on like the six faces.

Monique: So we’ve compacted it as much as possible. So what would you believe would be the dimensions of a box that has 20 cubes that would have the least surface area?

Student: [Unintelligible].

Monique: I heard somebody. What did he say? Randy, what did you say?

Student: 4 x 5 x 1.

Monique: 4 x 5 x 1? Does everybody agree that’s going to give me the least surface area?

Students: No.

Monique: No?

Student: 5 x 2 x 2.

Monique: 5 x 2 x 2? Does everybody agree that that’s going to give me the least surface area? Probably. What kind of numbers are 5, 2 and 2?

Student: Prime.

Monique: Prime numbers, so can I break them up any more?

Students: No.

Monique: So is that going to give me my most compact?

Student: Yes.

Monique: Yes, so that would be my most compact.