

## Video Transcripts

### Using Trigonometry: Activity Design

*Jubilee Hu (Teacher):* I am very passionate about communication and representation. It's something that I've always wanted my students to work on in a more explicit way. So I just grabbed the opportunity that this is my chance to make it happen so that students can really work on their communication and their representation in a very meaningful way, and they can self-assess on these aspects of the competency without feeling that this is detached from what they're learning.

We worked backwards, so we started with the self-evaluation, the self-reflection. So we started forming these questions first, and then when we went back and looked at what would make sense for us to use to really have that come through in the process. And I wanted to do something visual, something that can also be solved in multiple different ways. So I had chosen trigonometry, because it can be graphed, can be written as a table, and can be modeled as a function.

The reason why we really like the self-evaluation at the end is that it's really adaptable. It's not just limited to trigonometry. This can be applied to other subjects, or other areas of math. From my perspective it could be anywhere from Grade 8 through 12, and it doesn't have to be the pre-calc stream either. Anywhere you can find problems, or they make use of real-life situations, and they can solve together as a group, and a surface where they can represent everything in a visual way.

### Using Trigonometry: Activity Delivery

*Jubilee Hu (Teacher):* So, you're already familiar with working at the white boards and the window. That's our vehicle. We're going to use that to really let that communication and representation to come through. Pick one option from the three within your groups. Your final answer should be a sinusoidal function. And you can present it in terms of an equation, you can present it in terms of a graph, it's really up to you how you want to do that I'm going to get everybody to read it before you actually do the activity because I want you to be aware of what you're assessing yourselves on at the end of this. I want you to purposely address these things while you're working through the problem that you have chosen.

*Ingrid (student):* With today's activity we were actually just given data that hadn't been analyzed, it hadn't been processed, it wasn't filtered, so you really had to figure out what data to use and how to it. Like, "do I use all of it, do I select some of it, which parts do I use, how do I represent that?" It was challenging and it really forced us to think beyond where we usually would.

*Anson (student):* Each of us got to contribute to solving the problem, and we used math vocabulary to communicate our ideas and intentions across, and with that comes thinking. We had to think in order to model something or communicate our point across to another group member.

*Caroline (student):* Communication was number one because you had to be able to explain your ideas but also let other people explain their ideas and strategies and you also had to recognize maybe I made a mistake and look like rewind and figure out what you did and then work with your group.

*Jubilee:* They do that on a vertical and non-permanent surface so that it creates a risk-free environment for them to try different things. They are not afraid to just erase it and start again, and also it's a really visual way for me as a teacher to see what they're doing.

*Ingrid:* It's more comfortable that way to discuss and be able to express, "oh, what if it's like this," and I can draw it out and explain and, "this point would be here, that would be there, and it would affect it like this." And I think that allows us to visualize things and express them better.

*Janet (student):* By standing and using a different surface it really helped me think outside of the box and be more creative than writing with pencil and paper.

*Nicola (student):* In this problem, there's a lot of times where you want to restart or go back or slightly change what we had written, so, it's nice to be able to erase it and then try taking a new approach to the problem. From this activity, I learned that there's many ways that a solution can be solved, so, I learned about the importance of sharing my ideas with the group and discussing which way we want to approach the problem.

*Jubilee:* The students did well working through their struggles. They were quite bold to try different things, to ask each other different ideas, whether or not these ideas would make sense. So I was quite impressed with their approach and how they got through their problem.

### **Using Trigonometry: Activity Reflection**

*Jubilee Hu (Teacher):* There's certain things that they thought they knew. After working within the group, they realized that, oh that was actually a misconception. Or they felt that they've got the best function to represent this question, but someone else had an even better solution for that particular question. So working in groups really helps students build their math understanding on a different level.

*Anson (student):* I felt that working with a group certainly helped, as my group members could complement in my strengths and weaknesses. We were able to point out each other's mistakes and contribute as a whole to solve the equation.

*Caroline (student):* When you work with your group you can really see the opinions and strategies from your other group members. It can help you develop your understanding of, not only what we're learning in math, but also for problem-solving and critical thinking. Working with groups and about a real-world issue, it's really like, it's kind of like satisfying. So, that all your hard work can be applied to something useful.

*Jason (student):* If it's a real-life situation you can connect to it more, right? And then, yeah, you're able to think about that situation in your head, and then, yeah, come up with solutions.

*Ingrid (student):* To think about things that—people probably actually do these calculations. Someone is actually wondering about, what period of time is optimal for berry picking. It was something important that we needed to realize, that the things we're learning actually do have an impact, and I think it's a good activity.

*Janet (student):* Getting to work in the smaller groups and getting to work on real-life application was really helpful to have another perspective on math, because math is boring, but it's not anymore. Yay! It was fun, and I learned really a lot.

*Jubilee:* They're reflecting, they're thinking about their learning. The meta-cognition that's working which I find very valuable, because that will really help them develop this particular curricular competency.

*Ingrid:* It's good to stop and think about it immediately after, to go through the events, the process, what did I do, how did I perform, what I contributed. The fact that we read over it before we started, so that you know what you're setting out to aim for, and in the end actually thinking, "did I do what I was aiming to do in the activity?" I think it helps us learn to self-reflect and critique ourselves in a healthy way.

*Caroline:* It actually really helps me to see what I did well and what I could improve on for in the future when I work with other groups. And not just in a math setting but like any group project or anything it helps me to know what can I do to improve my communication and my social skills and all those things.