

Video Transcripts

Predicting a Catastrophe: Activity Design

Rebecca Sulek (Teacher): I think the big idea for us as teachers was to come up with something that really supported and reflected the curricular competencies, and that was difficult. It was difficult to keep reminding ourselves to come back to those curricular competencies, and we tried to be really specific when we designed it. So we really tried to come back to, "Is this reasoning? Is this modeling?"

Clare Hay (Teacher): We looked at a situation where we had population for a country and the food production for that country over a number of years and looked at graphing that data and seeing where the intersection happened and what that meant.

Rebecca: The activity connected well with the Math 10 curriculum because it's linear relationships, linear modeling.

Clare: We weren't necessarily concerned with the right answer at the end of the day. It was more how they were getting to that answer and what their graphs looked like and the considerations they were taking with that. So that was a hard thing to focus on because usually with math you're wanting the answer is the important part, but in this case we wanted to continue focusing on the process of getting to that answer and what their models looked like.

Rebecca: I think what was helpful was I sort of gave myself the idea of task-specific evidence. So what does it look like to have good reasoning and what does it look like to have good modeling? And I kept asking myself that when designing it and letting the solution not be a part of the activity so much.

Rebecca: It works well with the Social Studies 10 curriculum. And I think that the opportunity to work with a social studies specialist and how you encourage that type of communication and discussion in the classroom would be so great for a math teacher.

Clare: I think it would be a neat thing if the kids were interested in it to maybe put it to their socials teacher and have more of a look into it, or a science teacher. What could be done? How could we change food production? Or doing some research into the different ways that food production is already starting to change in the world.

Rebecca: The activity that we designed I think is good as an end activity. I have a lot of students that they get a test, and they just sort of blank. They don't do well on tests. But I know if I have that conversation with them, they understand what's going on. And I think that this really gives those students a chance to explain their thinking and communicate their thinking without having to write it down on a test.

Clare: Talking to the students after today's activity, they really appreciated the ability to sort of get up and move around and talk about math in a real-world situation and I think that to see how engaged they were in an activity like this makes, definitely makes it worthwhile to put the time in to try to develop and try an activity like this. And I don't think it's going to work all the time and it's definitely going to be different with each class that you're doing it with when you leave things so open-ended and so unstructured, but I think it's important to try.

Predicting a Catastrophe: Activity Delivery

Rebecca Sulek (Teacher): So hopefully the activity today will get you thinking about your reasoning skills and your modelling skills, that's the goal. We're going to start with a video.

Video: "a thousand years ago there were only a third of a billion people"

Rebecca: If we look at that fact that the death rate is diminishing, the population keeps increasing, what's going to happen? What do we worry about? What do we wonder? Look at the data first and then we'll talk about it as a group.

Clare Hay (Teacher): Do you notice anything between how the population is changing and the food is changing?

Student 1: after the world wars everything went up, cause all the healthcare and stuff...

Student 2: so in 1995 it dropped?

Rebecca: Think about some of the terms that we've used in chapter 6, rate of change and constant, non-constant.

Clare: How else could we look at this relationship?

Student: Graph.

Clare: We could graph it, definitely could, how else could we look at it?

Student: Equation.

Clare: There's a few questions there to guide your thinking and talk about it with your group. What do you think about a graph or an equation or do you have another way to look at it?

Student: I know the argument is that It's more exact or more obvious when you have a table. I find graphs much easier to read than tables.

Student: I find tables way easier, it's just..

Student: Oh no, I find graphs are easier.

Rebecca: So if I asked you to come up with a graph that describes this, or an equation, what would you like to do?

Students: Graph.

Rebecca: Why do we like graphs?

Students: Visual.

Clare: It's a nice place to start, so can we do it? Before you jump up and start graphing, let's just stop and think about it for a second, because like we said these numbers are big, we now have 3 different pieces of data we're trying to fit onto one graph.

Student: x should be years.

Student: Um, yeah for sure.

Clare: And what's your y ?

Student: It would be the population and the food production.

Student: Yeah

Rebecca: Was that easy or was that hard?

Students: Fun!

Clare: Fun, oh good I like that.

Rebecca: I heard fun, that is good.

Rebecca: Why was that hard? What was difficult about that?

Student: There was no specific number to place it on, you had to ...

Rebecca: Right, and it was because of what?

Rebecca: When is the population going to be greater than the food production based on just this data that we've graphed here? There's no right answer, what do you think?

Student: 2045

Rebecca: 2045, so Jack's going like, ah, I don't know around here? Any others?

Rebecca: What else can we use to graph? Do we have to use our hands? Why don't we use some technology to graph it, right? That might be better. Ok, you're going to head into a Desmos activity that already has the data plotted for you.

Rebecca: The goal today was to encourage you to use your reasoning skills and your modelling skills, and I want you to reflect on that today.

Predicting a Catastrophe: Activity Reflection

Rebecca Sulek (Teacher): Students were able to check in to their strength. So my math kids talked about the math. They looked at the numbers. They looked at the scale, and they looked for the rate of change. And I think that's really great, but my non-math students, my students that might be stronger in humanities or have an interest in world issues were able to talk about that part of the activity. And having them work on those together was excellent.

Naomi (student): In today's activity I learned how to take a problem and look at it from a bunch of different angles. Putting it on a graph can help you see like the severity and the trends and how it's changing, so if somebody were to just give me numbers I might not be able to see it, but once I graph it or put it in equation it's easier to see.

Matthew (student): I've learned today about the issue of like, population increasing relative to the food that's available in the countries, and the world until there's a certain point that the population gets too big.

Clare Hay (Teacher): I think having the base in the real-world really helped the increasing engagement of it because they could see it was a relevant issue that we are dealing with. It was interesting for the students I think to play with something that was real and messy and it wasn't the perfect equations that they're used to seeing. So they struggled a lot with it, but I think that struggle was a really sort of productive learning experience for them.

Grace (student): I think it's really important that we see the real-world impact because, otherwise we don't think of it as something that actually affects us. We just think of it as numbers on a page and not something that we can actually apply to real-life. It feels useless almost. And, this puts somewhat of a purpose into it.

Rebecca: Breaking the activity into parts allowed me to have checkpoints with the students. So some came up with the ideas right away, and others needed more time or weren't able to come up with some of the things that we were hoping. So in having sort of a start and end to each part, we could bring everybody together and get everybody going off on the same page. I think that was really helpful. And sharing the ideas within the group.

Naomi: I liked the presentation because we got to work on small sections versus just getting all the information, saying, "Okay, figure it out." I like working in steps and figuring it out like that.

Liv (student): Having all the different resources to look at math differently really helps. Everyone's on the same page, everyone can help each other out, it's a lot better.

Rebecca: Group work in math is great because you tend to have your really mathy students that are strong, and when you put them with students that aren't as strong, there's a really good dialogue. Even though that kid can come up with the solution, they have to explain to their peers why it works and how it works. So I think that group work is really important for addressing the curricular competencies.

Kaleah (student): I thought it was good that we got to collaborate with other people cause with other people you can see the different perspectives and different mindsets that people have looking at an issue.

Clare: We need to sort of spread it out over two days because we talked about trying to cut something out of it and I think that all of the parts were quite valuable and they were engaged with it and we were cutting them off. They needed more time for it.

Grace: I would just like a little more time to fully put down all of my ideas and brainstorm with my friends and, be able to represent it in multiple ways.

Rebecca: My students had spent a lot of time learning the concepts in more of a traditional manner. And because they were really confident and competent with those concepts, the activity was successful. So when we're working with the curricular competencies, that content has to be there. So there has to be a mix of the two. I think that's really important to recognize.

Clare: So it was really interesting to see them talking about the slope and the rate of change in with the data, because those words seem to almost come naturally to them, which was great to see them put the vocabulary of what they've been learning to a real-world situation.

Noah (student): We've already been taught to do this one graph, which is the two sides, but throwing that third one in, I find those are a really good thing for a lot of kids, because it helped us try to figure out like, "Okay. What do I do now?" None of us really knew until we figured it out in the end. This was a good challenge, because it actually made us think a little harder than we usually do.