

LISA HENNEFARTH : I thought today's lesson was really eye-opening. I mean, I- I loved your questions at the beginning about anticipating. I will often anticipate when I write my slides, when I write- when I- when Arminda and I get together and talk about a lesson. Um, we will talk about what are gonna be barriers, what are gonna be things that they'll get, where is it gonna stretch their learning? And when I saw this task today that we were gonna do, I was really excited because I thought it would lend a creative element that we don't typically see in a math classroom. I know we talked the other day in class about the squirrel in the tree and the function of distance over time and what it meant. And I was really pleased with that when they were able to tell a story. This was a little bit different because it's not only telling a story, but it's writing a story. And this is where that- that cross-curricular component comes in.

And we recently just had a meeting, a department meeting where somebody said, you know, how are these students in this A11 program going to be successful in an English class if you are making them do so much reading that's not at their grade level? And I basically said, how do you get better at doing something unless you practice it? And if I always dumb it down, then you're never gonna get better. If I always expect you to perform here with simple one, two word sentences, I mean, at best, evaluate a function, how does that help a student in an English class, in a social studies class, in a science class where you have to read complex directions or read this- they did a great job reading through the task, understanding what it was.

One student at the front, Chris, asked me- I said, do you know what the word commentary, what it means? He goes, no. And I said it- I go, do you remember the video we watched? Remember that person talking? Oh. So who is the one that talked about defining it? He did. And he didn't use swimming, he used, it's a person that kinda talks about what's going on in the game. There's a boy that's- that's a long term English learner right there. So again, having access, letting them take a look at graphs, because now they're gonna take a look at graph and they're gonna tell a story about that graph. So again, that opening exercise of which one doesn't belong, it's really- it's a nice entry point. We call it low floor. Everybody can access it, right? So everybody is accessing it. Everybody can put something down.

And now we're gonna do the real task at hand, which is, Kate, read this task. What does it tell you? Some didn't know how to- I knew anticipating. Exactly. In fact, I was surprised the ones that struggled were not the ones I would have thought of at all. In fact, the ones that I thought were gonna struggle, yeah, they struggled, but once I kind of got them going, they knew what to do. One girl who I thought was not gonna struggle at all, really struggled until we talked about what the graph meant. She needed- so maybe in hindsight, maybe- maybe reading the graph the next time. But then I don't want to like front-load everything for them because then when they're- where are they thinking? Because this is- what's important is all too often, our students aren't thinking anymore, they're just doing. So I thought today went well.

Again, if I look around the room, I look at the whiteboards, I loved how they were then able to take that information and combine it with somebody else. And then I remember going around asking, what did you hear from somebody else? Oh, more details, oh more adjectives. What else did you hear? Oh, somebody talked about the time. Oh, so do you think you might wanna add that? So all in all. So again, just being able to see graphs that were different, being able to articulate. And I still leave them with giving students that vocabulary. How they- some really struggled. Some said points. Well, they don't know what a continuous graph is, we've never talked about that. But- and even the- the comment about that it was diagonal and in touched both axes at either side, that student couldn't articulate what that was. So trying it again to draw in some of the language, like somebody said, oh, I noticed it was not linear, it was the only one that was curved.

So again, their struggle around some of the language, around how to describe something is still lacking. Even though we've given them the language, we've given them the vocabulary, but again, if I think about students, this is the first time a lot of them have seen these. Seen these vocabulary words, seen this kind of work. So if you think about- they're just starting out on their math journey, so if you're just starting out, I'm not expecting them to be proficient. But can they call out things that, oh, I notice that one is sloping negatively, one is sloping positively, one is curved, then that's a step in the right direction because at least it's getting them engaged thinking.

So that was the opening exercise, just getting them to look at graphs and to see what was the same, what was different, which one did they feel? There was no wrong or right answer here and they know that. By now they know that they could state anything they want based on what they observe. And oftentimes I like them to write their letter down immediately because they're always gonna go to one day they like, and now support that. Because if they start thinking too much about it, then they start to second guess their thoughts. And they start to kind of like, oh, what's that person writing? And it's all about they wanna be validated because they're so afraid to be wrong. So that's what this- which one doesn't belong helps them overcome that I'm not looking for any particular answer.

LISA HENNEFARTH: First of all, I wished it was done in an American, I realized the subtitles were off so I went quickly over to the video and I put the subtitles on. Um, which when I- I thought it was all in English for some reason. So maybe I could've chosen a better video. However, what are the things I liked about the video is the most exciting part happened at the end. And I liked that the students were then able to take that experience and remember like, how did the race start? Where were the swimmers? What did you hear when it started the race? What did you hear? They called out the- the winner at the end. So that was a calculated move on my part because originally I thought about, Oh, let's do a downhill racing. Let's do a bobsled race. Um, but then just making sure that they understood that we were talking about swimming and that, you know, I asked the question, you know, how many changes in the lead did they see? And I was hoping that that prompt would then get them to see it on the graph, on the task. That- and actually some of them pointed it out on- in their posters that- that this person then went ahead or this person fell behind. So tho- those were good things. Um, I think- again, I used the video to equalize the playing field for students that may have never seen a swim race before. We, before we looked at the swim race, we talked about like, has anybody ever seen a race? And most students in the room, some of them said, uh, running, and there were more often than not, students talked about car racing. So again, that to me was very unusual. I- I- I don't see any car races and maybe there's car races that I never see on there- on the TV. Um, so I was surprised at how many and not more of them thought about other kinds of racing like track and field or, um, I don't even know, like- well, car racing, yeah. Where else, swimming? Where else is there a race? You race- you'd- you race your friends, right? But for some reason that was- I did the- the swimming on purpo- there was deliberateness to that to, again, level out their playing field. The three reads, again, I've always- there's so many variations that I've seen on the three reads and I've been instructed in a lot of- I've seen it done all different kinds of ways. So I've always done it as, read it quietly to yourself just to get the gist of the problem. Just get- just read through it quickly and then read it again by yourself the second time and highlight things that are, maybe, you know, maybe they're uh-huh's, maybe things you don't know, circle them, you can an- in other words, you're annotating, um, a paragraph to- for your own benefit to be able to call out things. The third read that we did was out loud. So after we did the out loud read, and the gentleman that actually read it out loud, it was great because he is a second language learner. He's, um, in some of the lowest, in our English support classes here. Um, I know he struggles and I was really pleased to see that he was not afraid at all to raise his hand to read it out loud. So in reading it out loud, it allowed students, now you've read it yourself, you've highlighted, now somebody's gonna read it. And now- then in a sense, I kind of did like a three-and-a-half because I built on that last read to kind of say, Okay, let's ask them specific questions: what is this about? How many races are there? What are you going to be asked to do? Does anybody wanna build on what somebody said prior? You know, like somebody said oh, you don't like- make sure it's as detailed as possible. So what is that look like? You know, what kind- and somebody- I think maybe not or maybe I heard somebody say using adjectives. So that's good. So that was our version of the three read here.

LISA HENNEFARTH: So, um, students started out after we did the three reads, they were given- everybody had a white board, and they were supposed to draft their first draft of the commentary. So again, students- and I knew- by anticipating, I knew who to watch for, and who was gonna struggle. And sure enough, I mean, I knew the ones that didn't have anything on their whiteboards at all. So it was a matter of going over to them and- and asking where- where- tell me why you're stuck. I don't know what to write. Talk to me- talk to me just about, what are you supposed to do? It's supposed to- I'm supposed to write about the commentary of the race. So you tell me, what- what do you, what do you remember from? So again, watching the video allowed me to prompt them to say, okay, think about the vi- video we watched, the YouTube video on the race. What did you notice about that? Oh, that the racers were on platforms, or on a board? Okay, then what happened? Oh, that something went off and they dove into the water. Okay, so show me on the graph where that's happening. And so then- and then what happened? So now all of a sudden, we're connecting that video to what they're being asked to do. So I anticipated knowing where to strategically go, and check in with students. And with the exception of that one student that I thought would have no trouble starting; everybody else were the students that I went around and checked in with, to see, like, what do you- and they all pointed out certain things from the video. So after that, it was monitoring progress, making sure that they're on task. So from there, we transitioned into the, okay now you're gonna get up, and you're gonna go share with somebody else. You're gonna do a successive pair share. So I made sure that they read- found somebody that wasn't at their table, go and talk to somebody, read it verbatim. So what could I have done differently or better? Maybe being a little bit more explicit in that, don't erase your whiteboards. Um, make sure that, you know, maybe if you're on this side of the room, find somebody on the other side of the room. Um, but that's all in hindsight, but I think it accomplished. So giving them a high-five that we're gonna start, you're gonna listen. You're not gonna, you know, critique or anything, you're just gonna get information. So after that, we did it three other times, and they did it a total of one, no, three times total. So then by the time- each time I was hoping that they would've heard more detail, more nuanced language around the function and the graph, and what they were seeing. So after that- after that last time of listening, students were to return to their desks, and now they were given the direction of, now you're gonna do the best job you can with your partner next to you to write the commentary, and you're gonna pull out all the things that maybe you don't have on your whiteboard, that you remembered somebody telling you. So you're gonna look at these. So I want- and I kinda almost front-loaded a little bit, I kind of said, you know, what about the axes, what about times? What about distance? So making sure that you make your best reiteration possible, pulling out as much detail as you can. So then students were given poster size paper, and I know one student asked me, like, So if you give us such a big piece of paper, does that mean I have to fill up the whole thing? And the answer is no, just write what you can. And so they went about, and I could see that as they started, it was slow, but then over time all of a sudden it was like, oh, now I'm starting to kinda add more detail.

LISA HENNEFARTH: So again, going back to those- the five steps of- of what we kind of built this lesson around. How am I going to select that work? So then all of a sudden it kind of, I realized that as I was walking around the room, that students actually- some students had just great narrative. And then some students had some narrative with a little bit of detail on- on function and time. And then somebody else had a lot of detail around function and about time and where the race changed leads and all of a sudden, instead of looking for common, I totally changed my mindset to say, look at- this is what I'm seeing, it's not bad or good. It was actually really nice narrative detail and how am I going to be able to s- show progression? Because nothing that the students had done was wrong. It was actually really well. It was just one was more mathematical because it had more numbers. So that's how we finished, was the final, um, poster showed where this person changed hands. And when they shared the first time the person- the posters got shared, I didn't put a graph up there because I knew that they didn't have the detail around it to show where, but they had great narrative. So then the next time somebody came up, I said, I want you to just listen carefully to the details and to the- the descriptions and we're going to use the graph now to kind of point out. And it just got so- so it got, um, progressively more detailed. Uh, not that it was wrong. It was just more detailed to finally where the person, the last group, you know, said, who won the race and by how many- I think even by how many seconds maybe, I can't even remember. But in that- that the winners were this, and second place was this, and then third place was this. So it was just a nice way to showcase and to showcase all the work that was being done in varying levels of detail. And the final connections where I- I basically knowing that we were all short on time, I walked up, uh, to a couple of the students near the front and I asked, so if you were to pick which one, which one did you enjoy listening to the be- or the most and why? And the student responded that, um, the last one, because it gave the most am- I kept saying to students as they finished that'd backup. So as each pair backed up or after they were done and everybody said, Great job. I said, so I want you to think about like- so could you have visualized what they were talking about? You know, could you have- could you see the race and the graph and in the points on the graph where they were talking about these pieces of information. So as we move through each person, I just always kind of came back to that to say, were you able to visualize what they were talking about? And did- we had the graph now in front of us, could you see by their details where- what was going on in the race? So when I- at the end when I was making connections or I wanted to make a connection back, I went up to a, uh, two students and I said, so which one would you have picked? And the student said, the last one. I said, so tell me why and- and how would you compare it to yours? Just like, well, they used more detail around like seconds, and time and distance and I realized that we didn't say that in my graph. And so from there I said, okay. And so then I went to the next table group. And it just so happens, it was one of the students that was, um, had presented. And I said, so tell me, like yours was terrific, that's why I picked yours. So tell me what's different about yours versus what you heard from everybody else? And he said, well, mine was just a description of the race. I didn't pull out any details; about the time and like who was where at certain points and where the lead changed and that so many seconds this person went ahead because we just didn't do it. We just- we just kind of did it in a general sense. And I said, and you did a great job doing it. And then I went to the front and I just said, so if you guys were to think about which gro- or which group gave you the most amount of detail, they were all terrific, they all gave some detail. But again, visualizing the graph, visualizing the race, tying it back to maybe the YouTube video. I didn't say that. I wish I would have, right? Which one would've been the best and they said, the last one because they had done just that. They had pulled the part, the graph from a time standpoint and from a distance and where the lead changed and at what intervals did it change, and what the- in fact, I think even somebody else did the winning time, or maybe they talked about the time, which was great.

LISA HENNEFARTH: Well, functions as they're- as they've learned, the formal definition, if I were to ask any student with the formal definition of a function is it's a relationship between two things, they couldn't. They wouldn't be able to articulate that at all. What I was hoping at the end of this is for them to say, you know, like if you'd thought about this race, what were the two things that were going on? What were the- what was the math behind the race? That- that they were- they were racing, and what were they racing- they were racing in a pool. How do we measure length in a pool? By distance, meters, yards. And then what else were, you know, how do you know who wins a race or who crosses the finish line first? But what is that a function of? What- what is the importance of that? Well time. It's whoever gets to the wall first.

So again, the relationship, in this case the function was distance and time, right? So what does that relationship- so can they tease out, when they look at a graph, this has been something that I keep noticing that students don't want to do. They don't want to talk about the units. They don't want to talk about- they just want to say, well, this is what's going on, but give me more detail. What does that detail I'm looking for? I'm looking for the time, I'm looking for the distance, I'm looking at the time, I'm looking at the height. I'm- I'm the drone in the rocket, the squirrel in the tree. So how long after the- the squirrel was in the tree, did he fall out of the tree or did he. So just all of those nuances around the math. That's the math that we're looking for. That's the math we're trying to tease out of them is this relationship between the two variables that we're talking about, independent, dependent, they can identify that. But what story is it actually telling us? And at the end of the day, you can tell a story, but now, make sure you identify the variables and what they stand for in your story. The three reads, you know, like editing that last piece of just, you know, talking about, um, you know, obviously reading it aloud was important. I- that- that was a little bit nuanced more. I probably would have maybe spent one more time just having them like make some notes uh, on their own papers to annotate. I mean, I just had them circle and stuff, and we went right into like, okay, let's read it out loud. Now let's talk about it. So, I kinda shorten that part up.

The other part was, again, I had talked about in my opening remarks about I was looking for commonalities like what did everybody do? And on the fly, I noticed that I had these great posters that were given me great information, and there was nothing wrong with any of that information at all. It was just the level of detail was different, and that is the piece that I wanted to make sure that I talked about or that- And that was done on the fly. That was- it was like, okay, instead of doing this, I'm gonna do this because this is what I'm seeing from the students work. And, so it- I think it worked out well because they all felt successful going up in sharing and not at all. They weren't afraid that they were going to get criticized in any way. And I made sure that this was not going to be a critique. It's actually a lot of what we do but we never write down. And as a teacher, your practice is always refining and reflecting.

So I will, this lens of going through those five steps like, like obviously planning a learning objective. That's really, really important because at the end of the day, what is the math that you want your students to learn? The next piece is that anticipating, I think they all work, is like a- a conductor that, you know, is what, you've got an orchestra in front of you. And so you're conducting this teaching in your classroom. That's really important to understand that it doesn't happen in isolation. Nothing does. It's gotta be kind of like a concert. So you've got to be able to have your learning goal, figure out like what do you want them to do. But what are going to be some of the things that's going to happen to get in the student's way. How can I plan? So everybody has access to that.

So that's- that the piece around sequencing. So like you go anticipate, then it's a matter of like, you know, how are you going to build that lesson? How are you going to make sure that

everybody has access to it? Then it's walking around, and making sure you monitor their engagement. You can't stand in the front of the room. You- I mean, unless you have uh, an environment where maybe you have a small short class period or maybe you're gonna to do that. But I love to move around the classroom because it allows me to see first-hand what they're doing, you know, are they writing or they are- You can even tell by their facial expressions whether they're listening or not, because it doesn't always come down to writing. You know, a lot of times is they're thinking, they're reflecting, they're processing, so how can I scaffold a question to make sure that they're understanding what it is that we're doing.

So then it's a matter of like, if I want to do a task, and I want the students to have something that they're going to be able to produce, then showing sequencing and steps, and then why do I want that student to talk about their work? Why is it that I picked your work and not somebody else's? Oftentimes students think like, oh gosh, I done, again, I talked about like, I've done something wrong and it's no. We have to kind of frame it in, in a very positive way.

So all of these steps, these five steps, are very much part of a practice that now you're doing with thought and with reflection, and you're not afraid to make those changes, as you move through the lesson to make sure that you- you stay on TAC. Connecting, always back to the learning goal like, what did my students need to learn at the end of this lesson? Were they able to accomplish that goal? That's another important. And if you didn't, is there a way for me to reflect, and think about how I can pick it up the next day. So it's almost a little bit of a continuum, an ongoing continuum depending on where you're at in that five-step. So, and I'm not at all afraid to say, okay, I didn't get to Step 5, so maybe I- I can, in somehow incorporate Step 5 or Step- together in to the opening of the next day's lesson.

LISA HENNEFARTH: So, here's our intention. Remember, it's to be patient. So remember patience is something that's sometimes really hard for us because we're getting impatient with ourselves if we don't learn quickly. I get impatient if I don't get something that I'm looking for, that's not just my own personal challenge. So right now I'm going to ask you, what are you going to do today in class? What are you going to do all day tomorrow? To be patient with your friends, be patient with your learning. Be patient with people that you work with. So take 15 seconds, please, and just set it quietly. All right. So here's our learning goal today. You, today, are going to be a radio commentator and you're going to write your script as if you were announcing something. This something you'll learn in just a minute, you're going to be describing a real-life situation that involves a function. So you get to be that radio commentator that's going to be describing a situation that involves a function. So we're going to start out with our math talk, you're going to notice that you have a sticky note. So remember, I love the sticky note idea because it allows everybody to access this and you don't- and it's anonymous. Okay? So you guys all have a pencil or a pen? You can write in pen or pencil today. And also today when you write your drafts, I've got- you're going to write some on your whiteboards, but we also have markers up here as well. All right? So, you guys ready? If anybody needs a pencil, I have them up here, or a pen.

STUDENT: Thank you.

LISA HENNEFARTH: Okay. So here we go. Before we get started, remember you're going to label A, B, C or D. Don't put that in there yet because you don't know which one you don't want. All right. So you're going to say blank doesn't belong because and I'm gonna want you to note that there is some blue strips of paper that are taped to your desks. Those strips of paper have these vocabulary words that you could use to explain to me which one do you think doesn't belong. Okay? So, Addy, will you do me a favor? Can you just read the vocabulary words to use up there?

STUDENT: Constant rate of change, positive, negative, intercepts, vertical/horizontal, minimum, maximum, linear, increases, decreases, and continuous.

LISA HENNEFARTH: And not- and there should be- notice I forgot one, non-linear. Okay? So those are the words that I'd like you to use when you do this sentence frame of "blank doesn't belong because." All right? So here are the graphs. I'm going to give you about 30 to- 30 seconds to a minute of think- quiet think time. Okay? So you can think and write, so here you go. Which one do you think doesn't belong? Okay. So if you're still thinking or you haven't started to write, go ahead and start to write. Don't get up. Okay. So you can say the line is a negative, this line, right? So you can say that. For those of you that have something, everybody should have something written. Some of you have got some really good stuff, lengthy. So go ahead, now, let's look, A, B, C, D. All right. So after you place your sticky note, I don't want you to go back to your desk. I want you to kind of stand in the middle of the room so we can see where most responses lie. All right. So go ahead and get up and put your sticky note where you think it doesn't belong. Yes, just kind of stand in the middle of the room. So you- you only need one, so pick the one that you want. All right.



LISA HENNEFARTH: And look at where most responses are. What do you think? Which letter has the most responses? A, B, C, or D? What do you guys think? You think A? What else has got the most responses?

STUDENT 1: D.

LISA HENNEFARTH: D. So why? So what I'd like you to do is I'd like you to walk around and read the various responses on the ones that you didn't choose. All right? And I'd like you to pay close attention to maybe one that you find is interesting 'cause I'm gonna ask you which one you find is interesting. So go ahead and walk around and take a look. So make sure you go around at all of them.

STUDENT 2: It doesn't belong because it's the only graph that does not have a constant rate of change.

LISA HENNEFARTH: All right, so curious. So think about which one you chose, since I have no idea which one that you chose. And then think about when you walked around, which one was interesting to you that somebody said. Anybody wanna share? Chris, how about you? No, Chris tell me, which one did you choose? We- we had a conversation. I asked you, "Which one did you choose?" And you said?

STUDENT 3: C.

LISA HENNEFARTH: C. And why did you choose C?

STUDENT 3: This is the only one that has a dotted line.

LISA HENNEFARTH: Because it's the only one that has dots that represent whatever this is. And then you said that you looked at which one?

STUDENT 3: Uh, D.

LISA HENNEFARTH: D. Walked over, and you read some of the ones on D, and what did you notice that somebody had written?

STUDENT 3: That it was negative and it was the only, uh, uh, remark.

LISA HENNEFARTH: Right. But you said something to me about it. About- and I said well, this line's straight. And then you- you said something else to me. You said what?

STUDENT 3: Uh, it's hitting the corners.

LISA HENNEFARTH: It's- it's hitting the corners. So it's like a diagonal line that hits, and I'm gonna help you out here. It's hitting both the y-axis and the x-axis at intercepting points like at the zero and zero right there. You said it kinda connected on a dia-, I'm going to use the word diagonal. Okay. Is there anybody- Connor by chance, what did you pick? No, I'm just curious.

STUDENT 4: T, because it's, yes, the only one with a line I'm going through it.

LISA HENNEFARTH: Okay. Okay. And how about you Matthew? What did pick?

STUDENT 5: I picked D.

LISA HENNEFARTH: D. And why did you pick D?

STUDENT 5: Because the dots are like the only ones that are labeled.

LISA HENNEFARTH: Oh, they're the only ones that are labeled. Okay. Anybody else want to just really quickly- AJ.

STUDENT 6: I picked A because all the other graphs seem to linear except A.

LISA HENNEFARTH : Okay. So all the other graphs seem to be linear and I like that choice of word, seem to be linear. Okay, so we're gonna take this information. It's kinda like a way to build, and now we are going to move towards our original- our next task, okay? So swimming race. Okay, let me ask you guys a question. Anybody in this room swim, like competitively? Anybody play water polo? All right. How many of you have ever seen a race, any kind of a race- any kind of a race? Ah, okay. What kind of race have you guys seen? What kind of a race?

STUDENT 1: Um, cars.

LISA HENNEFARTH : What did it involve? Cars.

STUDENT 1: Cars.

LISA HENNEFARTH : Okay, so a car race.

STUDENT 2: Pod race. A pod race, it's from Star Wars.

LISA HENNEFARTH : Okay. A pod race from Star Wars. Okay. Jaime.

STUDENT 3: Motocross.

LISA HENNEFARTH : Motocross. Okay. So we've got car- motocross that's motorcycles, right? Okay. Dirt biking. Anybody else? What other kind of racing have you seen? Track. Like track and field, like racing like on a track like if peak- hurdles or- hurdles, peak. Anybody else? What is lightning between- cars. Okay. All right. I think you're gonna say Steve McQueen because he- but he was an actor. All right. Let me ask you guys this question. Did anybody in this classroom see the movie Ford versus Ferrari? You saw it? Okay. Do you guys like car racing?

STUDENTS: Yeah.

LISA HENNEFARTH : Okay. Go see that movie. It is- I saw it. It's amazing. It's an amazing movie. It's about car racing and, uh, this guy. So did anybody- nobody's seen it? Emma and Mia are the only two that have seen it in the room? Nobody else has seen it? Well, somebody might- well my other class has told me about it. You saw what? That's the- okay, but it's not like that, but this is actually race car, right- right. All right. So what makes a race exciting? For those of you that have seen car racing motocross-

LISA HENNEFARTH : -track, what makes a race exciting?

STUDENT 4: My dad races cars.

LISA HENNEFARTH : Your dad races cars. Okay, do you go and watch him? Okay. What makes it exciting?

STUDENT 4: I don't know, if they win [inaudible 00:03:01] the team wins.

LISA HENNEFARTH : If the team wins. Okay. What else makes race- if you're gonna watch a race, what makes it exciting to watch?

STUDENT 5: The sound effects.

LISA HENNEFARTH : Sound effects. Of course, it is always important. Of course. Jaime, your hand was up.

STUDENT 2: How loud- how loud the [inaudible 00:03:19] is.

LISA HENNEFARTH : Oh, how loud it is. Okay. What else? If you watch a track race, what's exciting?

STUDENT 5:: The gun going off.

LISA HENNEFARTH : That they're competing with each other. Okay, Jaden, what-

STUDENT 5: I said the gun going off.

LISA HENNEFARTH : The gun- so the start of the race?

STUDENT 5: Yeah.

LISA HENNEFARTH : So the gun going off. Anybody else? Okay. So what about when, like there's people like change leads, like the lead changes, or somebody- you guys ever watched hurdles where somebody knocks the hurdle over, or car racing? God, there's a lot of things that happen in car racing. They crash. That's pretty devastating. It's almost scary when you watch that, right? So, okay, so we're gonna do, is we're actually gonna watch a swimming race. And this swimming race, I want you to just listen to the announcers, and there's certain parts of this race that I'm gonna either speed through, in order for you to be able to hear it. All right. So here we go. Oops.

Announcer: That was one of the most expected races. The goal of Michael Phelps was winning eight gold medals. More medal-

LISA HENNEFARTH : So this is a race between the USA and France, in the Olympics.

Video playing

Announcer: (speaking French)

(applause)

Announcer: Lezak in first, Amaury Leveaux of France leads it off. Oh, look at Eamon Sullivan from Australia, though! Wow, he's out. Oh my goodness, 22.48? Look at the world record line! Way ahead of it is a number of swimmers.

(intense music)

(dial tone)

Alain Bernard: (speaking French)

(cheering)

Alain Bernard: (speaking French)

Lezak is closing a little bit on Bernard. Can the veteran chase him down and pull off a shocker here? Well, there's no gap, it is tight enough! Bernard is losing some ground! Here comes Lezak!

Unbelievable, at the end! He's done it! The US has done it! They've done it! (cheering) Phelps's hopes alive!

(speaking French)

LISA HENNEFARTH : So basically, what happened in that race?

STUDENT 1: The USA came back.

LISA HENNEFARTH : The USA came back. When did they come back?

STUDENT 1: At the end of the race.

LISA HENNEFARTH : At the very end. Are you guys- do you understand this was a real- you may or may not know. This was a relay race. Do you know how many swimmers swim in a relay race?

STUDENT 1: No.

LISA HENNEFARTH : Four. So there's four. So they- basically, it got really exciting when, at the beginning or at the end?

STUDENT 1: At the end.

LISA HENNEFARTH : At the end. How many times could you guys track how many times that the lead changed? Anybody have an idea?

STUDENT 1: Not a lot.

LISA HENNEFARTH : Do you think a lot or not a lot?

STUDENT 1: Not a lot.

LISA HENNEFARTH : You think- so who was leading most of the way?

STUDENT 1: France.

LISA HENNEFARTH : France. Okay, so one person was leading, and then the USA came back at the very end. When I watched this last night, I was like going, this is really exciting. I really love swimming competitively. I used to race. So that's what makes it interesting for me. Okay. So what I did was on your table, locate the piece of paper that I dropped, okay? So we're gonna start out with what is known as a three read. So I'll let you guys first get it in front of you. You've got your paper, you've got your pen, you've written your name on it. This is yours. You can mark this up as much as you can or as much as you want. All right. So what we're gonna do with our three reads is you're going to right now, read it to yourselves quietly. All right. Just read it to get an understanding of what it is about and what it's asking you to do.

So I want you to give me a silent thumbs up if you've already just read it once, just so I- I have an idea that I can move on. All right. So let's- what we're gonna do now is we're gonna read it again and what I'm gonna ask you to do is to highlight and underline things that are important. Important pieces of information that we need to get from this in order to be able to understand what it is we need to do and read it again to yourself, highlighting, underlining. Maybe there's a word you don't know what it means, circle or highlight that. So that way we're gonna then ask people in the room to explain it. So that way we're all ready to go. I'm gonna ask for a volunteer. Who would like to read this out loud? You wanna go for it? Yes, Chris, go for it. Awesome.

STUDENT 2: You're a radio commentator at a swim meet. Your job is to describe to your audience a 200 yard freestyle race between three female swimmers. The graph below represents the race. Write a radio commentary describing the race with as much detail as possible including who is uh, leading and when- who is picking up, slowing down or overtaking the others always and the average speed each other is traveling to at the- at different times during the race. Finally, you need to announce the winner and the other two who finishes and the final time be has interesting in how you complete as you can be.

LISA HENNEFARTH : Perfect. So I want to know, curious, what is this task about? What I want you to do right now before I start calling on people is I want you right now to have a conversation with your table group as to what is the task about? How many people are we talking about? What are you being asked to do? And then we'll- we'll explore in more detail. Ready, go, like 30 seconds max.

STUDENT 2: People at a swimming race and they're- they're racing and you're the commentator and you need to describe the- your audience like what's happening in as much detail as possible.

LISA HENNEFARTH : All right, we're good? All right, so I'm just going to start us out. How many swimmers are swimming?

STUDENT 3: Three.

LISA HENNEFARTH : Three. What are their names?

STUDENT 3: Rebecca, Barbara, and Janelle.

LISA HENNEFARTH : All right. Rebecca, Barbara, Janelle, three of them. What are we going to be doing, Yaslin, in this, um, activity?

STUDENT 4: We're going to find out-

LISA HENNEFARTH : Who are we acting as? Let's put it that way. What's going to be your role in this task? Jane, can help you? You want to ask, Jane?

STUDENT 5: Um, a radio commentator.

LISA HENNEFARTH : Okay. A radio commentator. Who can tell me what a radio commentator is? What's a radio commentator? Briana, you know this because we talked about it. What is a radio commentator?

STUDENT 6: Is a person who talks about the lead.

LISA HENNEFARTH : Okay, the lead. Chris, what did you and I talk about when I came up and we were talking about this?

STUDENT 7: Uh, a radio commentator is a person who talks maybe he was hap- what's happening and, um, he is telling the score and all that and as much time goes uh, who's in the lead.

LISA HENNEFARTH : Exactly, exactly. Okay. So we've got a radio commentator, we've got three people. Brian, what are we supposed to be doing in this task? What- what's the big thing that we're gonna kind of do?

STUDENT 8: Like show the- like the person who's in the lead, like, swimming, like, how they're going.

LISA HENNEFARTH : Okay. So we're going to write something and we're gonna write something about explaining what the race is about and who's in the lead. What else, Matthew? Build on what he says. What else are we going to do?

STUDENT 9: Um, we're supposed to give as much detail as we can about like what is happening, who takes the lead, who finishes in the lead, and like how fast they're going.

LISA HENNEFARTH : Okay, So Monica, anything you might want to add about what this task is involving that we haven't covered?

STUDENT 10: Um, just make it as interesting as possible.

LISA HENNEFARTH : Make it as interesting as possible. So building on what Chris says, Chris said earlier, these- peo- people are listening to you, right? You don't wanna be boring because what happens? What happens when I'm boring? What do you do?

STUDENT 4: We don't listen.

LISA HENNEFARTH : You don't listen. You?

STUDENT 4: Put our heads down and sleep.

LISA HENNEFARTH : Put your heads down, you fall asleep, right? So think about that when you're writing this. Okay. So what is it going to look like?



LISA HENNEFARTH : Do you guys have any questions for me about writing this commentary that I can answer? Nobody's asked me how long it has to be, I love it. So write as much as you want, right? Write as much as you want, lots of great detail. So how are you gonna do this? Okay, so here we go. Step 1- uh-oh, where's my- is it working? So the Step 1 is you're gonna do your first draft on your own, okay? So Step 1, you've got a whiteboard. You're going to use your whiteboard to draft- to write your first draft, okay? So write down all your ideas for the commentary on the white board. Draft number 1. I'm gonna walk around, make sure. If you're struggling, I'm gonna help you, okay, get you started. So the time starts now. The race, so what happened?

STUDENT 1: Um, they're on the plank [inaudible 00:01:31].

LISA HENNEFARTH : Okay, they're on the what?

STUDENT 1: Plank.

LISA HENNEFARTH : Okay, and then what happened?

STUDENT 1: They dove into the- they dive into the pool.

LISA HENNEFARTH : What- what tells them to jump into the pool? Think about what Jane said that kinda makes things interesting. What went off?

STUDENT 1: Um, the gun.

LISA HENNEFARTH : Yeah. So then after the gun goes off, what did they do?

STUDENT 1: They dive into the pool.

LISA HENNEFARTH : Okay, so go ahead, you're good. When we were watching the video, where did they start?

STUDENT 2: [inaudible 00:02:10].

LISA HENNEFARTH : Right, and what are they standing on?

STUDENT 2: [inaudible 00:02:16]

LISA HENNEFARTH : Okay. Good, and then what kind of signal started the race?

STUDENT 2: I don't know.

LISA HENNEFARTH : The gun goes off, right? So then they jump into the pool. So you can talk about about, like, what's going on, like who was in the lead in the beginning. Okay, cool. Yeah. How about- just finish. I know some of you are still writing- I mean, it looks fabulous, but I wanna wait- I've got two students out to the restroom, so I want to wait to give the next direction so that way you guys know what to do, okay? So just finish up, or maybe- don't worry, you have more time- you'll have more time to revise.

LISA HENNEFARTH : So this is what we're gonna do and I'll- I'll tell the two students when they come back in. Okay, Step 2, here you go. You are going to share your draft. So this is what it's gonna look like. You're gonna get up out of your seat. You are not allowed to share your draft with anybody at your table. So what it means is let's just pretend Haley and I, you and I are going to share. So Haley, once you get up, so you- where you- don't worry, you're not reading anything. You're just going to hold your whiteboard. So everybody take a look at what we're gonna do. You're gonna find somebody else in the room. You're gonna carry your whiteboard and you- I'm gonna have my whiteboard, Haley is gonna have her white board. I'm gonna- we're both gonna give each other a high five, okay. So at the end of this, you're going to give a high five to four other st- to three other students.

Okay. So Haley, I'm gonna go first. I'm going to read my whiteboard. Haley is gonna listen to what I've wri- re- written. She's not gonna say anything, she may ask me a question. She's allowed to like if she doesn't understand something. And then when I'm done, Haley is going to read hers to me. Then you're gonna thank each other, and at my signal then you will find another student. But we're going to start with the first one. This is called successive pair shares. We are sharing our ideas with three other people in order to get the best information possible. All right? All right, so everybody stand up. On the count of three, you're going to go find somebody else to talk to you, 1, 2, 3, go find somebody else to talk to.

STUDENT: There are three swimmers in the race. Before they start the race, they hear a gunshot. They dive into the water and swim as fast as they can. Rebecca had- had started [inaudible 00:02:38] , Janelle caught up, [inaudible 00:02:38]

STUDENT 1: So all races start and Rebecca takes the lead, Barbara trailing and Janelle third.

LISA HENNEFARTH : All right everybody. What you're going to do is if you still- who needs more time to read? It's totally if like Janelle because I know you had three. So guys remember it is only two people that you're sharing with. There should only be one group of three because I have an odd number of students in the room. Everybody else should- it's only should be one-to-one. All right? So now what you're going to do, make sure you thank the person for listening. Now what I want you to do is find Step 3. You're going to share your draft with now another student. Somebody not from your group. Ready, go.

STUDENT 2: So the winner of the whole entire game is Rebecca, because she- she got first place because [inaudible 00:03:32].

STUDENT 3: I dropped mine.

STUDENT 4: Okay. The swimming race was off to a great start, with all the contestants neck and neck. Janelle goes up a few yards. Oh, it looks like Rebecca and Barbara are catching up. Janelle keeps swimming. And she wins, Janelle is the winner and the reason why is because by the time they get there, she had the most least amount of time, which means she got there faster than all of them.

STUDENT 5: I agree, it's Janelle.

STUDENT 3: [inaudible 00:04:03] Okay, so I draw mine but it was supposed to be like a timeline and then it points out what significantly know what's happen like this supposed to- I don't even know a name by Janelle is in the lead and then Janelle finishes first, Rebecca finishes second. That was supposed to be, I think it was like, what was it? Becky? I'm noticing Becky. Rebecca. That is it. Barbara. And then Barbara finishes last. I think.

STUDENT 4: Yeah. Barbara- Barbara finished last. But she has the multiple line possession.

STUDENT 3: She's slow.

STUDENT 5: Yeah.

STUDENT 6: All right. Janelle goes in a pattern which is shown right here. She keeps on going like up and down, up and down and Barbara starts in slow, hits 100 yards and keeps going fast. And is it, see it's a dotted line and goes fast. But still finishes last.

LISA HENNEFARTH : All right, everybody in 5, 4, 3.

LISA HENNEFARTH : Okay, so I am gonna restate the rules because I have some of- some people want to only- first of all you need to be up out of your chair, so stand up Jay- Jayden and Brianna stand. You weren't here so- and Juliana, stand up. All right, so you now for this last read, you are not- there shouldn't be two people per read, two. There's only one group of three, and what you're gonna do is when you get to this last group you are gonna high-five the person. There are some of you that have not moved. Some, I said some, I said some, I wasn't- okay, make sure that you move and talk with somebody else. All right, if you're on this side of the room, maybe go to the other side, or maybe find somebody else to read your draft to. Ready, set, go.

STUDENT 1: Uh, about 12 seconds Jean's in last with, uh, Barbara close in front and, uh, Rebecca in first. After 24 seconds we see, uh, Jean speed up and the- after 12 seconds, uh, after 12 seconds she flies to first. But the glory only last for- the glory only last for about- for about 12 seconds because Barbara speeds up to first Rebecca into second and Jean back in last. I'm staying this for 24 seconds. Not that.

STUDENT 2: Yeah, I said this one was saved and marked in there off. But it takes a quick survey to know it was unfortunately falling behind with Barbara in the middle of the swimmers to take their first turn around and- and Rebecca takes a quick lead somehow. Barbara and Janelle are about even as the swimmers approach the halfway mark and take the turn around and Barbara takes a quick lead with Rebecca in second. And Janelle falls behind and- yeah, I just finished. But, yeah, Janelle won.

LISA HENNEFARTH : Do not erase your whiteboards. Make your way back to your desk. Don't erase your whiteboards. I don't know. Do we know who is next? Awesome. All right. So we got a chance to move around, listen to each other. So what you are going to do now is you had the opportunity to hear some people that had some really great detail. They had some good descriptions. Maybe you heard something that you don't have on your whiteboard. Some of you I know accidentally may be erased it just because you didn't- you didn't realize that you needed to save it. That's okay because you've heard all these great ideas. So now what you're gonna do is I'm gonna give you a piece of white poster paper. You are gonna work with your elbow partner or across, and you are gonna write the best possible radio commentator script that you can. Giving the most on that race. You've got- you've got your whiteboard ideas. You- like I said you heard ideas from other people. Some people gave some really good details. They pulled out some information from the graph. Think about the graph. Think about all the work we've been doing in this classroom about reading a graph. Think about what are the axis's tell us in the graph. Think about those vocabulary words that are taped to your desk. Think about how are you going to portray this race in the best way possible? And you're going to edit, revise and add and on this. You're gonna work with your partner to write the best possible one. You could do it in pen, okay, Jonah, your hand is up. Your question is?

Jonah: Who- who won the race?

LISA HENNEFARTH : You need to tell us who won the race- you need to tell us who won the race.

STUDENT 3: I know who won the race.

LISA HENNEFARTH : I'll come and talk to you. Maybe your partner knows. Okay? Are there any other questions? All right. When you get your paper talk to your partner, what are you gonna write? There's only one group- there's only one group that's got three and that's this middle one right here. I will, let me come back. Okay. There you go. Sorry. All right, guys get to work the

minute you got your paper. Here's one for you, you guys and you guys can work- and Juliana, you're responsible for writing cause of her wrist. Okay? Awesome. What was that question?

STUDENT 3: So should it take up and create another space?

LISA HENNEFARTH : No- no, I just gave you a nice big sheet of paper just- so in case. Okay, so 10 minutes guys, 10 minutes, 10 minutes.

STUDENT 1: Anyways, we should start it interesting, I guess.

STUDENT 2: What do I label it?

STUDENT 3: But we don't need to label it, it's fine.

STUDENT 1: Just write it.

STUDENT 2: Do you use this?

STUDENT 1: She used marker, they're- they have markers over there. What color?

STUDENT 4: Get purple.

STUDENT 1: Purple?

LISA HENNEFARTH : There you go, the green. Genelle. Perfect. There you go. Awesome. All right. [OVERLAPPING] that was awesome. No, you didn't. You didn't.

STUDENT 4: I didn't know it.

LISA HENNEFARTH : Okay so, are you gonna do anything with time? Are you gonna add anything about time?

STUDENT 5: Yeah.

LISA HENNEFARTH : Or just- just- I like when the bell- bell call- is that a bell?

STUDENT 5: I don't think so.

LISA HENNEFARTH : What do you remember- what went off when they jumped into the water?

STUDENT 5: Well, they're indoors so they can't do a gun.

LISA HENNEFARTH : Uh, they- we usually have some have kind of a bell or beep. Right, they have that beep beep beep and, you know, they used to be there. they were thought- they're like a starter guns. Keep talking, sorry, I didn't mean.

LISA HENNEFARTH : With- which- what are the best pieces together that you have- that you both have that you wanna make sure, you [OVERLAPPING]

STUDENT 6: Our main character starts off, like, winning immediately and then she starts falling behind and then see what the girls start like getting ahead and then tying together and then Rebecca finishes her off.

LISA HENNEFARTH : Can you- do you think you might wanna talk about lead changes? Do they have lead changes that are different?

STUDENT 6: Yeah.

LISA HENNEFARTH : Okay. Awesome. Awesome. [OVERLAPPING]

LISA HENNEFARTH : So what are you guys- so what are you guys gonna- how are you gonna start your writing? Your commentary?

STUDENT 7: Um [OVERLAPPING] one I did [OVERLAPPING] a little bit. I didn't finish it, but.

STUDENT 8: Sorry.

LISA HENNEFARTH : Cool. And I think that you had something like this on your whiteboard, right? Did you just kinda.

STUDENT 7: Yeah, I just put on the [inaudible 00:01:50]

LISA HENNEFARTH : What did you- what was on yours that he didn't have or vice versa? What did you guys find when you guys [OVERLAPPING]

STUDENT 9: He had more than I had. He had like more description, like the yards and everything. I was just kinda really general about it.

LISA HENNEFARTH : Okay. Good.

STUDENT 7: [inaudible 00:02:02]

LISA HENNEFARTH : No, no. That's perfect. That's perfect. So we don't wanna- want-

STUDENT 2: For the actor.

STUDENT 1: And- and Rebecca takes the lead. Sorry. Go.

STUDENT 3: Now read it. It's not Rabeeca, its Rebecca.

STUDENT 2: Rebecca starts?

STUDENT 3: Takes the lead.

STUDENT 2: Takes.

STUDENT 3: The lead immediately.

LISA HENNEFARTH : Okay. Awesome. [OVERLAPPING].

STUDENT 1: Barbara and Genelle are falling behind.

STUDENT 2: You still haven't read mine, bro. Huh?

STUDENT 2: Take the lead, and then I start that? 12 seconds in.

STUDENT 3: Yeah.

LISA HENNEFARTH : Seven more minutes, okay? Seven more minutes

STUDENT 2: Wait, read it to me.

STUDENT 3: Twelve seconds in, we have Rebecca in the lead at 25 yards.

STUDENT 1: You already wrote the Rebecca has the lead.

STUDENT 2: Oh yeah. [LAUGHTER]

STUDENT 1: That's why I told you not to write that.

STUDENT 3: Okay. Okay.

STUDENT 2: Rebecca in the lead at

STUDENT 1: At 25 yards.

STUDENT 2: Twenty-five yards.

STUDENT 3: Then we have Genelle.

STUDENT 1: Genelle. G-E.

STUDENT 3: You can't spell for shit.

STUDENT 2: Really?

STUDENT 1: [inaudible 00:03:31] Genelle.

STUDENT 2: G-E-N-E-L-L-E. You put G-A-N-E-L-L-E.

STUDENT 2: Genelle.

STUDENT 1: Genelle. Not Ganelle.

STUDENT 3: Uh, Genelle- Genelle pacing herself in last place. [LAUGHTER].

STUDENT 2: And who?

STUDENT 3: We have Genelle- please- Pacing herself in last place.

STUDENT 1: Would you know?

STUDENT 3: No, just like- that [inaudible 00:03:55]

STUDENT 1: [LAUGHTER]

STUDENT 2: Pacing.

STUDENT 1: Herself.

STUDENT 2: By herself.

STUDENT 1: You don't know how to spell Mariana. [LAUGHTER]

STUDENT 3: In last place. [NOISE]

STUDENT 1: Oh my God, what is your prob-



LISA HENNEFARTH : Rebecca is.

STUDENT 9: I know but [OVERLAPPING]

LISA HENNEFARTH : Okay. And then what?

STUDENT 9: How does this [OVERLAPPING]

LISA HENNEFARTH : Oh, okay. So we've got 12, 24 is how are we counting by, so 12. Let's say, that's 1, 2, 3, 4. So each one is 3, so 12, 15, 18, 21. So you're counting by threes. Okay?

STUDENT 9: Okay, thank you.

LISA HENNEFARTH : You're welcome. So who ends up winning the race?

STUDENT 9: Genelle.

LISA HENNEFARTH : Genelle. How do we know that? Okay. Awesome, awesome. How many lead changes were there? How many times did the lead change? So what kind of gives it away were the lead changes. What are you looking for? I'm just more curious.

STUDENT 9: The lines.

LISA HENNEFARTH : The lines and what they- what? And were they increase or- what are these points here? Are they what.

STUDENT 9: Oh. Oh.

LISA HENNEFARTH : Like they- is it on here where they intersect? Okay, so. You guys good? You wanna move over this way or maybe -would that help? So that way.

STUDENT 10: Yeah.

LISA HENNEFARTH : Yeah? So that way it- Good. [BACKGROUND]

STUDENT 1: Ninety seconds.

STUDENT 3: Genelle pulls out the lead.

LISA HENNEFARTH : I like that terminology.

STUDENT 1: And in last place.

STUDENT 3: In the first place.

STUDENT 1: Is Barbara. At 108 seconds.

STUDENT 2: Did you- how good was it?

LISA HENNEFARTH : It was beautiful.

STUDENT 9: Pretty good.

STUDENT 2: Why are you lying?

LISA HENNEFARTH : You gotta come up and share it.

STUDENT 2: I am.

LISA HENNEFARTH : All three of you. Do you mind doing that? You both can come up- you could decide- you can't be filmed. You won't be filmed.

STUDENT 3: All right.

LISA HENNEFARTH : But you- if you talk, they can all hear your voice. That's okay. But you won't be filmed. But you both have to come up so share your work.

STUDENT 3: So the results are.

LISA HENNEFARTH : Okay. I'm going to ask you guys to come- yeah. You guys to come up.

STUDENT 2: Okay.

LISA HENNEFARTH : Okay. All three of you.

STUDENT 2: We'll be that good? Yes, my [inaudible 00:07:35] should be good.

LISA HENNEFARTH : All right, guys. Finishing touches. Last 30 seconds. I'm gonna invite- I'm gonna invite the following STUDENTS to come up and share their work, and you guys are gonna be really good listeners, right? And what I'm gonna do is, we're not here to critique. I may ask some questions, all right, about what you did, but no critiquing. All right. So Connor and Brian come on up. All right, you're ready? All right. Go.

STUDENT 1: Um, it says, all the three girls get ready to start, as they're presented on the graph. And uh, Rebecca takes the lead. And then, uh, Janelle seems uh, to start slowing down. And then Reb- and then Rebecca and, uh, [inaudible 00:01:12] Re- and then Rebecca starts slowing down, and then Bar- uh, Barbara and- and Janelle catch up to her. And then Janelle is [inaudible 00:01:21] uh, uh, catch up with Barbara. And then Rebecca and Barbara are tied for a second at the moment. And then Rebecca and Barbara get ahead of Janelle. And then [inaudible 00:01:42] for first. Janelle starts speeding up, while Rebecca and Barbara start to slow down. And Janelle takes the lead in the race, first place. Rebecca comes in second, while Rebbe- where- while Barbara comes in, uh, third place.

LISA HENNEFARTH : Thank you. So, I want you to think about their draft, their final draft, and whether we were able to visualize the- the race. Okay. Whether we were able to visualize the race having the graph behind us. Okay. I'm gonna now invite Haley and Curtis to come on up and read theirs.

STUDENT 2: Hello, everybody. Uh, today we have three female swimmers: Rebecca, Barbara, and Janelle. We're having a 200 yards freestyle race. The buzzer goes off and Rebecca is in the lead. Then Barbara, uh, last with Janelle. Then at five- 50 seconds, Rebecca and Janelle are at the same speed, with Barbara still at last. Okay. Uh, now we're at 68 seconds, Barbara comes at a rapid speed. With Barbara in the lead and Rebecca is- is in the second and Janelle at- is at last. Then the last few yards, Rebecca and Janelle are in the same speed and Barbara at last. Because Rebecca is falling behind finally- at towards the yards, uh, towards the yard, in the first place, Janelle with 94 seconds, and second is Rebecca with 100 seconds. At third place is Barbara with 140 seconds, uh.

LISA HENNEFARTH : Listening to the commentary of the race, you're being able to extrapolate the information from the graph using language that helps you visualize what's going on. I'm now gonna ask um, Briana's group to come up.

STUDENT 3: Uh, we have three swimmers and their names are Rebecca, Barbara, and Janelle. Uh, the race- the- the race begins, shortly after, uh, after Rebecca takes the lead immediately. Uh, 12 seconds and we have Rebecca in the lead as, uh, at 25 yards. We have Janelle pacing, uh, herself in the last place. We then have Barbara pacing, uh, yes, slowly down. And Ge- and Janelle is quick to come in first as Barbara and Rebecca fall back. Janelle backs- uh, Janelle fall back shortly after as Rebecca and Barbara get back in line with Barb- ah, with, ah, Barbara in the lead. They slow- they slowdown generally quickly, race- Janelle quickly races up to finish in first place at 79 seconds. In second place comes Rebecca at 100 seconds, and the last place is Barbara at 108 seconds.

STUDENT 4: It's 200 yards between three swimmers: Rebecca, and Barbara, and Janelle., and they're on, Rebecca takes a huge lead right out of the gates. Following her is Barbara and last is Janelle. Around 48 seconds is when things start to change. They're about 50 yards in when out of nowhere Janelle speeds up and takes the lead, leaving Rebecca and Barbara neck-and-neck behind her. Janelle remains the lead for 22 seconds until Barbara and Rebecca overtake her. Janelle falls far behind while Rebecca and Barbara lands pace. Barbara creates more breathing

room while Janelle matches Rebecca. Janelle accelerates far enough to cross up Barbara right before the 200 yard mark. While Barbara is surprised, Rebecca overtakes her and leaving Barbara in last place. The results are Janelle first, Rebecca in second, and Barbara in third. Nice race, swimmers.

LISA HENNEFARTH : All right. Ladies and gentlemen, this is what I want you to do. You are gonna turn and talk amongst yourselves as to which one gave you the most amount of detail? Which one gave you the biggest picture that you could follow? What made it interesting? Why did you select that one? What are some of the words that you remember them using? Ready, go. One minute. Like how- what do you- what do you mean by details? What do you mean by [inaudible 00:00:33]

STUDENT 1: Well-

STUDENT 2: Well, they cut it off. They cut me seconds before I actually [inaudible 00:00:37].

STUDENT 1: Like saying something that we can't make it.

LISA HENNEFARTH : Okay. What about things like they put- pulled out the time?

STUDENT 1: Yeah.

LISA HENNEFARTH : Do they- because you even mentioned something about time, that they use the time. Okay. Okay. Which one did you guys- you guys did a great job. What's the difference between yours and what you heard?

STUDENT 3: Ours was, like, we didn't really do anything with the graph. We didn't, like, say at what time what was happening. We just went on by doing- we didn't really say what time. We just went on with what was happening.

LISA HENNEFARTH : That was beautiful though. That's why I liked it because you gave good description. You gave really good description. Okay. So guys, eyes up here in five, four. All right. So I'm gonna start with Connor and Brian because I asked them, I really liked their poster and activity, and I asked them, like, what did they think about theirs versus what they heard. Connor, do you mind sharing what you said to me about- about this?

STUDENT 3: That we didn't really say any, like, time on the graph. We just went on with what was happening. We didn't really specify what time.

LISA HENNEFARTH : Great. So they gave a really good description as to what was going on with the graph, but they didn't pull out specifics. Ivan, then- I came, and I was asking you guys what- which one did you- would you say was- guys don't. Whoa, whoa, whoa, whoa, whoa. Please. Please. Please. Real quick. Ivan, which one did you like?

STUDENT 2: The last one.

LISA HENNEFARTH : Why did you like the last one?

STUDENT 2: Because that didn't have details like [inaudible 00:02:24] like how many seconds [inaudible 00:02:27]

LISA HENNEFARTH : Okay. So they use time in function language. Guys, you did an amazing job today. Amazing. Leave everything. I will take care of it.

LISA HENNEFARTH: I'm Lisa Hennefarth, and I am a Algebra 1 teacher here at Menlo Atherton High School. The course this year is a brand new course. It's an initiative course. It's called the A1I Initiative. And it's basically a pilot program where we are, um, taking all 9th grade students in a heterogeneous classroom environment so that this is grabbing all of the students that are coming from our feeder schools. We have primarily students that are coming from Menlo Park and Atherton, and from East Palo Alto, and the Ravenswood School District. We are building a classroom environment where everybody has got access, and accessibility to the Algebra 1 program.

So this class is made up of students that would have scored into our readiness cohort model, which means they are performing below grade level in mathematics. We have students that are, um, ELL students, we have students that are IEPs students, and we have students that are- that had scored proficient in their 8th grade, uh, math, historically coming out of their middle schools. So this is a nice balance of students, um, again, all 9th graders. This class is very interesting again, based on our feeder districts, uh, Menlo Park, Atherton, even, uh, we have some students that come out of Portola Valley, which is part of, um, this district as well. That those students that come from those middle schools have no problem engaging with mathematics. This being an Algebra 1 course, it is the grade level course that you would normally enter into in high school. So they are familiar with the content, they've had a really good, strong relationship with their math program in 8th grade math. So those students come in ready to learn.

On the flip side, my classroom is made up of students that struggle to engage in mathematics based on their prior historical middle school experience. So some of these students had substitutes for a number of years in their 6th, 7th, 8th grade math. They've spent all of their time on a computer. So just getting 'em to be able to come in, and sit in a classroom environment where somebody's actually gonna be teaching them, it's really been a struggle. The other part of this class is the collaborative environment. So asking students to turn and talk to each other, to problem-solve, and to reason, and explain their mathematical thinking, if you've never been asked to do that, it's really a struggle. And so giving them the proper entry points, giving them the proper vocabulary, just being able to turn, and look somebody in the eye, it's really, really difficult for some of these students.

LISA HENNEFARTH: The lesson today is going to be asking students to write a commentary on a swim meet. So students are going to be asked to look at a graph that's got a race of three people. I think it- I believe it's a freestyle race. And they are going to have to interpret a graph and then write a commentary as if they were commentating on the radio. So they're gonna have to kind of pull on their prior knowledge of, do they know what a swim meet is? Do they know what a freestyle swim meet is? Can they- I feel fairly confident that they know how to read a graph. We've been- we're currently in a unit on functions, so we've been reading graphs in preparation, learning, you know, what does lines mean, what does it mean when things intersect or cross over, so I'm fairly confident that they should enjoy this task because it's something that's a little bit different.

So the learning goals for them are going to be to be able to read a graph on the coordinate plane, and from there be able to interpret the graph looking at various things like steepness. I'm not asking them to- to look at rates of change, but we're looking at where do the lines intersect? Where do they cross? Where does certain, um, swimmers could potentially be like ahead of the other person? What's the finish? Who wins the race at the end? What- um, in terms of building and the excitement of it, like, can they look at the steepness of the graph? Are they gonna look at where- where it starts? I want them to be able to interpret the graph and apply their knowledge because we're in functions. Be able to apply their function knowledge looking at the graph to be able to interpret and describe in detail what is going on in the graph. So looking at things like intersecting points, looking at the finish, looking at where the gr- race starts, and whether, you know, things are climbing steadily. Does- in one case, we've been working on graphs; does anybody notice that nobody stops? Because we've seen graphs like that where, you know, all of a sudden it goes horizontal. And so they- they've learned and they've practiced what that means.

So that's what this is getting them to do, is to write a commentary. So this is a little bit out of the norm too because it's gonna be very heavy on the writing component. I'm hoping that students will be able to walk away being able to determine, um, who wins the race will- will be ideal, um, what do the various intersecting points mean on the graph? So looking at three swimmers, at their rates, why, you know, they're gonna hopefully notice that none of them are a straight line. Um, I'll be interested to see if any student attempts to try to figure out the rate, um, based on the fact that we just finished Unit 3, which was on bivariate data, and we did a lot of work around lines of best fit. So it'll be interesting to see if anybody teases out or pulls any of that information, prior knowledge, um, from last semester into this work. It'll be interesting to see um, in terms of vocabulary, um, you know, increasing, decreasing, intercept, maximum, minimum. These are all function-related words that we've been practicing. I'm hoping that students are going to be utilizing vocabulary that we've been practicing throughout this unit.

So I know that some students may struggle because this is a heavy writing assignment. We're gonna ask students to- to write a first draft on a whiteboard and then go through and do successive pair shares, strengthening their writing as they go or trying to get ideas as they- as they talk to individual students.

LISA HENNEFARTH: So what I'm hoping to do is, um, knowing that writing may be a struggle for some, providing some of the vocabulary words and it's on their student desk, just some key words, anticipating that some students may struggle. So what does that going to look like? It may look like, they're not starting to write. So it could be- it could mean that I need to kind of just make sure that I answer any questions, maybe go up to that student and double-check to make sure- make- and I've selectively paired students with each other so I can- hopefully, they can kind of ask questions, so I'm really going to encourage them to have dialogue. Even though they're- they're going to be writing individually, it's anticipating where students are going to struggle and where students are going to excel based on EL status. In the classroom, I have- because this is heterogeneous, I've some students that are long-term ELs, I have students that are in English support classes, I have students that are in advanced standing math, ah, English classes. So knowing where those students are and trying to direct myself to help those students where they may need the help.

Students on their student's desk today, they're going to have white boards. Everybody's going to be working individually. And then I also have on their desks, uh, strips of paper with some key vocabulary words. They're not going to necessarily need all of those vocabulary words, but at least it gives them a prompt. So then what I'm gonna do is, I'm going to walk around, um, and just check in. I want to- again, going back to anticipating, I already know the students that could potentially struggle with this. So making sure that I'm constantly scanning the room to make sure that are those students, have they uncapped their pens? Do they have anything written yet? Maybe I tend to do what is known as a figure eight. So walking in a very sequential manner, um, students are very much placed strategically. Uh, for that reason, I know where my IEP students are, I know where my ELs are.

So again, walking around, constantly looking and over, noting where students are struggling, noting where students are writing quickly, maybe offering words of encouragement, um, letting- because often times students are afraid. They're always afraid that- to write that very first thing down. But again, that's why we're writing on whiteboards. Whiteboards are not permanent, so they're very easy to erase, they can start over. So that's how I'm going to go around and- and monitor their work and engagement. So I'm- I want to obviously showcase all levels of work. And oftentimes as teachers, we tend to want to just go to error and error analysis and point out what's wrong. But I'm going to be looking for different levels of student work and it doesn't necessarily mean that there's anything wrong with it. I want to show students' progress over time.

So what's the most common kind of writing or content that I'm seeing? How am I going to strategically select work from students that are comfortable. So you know, uh, having their work shown. Some students are extremely shy, extremely nervous. This goes back to your original question about, you know, what kind of classroom is this? Well, some of these students have really- not really good math experience prior. So how I- am I going- we've created a really safe learning environment for students in this classroom. So I'm hoping that by this time in the school year that students are going to know that we're doing this. I'm selecting your work because there's a reason. I need to show it, so I'm going to select those students work that are showing like really solid content, maybe where students could potentially be not so much struggling, but that I see in common- that may be it's a common thing- theme throughout and how can we then tease out what we're looking for at the end as part of our learning goal.

So again, we often just want to pull out and showcase work, um, that's wrong. So we will often like put a student's work under and then we critique and evaluate to say, you- you know, like this is what a student said. You know, what's wrong- do you agree or disagree with this piece of work? And because this student- this is student work that's actually in this classroom. Again, I'm



going to try to figure out or try to pull work that's common. When am I seeing as a common thread, maybe that nobody has pulled out, that the intersecting points is where somebody has, um, changed, uh, being in first place, or maybe that they've noticed that, um, they've never made reference to time. That they just, um, like, well, it's assumed that I know that that person's in first place because they're the highest, uh, line on the graph.

But- but what kind of information are we looking for? If you think about functions, we typically have independent, dependent variables. We really- that part of that mathematics, we want to make sure that we are pulling out that mathematical learning that we really- to take them to the next level. So sequencing that common theme. Then maybe something that, um, people are building towards- maybe somebody has pulled out that they've noticed something over time. And then the last piece that I would show would be possibly something that we're looking for in terms of an exemplar model that showcases all components.

So again, this is about a commentaries or learning goal as students are going to be connecting a real-life situation to functions. And this real-life situation has to do with them writing a radio commentary for a swim meet. So again, pulling out the learning goal, making sure that we connect, how is a function related to a graph? In this situation, where do we see function being part of the content of your commentary? Where did the graph fit in with, ah, the function? Why is that so important to have? What message or what, um, what learn- what do we learn from doing this activity? Did we learn that there's a relationship between a graph and a function? Yes, we've been spending time doing that, but now we actually get to see something that maybe you might use if you ever wanted to go into journalism or that you're actually commentating, ah, a race somewhere where it's like, oh man, I have to make sure that I pull out that time. It's not only distance, it's time as well.

So one of the things we're gonna be using a routine called a which one doesn't belong. So oftentimes, I'm gonna be projecting three, ah, four different graphs. And I do it a little differently and then I'm really want students to think quietly, um, about which one that they're gonna pick, A, B, C, or D. And then what I have them do is on their, ah, desks are- are the vocabulary words as well as sticky notes. So it gives them a chance to s- use the vocabulary words that we've been practicing in order to be able to pick and select which one they think doesn't belong using the appropriate vocabulary. This is a great entry-level. Everybody can access it. And from that point, they get up and they go around they- in the room and they put their sticky note up on an A, B, C, or D. After that, we will launch, um, I'll show them a- a video of a race so they have an idea, especially for students that may not be quite sure what a commenta- what a commentary would be. After that, we would then launch into a three reads.

So they'll get the task, we'll read it. So whe- they'll read it once quietly to themselves then we will kind of ask everybody in general, like, what's it about? What do they hope- what- what is the task that it will involve? How are we gonna do that? And from there, there's never where we lower expectations for students, the cognitive demand, where they're gonna be able to write themselves their first draft. Then they get to walk around and get feedback and listen to others with their draft. So that's that successive pair share that's gonna happen. So I'll ask them to write it individually. They're gonna get up. They're not allowed to talk to the person at their own desk or go to go talk to somebody else. Read actually what's on their whiteboard. Listen carefully to what somebody else's written. Get ideas. Get a chance to really formulate more of an idea of what- may be what somebody else has done in the class that they haven't done. So then they do that three times. After they've done it three times, they're gonna go back to their desk and write their final draft with their partner. So again, accessing the math is going to be done with that first task of which one doesn't belong. Successive pair shares allows them to build on their knowledge as they move around the classroom and then finally working with their partner to come up with the commentary and then we'll select student work to share.