Dan Meyer:

Welcome back to Math Teacher Lounge. I'm Dan Meyer.

Bethany Lockhart Johnson:

And I'm Bethany, Lockhart Johnson. And guess what? I can see your face, Dan, but our listeners, they are listeners. Now we're a podcast.

Dan Meyer:

No more viewers.

Bethany Lockhart Johnson:

This is a big transition, Dan. And let's just talk super briefly about why.

Dan Meyer:

Reason number one is I decided as a kind of resolution early in the year that I'm done shaving and no one likes to look at that right now. And so we decided we had to go to audio only, our standards and practices people were not happy at the look of things that that's one and others, I don't know. Were there others? I forget.

Bethany Lockhart Johnson:

Well, I say the real reason is because we've had so much fun talking to these guests, you know Fawn Nguyen, Megan Franke, I mean, all of our guests, I felt like I could talk to them for hours and I wanted to, and actually you cut me off more than once. When I talking, I just feel like perhaps a podcast us is gonna allow us to have a little bit more of an in depth conversation with folks a little bit longer. We try to keep our video segments short and quick. And if something does lend itself better to video, we, you know, we leave that door open. We can always pop in with an image or two, but for now, we're gonna try this out. And I'm, I mean, I'm excited.

Dan Meyer:

I'm excited too. Yeah. We had so many viewers that were telling us like, yeah, I was trying to watch your YouTube videos while I was driving. And I got in like terrible accidents. And so now we're doing, we're doing audio. And so we're in your car, we're in your ear. We're happy about that. Super excited.

Bethany to start off our first podcast episode here. Like I, you, we know each other quite well. And I just wanna confess, like my, one of my tendencies to the audience, which you well know is that I am a very jealous person. In particular, I am jealous of things that people like and love that are not mathematics. You, you know this about me. Like we, like, I love

Bethany Lockhart Johnson:

Green with envy.

Dan Meyer:

Yeah. You have a lot of positive vibes towards math. Negative. Of course we all do. But like I love math and that makes me weird among my social circles, my family and friends, and there's things out there that are just so popular. And I'm always like why can't math be more like those things. So to start with one of the most popular things in the world right now in the, in the English speaking world right now is a game called Wordle. How did you Bethany know that Wordle was super mega popular?

Bethany Lockhart Johnson:

A friend told me there about the New York Times article and I read it and was like, what is this? I have to check this out. I am a fan of Words with Friends. I love a good game of a Scrabble online. So I thought, hey, I might like Wordle. Little, did I know how consumed I would become. And the many, many text messages that would be exchanged between myself and others about Wordle.

Dan Meyer:

For those who don't know what Wordle is, it's the same thing every day. You've got a five letter word that everyone in, in the word in the world is trying to guess, and you have six tries to do it. So today's word which not gonna spoil this because this will come out later. It was cater, C A T E R. And my first guess was not cater, but what's so interesting about Wordle is how, like number one, how it treats your wrongness, that being wrong is inevitable and always a learning opportunity. If I guess any word it's gonna tell me interesting feedback about that word that helps clue me into the differences between the target word and the word I just chose. There's so many examples like that, where I'm like, why can't, what, what is holding math back from being more like this? What else have you Bethany experienced about Wordle that might help explain why it's viral and what math might do in response.

Bethany Lockhart Johnson:

I will say that I have a family member who would not describe herself as somebody who enjoys word games of any kind. She wouldn't say she's a word person, but just likes the idea of playing a word game. And yet she got obsessed. Right. And I think it was because you mentioned the feedback piece and I really think that's it. I think that, that when you, you take this first risk and you're like, it's totally okay to be wrong. Right? Expected. It's totally okay. And it's expected if you were to get it on the first guess, like

Dan Meyer:

Yeah. You cheated.

Bethany Lockhart Johnson:

And put cater today, right? Yeah. You know, you're expected to get it wrong. So it's like, it's not scary to take that, that first word. You're like excited to put in that first word, because you wanna see, did I get any of the letters? None of the letters, all of it gives you information and, you know, to describe your connection with math, you know, so often we don't wanna take that risk. Right? The, some of the fears, some of the anxiety is I don't wanna be wrong or what if I'm wrong, right. When we are talking about this feedback, that is actually exciting feedback and helps you to like, even tune in deeper and get more engaged it.

Dan Meyer:

Yeah. I love that. It sees the value in whatever response I have, whatever word I enter. And you have, you have six tries for it. So wrongness is expected and correctness is expected, but whatever I put in there is some kind of value in it. Even if I had none of my letters are in the ultimate, you know, word I'm trying to chase down. Just knowing that those letters aren't in the final word is itself valuable information. So I'm asking myself as someone who thinks about math instruction and math curriculum, like how can I ask questions that invite lots of responses and where whatever the response is? I can say something that's, that's good about it. Like here is what is so valuable about that and make the next guess a little more, less risky as well.

Bethany Lockhart Johnson:

Right? The feedback is so important. And then the other thing is even if somebody who is like Scrabble champion of the world, right, they may also like, no matter how proficient you are at word games or strategy, you might solve the word after, you know, six tries. You might put in that first word and also not have any letters. Whereas myself, I, you know, New York Times crossword Monday or bust. Right.

Dan Meyer:

Whoa.

Bethany Lockhart Johnson:
Monday, I'm out, I tap out, but it's, you know, I feel like I can still participate. Right. So all levels can approach it and give it a good try. And the, and the feedback will be valuable across the board. So you're in, you're, you're some people are in competition, my family and I, when we're texting about it, we're not competing. We're more like, ah, did you get this? You know, and it's, it's, I feel like it's exciting. Maybe there's a little bit of competition, but I'm not looking down on anyone who didn't guess it until six. Now, have you ever not gotten it Dan? Or have you always?

Dan Meyer:

Oh yeah, yeah, yeah, for sure. I've missed it.

Bethany Lockhart Johnson:

No.

Dan Meyer:

And what really, what I like… what. Can you mind your judgment?

Bethany Lockhart Johnson:

No judgment. No, but there's

Dan Meyer:

Yeah. All right. Fair enough. Fair enough. I've, I've missed it. Hey, hold up. So I've missed this now and then, but I also miss it because me and my friends decided to play it a little different. This is another

aspect of that I love, that's not always present in math class, which is that Wordle allows for variations on the game, allows you to bring your own kind of rule set and say, what if you know, like what if this, what if that and play that way? So of my friends and I, we each, I got, I got three friends, the three of us total rather that's my, the entirety of all of my friends in the world. It's all I have. And we all suggested one word that we all play at the start. Like we just play 'em in order, no matter, like, whether it's a smart thing to do or not, you know, like I chose pygmy, like that's, that is not a good word to choose for. Wordle has like,

Bethany Lockart Johnson:

No, you have two Ys.

Dan Meyer:

Two Y it's doubled up and it's got no like, kind of official vowels, but it makes it little more stressful. Makes it a little bit more stressful at the end of it. And so, yeah, I've, I've, I've my streaks, you know, gets a little busted sometimes cause of how, how we, we play it. Are you telling me you, you have never broken your streak. Is that, is that real?

Bethany Lockhart Johnson:

I have, but you know what? It, that streak doesn't even matter because when New York Times bought it and they transferred it over, all of my stats were gone. So it didn't, and that was a lesson in letting that was a lesson in letting go of stats, because this isn't a competition anyway.

Dan Meyer:

I love this conversation. I think that whenever we experience something as human beings that is enjoyable and is a learning experience, those two things are both true about world that we like start looking at that as educators of mathematics and say like what, be a little jealous about it and say like, you know, not like, oh, this is just in a separate world of like fun things. And it's not appropriate to compare the world of fun things to the world of math learning, but rather what can, can we grab from the world of fun learning things and scurry over there, grab it, steal it, and then scurry back to the world of mathematics?

Bethany Lockhart Johnson:

With the goal of making math more accessible, more a space where we take risks, where we have fun. But yeah. Yes, Dan.

Actually, I'm super excited because our guest that we have today is somebody who has teaches teachers and is inviting us to think about how we ask questions in mathematics in ways that get people buzzing, that, that get, get the, the stats a ticking. You know his ideas and thoughts have gone viral and people are in conversation about mathematics in a way that we long for them to be out in the streets shouting about mathematics. So I'm so excited. I'm so excited, Dan.

Dan Meyer:

So to help us think about what makes mathematics go viral. We wanted to bring on one of our favorite viral mathematicians, someone who does math publicly in a way that just catches people's eye and has them sharing things and learn more from his secrets. So we posted on Twitter three facts about this person and invited people to guess who this was. Those facts were, this is a person who teaches math, who lives in Fresno, California, who can throw a rifle 15 feet in the air, back flip and catch it. I dunno if that nail narrows it down for people, shout out to folks like Martin Joyce online, Joel Baer, Idil Abdulkadir, and other people who knew who this was, please welcome on Howie Hua.

Great to see you. Thanks for being here. You how we are as someone who teaches math to future elementary math educators, is that right?

Howie Hua:

Yes.

Dan Meyer:

Among, among other people.

Howie Hua:

Yeah.

Dan Meyer:

And I'm curious, what got you to head over to social media, like TikTok, where your short explainer videos just kind of get the people go. What initially got you going to the internet to start interacting with other people and teachers there.

Howie Hua:

I joined Twitter in 2017. I have to thank Jamie Garner and Chrissy Newell for that. I went to CMC Central. It was my first ever math conference in 2017. And at the very end of their session, they were like, the you're missing out if you are not on Twitter. And they told their audience that. So I did have a Twitter. I didn't really do anything with it. And it was because of them that I decided to join Twitter. And I think it was 2020, or 2 Novembers ago I decided to make a TikTok. And it was because of two reasons. The first reason I was I'm very sentimental. I really hate things ending. And I have an optional list serve for my past students. It's like, hey, if you still wanna hear from me, feel free to join my list serve. And I just decided to make a TikTok, I'm like, hey, past students, if you still want to learn math from me I made a TikTok so feel free to continue learning from me if you want to obviously not mandatory. So that's one part. The second part is I think that maybe people don't want to watch 20 minute YouTube video on something math related. Maybe they just want a short one minute explainer. So I thought that I could just help the community with that.

Bethany Lockhart Johnson:

So Howie, I think that I met you at a conference and I remember you being so warm and so friendly, and I feel like that energy comes across in your videos. And I think a lot about folks who have math anxiety because in my history I have and do navigate my own math anxiety. And I feel like your videos are just such this, like what you want to dip your toe in, like, ooh, I'm curious about this and you see one video and it makes you wanna see more, you know? So do you find that folks, like what kind of feedback are they giving you about your videos? Are they, are they feeling like it's something that you're offering them new ways to think about things or what what's kind of been the experience as, as these videos have been reaching some such a wide audience? Yeah.

Howie Hua:

I think that in general, people just want to understand what's actually happening. For example, I got so many nice comments when I explained what's actually happening in the long division algorithm. Let's visualize it. And I got a lot of comments saying like, wow, I finally understand the long division algorithm. It's not just a whole bunch of procedures or connecting the permutation and the combination formulas what's actually happening. There got a lot of nice comments there. So I think in general, people just want to know what's happening rather than just use this formula to get an answer.

Dan Meyer:

Yeah. I love it. I'd love to share with people a couple videos just to give them context on like what it is we're talking about with your style and your approach. So we can figure out like reverse engineer, what it takes to offer explanations and offer experiences that are so shareable and so inviting. So the first one I'll just share briefly is one where you talk about with teachers about a teaching tip called you call, test talk. So here's that video, which was liked you know, it was watched hundreds of times liked thousands of times have a listen folks to this one.

<<Video of Howie Hua plays>>:

Teaching tip, a lot of students have test anxiety. So something that I do is called test talk where at the beginning of a test day, students put their writing utensils on the ground. I hand them the test and students can talk with their group about the test for five minutes. I've done this for the past seven years with my in-person classes. And students have mentioned how much it lowered their test anxiety.

Dan Meyer:

And then I also wanna share another video. And this is, I don't understand how this did the numbers that it did. Honestly, I'm hoping to get some insight into this. It was, you asked people a very short, simple question, which is: how do you calculate 17 plus 18 in your head?

<<Video of Howie Hua plays>>:

Might be embarrassing to say, but one of my favorite hobbies is to listen to how other people think about math. So if you wanna make my day, comment or stitch this video with how you would calculate 17 plus 18 in your head.

Dan Meyer:

And you got like tens of thousands of likes on that one, almost a hundred thousand likes on that one. And tens of thousands of comments on it that one's just like a, a purely mathematical video. So these are, these are the kind of numbers that people get when they post videos of kittens saving puppies from sewers or whatever, just like wild numbers. I've seen, like, you know, pretty good TikTok dances that haven't done numbers like 18 plus 17 did like you're just objectively a very effective mathematical communicator. Can you offer our audience a few tips for how they can be effective mathematical communicators as well?

Howie Hua:

Well, thank you. So with TikTok, you need to grab attention in the first couple seconds. So I think about how to make a certain topic exciting. So for example, hey, why do we flip the second and multiply when dividing fractions? Or why do we move decimal points when multiplying and dividing, or what happens if we add across fractions, things like that to their attention. And it's an exercise for me as well. Like how can I make this exciting?

Bethany Lockhart Johnson:

I think also, like for example, with the multiplying, you know, working with fractions that, oh, just flip it and multiply, you know, to divide a fraction. I feel like that's a question that's been asked in so many classrooms and teachers, plenty of people have had teachers who just said, that's just how you do it. You just, just do it. It works right. Whether it's the teacher that maybe doesn't feel comfortable in the conceptual knowledge or whether, you know, maybe they haven't been taught the reason why. So there's something so great about the way that you invite us to really get curious about these questions.

Dan Meyer:

Yeah. One look at this at your whole catalog here, Howie is that you take what is oftentimes assumed is like, yeah, you've gotta just do it this way and challenge yourself, I suppose, to think about like, what is like, why is it that way? That's pretty sighting. I also see you as like, as engaging part of the communication is community. It feels like in your work, I'm wondering if you could speak to that, like how you operate with people in the comments of your video, seem to me like pretty special. What's your move there?

Howie Hua:

Yeah. So to invite community, I do mental math Mondays. Just say like, hey, how would you do if you buy 12 items that are $4.50 cents each, how would you calculate the total, assuming that there's no tax? Just to invite them in, just to show that their mathematical thinking is brilliant and that there are so many ways to do this. So that is how I build community on TikTok. Just invite them in. Hey, how would you think about this?

Bethany Lockhart Johnson:

Well, I think it's also beyond TikTok, right? It seems like. So as you are working with future teachers, you're teaching folks about the craft of teaching. So I feel like you're inviting them to be better communicators too. Do you find that they are, are they saying that they like, are they hopping on to, to create these videos? Are they finding that it's helping them to, to be able to have these conversations with their students?

Howie Hua:

Yeah. So I asked my students a couple weeks ago raise their hand if TikTok is your most used social media app. And over half of my students raise their hands. So it's very important to be where the students are. And I'm like, okay, well, that's good because half of the videos that I post on TikTok are for my students. I'm like, hey, we're learning about fraction division, so I'm gonna make a fraction division TikTok. So I say like, hey, if you're absent, just watch this one minute video of me summarizing what we did. So, so yeah, I kind of, I like to utilize that app for lessons as well.

Bethany Lockhart Johnson:

I want to, to kind of also kind of get to the heart of what you're saying about the community though, because about communicating these ideas because not every teacher is gonna wanna hop on TikTok. Right. And we're certainly not, I'm certainly not advocating our kids to, I mean, whether they're on it, they're already probably on it, but point is

Dan Meyer:

Team Twitter forever right here.

Bethany Lockhart Johnson:

So

Dan Meyer:

I'm into this, I'm into this.

Bethany Lockhart Johnson:

How do we, you know, regardless of whether it's on TikTok or Twitter or Facebook or any, you know, future apps, the heart of the communication I feel is you are allow, you're making it accessible and fun and giving permission to ask these questions and to really show us that mathematicians ask questions, mathematicians wonder, and they talk about their ideas with other people. And it, it, I feel like that to me, regardless of the platform really comes across.

Howie Hua:

Yeah. Thank you. Yeah. I, I post my videos on Twitter and on YouTube for those are not on TikTok just to make things more accessible. So, so yeah.

Dan Meyer:

Yeah. Howie post videos at the old folks home called Twitter. And that's nice of him. That's where I'm at. But yeah, like I'm with Bethany also. Like, I feel like the, the real lessons here, aren't just about like social media. And I don't know if, Howie you're too modest is just like name what's so effective about all this, but it just seems to me like there's, there is you have an approach where you say there are forbidden questions in mathematics that shouldn't be forbidden, you know, like, why is it done this way? And you, you tackle those questions with, I think a lot of at the end warmth and invitation and what I saw in the comments that I just think that I would love for people to think a lot about is how someone will say here is how I saw 18 plus seven 17, and you're jumping in there and offering like a word that communicates

to that person. Like, hey, I see that. And that's smart. That's not what I did, but that smart. And there's just like, there's just so much about that, that like moves over into the, the physical space. And I'm wondering if you have any stories of like your teachers that you teach math to drawing lessons from your approach that they then find applicable in their own classes.

Howie Hua:

Yeah. So about five years ago I had, I was teaching athematic sequences and I threw about five or six athematic sequences on the board. And one of them was 3, 7, 11, 15, 19. And I asked them to find the 100th term. And in my head I was hoping, okay, hey, they're gonna be thinking we're starting at 3 and we're jumping 4, 99 times. And I was hoping that they would do that because it really lends itself to the athematic sequences formula. And that that method did come up. And then a student raised his hand and said, well, I got the same final answer, but I did it a different way. So I'm like, okay, great, come up to the board and chair. And so the athematic sequences was 3, 7, 11, 15, 19. And under it, he wrote 4, 8, 12, 16, 20. And he said, while I noticed that all of these were one less than a multiple of four.

So if we're looking for the 100th term four times, 100 is 400, take away. One is 3, 99. So that's how I got my answer. Wow. And my mind just exploded because that is so much easier. The athematic sequences formula for 3, 7, 11 and so forth is four N minus one. And I never connected it to, hey, it's one less than the multiple of four. And it wasn't until he shared that, that I totally related four N minus one as it's the multiples of four minus one. So I always bring that example up to show that we really need to listen to student ideas because student are student ideas are brilliant.

Bethany Lockhart Johnson:

When, when he shared that. And it was something you had never thought of. What was your response in that moment? Because I think that can speak to how teachers like giving ourselves that permission to be brave and let go of the control. And here are the answers we don't know are coming.

Howie Hua:

I really like being explicit. So I'm like, wow, I never saw it that way. That is awesome. And I praise students like that. It's like, wow, I never thought of it that way. So it really goes to show that math is a creative subject. I say that once every week to show like, hey, can we find another way? What's another way that we can do this and all of that. And I tell my students, the beauty is in the us, not the final answer.

Dan Meyer:

Yeah. I love that. It just goes a show. Like there's just so many different ways to approach that surprise from students, one of which could be like, oh, I can't reveal my surprise that I didn't know this was possible. And you've managed to kind of extract ego from the whole equation and be able to just react to that student with warmth and surprise and delight. I'm a hundred percent sure students respond to that. It's really exciting to hear all this from you Howie and, and you've described the conditions under which viruses like mathematics can go viral, like there's conditions in which like actual viruses of which we've heard a lot lately can, can like spread. And you've just describe conditions where through

empathy and through warmth and math knowledge and task design, you've managed to make math go viral, which is exciting.

I'm wondering if there is a way, a way that we in the Math Teacher Lounge can engage with your ideas ourselves beyond just listening to them. What is what is it the Math Teacher Lounge challenge for this episode? What could you offer us that would help us yeah. Engage with your ideas here?

Howie Hua:

I think that one of my strengths as a teacher is that one of my favorite hobbies is to listen to how other people think about math, because I obviously know how I think about math, but I'm always curious if we're looking at the same problem, how are we solving it? Are we solving it the same or are we solving it differently? So my challenge is how would you mentally calculate 17 plus 18 and then ask around, ask your family members, ask friends, ask social media, how would you calculate 17 plus 18 and see how they would calculate? And I have another one. I really like walking around whether it's a new city or around the school and just taking pictures of what I can count and then just ask people, hey, how would you count these? So on your next walk, just walk around and see if you can find something that you can count, take a picture, and then ask around, Hey, how would you count these and see if their way blows your mind, see if their see if their way is the same or different as yours.

I think that, like I said the beauty in math is found in the process, not the final answer. And we lose out on that beauty. If we just keep focusing on the answer.

Bethany Lockhart Johnson:

And we wanna invite you to actually share those pictures and those thoughts and you can tag us and Howie. You can tag us at @MTLShow on Twitter so that we can see what images you have found. And we can have a continue this conversation with how are you viewing mathematics and how, how can they tag you?

Howie Hua:

You can find me on Twitter at @Howie_Hua.

Dan Meyer:

And yeah. And shout out to the Math Teacher Lounge Facebook group as well. We'd love to see you post your descriptions of how people added together 18 plus 17, or your photos of different collections of things post 'em over there. Bethany and I will tune in and we'll we will try to, we'll definitely marvel it, your contributions over there as well. Howie, thanks so much for your time for sharing how you've made math go viral. Appreciate it.

Bethany Lockhart Johnson:

I am. I'm gonna do the challenge, Dan. You're gonna do the challenge.

Dan Meyer:

I'm doing it. Yeah. I'm gonna post it in the Math Teacher Lounge Facebook group. We'll be in there commenting with you folks and looking for your responses. We're gonna read a couple live on live on air, live, be recorded, live prerecorded on air. Next time. Just gonna be dazzled by your creativity. It's looking forward to that.

Bethany Lockhart Johnson:

No pressure though. Just hop in and enjoy it.

Dan Meyer:

If it's not creative, we'll enjoy your lack of creativity. Great to great to chat with you, Bethany. Great to see Howie and we'll see you folks next time around.