

Jennifer Bay-Williams (00:00):

The games are fun, but that's a byproduct, right? That's not the reason we're doing the games.

Dan Meyer (00:06):

Hey folks, welcome back to Math Teacher Lounge. I am one of your co-hosts, Dan Meyer.

Bethany Lockhart Johnson (00:10):

And I'm Bethany Lockhart Johnson. Hi, Dan. Welcome back to another episode.

Dan Meyer (00:15):

Yeah, and I've been missing you. We had a live show at NCTM, the National Council of Teachers of Mathematics annual conference, where I was and you were not. And I was definitely feeling your absence. So tell me you're well, at least.

Bethany Lockhart Johnson (00:30):

<laugh> Well, no, what I wanna tell you is that when we started planning for this season, and we were talking about different folks that like would be on our dream list to interview, right? Today's guest, the person that Dan got to talk to, was on that list. She's like the second person that I mentioned. So it was kind of funny, because we're all geared up for NCTM and then, for a variety of reasons, I had to say, "Actually, I cannot attend." I was very disappointed. And so what I THOUGHT was gonna happen is that all gears ground to a halt, and it was going to be, "OK, well, then I guess this can't happen. We're gonna have to reschedule her for when Bethany. ..." <Laugh>

Dan Meyer (01:13):

I thought that they were gonna cancel NCTM's annual conference and reschedule.

Bethany Lockhart Johnson (01:17):

I thought so, too.

Dan Meyer (01:17):

The entire thing. For when Bethany Lockhart Johnson could attend.

Bethany Lockhart Johnson (01:21):

I thought so, too.

Dan Meyer (01:21):

But the show, the show went on.

Bethany Lockhart Johnson (01:24):

It went on.

Dan Meyer (01:25):

<laugh> I had the privilege of chatting with one of Bethany's absolute math-education idols. And I tried to treat her with the deference and enthusiasm that you would. But yeah, thank you for connecting me — connecting US — to one of your best friends. That was fantastic.

Bethany Lockhart Johnson (01:43):

Yeah, you guys made fast friends. You guys sounded real chummy there. Um.

Dan Meyer (01:47):

Yeah! Did you get invited to her birthday party next year? <Laugh> Because I did. I don't know if you got that. ...

Bethany Lockhart Johnson (01:53):

You're my heart, Dan. My heart.

Dan Meyer (01:55):

Anyway, so we're gonna get to it here. It was a sprawling episode, a live show with lots of moving parts and interests and audience participation.

Bethany Lockhart Johnson (02:04):

And we are bringing that to you, dear listener. And so Dan, I do appreciate that you're gonna help set the scene for me, because I know audio will be a little different, 'cause it's live. But that's what makes it exciting. So who we got on the show today, Dan? Why don't YOU introduce her, since you were there?

Dan Meyer (02:24):

Yes. We will give Dr. Jenny Bay-Williams her due in the actual live show you'll hear. But just so you folks know, Dr. Jenny Bay-Williams is an expert on many things related to early math ed. She's got her name on one of the absolute seminal biggest math-methods textbooks for elementary educators. And she also is an expert in fluency, including fluency building games, which is the main reason I was excited to chat with her. And so she authored a book with Gina Kling, entitled "Math Fact Fluency: Sixty Games and Assessment Tools to Support Learning and Retention." So, should we jump in?

Bethany Lockhart Johnson (02:58):

OK, that sounds good, but I'm gonna stop you when I have something to ... I'm gonna hold myself back, but I may jump in a few times. How does that sound?

Dan Meyer (03:05):

Fair, fair, fair. And there's gonna be some moments ahead where I gotta jump in real fast to explain what was going on in the room. That's how outta control things got back in the day.

Bethany Lockhart Johnson (03:14):

All right, let's give it a listen. <Recording from NCTM starts>

Dan Meyer (03:21):

Ladies and gentlemen, please put your hands together for your host. It's me! It's just me. <laughter>. Hey, love that! Love to see you folks. My name is Dan Meyer. I'm not sure how we know each other. Perhaps through Three-Act Math, Desmos. I'm a father, son, brother, man-about-town. It's just great to see you folks. Have you had a good NCTM? <Woo!> Love that. Love that. Great to hear it. Tallied up — I'm curious — how many sessions have you attended? This is a real question here. Tallied up. I'm just curious, has anyone been to four or above, counting this one? <Yes!> Count this one. Five or above? <Audience murmuring> Six or above? Seven or above? Eight or above? Nine or above? Have we even HAD nine sessions? Ten or above? That's incredible. Big ups to you folks! Big round of applause for you learners. I gotta be real. I'm a bit of an introvert. Who would've guessed that? Like, a math teacher nerd-type is an introvert! So I gotta occasionally have my fortress of solitude. But you, doing 10 sessions like that? Oh, nine sessions. Thank you for correcting me. <Laughter> Nine sessions. That's real learning. I appreciate you. So, I'm not sure how we know each other. Perhaps ... are you familiar with Math Teacher Lounge, my podcast? <Woo!> Any subscribers? A few of you. Some of you just saw "free junk" on the brochure and were like, "Ooh, more free stuff. I'm into that." If you folks are a subscriber, I'm so happy that some of you are not; I encourage you to subscribe. Team here puts a lot of time and effort into it. But if you do subscribe, I gotta ask one question very seriously: At what speed do you listen to it? <Laughter> Is it a 1x? You're a 2x-er? <Voice in crowd: No! 1.25!>

Dan Meyer (05:17):

Anybody slower than 1.2? I wanna know who the real heads are out here. <Audience member: I listen to it at 1.> 1x! You're invited to my birthday party! The rest of you enjoy not being at my birthday party. <Audience laughter> I don't listen to a single podcast any slower than 1.5x. So 1x really means a lot. I try to talk super fast, so folks slow it down for me. You know? So if you do know me from the pod, you know that I have a co-host, Bethany Lockhart Johnson, who is every bit my better half. She's so wise. She knows the little kids where I know the older kids much better. She could not be here. And so this is a little bit corny, I realize, but can I just get you folks to give a frowny face, a sad face, maybe a tear, like that? Just so I can send a picture back to Bethany. Just pantomime like you're sad. I know you're pumped and happy. Work hard and try to bring the mood down a little bit. Stop smiling. <laughter> Stop laughing. All right, here we go. All right. This is not bad. You still seem pretty pumped, but I'll see. She'll be like, "Oh, that was a crowd of people without me. Nice."

Bethany Lockhart Johnson (06:26):

OK. My first interjection, Dan, I have to say: That was very kind of you, I felt for a moment the emotion in the room at my absence ... OK. OK, let's keep going. Let's keep going.

Dan Meyer (06:37):

Let's get this going here. We have a few things for you. Wanted to be a nice time. So we have a few things, you know: My Charm, whatever this is. Bag of stuff. Warm up the crowd. But the real meat of it is this. On the podcast this season, it's been all about fluency. And no one in here tell me you've got fluency figured out. We did this season — now five, six episodes; Martin, what is it? Six episodes. Who even knows? Who can count that high? But I've not been doing this as a "let me share my expertise about fluency." I feel very conflicted and destabilized about fluency. So inviting guests on, Bethany's been helping out, obviously, and we've been learning so much about what fluency is, how to assess it, how to develop it. I gotta say, here's my unease. Here's my unease. Check me on this here, OK? If you were to ask someone who would say to you, "I really don't like math" ... I mean, who would say that, really? But if you're at a party and you say, "Hey, I do math," you might get someone who feels a bit uneasy about math. And if you ask them why, I find that there are a couple very common reasons. One

of them is about fluency and how it was attempted to be developed in them as a kid. Oftentimes in experiences that felt very high-stress, very high-stakes — maybe they were timed; maybe there are flashcards involved. I'm not saying those always lead to anxiety, but that's a common reason why people freak out about math. But another common reason why people freak out about math is "I just didn't get it past a certain age." And do you know what helps you get it? Fluency. Fluency is the sort of thing that makes so much possible. So I just admit, my stock in trade, what I get excited about talking about, is ... not fluency. Like, I love thinking about learning new things and why we're doing this and what's the application and how can technology help us. Fluency? I'm like, well, we'll just leave that to the experts. And so, it's been a growing season for me, of trying to find my enthusiasm for fluency. It's really timely, 'cause I got kids in kinder and first right now. So I'm watching what happens with them, with their teachers. I'm so grateful for the thought that goes into that fluency exercises. And today we have one of the guests I'm just so excited about, very excited about, hanging out with us today. Someone who is an expert in fluency. Someone whose name is on the book that teaches so many people how to learn, how to teach elementary and middle school mathematics. An expert in pedagogy. And someone who's an expert in fluency, but not just that, is an expert in game-based fluency, which — I dunno if that has an appeal to you. I think fluency, I'm not thinking games necessarily. But this is someone who knows how to turn fluency, a thing people sometimes dislike, into a thing people like: A game. So we're gonna be up here. I'll have some questions for her. You might have some questions. We're gonna play a game, me and her. And we're gonna compete in that game against you folks. You have the materials to play this game yourself. I hope we all learn tons. I know we will. I'm so excited to welcome up Dr. Jenny Bay-Williams. <Applause> Please put your hands together for Jenny! Welcome, welcome. Please join us. Have a seat. We're gonna segue gracefully to the other mics here. Nothing weird about this. OK. So welcome to our show, to Math Teacher Lounge.

Jennifer Bay-Williams (10:09):

Thank you.

Dan Meyer (10:10):

How has your NCTM been?

Jennifer Bay-Williams (10:12):

It's been great. I was lucky to be able to go to a lot of sessions and I've been targeting sessions of teachers that might be first-time presenters. So I've really gained some great insights from some people that I didn't otherwise know.

Dan Meyer (10:26):

It's tricky, right? How you pick your sessions? It's like, there's names you kind of know, but who knows what's out there, off the names you know. Do you go for ones that are, you know, maybe a bet for a solid double? Or maybe you just go swing hard and go for a home run in some room down on the third floor or something. You found some good stuff.

Jennifer Bay-Williams (10:43):

I found some good stuff. And you know, we all presented at one point by ourselves for the first time, and all of that. And so I was in some great sessions that had, you know, maybe 12 others that got to benefit from the session, and it was really, really good. So yeah, I felt lucky to be there.

Dan Meyer (10:57):

Awesome. And you're in a position to amplify their voices even more now, as your work on the editorial board of our journal, *Mathematics Teacher*.

Jennifer Bay-Williams (11:07):

MTLT. <Mathematics Teacher Teaching & Learning> Always looking for good writers.

Dan Meyer (11:08):

Love that. Always be plugging, always be plugging. Anyone know how to write out there? Great! Talk to Jenny. Awesome. <Laughter> So can you give us a brief tour of how you got to be where you are? The work that excites you? I assume you were a classroom teacher at some point. Just start us from there and give us a couple of highlights.

Jennifer Bay-Williams (11:29):

All right. I don't know if this is where you want me to start, but I wanna start with—

Dan Meyer (11:33):

Birth! Go for birth. I don't care. <Laughter> Let's do this.

Jennifer Bay-Williams (11:36):

I remember sitting in high school, thinking I would never be a teacher. Because they just worked too darn hard. I just couldn't be that person at eight o'clock in the morning. So then in college I was bored. I actually didn't know what a syllabus was, so I couldn't figure out why everybody was so busy, because I had all this free time. I didn't realize there was homework on the syllabus. <Laughter> So anyways, I saw this volunteer open opportunity at an elementary school. And when I got to that school, true story, a child needed help with their basic facts. And I came back to the school a week later and the specialist, the vice principal or somebody, met me at the door and she said — this is a pseudonym — "What did you do with Adam?" Well, of course I'm having a panic attack, 'cause I didn't get any instructions. I just worked with him. And she said he got a perfect score on his basic facts test. And I felt better than I'd felt about anything else I was exploring.

Dan Meyer (12:33):

Wow.

Jennifer Bay-Williams (12:34):

And you know, when you're a freshman in college and you don't know what you wanna do, the pressure's on. So I took my first education class. And then ever since, I've been teaching. I love teaching in courses; I like taking the sections. When I was a middle school teacher, I would take the — I hate this phrase, but lower-level classes and just noticing the impact over time of whether students are fluent or not. And also their confidence, you know, going hand in hand. So that's really how I got started. And then I got to come and do a workshop at NCTM, actually, ages ago. And I just got such a thrill, after I got over the terror of it, that I really found a passion for working with teachers.

Dan Meyer (13:11):

You people are scary. <Laughter> When you look at us, you're very scary. The way you listen is really unnerving.

Jennifer Bay-Williams (13:16):

I'm sweating up here. <laugh>

Dan Meyer (13:17):

So yeah. Very intimidating. That's a fantastic story and very relatable. I would love to know ... on the subject of fluency, I would love to know something that in your personal life — as personal as you want to go here — that you are developing fluency in.

Jennifer Bay-Williams (13:36):

Something I'm developing fluency in ... there's so many things that I should be working on. One thing, so, my favorite thing that I'm developing fluency in is horseback riding.

Dan Meyer (13:49):

OK! I am not a ... what do you call it? An equestrian? I'm not a horseback rider myself. So I am, in this moment, not sure I could pick a horse out of a lineup, honestly. Like, you know, horse, cow, lion. I'm like, "Hmm." So I'm wondering, how would one develop fluency, with intent? I imagine it involves some riding, but try to imagine if you would, what goes into becoming fluent in horseback riding? Tell us.

Jennifer Bay-Williams (14:17):

Right. So, actually, when I was a teenager I rode Western. I lived in Missouri. I rode Western. I actually won some stuff at the county fair on my horseback riding. So I had some skill. I had one way of riding. So that's a connection to fluency, as I think about it. And then COVID hits and my husband suggested maybe I need to get out of the house <laugh>. So he suggested I go ride at a place down the road in Kentucky where we have what I would call English riding. I didn't know there's a whole host of kinds of ways to ride, with a saddle that didn't have a horn on it. So.

Dan Meyer (14:51):

I can imagine. <Laughter>.

Jennifer Bay-Williams (14:51):

So you have to post when you're riding. I'd never done that.

Jennifer Bay-Williams (14:57):

And then the teacher is using language I had never heard before. And I'm like, "I don't know what that means." And I'm holding two reins in two hands instead of, you know, one rein in one hand. So I'm just learning this whole different way to go about it. And I guess one day I'll know what the difference is between, I don't know hunt seat, English, this or that, or whatever — all the different kinds of riding and how you're supposed to sit in the saddle and all the things. But it's a pretty fun challenge.

Dan Meyer (15:24):

OK. As a teacher, that's interesting to me. You know, I kind of just assumed, if you stayed on, you're good. <Laughter> And if you don't, you learn from that! But actually, someone is helping you develop your

fluency. Fantastic. I would love to ask every one of you what you're developing fluency in. It's an interesting question, I think, especially outside of mathematics. So here's the thing about you I find fascinating. It's that you've done some very Serious Work. Very capital-S. The kind that has citations and goes into the fancy books. And you have a lot of that serious work. And then you've pivoted a bit or have developed this whole angle around games. Game-based fluency. To the degree that I think if we ... yeah! Here's some books that our guest Dr. Jenny Bay-Williams has authored on fluency! Including this one that we're here to talk about today: *Sixty Games and Tools to Support Learning and Retention*. So what's the appeal of games to you? What have games offered you? Could we have an equestrian, a horseback-riding game for your fluency? <Laugh> Answer whichever part of that scattered question you want to! <Laugh>

Jennifer Bay-Williams (16:39):

So I am a serious person. And I sometimes say I am from the Show-Me State. So like you have to show me something's really gonna work before I'm willing to try it. I was that teacher that really wanted to feel solid; something was gonna work before I would try it. So I've always carried that with me. And I appreciate teachers that don't just on a whim try something without evidence. So I've been an evidence-driven person. I got my doctorate, I read so much research, I really don't wanna do anything that there isn't some solid background on. So I am a serious person. But then, in all of my work, I continue to focus on how many students don't feel ... let's just say "people." Many people don't feel good at math.

Dan Meyer (17:21):

Yep.

Jennifer Bay-Williams (17:22):

They don't like math. And when you boil down to it, they're not good at basic facts. And you know, I've taught hundreds of pre-service teachers, mostly elementary. I've done the whole gamut. But this is a negative memory for most people. And so that's not fun in games. And so then I'm in Grade 1 and 2 classrooms, watching with dismay at how children are learning their facts. You just see the joy coming right out of whatever they brought to school with 'em. So that's when I started thinking: "How can you bring more joy to the learning of math, in a serious way?" Like, the games are fun. But that's a byproduct, right? That's not the reason we're doing the games. I tried to do, at the end of a workshop, "Wait, let's go back. Why are we doing these games?" And the teachers are like, "They're fun." And I'm like, "But remember, that's the byproduct. Really why are we doing the game?" So that's the serious side of it.

Dan Meyer (18:17):

Yeah. Excellent combination of serious and fun. And I'm excited today to learn a game with you, especially one that's about subtracting two-digit numbers, which has always been on my bucket list of things to learn how to do. <Audience laughs> So if I may, I'm gonna learn this game. We have a deck of cards, and apparently this right here — which as it happens, you folks will be getting this — can help kids learn how to subtract two-digit numbers, and probably other things as well, in a serious and fun way. I do feel like I need to take out the jokers. I assume? A joker, gone?

Jennifer Bay-Williams (18:54):

All the guys go. No offense. <Audience laughs>

Dan Meyer (18:57):

Oh!

Jennifer Bay-Williams (18:57):

The jacks go. The kings go. The jokers go. All the guys go. You do have one of these. Do you want them to take their their cards out or...?

Dan Meyer (19:05):

We'll just wait a second.

Jennifer Bay-Williams (19:07):

Yeah, just watch Dan with this nice little deck....

Dan Meyer (19:10):

Yeah. Give us a second here.

Jennifer Bay-Williams (19:12):

The queens stay. The ladies are the zeroes. The queens are the zeroes.

Dan Meyer (19:15):

Queens are the zeroes. OK.

Jennifer Bay-Williams (19:18):

And so this is how I usually have my decks, in my classroom and in my book bag. And when I travel, that's the deck, right? But for this game, you don't want your tens. You just want single digits. So we also gotta go find those tens again.

Dan Meyer (19:30):

Yeah. I suppose if you pulled one of your math class decks out for an evening of playing Texas No-Limit, it gets a little bit weird for people.

Jennifer Bay-Williams (19:38):

You just wait to see how long it is till somebody notices that no face cards are showing.

Dan Meyer (19:42):

"No one's cards are all that great."

Jennifer Bay-Williams (19:45):

That happens at my house, actually.

Dan Meyer (19:47):

<laugh> I actually am not surprised at all. I have never shuffled a deck of cards this small. <Laughter> I had ample opportunity to do this before you got here. <Laughter>



Dan Meyer (20:02):

Bethany, you can't imagine just how much fun this part was for the audience.

Bethany Lockhart Johnson (20:07):

I'm pretty sure the only thing more fun than watching you try to shuffle a deck of cards — miniature cards — is LISTENING to you try to shuffle a deck of miniature cards. So we will reenact this next time I see you. Just to be clear.

Dan Meyer (20:20):

I'll learn that one from a child. <Laughter> Good enough, good enough. OK. So we've got this. And I don't think that a civilian — which is what I call someone who's not like us — would see these and say, "Oh, there's a math game about to happen here," right? This looks like just kind of normal playing cards. My goodness. These are not wax-coated. <Laughter> This is not my usual deck. <Laughter> Do these have seven sides? <Laughter> How am I still rotating some of these?? <Laughter> Stop! Down! Down!

Jennifer Bay-Williams (21:00):

Can I make a suggestion? That we just turn them face down and not worry about it?

Dan Meyer (21:03):

I am gonna beat these cards. There. OK. <Applause> See, I love the relationship. I looked at them; they knew I was struggling, and I looked at them and they saw in my face both pride and the desire to be acknowledged for having done this. And they gave the acknowledgement. This is why we vibed so well. OK, so what's next? You'll watch us do a round and then give it a try yourself and we'll see who wins. The two of us, or anyone out there.

Jennifer Bay-Williams (21:30):

We're playing a version of a game called For Keeps. We get to keep two of our answers, OK? We're gonna play four times. That's big picture. We're gonna do this thing four times. We only can keep two answers. So Dan, you can start. You're gonna draw four cards.

Dan Meyer (21:46):

I'm gonna draw four cards. Just right at the top?

Jennifer Bay-Williams (21:49):

We're gonna be teammates here. I'm not gonna play against Dan in front of a live audience.

Dan Meyer (21:54):

<Laugh>

Jennifer Bay-Williams (21:56):

OK, so we're gonna turn 'em face up.

Dan Meyer (21:57):

You're gonna waste me here. So we got. ...

Dan Meyer (21:59):

Bethany, here's where I drew a three, a nine, an eight, and then another eight.

Dan Meyer (22:04):

We have a very well-shuffled deck here, as you can tell. <Laughter>

Jennifer Bay-Williams (22:13):

And so now. ... There is an advantage to not having a shuffled deck, as you're gonna see here. So we're trying to get the smallest difference. We're gonna arrange these however you want to have two digits minus two digits with the smallest difference. OK? For example, this would not be my answer. ...

Dan Meyer (22:34):

Bethany, I think it might be helpful here to talk a little bit more about what this game looked like. Is that OK? Please?

Bethany Lockhart Johnson (22:39):

Yeah. Yeah.

Dan Meyer (22:40):

So, four cards come off the deck. Jacks and kings are gone. So we're talking number cards and queens for zeroes. All right?

Bethany Lockhart Johnson (22:51):

The well-shuffled deck is face down?

Dan Meyer (22:54):

Yeah. Super-well-shuffled deck.

Bethany Lockhart Johnson (22:55):

And you're flipping over four cards.

Dan Meyer (22:58):

Or just draw four off the top. Anyway, now there's four face up, and they're in no particular order. And our job is to make two-digit numbers out of those cards. So you can imagine the different kinds of numbers that might have popped up and how you might decide to start arranging them. And there's no wrong answer here, which is kind of fun. Put them into any two-digit numbers and you're fine. Find their difference. You can imagine now, perhaps, their difference, and that's what we're doing.

Bethany Lockhart Johnson (23:30):

That's super-helpful, Dan. I can totally picture it. Let's keep going.

Dan Meyer (23:35):

The worst difference would be something with the nineties and the thirties, I would imagine, right? That'd be real rough.

New Speaker (23:40):

So if we were going for the biggest difference, that might be a possibility. We're going for the smallest difference. Dan, how do you wanna arrange your cards?

Dan Meyer (23:49):

I just wanna like catch the vibe, though. <Laughter> There's like a moment of activation for a game versus a worksheet, where people are kind of murmuring and chattering and like mentally strategizing to such a degree that it comes out of their mouth a little bit. And they kind of murmur to themselves. And I wanna dig on that a little bit: What makes this a game, versus why is a worksheet less of a game, let's say. So right here.

Jennifer Bay-Williams (24:14):

<Laughing> As he's talking, I'm itching to come over here and start like moving the cards around to try help things.

Dan Meyer (24:21):

I noticed that there's a potential for some 80s going on here. So I do want to think about what it would be like to do 89-83 is one thought I have. Those ones are pretty close.

Jennifer Bay-Williams (24:34):

OK, so that gives us an answer of ...?

Dan Meyer (24:37):

That right there is an answer of six. I think we've got maybe better, though. Is there a better one, if we if we switch? I felt good about that, by the way. Real good. But like I'm curious, though ... low nineties, high eighties...?

Dan Meyer (24:53):

Here I reorganized the cards to give us a 93 and an 88.

Jennifer Bay-Williams (24:58):

Oh, now he's got the vertical orientation, instead of the horizontal orientation.

Dan Meyer (25:02):

You see that there? Oh, I know my standard algorithm. <Laughter> Oh, I know it.

Dan Meyer (25:04):

Because this one involves regrouping right here. <Laughter>

Dan Meyer (25:07):

Yeah. So that'd be a five! <Laughter> I did not get the acknowledgement I'd hoped for there. And instantly second-guessed myself.

Jennifer Bay-Williams (25:17):

Dan's still working on his fluency. <Laughter>.

Dan Meyer (25:20):

I'm working on my fluency. <Laughter> Yeah, it's great to do fluency when you're developing it in front of a huge crowd. It like helps you like desire to avoid embarrassment, helps you do better. <Laughter>

Jennifer Bay-Williams (25:30):

OK, so Dan is settled. So our first score is for keeps. Here's our little scoreboard here. You're gonna be doing the same thing. This is also in your bag. So, five. Now we have to decide if we're gonna keep this one or we're not gonna keep it. So we only get to keep two, and we can't change our minds.

Dan Meyer (25:46):

Oh, so we don't do all four. Ohhhhhh. There's something about this that is game-like, you know what I'm saying? I don't quite know what it is, but it feels game-like. The audience wants to participate, on the question of what makes it game-like, but you have misjudged the situation, friend. This is not an audience-participation moment. <Laughter> Though there will be time for you. <Laughter> Do you have a big mic? Do you have a big mic? You don't have a big mic, do you? <Laughter> OK, well, I'm sorry about that. <Laughter> I would involve you here, but not right now.

Bethany Lockhart Johnson (26:18):

Dan Meyer, I have to interject to just say, your community-building in that room ... I feel it, Dan. I feel it. No surliness there.

Dan Meyer (26:32):

All right. I think that not having you there really revealed to the audience, the people there, to me, especially, one of the main things you bring to our partnership, which is being nice. You know, you just gotta name it. Just gotta name it. I got a vibe. I had an antagonistic vibe with the crowd; I think you would've brought a lot of levity to that, I think. So missed you.

Bethany Lockhart Johnson (26:55):

Missed you too!

Jennifer Bay-Williams (26:56):

But it reminds me of the start of a game show, where the audience is saying, "Low! Go again. Go, go!"

Dan Meyer (27:03):

You've been sick at 10 AM and watched that on TV when you were a kid or something. I know you have. Can I just say I am definitely keeping five? Like, you cannot talk me out of getting rid of five. Five has gotta be a real good number here. Again, I'm looking at the crowd to see, "Do they agree with me? I think they do. All right." Is that cool with you?

Jennifer Bay-Williams (27:24):

I'd like to see the crowd. Any thumbs down? Thumbs up? You would keep it? Thumbs up?

Dan Meyer (27:28):

OK. OK, I'm gonna go for it.

Jennifer Bay-Williams (27:29):

You got some love out there.

Dan Meyer (27:31):

Let's just do one more and then pass it to them to do a couple on their own. Some folks are already doing it. Can we just peel off a couple more here?

Jennifer Bay-Williams (27:37):

You don't have to shuffle again. Nobody wants to watch that. <Laughter>

Dan Meyer (27:40):

No one wants to watch that. That was literally miserable for everybody — most of all, me. OK, so I just deal off four more,

Jennifer Bay-Williams (27:48):

Four more cards. A nine.

Dan Meyer (27:50):

Great. So tired of seeing nines. I'm gonna cut the deck, at least. <Laughter> OK. All right. A new number. A nine. five. Five? OK. And a five! <Laughter>

Jennifer Bay-Williams (28:06):

I'm taking these two away. I'm gonna make you draw again. <Laughter>

Dan Meyer (28:09):

This is how I do it when I'm in Vegas at the tables. I'm like, "I don't want that one." <Laughter> "Different one!" OK. All right.

Dan Meyer (28:18):

So, quick cutting here. This is when Jenny mercifully replaced two of those fives with a four and a seven, giving us a nine, five, four and seven. Think about how you might have paired those up to create two two-digit numbers.

Dan Meyer (28:31):

I'd love to hear how you think through this yourself or if you can channel a kid. I did a lot of talking last time, so I'm curious where you'd go here at this one. And then we'll pass to you folks to try a round.

Jennifer Bay-Williams (28:41):

Right? So I'm having a. ...

Dan Meyer (28:47):

OOOH. <Audience goes "ooh"> The audience has a question, expressed via via card. <Laughter> They wrote it down on the card because I brutally shut my friend down here from participating <laugh>. So they're like, "Oh, that was your question?" They're like, "We're communicating non-verbally." And the question was a good one, and I regret, you know, not calling on you. The question was, "Can it be negative?" And what does that do for us, rules-wise?

Jennifer Bay-Williams (29:14):

So —

Dan Meyer (29:15):

Why am I asking you?? Isn't the best part of a game that <laugh> we can decide? Right? Is that cool, to decide?

Jennifer Bay-Williams (29:22):

I always get asked, "What about this? What's the rule on this?" And I'm like, you know, "You're the teacher. You get to make the rules." That's one of the joys of teaching; you get to make the rules. So if I'm teaching middle school, I can't wait for our students to ask that question. I might not put it out there to tell them about that. But then when they're working for that overall smallest amount and they recognize that if they have something like positive 15 now if they could counter with a negative 15, then when they put those two results together ... right? But I do like to start simple. I don't like to make it too hard at the start. So Dan's gonna stay within the positive world.

Dan Meyer (30:00):

I'm staying in positive world, which suits my personality. <Laughter>

Jennifer Bay-Williams (30:05):

Or zero. You can do zero.

Dan Meyer (30:06):

I just love that you can a kid, "What would make it most fun?" Or ask a teacher, "What would be most mentally productive?" Anyway, that's just fun, the creativity there. So, talk to us: How are you playing this from here? What's your move?

Jennifer Bay-Williams (30:16):

Yeah, so what I'm looking for is numbers that are close together, to put them in my tens place. That's where my brain goes. So my first thinking is that I want these in my tens place.

Dan Meyer (30:26):

So, Jenny put the five and the four in the tens places.

Dan Meyer (30:29):

OK, get that five and four.

Dan Meyer (30:32):

Remember, that left two cards: a seven and the nine. And then Jenny decided to make a 57 and a 49. How's that sound?

Dan Meyer (30:40):

You did that fast. Can you like tell us your thought there, about why you did it? How that was quick for you? What are you thinking about?

Jennifer Bay-Williams (30:47):

Well, because if you have it this way—

Dan Meyer (30:53):

A 59 and a 47.

Jennifer Bay-Williams (30:55):

—then you have more than 10, if you're counting up.

Dan Meyer (30:59):

OK. OK.

Jennifer Bay-Williams (31:00):

And so if you do it this way, now it's under 10.

Dan Meyer (31:04):

Nine. Yeah. OK. Follow that, follow that. OK. Thumbs up on that one? Sound good? So that that'd be an eight.

Jennifer Bay-Williams (31:11):

An eight.

Dan Meyer (31:12):

You could ask me my middle name and I would second-guess myself with the whole crowd watching. <Laughter> I was like, that's an eight, right?

Jennifer Bay-Williams (31:17):

We got an eight.

Dan Meyer (31:18):

So, thumbs up to keep eight or thumbs down to get rid of eight. ...The crowd says thumbs down. Eight's gone. OK, the two of us are gonna wrap up our second two hands while you folks try out with someone else. And we'll just be curious who's got the lowest total sum of your two.

Jennifer Bay-Williams (31:40):

Ultimately Dan will have a total; see if you can get under Dan's total.

Dan Meyer (31:44):

Yeah, right on. All right. And everyone in here has to shuffle! I had to do it; you've gotta do it! <Laughter> YOU see how easy it is, OK? "Why is he shuffling so weird? How come he's so bad at shuffling?" You try it!

Dan Meyer (32:01):

So, Bethany, here is where we let the audience play for themselves, which we'll speed through. But I've gotta name that everyone who was trying it felt a lot of empathy for me when they tried to shuffle these impossibly small cards. I felt very vindicated with how hard that was.

Bethany Lockhart Johnson (32:22):

Well, what you didn't say in the audio, you know — I know, because I've seen the cards — but you didn't say that they're mini-cards. Miniature. So that makes it even better. Got it. But wait, for reals though, Dan, I want to flag what you said. I love how you called out the energy in the room. You said, "Whoa, hold on!" There's this activation that happens when you're about to like launch into gameplay, right? Can you talk a little about the vibe in that room? The shift that you felt?

Dan Meyer (32:56):

Yeah, I think the way Jenny set up the game created conditions where people wanted to get into it. People were done with us talking about it, done watching us play, and wanted to do it themselves. And I think a big part of that is ... I've had games introduced to me where we're basically reading the whole rulebook. Where all the pieces are trotted out, and the launch of it is more muted than it was in the room. 'Cause I think Jenny did not get into all the ins and outs, the strategy, all the technique that she knew would emerge from the game, but instead, was like, "Hey, here's the pieces; here's what you're gonna do with them; here's the goal." And people got that and wanted to get going. And the game itself really lends itself to that kind of energy, I think.

Bethany Lockhart Johnson (33:42):

So hopefully, as folks are listening to this, they're thinking about how games could play a more central role in their everyday fluency practice. So let's get back to the room.

Dan Meyer (33:55):

Let's head on back. Having seen what's out there in the crowd, I am embarrassed <laugh>. I'm honestly blushing to report a nine <laugh>. Is anyone worse than nine? <Laughter> Cool. <Laughter>. Yeah, we got some folks who are getting outed. I see ya. I see ya! We got a little special double-digit club for you. <Laughter> Which I am not in. Ugh. I could never be in the double-digit club. <Laughter> Just in the high single digits. <Laughter> So, who's got something lower than nine? Show us. Most everybody. Lower than eight? Lower than seven? Lower than six? Lower than five? Lower than four? Lower than three? Lower than two? Lower than one? One or lower? So, two. Back there we got twos? Twos!

Jennifer Bay-Williams (34:46):

Amazing.

Dan Meyer (34:48):

A few twos. That's amazing. Give a round of applause for our twos. That's strong.



Jennifer Bay-Williams (34:52):

Amazing!

Dan Meyer (34:52):

Look, I'm into this. The good news—I mean, the bad news, is that I crashed and burned in the game. The good news is that I now know how to subtract two-digit numbers. <Laughter> I feel, in a word, fluent. So I have a few questions here. Here's my question, and it's an annoying one to start with here, to debrief this: But, what is a game? You know, it begs the question for me. If you give me the flashcards, the four flashcards, of the same four problems that I solved, and said, "Do this one; do this one; do this one; do this one," it would not have felt as game-like. The same four problems, in that context. So my goal here is that the listeners, you folks here live, we could go back and think about what we're trying to help students develop fluency in, in a gamey kind of way. But I'm curious: What made that a game for you?

Jennifer Bay-Williams (35:54):

Yeah, it's a great question. 'Cause as we were working on the book, sometimes we were putting instructions down, like, "Is this a game? What makes it a game?" So I think it's a great question. And there's probably no right answer to this. But one thing is this: the surprise that happens when you draw a card or roll a dice. Like, you could play this game with dice instead of the cards, you know? So since you don't know what's gonna be your options, your cards, then there's some gaming to it because You Get What You Get <laugh> and You Don't Get Upset. You arrange your cards, and then you're doing some math. You're creating problems from that. And then, I mean, it's true that in games there is oftentimes that motivation to beat. It could be to beat your partner or beat a score. Like, I love what Dan just said about two digits. Can you get your score under two digits? That's a beautiful target ... which should be easy. <Laughter>

Dan Meyer (36:48):

Roasted! Roasted! Wow, that was brutal. I thought only I did that to the audience. But, that's cool <laugh>.

Jennifer Bay-Williams (36:57):

It's rubbing off. 'Cause I'm not usually that way, really <laugh>. No, actually I did grow up loving card games. I did love card games. So I think there is that chance. So I think that's the game thing; it's there's this element of chance. If you did win or you didn't win, it's more the luck of the draw — literally — than what you know or don't know. I mean, you can make bad choices with your cards, of course, 'cause you're working on your fluency, but in general it's the luck of the draw.

Dan Meyer (37:22):

So the only thing worse than doing arithmetic in front of a crowd for me is doing handwriting in front of a crowd. Just to name this, there's a balance of chance and skill here, where the cards give you the chance-y stuff, but there still is skill involved. I'm just like summarizing for myself and maybe the crowd here as well.

Jennifer Bay-Williams (37:38):

So you have a goal, a target, to get a low score or a high score. You have a goal you're working towards.

Dan Meyer (37:43):

And the target can change. Like, it could be like the greatest difference. The smallest difference. Get your difference to single digits. For some people, might be a really big thing for them. You know? <Laughter> It might be a really special day. Where when you do that, you go home and you brag about it a little bit and you treat yourself to some TV and ice cream. Single digits. OK! So the targets ... and what are we missing here? What else?

Jennifer Bay-Williams (38:08):

I like to think a game ... they don't all have to be with another person, but I think games tend to be interactive.

Dan Meyer (38:15):

OK. So cooperative mode, competitive mode ... if you're me, growing up, solo mode. <Laughter> You know, it's cool. My favorite person. <Laughter> So, OK. We could have been competitive but we were cooperative in our version here.

Jennifer Bay-Williams (38:35):

Can I just say, also, when I first started playing this game, it was one person against one person. But it was so much more fun — and I learned these from watching teachers in classrooms — when there was partners. Because they did have an idea, and then they're like, "Wait a minute! Wait a minute! Here's a smaller difference!" We could get to the discourse between the partners playing; the two across the table turned out to be a richer discourse around the mathematics.

Dan Meyer (39:00):

I love the vibe that we get in this room, and for me, when we hear "discourse." Rich discourse. <Laughter> People are like, "Hmm, that discourse, it's rich." <Laughter>. I think sometimes about people I know in my life, if they saw the way we talk ... that's why I love being here. One of many reasons. OK, here's my question. Here's a question. I love that we have some basics, some ideas, about what is a game. And I see how flashcards fail a couple of these. Right? You could do flashcards by chance. It's hard to do flashcards with a target that's variable or interesting, 'cause it's like, The Answer. Right? There's not a lot of chance. It's hard to be cooperative. So I'm seeing some differences there. But I love the idea of different materials, cards, dice. We gave all of you a single number cube in your bag. You're welcome. <Laughter> Here's what I'm curious about though, is what kinds of materials could we turn into a math-y game? So we're gonna do a little bit of improv for Dr. Jenny Bay-Williams. We haven't scripted this at all, at all. I don't know what you're gonna say here. But what I want are either a household object, something that you would imagine everyone in the room might have. Either an object in the home or an object in a classroom. And we're gonna ask Dr. Jenny Bay-Williams here, to turn that into a math game for us. <Audience: Oooh.> Taking the first four, here; talk to us. A pen, or multiple pens. We'll give multiple pens. OK? This is your moment, sir. 'Cause I shut you down earlier and now you're in. Bring it what you got. Make it count.

Audience Participant 1 (40:48):

Shoes.

Dan Meyer (40:48):

Shoes. Including laces. No loafers, necessarily. Can use the laces. OK. please.

Audience Participant 2 (40:56):

Toothbrush.

Dan Meyer (40:57):

Toothbrush. OK. Plural. Works can be multiple. OK, let's go two more back. I feel like you might benefit from a lot of options here, actually. Two more back here. Hit it.

Audience Participant 3 (41:08):

Forks.

Dan Meyer (41:09):

Forks! Which we will allow you to broaden to all silverware. And one more over there.

Audience Participant 4 (41:13):

Coffee cups.

Dan Meyer (41:14):

Coffee cups. And then one last one right here.

Audience Participant 5 (41:18):

Coins.

Dan Meyer (41:19):

Coins. Any coin imaginable. I do feel like you might've just really offered a real life preserver. To me, anyway. YOU might've had it for all of these here. And someone give us a math topic: "Solving quadratic equations!" Psych. Just kidding, just kidding. <Laughter> Choking. Choke-a-choke. OK. You can do what you want here. Fractions is a fun one. Another math topic you might think about. Times tables, multiplication. We're gonna just take one minute where you can think about these. And think about multiplication. You can think about fractions. I cannot hear you. ...What is this? Is this important, or is this your table? Come on, tell me something. "Combining like terms!" Ooh. OK. Take one minute. One minute only. And then we'll come on back to you. You think about what you might do here. OK?

Jennifer Bay-Williams (42:17):

OK. Wow.

Dan Meyer (42:18):

Let's give Jenny some time to think about that.

Jennifer Bay-Williams (42:21):

<Crowd activity noises> We have shoes. We really have as many of these as we as we want, right? And we could use the toothbrush as our fraction bar, right? That could be the equation.

Dan Meyer (42:32):

And here is what Jenny came up with, after not even a minute that we gave her to think.

Jennifer Bay-Williams (42:38):

I have an idea.

Dan Meyer (42:41):

Everyone, quiet. Everyone be quiet, right now. Jenny's got an idea.

Jennifer Bay-Williams (42:46):

Wait, it's only half-baked <laugh>.

Dan Meyer (42:48):

She thought she was gonna run this by me and we were gonna bake it together, but nope, we're doing it live <laugh>. We're doing it live. All right. It's just rough-draft thinking. You're among friends here. Can you feel the friendship? We're all friends here. <Laughter>

Jennifer Bay-Williams (43:00):

Right. It's also like, everybody jump in and polish the game, 'cause it's just my first thought. OK. So one of my favorite ... I'm going with the fraction idea. So one of my favorite strategies for fractions, the inspiration for this game, is the idea of being able to make a whole. So I'm gonna work backwards from what I'm heading for with this game. So, big picture is, if you're adding two and three-fourths plus two and three-fourths, there's no need to stack 'em and get a fraction greater than one, and do all that. No, you can just move one of the fourths over to make a whole. Right? OK. So my shoes are going to be the holders of the parts. All right? So the coin is gonna get flipped or you're gonna drop some coins or flip the coin? To pick your denominator. I'm telling you, it's half-baked!

Dan Meyer (43:54):

No, I'm feeling it, though.

Jennifer Bay-Williams (43:55):

Right. So you're gonna get your denominator. So let's say ... let's see, how's that gonna work?

Dan Meyer (44:02):

The coins all have a number on them, right? So we could kind of like shake 'em a little bit? And that's your denominator?

Jennifer Bay-Williams (44:06):

Sure.

Dan Meyer (44:08):

How does the flipping. ... She's in love with this idea, by the way. I know her well enough. She loves this idea.

Jennifer Bay-Williams (44:14):

No, I'm stubborn. I'm gonna figure out a really great game and I'm gonna publish it in Math Teaching and Learning. <Laughter>

Dan Meyer (44:20):

And we were there for that.

Jennifer Bay-Williams (44:22):

OK. So, well, what I'm thinking is, if we were gonna drop the coins really high into the coffee cup and whatever bounces out, that's our denominator. <Audience: Ohhh!> So if you get six cents, then your denominator is six.

Dan Meyer (44:43):

Got your chance. Got your chance.

Jennifer Bay-Williams (44:45):

Could it work? I'm not really sure. I'm already thinking that my own children have walked away by now. <Laugh>

Dan Meyer (44:53):

Bored. I just love the thought process, though. I love the thought process. And if I could just say one more thing: I want to add to this our list of game-iness things and we can pick this back up and keep brainstorming. I get this sense that you're not happy with where this has ended up.

Jennifer Bay-Williams (45:07):

It needs some work <laugh>.

Dan Meyer (45:09):

But I really love that you involve us in your process here. And I just wanna name a difference between us. When I was thinking about this, I had an idea that had chance, and I had not thought through a target. But I especially had not thought through a mathematical goal. And Jenny was like, "Yeah, but what are we doing here? What ideas are we trying to develop? And you all heard it happen there: This idea of making wholes was one of the first few things that Jenny started with, and worked backwards from there. Rather than me thinking like, "Wouldn't it be cool if we threw knives at a wall or something?"

Jennifer Bay-Williams (45:49):

If somebody would've suggested, you know, beans from their cabinet or something ... I gotta have something I can count. So this was a rough list. <Laugh>

Dan Meyer (45:57):

Love it. Last question from me is just this: The idea that you have little playing cards; you have dice; we have, you know, beans. There's so much that can be turned into a fluency game. What I'd love to know is if you had say \$5 per child for a fluency packet, stuff you could buy for five bucks or less, dollar store,

Dollar General, that kind of thing, and you made one of those, you know, for your Class set. So you have five bucks a kid, and that's gonna carry you as far as you can make it last. What are the essential elements of your pack here?

Jennifer Bay-Williams (46:36):

Well, for sure, cards. I think after watching Dan, I would splurge on the bigger ones. <Laughter>

Dan Meyer (46:42):

Thank you. It's a little bit late, but thank you.

Jennifer Bay-Williams (46:44):

And then, definitely dice. If I can fit it in my budget, I want the 10-sided die, because zero is on the 10 sided die, and I got all the single digits. So I prefer the 10-sided, but I do love the six-sided as a start. If we were doing for keeps with a six-sided die, the one that you have, if you just find a few friends, then you have smaller possibilities. They're all within 60.

Dan Meyer (47:09):

I wanna say we're up to like three bucks now. Maybe a little higher. But two more dollars: what do you got for this?

Jennifer Bay-Williams (47:15):

So then, counters. But if that's too expensive, buy some large lima beans. I've done this on my back porch before, which my family didn't appreciate. 'Cause then we spray painted, one half in a school color and then we turned 'em over and painted the other half in a school color.

Dan Meyer (47:32):

Wow.

Jennifer Bay-Williams (47:32):

And then the concrete forevermore on the back deck wasn't really white anymore. <Laughter> But anyways. I would definitely have counters. So those are the three essentials. I mean, to be honest, every time I travel, those are the three things that have to go in my suitcase.

Dan Meyer (47:47):

Hey, TSA sees you coming, like, "Oh, good to see you, Dr. J." Yeah. OK. Love that. OK. Like, lima beans — what do they cost, lima beans? Like a dollar per ...I don't know what lima beans cost. You have still some room here. Is there any one last thing you'd sock in there?

Jennifer Bay-Williams (48:05):

Well, I —

Dan Meyer (48:06):

Lima beans in bulk. That was cheap, right? Yeah.

Jennifer Bay-Williams (48:08):

Well, I mean, I feel like I would want either big pieces of card stock or little note cards. Just for coming up with visuals to support their fluency work. Maybe not for the games, but there always could be a way to use note cards, right?

Dan Meyer (48:25):

Sure. I personally would choose a pocket calculator to help them develop fluency. <Laughter> Perhaps I I stand alone here but that is my bravery. Look folks, Jenny, it's been fantastic to hear how you are helping people work through an area of math that for many people was one of the hardest for them. Had some traumatizing memories from that. And you're doing it in a way that is game-like and fun. And I put "fun" as a co-equal goal for myself. Fun and math. What's the point of doing math if it's not a little bit fun sometimes? And so I just love your work and learning from you. Can we all give Jenny Bay-Williams a big round of applause? Thank you for your efforts.

Jennifer Bay-Williams (49:01):

Thank you.

Dan Meyer (49:03):

Thank you for being part of this, part of our time here. <Laugh> That's a diplomatic-summit handshake. <Laugh> We're in Washington. And thank you, folks, for being here. We are nothing as a podcast without our audience. And please like, rate, and subscribe. Let's see here: Hop on and join me and Bethany on the podcast as we round out our season on fluency. Make sure you listen to that 1x or even 0.75x. <Laughter> So those really brilliant nuggets don't pass you by too fast. And thank you, folks, for being here as this huge part of this live show. This was us all together, not just the two of us. It was a blast hanging out with you. Thank you so much and have a great day, team. Thanks.

Dan Meyer (49:49):

So that was the conversation with Dr. Jennifer Bay-Williams at NCTM. Bethany, what'd you think, aside from being just super-jealous that I was there, hanging out with your main, with your bestie. What'd you think about all that?

Bethany Lockhart Johnson (50:02):

By the way, she does not know me. At all. Not even a little bit <laugh>. It's my own appreciation from afar of your work, Dr. Jennifer Bay-Williams, for real. So Dan, first of all, I thought that was super-fun, and I love that folks got to participate and dive in. And I felt like they experienced that enjoyment and the excitement about the game, and I feel like they now can try to recreate that for their own students. And you also help to reframe what fluency practice could look like. So just say again, for me and our listeners, what were a couple of the elements that you think are gonna be crucial if you're trying to create that level of excitement and enthusiasm for our students in the classroom?

Dan Meyer (50:48):

Oh, my. Such a huge question. I think, buy the book. Buy Jenny Bay-Williams's book, I think.

Bethany Lockhart Johnson (50:53):

Fair enough, fair enough.

Dan Meyer (50:54):

But if I had to free-associate my own learning from what I heard here, we're talking about things like a very concrete goal, that someone three grade levels back could understand. The goal has gotta be just, like, crystal. And materials that are also like tactile and tangible, that involve an element of chance to them. So those were some of the elements, I think, that that worked really well. The goal: Small. Small is a word that lots of kids can understand. Right? And this element of chance when you deal off of the deck. And then like having a little bit of strategy and to risk something: Someone got like a difference that was small, but is that one you wanna hold onto? Or should you throw it back and try for a different one? Those were the elements I think that really kept the group ... like, they could have kept on playing this game for a lot longer, I think, based on a lot of those elements.

Bethany Lockhart Johnson (51:45):

I have two thoughts that I want to add. I'm picturing my students playing this game. And a couple things I'm thinking about are: how could we give students for whom this is really challenging, not being able to fluently come up with the difference, how can we give them more access? Could you provide hundreds charts for everyone? And whether they use it or not, it's up to them, but then it's just kind of this norm that we have a hundreds chart in front of us. Or Unifix cubes, or something. I know that in terms of ... if we could take that speed out of the game, or especially I love the idea of partnering with someone, so you can play around with the ideas together, and come up with the differences. I love that idea of that collaborative nature that could take some of that pressure off of it. So I kind of wanted to flag that, because I think it could become like really high paced. Like, we talked about it quickly, but does it need to move that fast?

Dan Meyer (52:42):

I really appreciate you flagging these possible modifications. I really enjoyed being collaborative with a teammate and competitive with other teams. And with my partner, we could strategize and think, and with other teams, I could be sassy, as everyone now knows about me. But the hundreds chart, that's really interesting. A tool for thinking. What tools for thinking might be helpful to have around the room, to keep students focused intellectually, where we'd like their focus, and not burdened, where we don't want them burdened. I think that's a really interesting comment.

Bethany Lockhart Johnson (53:16):

And I think part of fluency, building fluency, is repetition. And so with this game, it sounds like by nature you're, you're coming up with a lot of differences, because you're trying out different configurations. But I've always thought a lot of the fluency games, the goal is to get as much practice in as possible in our short timeframe. Right? So you don't want students to just do one version of subtraction, and like, we're done. No, they're comparing numbers; they're trying out different configurations; and I think that's where some of the richness and the fluency is built. And obviously this is one game on a long list of games you'd be playing with your students to build that fluency. But I think a real key as the teacher is pulling your students back together at the end of play, and discussing and debriefing. Talking to some of the students, how you were calling out, "Who got a total of nine? Who got a double-digit total?" And talking about the strategy a little bit. Or maybe even the next day, you throw up four cards and you have all your students play around with different configurations. You know what I'm saying? That debrief.

Dan Meyer (54:28):



I'm really tracking that. Yeah. And it was wonderful that we all did different problems. We all dealt off different cards to ourselves, and that was wonderful, from a sense of agency and autonomy. But as far as collective learning, I love what you just described of, "OK, now, let's all think about the same four cards." And I would imagine it'd be wise to make those intentionally dealt out to highlight some of the learning objectives, like thinking about place value, and you want large numbers in the tens or the ones place. But that makes a ton of sense. I think it's easily lost. I think I got excited about the game and the fun, but also to focus on the learning objective and how to best support that. I really appreciate your comments there.

Bethany Lockhart Johnson (55:12):

And we want our students caught up in the game, right? But then some of that really "rich discourse" as you flagged, comes from the student sharing: "I pulled these four cards, and at first — you know, just like Jenny or Dr. Williams did — at first, I had them arranged like this. But then I knew that I could get a smaller difference." And I feel like that could be a natural extension of the game that students are still just as invested in.

Dan Meyer (55:38):

Or to drag it back to sports as another frame: You play the game, but then the real pro sports teams don't just like say, "All right, see ya at practice next week!" or "See you the next game!" It's like, "Let's watch some footage; let's take one moment from the game and watch it from seven angles and dissect it as a group." And that feels like the moment you're describing.

Bethany Lockhart Johnson (55:59):

Absolutely. Whether you won or not, we're all learners.

Dan Meyer (56:02):

Right. Well, thank you so much for listening to this very special episode of Math Teacher Lounge. Please like, rate, and subscribe on the podcast platform of your choice. It means a ton for the algorithms getting our stuff boosted out there. And also my ego. My mom checks my ratings, you know.

Bethany Lockhart Johnson (56:20):

All right. All right.

Dan Meyer (56:21):

OK. Moving on.

Bethany Lockhart Johnson (56:22):

Next time in The Lounge, we're going to be talking with Dr. Jody Guarino about what it's like to make fluency a priority across an entire school.

Dr. Jody Guarino (56:31):

I think there was a lot of leaning into each other. So I think if people are interested in working on fluency, finding a friend — even if that friend isn't at your school or at your grade level — who can be that accountability partner or thought partner, you can sort of lean on each other as you're doing this.

Bethany Lockhart Johnson (56:47):

That's next time on Math Teacher Lounge. Thanks so much for listening.