Transcript for Staffroom Catch-Up
Episode 5: 'Becoming maths people'

Fran: Hello and welcome to this first practitioner podcast series from Cambridge Mathematics. I'm Fran Watson and I'm a member of the writing team and school liaison lead at Cambridge Mathematics. Part of my role is talking to teachers about products we design and very excitingly, creating new opportunities like this to have conversations with educational practitioners.

This series is called Staffroom Catch-Up, and some of the things we expect to touch on are people's interpretations of the word research, how they feel about it, and how it affects the work they do in classrooms.

As all these people have been recorded in their settings, I'm going to issue a challenge to listeners to tally the number of interruptions in any one episode, and then we can see if our tallies align at the end.

Today I'm here with three guests. Firstly, Sarah Dixon Jones. Sarah, would you like to tell us what your role is, please?

Sarah: Hi. Yes. I'm Sarah Dixon Jones. I'm head teacher of two maintained nursery schools in the North East of England.

Fran: Fabulous, thank you very much. Er, we're also joined by another staff member, um, Kathryn Nichols. Kathryn, would you like to tell us what your role is?

Kathryn: Hello. Hi. I work with Sarah in one of the schools as one of the lead practitioners, so I work with children who are three and four years old.

Fran: Lovely. Thank you very much. And lastly, but not leastly, we have Rachel Oughton. Rachel, would you like to tell us what your role is, please?

Rachel: Hi, I'm Rachel Oughton. I'm an associate professor of maths at a university in the northeast.

Fran: Fabulous. Okay, so to begin with, um, I would like to share with you a line from a Sondheim musical which goes [sings] "Something familiar, something peculiar, something for everyone! A comedy tonight!" And ask you to share something either peculiar or familiar that you found funny, that you've experienced connected with your work. Sarah.

Sarah: Um, oh, it's a hard one. There is always lots of things, um, that happen in school on a day to day basis that make us all chuckle and giggle. Um, I think probably when I ... thought about it, the, the biggest laugh really is that I'm actually a nursery head teacher because when I qualified as a teacher, um, I was offered a job in a nursery class, and I remember thinking, "Ooh! Actually", [sighs] I-I-I actually asked the head teacher if I could go home and have a think about it, because I really wanted to be a 'proper' teacher, Frances, and I thought at the time, uh-huh, that being a nursery teacher was not a proper teacher. And I remember going home and my mum talking to me and saying, "Actually, Sarah, you've just been offered a job. Like, are you mad?" [Group laughter.] I'm thinking, I thought, "Right, okay, I'll go and I'll take a job as a nursery teacher and I'll do it for a year and then I'll get a proper teaching job", um, and needless to say, I've been in nursery, teaching nursery, being the head of a nursery school ever since. So, you know, you never quite know where you're going to end up at the very start of your, of your career.

Fran: I love it, and I can hear people, um, everywhere who are familiar with nursery practitioners, um, er, reacting h-hugely to what you've just said, because of course it's hugely important, as is, you know, mathematics at any stage. But, you know, from preschool and, at, when they come in at the earliest stage to nursery settings and then beyond. And, er, interesting that your viewpoint of being a 'proper teacher' has now changed given all of your experiences. That's really, really nice to know. Thank you kindly. Okay.

Kathryn could we come to you next?

Kathryn: Of course. Hi. Um, every day, like what Sarah said, is entertaining, especially with young children. They certainly keep you on your toes, and they do give [chuckles] you a laugh and a giggle. [Group chuckle.] But one, one morning, which I'm going to talk about I came to school unaware that I was wearing odd shoes that day. [Chuckles and laughs] I clearly had just got up and got ready and left the house with any, with not taking much notice of anything else. I got to school, let the children in as we do every morning, and then one boy walked past me as he came in, clearly clocked them a lot quicker than anybody else. None of my colleagues had pointed this out to me either, by the way, on that morning! [Group laughter.] And then this boy walked in and went, "All right, Kath? Why are you wearing different shoes?" [Group laughter.] So not only did he spot my different shoes he also name dropped and called me Kath, which no child has ever, ever done ever. And I just kind of stood, then frozen and thought "Has he actually just called me Kath, and what does he mean when...?" And I looked and thought, "Oh!" [Group laughter.] "Oh! But none of my colleagues had told me that!" But they were all laughing, so it was an entertaining morning for the day.

Fran: [Laughing] I love it. Can I ask, were they wildly different?

Kathryn: Yeah, yeah, they were quite noticeably, noticeably different, [Group exclamations] I'm not gonna lie.

Fran: OK, nice. Wonderful stuff. I love the things they notice. Well, and possibly more on their level than, you know, kind of your colleagues' level who maybe aren't spending time looking at your feet. I don't know whether that's a good thing or not! Lovely stuff. Thank you very much indeed.

Rachel, can we come to you?

Rachel: Um, yes. Er, there's probably not as much kind of cuteness or hilarity in the maths department, er, at this university at least, um, but one time I had to bring my daughter, who was then probably six, er, because I was teaching a tutorial I think it was half term and it's always a bit of a nightmare. And so she had, we have kind of these rooms with whiteboards around the edge of the room, and the students work on those in groups. And she had a whiteboard to herself and she was, like she kept darting to this group of girls who were working together, er, and kind of just copying bits of stuff off them, their whiteboard like loads of Greek letters, like, like this graph that they were drawing. Um, I think there was a couple of tables, just all sorts of just gobbledygook. Um, and she was just putting it all over place on the board. And they were a really strong group. At the end of the tutorial this, er, guy student, he was at the other end of the room, asked them if he could take a photo of their whiteboards so that, because they had like the solutions, obviously, and he wanted to kind of have a record of them. So they said that was fine. Er, and then Megan, my daughter, said to him, [in higher voice] "Would you like to take a photo of my whiteboard?" And he was, I felt so like, I just want to hug him cause he was like, he was like, [enthusiastically] "Oh, yeah. Yeah, that'll be really helpful. Thank you!" And took an actual photo, like asked her to move away and actually took a photo and it absolutely made her day. So I just thought, I wanted to go and find him and give him a hug, [**Fran:** Uh-huh, gosh!] but I don't, we don't do that here, I mean. [**Fran:** Absolutely!] Anyway, there we go.

Fran: Oh, that's gorgeous! That's such a lovely... Well, and, and so nice for her as an interaction. I wonder if Megan still remembers it? Perhaps?

Okay, so um, let's, er, start our conversation then about, um, research.

Er, Sarah, could I start with you? When I say the word research or educational research, um, in your, you know, in your head, what does that make you think? What, what is it to you?

Sarah: I think, it is something that has different meaning to different people, um, and as a school, we've really encouraged staff. We talk about, um, research a lot and for staff to research things. So, when I think of it and from

my school's point of view, I think it's often based on reflection, um, and it's possibly a question that staff might have that they're interested to find out a little bit more about. It's about them going and kind of ... [exhales] digging deeper and, and kind of looking at layers of things and, you know, just, not, not taking that first bit of information that they find out about something, you know, going and actually unpicking [**Kathryn:** Dig a bit deeper] an item.

Kathryn: Yeah, dig a deeper. I would say, I'm sorry I'm jumping on there.

I would say from my point of view, research is kind of a study of a whole host of different things. So, it could be a study about material or a thought or people's experiences, or... But I also think that people's personal experiences can shape your views on research and what you... You kind of almost, I think, some people might feel confident and understanding what research is, but I also think other practitioners might be quite wary of the word and would back away and think that they don't do it, [**Sarah:** Yeah] when actually, I think a lot of time working with children in the Early Years Foundation stage, a lot of our work is based on research. We tap into children's wonders, to their ideas, to their, you know, their [**Sarah:** Questions] questions. And we, we, we research with them because we, we are just humans like everybody else, and we don't have answers to everything. And we are open and honest about that with children so that they know that actually, that's all right not to know something, but you go on a journey and you find out. So, I think there's lots of layers to research as well, so that's kind of one layer that we would do is that core researching with children. But then I think there's another layer. As a practitioner working with children, we have almost a duty to research to find things out, to deepen our own understandings of things and kind of sharpen our lens, if you like, in, in a, in a particular subject or an area of development. So, for me, there's lots of different layers to research, er, but I do think it's definitely an important part of education.

Sarah: Uh-huh. I-I-I, I was going to just kind of agree there with Kathryn. I think it's a, it's that duty isn't it. And I think so often in education you feel like things happen and get done to you. So there'll be a new DfE document that comes out, or, you know, or the latest Ofsted guidance. And I think it's trying to change mindsets that, yes, these things come out and we need to be mindful of them, but actually, you, go and find out something as well. Don't just do something because you've been told to, go and find out actually what, where does that come from? And I think as teachers, I think there's been a real shift recently and that focus that we should be ... doing our own research and actually getting our message out there, because sometimes people that make decisions and, and write frameworks don't actually know what it's like on the ground and in the shop floor working with children. So, I think that practitioner-led research is really important. Sorry, Frances, I feel like we've probably gone off track.

Fran: Not, not at all. It's lovely to hear the, the, the two sides of it and you each adding to the others' um, interpretation. And I'm hearing you saying that it's a very wide scope and that, as Kathryn mentioned, um, teachers are researchers, and the things they find out in their classrooms are going to be particular to their setting in a way that no external researcher, perhaps, unless they are coming into your, you know, setting, is going to know. Nobody's going to know your children better than you in terms of you finding out and learning alongside them. All the way through to...

Sarah, you were talking about bringing in research from outside and how important it is for practitioners to reflect on that and choose what it means for them and how they're going to interpret it, because taking things straight from their published format, doesn't translate into a setting directly. There's a, a whole branch of educational research about that, what does this look like in, you know, a-a-a setting different to the one in which the research was carried out? So it's important to have that reflection time and the talking to each other about it. And "What do we mean by this?" And "Do I want to adopt things and take the useful parts of it for, for my setting?"

Fantastic stuff. Rachel, could I come to you? What does educational research mean to you?

Rachel: Um, I think educational research is a bit of a, a sort of strange new world for me, because I'm ... so I'm an applied statistician. Er, mostly research for me means kind of problem solving, developing, like a new statistical methodology to, to solve some kind of, um, problem in, in all sorts of different fields like, um, environmental sciences or, er, finance or various different things I've worked with. Um, so, so, um, I think educational research, I guess it's hard to divorce it in my head from the idea of problem solving, and I don't know if that's maybe right, but I guess trying to find out new things specifically about, I guess, maths education and how, um, how children learn maths and how people teach maths and how people develop that kind of attitude towards maths. Um, but yeah, the methods that are used and the way that it's approached is very different from what I'm used to.

Fran: Right. Okay. Well, and I like that, that problem solving, I guess when we're finding out things in, er, an educational setting, perhaps, in the maths classroom, for example, there will be some, um, in terms of, er, published research there will be some research questions that are stated to start with. There might not be, um, anything as formal, but the equivalent, I'm guessing, for teachers who are thinking as researchers in their classrooms, is, "I wonder why – something", or, "I wonder if – something", or, "Why is it that this thing I have seen occurs and can I find out more about that to better inform me?" – helping it happen more if it's a desirable thing, or, um, stopping it occurring if it's a challenging thing, a thing you don't want to be happening. Um, or to facilitate children's learning better, you know, "What's the best way to...?"

and conducting research about that. So interesting to hear your different, um, er, takes on it depending on the setting. And of course, what the links between your problem solving statistical research is about, Rachel, compared to educators and practitioners working in classrooms who are, you know, um, very often using, er, the same sorts of ideas in the w... the things they want to find out, but going about it in different ways, perhaps.

Okay. Kathryn, could I just come back? You mentioned that the word research can be quite problematic and maybe off-putting for some practitioners, and I wonder if I could ask you to say a bit more about that – whether that's ... why you think it is and whether you have any thoughts about people out there who might be listening, who identify with that, what you would recommend?

Kathryn: Yeah, of course, I think, it's a hard one, isn't it? I do believe that people's personal experiences do kind of shape their professional practice in some way. And I think if research is something that, you know, you're really familiar with, so, if you have gone on that QTS journey, that qualified teaching status journey, and you maybe are used to, to kind of doing research at university. But for a lot of practitioners working within the Early Years Foundation stage, they have not been on that journey, so they wouldn't have been to university and done that route, necessarily. So I think for them, you know, and this again, personal preference, like my thoughts, but I think for some people they see research and think, "[Sharp inhale] it's not for me, I'm not clever enough. It's not something I can do." Um, and I think they see it as that kind of really, really deep level research with a big journal article attached to it. But I think sometimes, and I think as part of my role, I point this out to some of the staff and say, but actually listening to that child's voice, kind of using that pedagogy of listening and really thinking deeply about that wonder, or that, you know, that curiosity that that child is showing you over something, you've just gone on a journey with that child to find something out. That is one layer of research. That is research. So you are capable of that. Yes, you're not writing a huge document journal behind it, but that is research. You are finding something out that challenges your own thoughts, your own notions. It might validate something that you thought. You might find research that validates something or challenges. And then I think, like I said earlier, that then that next level where, you know, if you choose to, you can then go and dig a bit deeper in something and understand it more. And I think that's really, that kind of, for me, it, it's trying to make your staff feel empowered by research and not be afraid of it and just highlight that actually, it's part of our bread and butter. It's part of our everyday practice. And our school culture is, for these youngest of children, that they need to know what research is. And we will use that term with children; "I don't know this answer, but let's research that together and let's discover some more. Let's see what we can find out. Let's gain some new information about that..." material, subject, thought, whatever it is. Um...

Sarah: Er, sorry. Just to add on from that, I-I think one of, kind of that role as a leadership team within school is to really encourage that with staff. And so I think we've tried to really have a research-active culture within school, but it isn't something that happens straight away. It's, we've, we've had to kind of support some staff more than others because, you know, across both schools we've probably got about 45 staff and some are quite happy to go and find something out and research it and type into Google Scholar and want a document that they can read and unpick and get that nitty gritty, where some people that, like Kathryn said, feel really daunted by that and intimidated. I think that they just view formal research as something that isn't relatable. You know, that "Doesn't sit in my world. I'm..." You know, that attitude of, "Well, I'm just support staff. I'm a nursery nurse." So we've tried to really talk with staff about how you can use it to upskill yourself and actually, you know, try to improve something. Or if you are working with a group of children and you're not sure why they're doing something, well, let's have a look. Let's go and find an article. Let's go and see what the literature says about it. Will that help you view it from a different point of view? But I think we've had to be really mindful of where people are on their journey of picking up research and being able to interpret it, to have impact, because we want it to be a positive experience. We, and I certainly view it as CPD. As that training. And, you know, I know that the more I can get staff reading articles, Googling things, trying to find out things, that my staff become more, more fine-tuned, um, and that, that, they're, you know, becoming more of an expert in their field by reading Early Years research. But it, it, it's definitely been a purposeful journey. I think.

Fran: Fantastic stuff. And it sounds glorious. And what a, a nurturing conversation to be involved in, to be able to say to teachers, "Do you know what, you are a researcher!" Kathryn, you put it beautifully. Research is about finding out more, and whether you're finding out more about, you know, a, an answer you didn't know or a, a question that a child has posed alongside them, or whether your curiosity has been piqued by something that's happening in your setting and you want to pursue that further and find, other resources that you can draw on that people have studied or published, educational research about. I love the, the conversation that you're clearly having as part of your staff development in both your schools about it, you know, being a journey because you're quite right. It, certainly, anybody I've ever spoken to in the classroom who has considered it has said it's not a "Ooh, now I, I am" or "I flipped a switch." It's a very much a, an over-time development.

Um, I wonder then if we could hear from you, because um, the reason we're talking to three of you today is because of a project that you have all been involved in.

Um, Kathryn, I'm going to come to you first because I think it was you that possibly made initial contact with Rachel. Would you like to tell us, um, a little bit about the project, how it started to begin with?

Kathryn: Yes. Of course. Um, it's going back a few years now. We've worked together for quite a while. What are we in our third? [**Sarah:** Fourth] Fourth year. Um, so we've known each other for a while, but back, if we If we go back a bit, four years ago, the project started because the Early Years Foundation stage had a new framework that had just been released at the time and the maths part of that framework, that strand looked very different to what we previously had in our curriculum framework. So, because of that, we, we had lots of conversation in school with our staff around what that meant for us in our school, and what did that mean our maths curriculum was then going to look like. Now through conversation and through staffs' honesty, and hats off to them, they all, pretty much all of them said like maths wasn't their thing, it wasn't their strongest point. Like, it wouldn't be something that you would put yourself at the forefront for a lesson observation for, um, you know. And again, just through people's own personal experiences, I think maths carries a bit of a stigma in society for whatever reasons as well. And I think that was definitely being heard. So then as a kind of a senior leadership team we had a responsibility to kind of support our staff. And like you say, we have that school culture already existing where we, you know, we support and want to give professional development to people in the best way we can, but it has to be in a way that kind of meets then matches their emotional attachment to certain subjects. So we were feeling that people were obviously feeling a bit, "Eurgh" about it anyway. So then at the time, I, I knew Rachel was kind of a mathematician, but I didn't know anything else behind that. So I did send a cheeky email and it was a cheeky email just saying [high voice] "Hi, I know you're like a maths person. [Laughs] Um, I don't suppose you could work with us in our school and our staff on just kind of upskilling us and trying to, you know, highlight what we do do really well but build confidence ultimately for all practitioners in school" because we were doing a good job. It wasn't that we weren't, but we needed them to believe that, and we needed them to know what our new maths curriculum was going to look like and be like on the shop floor with children. Um, so thankfully [chuckle] we kind of got together and then, from nowhere, and I think that's the special ingredient, it was very organic. It came from nowhere. It wasn't Rachel coming to us saying, "Can I offer this form of CPD? And can

I look at this strand of maths and can you go away and do this in your school now?" It wasn't like, it wasn't a kind of a professional development program that was built up like that. It was the complete opposite, if I'm honest. It was a program where staff took their, their observations of children which is the way that we all work within the Early Years Foundation stage. And we listened to children. We really unpicked what it was that they were asking of us, what we were seeing them doing.

So something that's come up year after year now as we've gone on, there's always a big interest with ramp play and there always probably was in the past, but I don't think we've we viewed ramp play in the same way that we do now currently. So now we know that there's huge learning around maths with ramps that we probably didn't realise before the collaboration. So we would take these observations to Rachel and her team – she brought in a wider team of mathematicians – and we would share those. The team would have chance to read what was happening in school, and then they would then give us ideas of extensions so that we could then unpick those further for what that looked like for our children in school. But I must say that then, we met via Zoom. We only, it was, we started this collaboration during Covid. So it was you know, we never met. It was literally Zoom meetings every six weeks. They would read our observations, then they would share their ideas on some possible extension routes. But I think what was really special was, I'm not going to lie, those meetings did actually frighten me and probably the rest of the team then, initially, in the sense that we were talking really, really highfalutin maths and some maths that I'd never heard of, ever. And I used to sit and think, "Ah, uh-huh. That sounds interesting. What actually is that?" And Rachel would type up some notes and send those notes over. And I would honestly have to unpick those, hit Google some more to understand it a bit more, talk to the other practitioners that were in the meeting to understand that myself before I could then take that to children. So there was always like that kind of commitment existed from day dot, but it wasn't long before we realised the impact that it was bringing, the impact that it was bringing to our staff, and then ultimately the impact that it was bringing to our children and the outcomes that they were obviously, you know, were becoming these young mathematicians.

Sarah: There was it was a lot there Frances, [Kathryn laughs] I don't know if you want to unpick that.

Fran: Go on. Sarah.

Sarah: No, I-I-I think Kathryn's kind of summed it up really well. It, it wasn't, we didn't set off to, to do that kind of formal research. It was, it evolved,

Kathryn said really organically. I think from my point of view, it was that skilled knowledge that Rachel and her team were able to bring to the staff and talk about. It, it, it instantly had impact, didn't it? You know, within a couple of meetings. I used to sit in on the meetings and when they were finished and Rachel and the team had talked about highfalutin maths, we did used to walk into the same room and just go, “Wow, what was that?” Like, it, it was real. And, but I think that was the nice part, is that they didn't try and water anything down. They didn't try to dilute the maths, they just gave it to us. And it was then staff's role to unpick that. Like Kathryn said, the team would often go and do their own little bit of research – Google, what does that mean? – and then decide how that could be fed back to the children and in what form you could work with the children on different ideas and different concepts. And it was only as that year went on, I could see the magic of it. Quite early on, I could see that there was something really special about it, and it was, as the year went on, did I think we all had a light bulb moment and a conversation together of, actually, we need to capture this. This is, this something really special, um, and I think that's where we've been fortunate with Rachel and the team at Durham University is that they had that experience of being able, er, to write an article academically. And you know, we’ve since had two articles published, haven’t we Rachel, which has been amazing, um, and there’s been an awful lot of interest, and now we've got ten plus schools that are part of the project. And in June last year, we all had like a celebration event where we came together and staff from the different schools came and talked about the impact. I think we were probably quite nervous going to that because we didn't know whether what had happened was unique to our school and our staff, or whether this was something that actually would work in other settings. And I think we both sat and listened and we felt like proud mums really, because practitioners were talking about the same things, the same experiences as what we'd been through, how staff had grown in, um, knowledge. They’d grown [**Kathryn:** Confidence?] in confidence, love for maths and they all felt that their maths provision within school was of a better quality than it had been previously. So to see something that, like Kathryn said, just happened by sending a random email, have impact across ten schools and however many children was amazing.

Fran: It sounds phenomenal. And hearing you describe it that warmly and, like you say, as proud parents in a “Oh, look at what this is doing and there, it's out there now! It's not just our setting!” is glorious.

Er, Rachel, can I come to you? Er, tell us about your side of things and how you found being involved in this way.

Rachel: Um, yeah. So it's been, I mean, it's been really exciting for us as well because obviously we in the department all love maths. That's why we do what we do. And we do have this general sense of frustration. I've introduced myself to people at weddings or wherever, I try to avoid some I do, [**Fran:** Yes!] but if you say "maths" quite often, people say, "Oh, I hate maths. Maths is awful." But, you know, if Kathryn and Sarah went to a wedding and said they work with children, it's not acceptable to say I hate children. Or really anything else. But, er, so it's always nice for someone to email you and say, can we talk about maths, please? Um, and I think also the thing that people are frightened of is not really what maths is. Our daughter's learning long subtraction at the moment, and it's just this ridiculously convoluted series of steps that no one's really told her why she's doing what she's doing. And that's often what maths is viewed as. But actually, there's a whole world of questions that you can ask about, you know, ramps or circles or like, you know, "Why does broccoli grow the way it does", or "Why do geese fly in like a V formation", or why, you know, there's so much maths in the world that's interesting. And obviously we don't go into like the equations behind things. There's lots of stuff we don't say, but you can still appreciate the fact that it's a mathematical thing that's happening, and you can ask mathematical questions about so many things in the world. So it's been really cool to see that.

I think we were all surprised in the maths department about the sorts of levels of thinking that the children show. So the, the article that, um, the kind of main article that Sarah mentioned, um, basically happened because one of, well, a group of children in the first year became really interested in circles and particularly concentric circles. And so a lot of our meetings, we were just talking mainly, what are circles and why are they special and what are concentric circles, and how are they different from spirals and things like that, um, and it was getting into some, you know, quite advanced stuff that you wouldn't necessarily learn until university, but that isn't necessarily that sort of, um, hard to think about in a way, say, for example. Um, so topology is kind of a, a branch of geometry where you're not bothered how far apart things are or what angles things are at, you're bothered about what you can do to a shape before turning it into another shape. So you can bend things, you can coil things round, but you can't chop them or join them together. So a spiral, you can unravel it into one, er, line, er, but you can't do that with concentric circles. That's kind of the main point. And the children were really quick to grasp this idea and were quite interested in it. For example, when you're doing stuff with string. There's lots of string at nursery and I think that's fantastic, um, but that's quite advanced thinking. And, you know, they

were talking about like, the necessary and sufficient properties of concentric circles and they weren't using those terms, but that's what they were talking about. And so we were really amazed that they were so interested. Um, I can't remember what the question was now, so I think I'm just rambling, [Fran laughs] but, no, sorry go on.

Fran: Yeah, no, you doing it beautifully. I was saying from your point of view, what was interesting and you telling us exactly that, that you were surprised by being shown, you know, kind of the conversations or the curiosities that the children were exhibiting I think.

Rachel: Yeah. Yeah. Um, and I think that came across at the, the event that Sarah mentioned, um, in June. That was a theme that kept being repeated. It was, um, you know, er, educators from these different settings saying, um, effectively that they – not deliberately, obviously – had been, had realised that there had been kind of a ceiling on their children's maths explorations, placed, I guess, probably more by like the EYFS Framework than by them. But that being aware of other ways to explore things mathematically and just different branches of maths and the sorts of questions that you can ask and, um, things had enabled them to sort of lift that ceiling off and let the children run riot with lots of different maths ideas. So I think that's been really exciting.

I think one thing we've reflected on a bit is that, so as Kathryn said, it happened, it started during Covid and so we had a Zoom meeting because that was basically all we could do, um, but I kind of wonder if, if it hadn't been for Covid – I, I'm obviously not pleased about Covid – but if it hadn't been for Covid, I wonder if we might have instead decided we'll just come in and do something, um, because that's kind of the, the more common approach, I guess, to like outreach engagement. Um, and I think that would've been a disaster because we would have probably pitched it at completely the wrong level. Everyone would have been horrified by it. I think it probably would have made the staff feel worse because, you know, we'd do something. It would probably be, er, I'm being very pessimistic aren't I but, you know, I think it would have had [Fran laughs] a bad effect on everyone. The children wouldn't have had time to keep going back over the same ideas and sort of nurturing whatever thought process they were having, um, and it would've been terrible. But actually, what's happened through this, is that kind of, you know, the people that they're already really confident with, like Kathryn and the others, er, have become maths people now. So it's not that they're learning maths from some kind of weirdos from university that just come in once [Fran laughs] and then go away. They're learning maths from someone that they really know and love and trust, and that person is enthused about maths and is, is kind of saying, “Oh, let, you know, let's ask a question about

this". And that's, to me, that's the most exciting part of it is, um, the kind of confidence and ownership and, um, somebody that's when do you use the term maths capital, sort of fit in, that you have some belonging in maths and some kind of, um, ability to explore it on your own terms. And then that's really exciting to me.

Fran: Fantastic stuff. Thank you very much indeed. I love that phrase "becoming maths people" and that, er, although I contest your, er, labelling of, you know, university mathematicians as "weirdos", I have definitely friends who perhaps would label themselves as such but, um, certainly viewed from the outside can be interesting or intriguing or as well as intimidating, which is what we're acknowledging here that we're trying to break down those barriers to say you know, we are maths people. And, you know, the youngsters that we're talking about working with do maths and that makes them maths people, and the teachers who are working with them do maths and that makes them maths people, and that everybody developing their confidence, whether that's, um, the university staff supporting teachers to feel like they can be maths people, and are, and um, enacting what that looks like, and the children then picking up on that and being able to have those kind of conversations.

Knowing where it goes, too, was something you alluded to. I love the, um, er, running riot with maths ideas, which sounds to me like [enthusiastically] how everybody should spend their day, er, given a choice. Um, but it just is such a lovely idea. But to know what happens and certainly as, um, someone, I didn't, I don't have a maths degree. And so sometimes when I'm having a conversation with someone about a, a problem that I'm working on or something I've been doing with, you know, um, learners, they might say, "Well of course, that links to such and such's, maybe, theorem of so-and-so." And, er, and I'm like, "Does it? I had no idea of this!" And they were like, "Yes, well, that stuff that they were doing there is exactly what we say is... and then leads to a theorem on..." and not having to call it that or use specific language that might be off putting to some groups, but knowing that that's where it might go. In the same way that, when you cook a with a child, and you say, "We're chopping up these vegetables because we're going to put them in the salad. Of course, you know, if we make lasagna next week, we'll also be chopping vegetables, so that will be a skill that we'll be able to take forward and use in another place." And them seeing the relevance of that in both places, and hopefully enjoying it and, you know, kind of exploring for themselves. Um, Kathryn used the term organic and I think that suits it beautifully. It's the bringing what the children have done, Rachel and your team, you know, looking at it and then feeding back some, "Okay, well, this

is, you know, what we noticed about it," and allowed that level to be set that you're saying is so crucial to people developing their confidence in the project, and why it's probably gone forward as it has.

Can I ask, you were talking about, um, the event in June that involved ten schools now, is this, a, an ongoing thing still? I don't know who wants to come in on that. Perhaps there are different points of view to be, to be heard. Sarah's smiling, so I'm gonna go with her first and then maybe come to Rachel next.

Sarah: Yeah. I-I think, I think for us it, it's been so amazing. Staff have had such ownership, um, and I've like been scribbling notes as we've been talking. Staff have had such ownership of it and I think it's been something that's been so practitioner led and, and I think everyone is quite excited that... Yes, initially it was just our setting with the, the maths, er, people from Durham University. But I think seeing it have impact over ten settings has excited everybody because I think we can see real potential, and I think we've been able to get in touch with some other people, haven't we, Rachel? Other Early Years maths people, um, and get their input and views. And, you know, there was a Nuffield... there was a, there was an application put into, to get some more funding to kind of develop it further. And we weren't successful at that point, which felt really disheartening, um, but I think there is a commitment from everybody, for, you know, that started this, that we still need to keep going, that we can't just let it fizzle out. So it is looking at different ways of continuing.

Maths is the one area – I remember talking to my school improvement officer – and she basically said, when you work in Early Years, you're constantly looking at children through a lens. You, you, you put your PSED lens, you might look at it understanding the world, creative development. You're constantly looking at children and planning the environment, planning activities through lenses. And she said, what you find is that maths is often the dirtiest lens. So actually, when practitioners work with children and view children through this maths lens, it's often the one that is the dirtiest. It's not been polished; it's not been kept clean. Because of people's own experience of maths through school, um, people can feel really quite anxious and nervous and literally just look at the EYFS, um, for guidance. And, and as we know, the, you know, the EYFS is great and it is something that we have to follow. But it very much doesn't cover every bit of maths in the world. So if you are only ever looking at the EYFS curriculum, you, you, you're actually stopping children from discovering lots and lots and learning about lots of things. So I think we feel that there's a real need. Like I say, it's very much practitioner led. Um, we feel that we've discovered a system, a way that will

help others. Not only does it help with children and their understanding of maths, but it is CPD for staff. My staff now, if I said, “I'm coming to observe you on Wednesday and now, you know, and I want to view maths”, nobody would be like, “Oh no!” like... They would all be like, “Yeah, that's fine.” And you know, we don't have a maths table in our school. We, we don't have a maths area. Children and staff do maths everywhere, and they're all confident to do maths, and to talk maths, and live and breathe maths. Um, so I think that, that drives us Frances, if I'm being truthful – the thought that we could change people's hearts and minds, other practitioners, and support other practitioners to clean their lens so that, you know, now very much for staff, that there is no dirty lens, you know, there isn't one that isn't used or people are frightened to use. So, yeah, from a, from a Head’s point of view, I-I think, and from an Early Years sector point of view, I think we have a responsibility to not let this finish, you know, that to, to see how ...

Kathryn: We evolve further. Yeah. I think from my point of view, this, this, this specialness of the whole collaboration this far, if you like, has been that, that the feedback from the mathematicians and those new relaunch of ideas that we take to children has just allowed staff to be empowered and to be that adventurer of maths, and to not shy away from even using that word with children. Let's look and think about this in a mathematical way. Let's become that mathematician and tell children that that's how we're looking and viewing things at the moment, and that's what we're thinking about. And really then in turn, that's empowered children's thinking, without a shadow of a doubt. Um, and I think it's just kind of the whole school, I would say, we've got a love of that subject now. It's very much, you know, I would say it's a strength of our school now, and that's truthfully come through the collaboration that we've organically kind of nurtured over the years, and still trying to do, because, like Sarah said, it's how do we keep that going without losing the essence of what this collaboration is about?

Fran: Understood. Okay.

And I can see, Rachel, you're nodding along as, um, both Sarah and Kathryn have been talking. Um, what else would you like to add?

Rachel: Um, well, I mean, yeah, I totally agree with everything they've said. Um, I think as, as kind of Sarah started off with and it's, it's a practical thing really. So we've been trying to apply for funding. Er, it's surprisingly hard to fit into any particular funding body's, er, niche, because it crosses over between kind of humani... er, well, I dunno, is education in humanities or social science? But anyway. There, and maths, which is obviously in like the, um, sciences. So that kind of, yeah, it, it feels like in practical terms, it's quite

hard to find funding for it, but we would definitely like to keep it going, um, and as a thing that happens and helps, um, educators to be empowered, like Kathryn said, to do maths in nursery, to, to kind of be mathematicians, er, it's 100% worth doing. But I think it has stuff to contribute in the maths education world as well, because there's, there's, there's so many things where we haven't really found an equivalent to it, or we haven't really found, um, an example where something like this is already happening and we have had, we've had quite a few people who've contacted us to say, just the fact of kind of mathematicians and Early Years people working together is, is quite unusual. Um, and just the sorts of areas that we're looking at. We, we're not really, we didn't know what the, um, Early Years Framework said, we just say whatever comes into our heads. But, you know, that might also be stuff that interests the children. And then, you know, so, so there's children doing stuff that maybe lots of children haven't done before. I think that's, there's a lot of scope to, to kind of research it, um, both as a, as a kind of, um, intervention, if you like, but also to sort of see what comes out of it and see what it shows us about children, um, children learning maths.

But I was really encouraged, so at the thing in June we had a couple of people, um, Sue Gifford and Cath Gripton came up, er, to see because they're really interested in the project. And one of them said to me that you don't have any idea how exciting it is to see a whole room of people who probably really did not like maths a year ago standing up and saying that they now really love maths and would some, some of them even said, like, they had chosen it for an observation and things like that. Um, which was just really moving because yeah, we want people to like maths, at the end of the day; we, we don't want people to be put off by it. And we don't want these, you know, children going to school, and then they just decide – even my own kids, not because they're super bright, but just because they've got a mathematician mum – have sometimes said, "Oh, maths is boring, maths is hard." Like, it's just ingrained, isn't it? So if we can try and get in there early, and, er, say, they can be the kid that's going around saying, "Oh, maths is great, let's do it!" Um, so I think, yeah, the idea of changing mindsets I think is really exciting.

Fran: I couldn't agree more that the changing mindsets and the widening the club of maths people sounds like something we can all get on board with because none of us who, er, who consider ourselves to be in it want it to be exclusionary. We want it to be as welcoming and as relevant as possible. And as you say, you know, very often, perhaps people haven't come across Early Years practitioners and mathematicians at university talking to each other –

feels like a “Oh! These are maybe, you know, further apart on the continuum of maths people than I had considered.” And looking at your faces as you talk about it and how warmly you describe it and the fact that people who have been involved want to continue being involved and to carry on that work, speaks volumes about the impact it's had on you personally, as well as in your settings, I think.

Okay, so, Sarah and Kathryn and Rachel, this has been a fascinating and thought-provoking conversation. Thank you very much for sharing your experiences.

Oh, I'm gonna pause. Rachel, please.

Rachel: I just think we haven't men... we haven't mentioned the name of the project, I don't think. I don’t think that's been mentioned. Sorry. So it's Young Minds, Big Maths. And if you Google it you can find information about the project.

Fran: Fantastic stuff. Thank you very much indeed. So Young Minds, Big Maths. And we will make sure that we include, um, a link to the papers that you mentioned where people got their podcast download to find out more. Wonderful. Thank you kindly.

So I'd like to invite you, the listeners, to engage with Cambridge Mathematics on X (formerly known as Twitter) er, or in the comments section on our website to share your thoughts about the conversation you've heard today or any of the ideas that we've been discussing. Perhaps you'd like to share your story too?

We’ll look forward to hearing from you, and goodbye, until next time.