Kindergarten—Tim Transcription

Beginning Info: This video features Zachary Champagne interviewing a kindergartener, Tim, in order to assess his mathematical thinking related to place-value concepts. A document containing the interview tasks and materials is available at the Teaching Is Problem Solving website with the concept videos on place value.

Interviewer: So what we're going to give you this paper, and you don't have to solve all of the problems if you don't want to, you get to choose. If you have any questions—you can change your mind about the interview at any time; if you don't want to do it just let me know, okay? You ready to start? So here's the first thing that I'm going to ask you to do: So I've got some blue cubes here…. Now Tim, can you tell me how many cubes there are?

Tim: Can I count?

Interviewer: Of course!

Tim: (Counts the jumble of blocks by pointing to them as he counts silently) How do they go like that?

Interviewer: It's, like, leaning on its little dot there, huh? Yeah.

Tim: 30

Interviewer: 30? Okay. Can you write that number down for me on this piece of paper? (Tim writes the number.) So, this part of the number right here—does it have anything to do with what you counted over here?

Tim: (nods)

Interviewer: Tell me about that.

Tim: Because the, the number has a 3 in the blocks, have a 3 with the number.

Interviewer: So the number has a 3…and the blocks have 3. What about this part of the number? Does this part of the number have anything to do with what you counted over here?

Tim: Because this (motions to all blocks) has the 0 part and it…there's only 1 block and so the sides of the block and something different because that one had a hole in it.

Interviewer: Oh, okay

Tim: And then it looks like a 0 because there's a hole.

Interviewer: It looks like a 0. So just how you were thinking about that…? Okay so here's what we're going to do next: let's clean these blue cubes up, put them in here. Alright. So this time, I've got red cubes. We're going to do something a little bit different. With the red cubes, I want you to put 10 cubes in this cup and 10 cubes in this cup.

Tim: These are stuck together.

Interviewer: You can pull them apart, yeah. Sorry about that. (Pause) Okay, so we have 10 cubes in here and 10 cubes in here, right?

Tim: That makes 20.

Interviewer: Okay and those extra cubes here, how many cubes do you have all together?

Tim: Mmm…26.

Interviewer: Okay. How did you get 26?

Tim: Because they were in the bag, and I didn't know how much they were, so I counted them.

Interview: You counted them? And how—I saw you count the 6, where did you get the 20 from?

Tim: I got the 20 from the cups.

Interviewer: And that makes 26 all together? Could you write that number down for me on the paper? So, the number was 26. So, does this part of your number here have anything to do with what you did over here?

Tim: Because 1 of them…no I don't . . .

Interviewer: So is this a 0 or is this a 6?

Tim: 0

Interviewer: 0. So if the number was 26, can you write the number 26?

Tim: I'm really bad at writing.

Interviewer: That's a great 6 you just wrote there. So, tell me about this. Does this number here have anything to do with the cubes over there?

Tim: Because there's 6.

Interviewer: Oh, there's 6 there. Okay. Well, what about this part of the number? Does this part of the number have anything to do with the cubes?

Tim: Because the 20's have one thing with the zero.

Interviewer: Say that again, the 20 has…

Tim: The 20's have one thing in common with the 0's

Interviewer: So, where do you see this 2? Can you tell me about that?

Tim: Because there's… there's some 2… when I counted them, there was just 2 in here before when I counted before.

Interviewer: Yeah, I remember that, two in there. So now, you have 26 you told me, right? Could you change this and make it so that it's 16? What would you do?

Tim: 16, 17, Oh wait. I'll just take some… can I just dump them all out?

Interviewer: Absolutely. You can do it however you want, yep.

Tim: (dumps all blocks out of cups and fills up the two cups counting one by one)

Interviewer: 16, great. Let's get these out of the way. So now you have 16 there. Let's pretend that I, that you have your 16, and let's pretend that I give you 25 more. Do you know how many you'd have then? (Tim nods yes) How many?

Tim: 25 plus 16. Wait. Can I use these? (Holds up fingers)

Interviewer: Sure.

Tim: (Holds hands under table and counts silently).

Interviewer: Would you count out loud so that I know what you're saying?

Tim: 16, 17, 18, 19, 20, 21, 22, 23, 24, 25. 26, 27, 28, 29, 30. What was I supposed to count to?

Interviewer: So, you had 16 and I was going to give you 25 more.

Tim: Oh.

Interviewer: How many would you have?

Tim: Mmm, maybe 58?

Interviewer: Why 58? (Tim doesn't respond) That's what it feels like it would be? (Tim nods yes) That's a good thought! That's a good thought; it's a big number, huh? Alright, let's go on to the next part. I'm going to read you some story problems. That sound okay?

Tim: Just dump them all in?

Interviewer: Just dump them in there… I'm gonna take this out of the way. So for our story problems, you can solve them mentally, just like solving the last one where you used your brain, you can use your fingers, you can use the marker and paper, or you can use some of these cubes if you'd like to make it easier. We have some of them that are single, and we have some of them that are glued together like this, too, as well. You can use these as well, if you like. I'm going to leave them right there, we don't have enough space on the table for them, but you can use them if you like, but you don't have to if you don't want to. You can solve it however you like, okay?

Tim: I can use the marker?

Interviewer: You can write on there however you like, yep. You ready for the first problem? Your teacher has 4 new boxes of markers. There are 10 markers in each box. How many new markers does she have?

Tim: Mmm, 40.

Interviewer: How did you get 40?

Tim: (Thinks for a minute) 40.

Interviewer: How did you know 40?

Tim: Because if there's four 10's, then it makes 40 because it just makes it.

Interviewer: Okay. Alright, how about this then: What if your teacher had 13 new boxes of markers and there were still 10 markers in each box, how many new markers would she have?

Tim: Maybe 78?

Interviewer: Why 78?

Tim: No I just want 70.

Interviewer: Just 70, okay. Tell me, why 70?

Tim: Because the 10's make 70.

Interviewer: The 10's make 70? Um, can you say more about that? How do you know that the 10's would make 70?

Tim: Because the 10's they have something to do with all the numbers that are aft-, before-, no that are after the number that's before it, and it has a 0 and the other numbers don't.

Interviewer: I see, so the 10's have the 0 after it but the other number don't. Thank you for explaining that to me. I see just how you're thinking about that. Okay. I have another problem here, not about markers. This one, this problem is about pretzels. We're going to pretend that a teacher has a lot of pretzels and that she's going to try to put those pretzels into smaller bags, so she'll put them in smaller bags, okay? The problem goes like this: Your teacher has 30 pretzels. She wants to put the pretzels in snack bags so there are 10 pretzels in each. How many snack bags can she make?

Tim: Mmm, it says 10 there so it's just 10.

Interviewer: Okay, write it down. Is that your answer? So you think she can make 10? Tell me why you think she can make 10.

Tim: Because there's 10 pretzels and she can put 1 in each.

Interviewer: Well, I think she has 30 pretzels. What if she had 30 pretzels and she wanted to put 10 in each bag?

Tim: I don't even know this answer.

Interviewer: Do you want to skip this one? No problem at all. Okay, for the next part of our interview, I'm going to show you some pictures of small squares and you're going to try to figure out how many small squares are on there. So, let's look at the first one together. You don't need, you can put the lid on the marker; you won't need the marker for this. You mind putting the lid on there for me? Can you put the lid on it?

Tim: Can I put this?

Interviewer: You can put that right there; you can put the lid on this because we're not going to draw on these. Let me just take the marker from you, if I may. There you go. Okay so let's look at this one together. So, this says some of the squares are touching and others are not touching. Can you show me two squares that are touching? Yeah, good good. I see that right there. How many squares are touching in this group right here?

Tim: 10.

Interviewer: 10? Okay, so how many small squares are on this whole card?

Tim: 13.

Interviewer: And how did you get 13?

Tim: Because of this 3 here.

Interviewer: Then where did 13 come from?

Tim: 13 came from here (points to the three individual squares) and 10 and 13 have zeros.

Interviewer: 10 and 13 have zeros. Can you say more about that?

Tim: No.

Interviewer: No?

Tim: 13 doesn't have 0.

Interviewer: 13 doesn't have 0? I got you, but 10 does. So how did you that 13? How did you know that 13 small squares were on this card?

Tim: Because there's some here and there's a lot here.

Interviewer: And that made 13? Okay, let's try this. How about this card? How many small squares are on this one?

Tim: 2.

Interviewer: Including all of these small squares that are touching too. So how many are all together?

Tim: 42.

Interviewer: And how did you get 42?

Tim: What are we gonna do?

Interviewer: You were gonna tell me how you knew this was 42. How did you know there were 42 there?

Tim: Because there's 10; there's only one big line here ,and there's two are spread together.

Interviewer: Okay, and where did the 40,-you said, tell me, tell me how you got the 40.

Tim: Because… I already told you.

Interviewer: Well can you tell me again? Sometimes I have to ask a lot of questions to understand.

Tim: There's 10 in all of these numbers… at the end.

Interviewer: So you knew this was 40?

Tim: Yeah. That's 40 and this is 42.

Interviewer: Now I see, now I see. Okay, let's try this one. What do you think about this one, Tim? How many small squares are on this one?

Tim: 4.

Interviewer: We're going, we're going to counteven the ones that are touching.

Tim: That's 20. 30, 40, 50, 51, 52, 53, 54.

Interviewer: I see just how you did that. Thank you for counting out loud. How about this one? How many squares are on this card?

Tim: 3. I…, There is… 16.

Interviewer: How did you get 16?

Tim: No, not 16.

Interviewer: Not 16?

Tim: 12.

Interviewer: How did you get 12?

Tim: Because I could count them. And there was 12 on this paper so I knew. I just knew that there was 12.

Interviewer: Did you count these as well or just these over here?

Tim: I just…

Interviewer: Can you count all of them and tell me how many would be there?

Tim: 22.

Interviewer: 22. When you said 10, what did you say when you got to here? What count did you say? 11. I see. I see just how you did that.

Tim: Why did you do z when you did that? (points at interviewer's notetaking)

Interviewer: I just wrote it really fast. It looks like a z but it's really a 2. Alright, how many small squares are on this card?

Tim: Small?

Interviewer: All of them, all of the squares. We're calling these small squares.

Tim: 10, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29 30, 31, 32, 33… 33.

Interviewer: Okay, and you counted out loud and I heard you. Thank you. You ready for a big one? Alright, how many squares are on this card?

Tim: Oh, my gosh. 10, 20, 30, 40, 50… wait I forgot where I… 10, 20, 30, 40, 50, 60, 70, 80, 90, 100. 100 and, no 1,000 and infinity. It's infinity. There's infinity on here.

Interviewer: There's infinity? Can you say more about that? Tell me more.

Tim: Infinity. Do you know how you write infinity?

Interviewer: Yeah. Do you? Can you show me?

Tim: Yeah.

Interviewer: Here show me on this piece of paper.

Tim: A sideways 8.

Interviewer: A sideways 8? That's pretty cool. So, what does that mean?

Tim: It's a sign.

Interviewer: For what?

Tim: It's a number sign for infinity.

Interviewer: And what does infinity mean?

Tim: Infinity is the biggest number. It comes before 0.

Interviewer: It comes before 0?

Tim: It's the last number.

Interviewer: Oh the last number. Is there a number that's bigger than infinity?

Tim: Yeah.

Interviewer: What's that?

Tim: Infinity and 9.

Interviewer: Infinity and 9? Is there a number that's bigger than infinity and 9?

Tim: No.

Interviewer: That's it? Nothing's bigger than infinity and 9? What about infinity and 10?

Tim: No that doesn't exist.

Interviewer: That doesn't exist? I hear you; I hear you. Okay. We are all done. Thank you so much for your help today and for showing me the infinity symbol. That's pretty neat. Right on.