

The Teen Numbers

At the end of Session 2.10, the class gathers to discuss the Counting Jar. The teacher wants to explore how students are making sense of the idea that the teen numbers are composed of 10 ones and some number of ones.

Teacher: What was in the Counting Jar this week?

Yoshio: There was a red tower and a blue tower. There were 19.

Tammy: Blue is one taller.

Brad: Yeah. The blue tower had 10 and the red tower had 9. I got 19 too.

Teacher: Tammy saw that the blue tower is one more than the red tower.

The teacher stands the 2 towers next to each other.

Teacher: Brad said there were 10 blue and 9 red. How does knowing this help us know how many cubes there are altogether?

Sarah: You can know by counting them.

Sarah counts the cubes from one and then Jack counts on from 10.

Teacher: I saw a lot of children count the cubes. Raise your hand if you counted like Sarah—you started at 1 and counted to 19. . . . OK, now raise your hand if you counted like Jack. He said 10, for this tower of 10 cubes, and then he counted the cubes in this tower: 11, 12, . . . , 19. . . . Did anyone think about it a different way?

Kyle: I just knew that a 10 and a 9 is 19.

Teacher: How did you just know?

Jennifer: It's the way it works. 16 is 10 and 6; 17 is 10 and 7. . . . If it's 10 and 8 you know it's the one with 8 in it so it's 18.

Tammy: Yeah, all the teens have a 10.

Teacher: Interesting. Kyle and Jennifer and Tammy are saying something special about the teen numbers, something that has to do with 10. I think it's easier to talk about when we have something to look at, so let's build it.

The teacher asks students to help her build a tower for each number from 10 to 19, using 10 blue cubes and the rest in red. She also asks students to help her identify the appropriate Teen Number Card, and place it beneath each tower.

Teacher: OK, we built a tower for every number from 10 to 19. Take a minute to look and think. What do you notice when you look at the towers that show the teen numbers?

Sarah: It's like stairs. Each one goes up one step.

Teacher: What does that mean about our towers?

Russell: Each tower has one more cube. 10 and 1 more is 11. 11 and 1 more is 12.

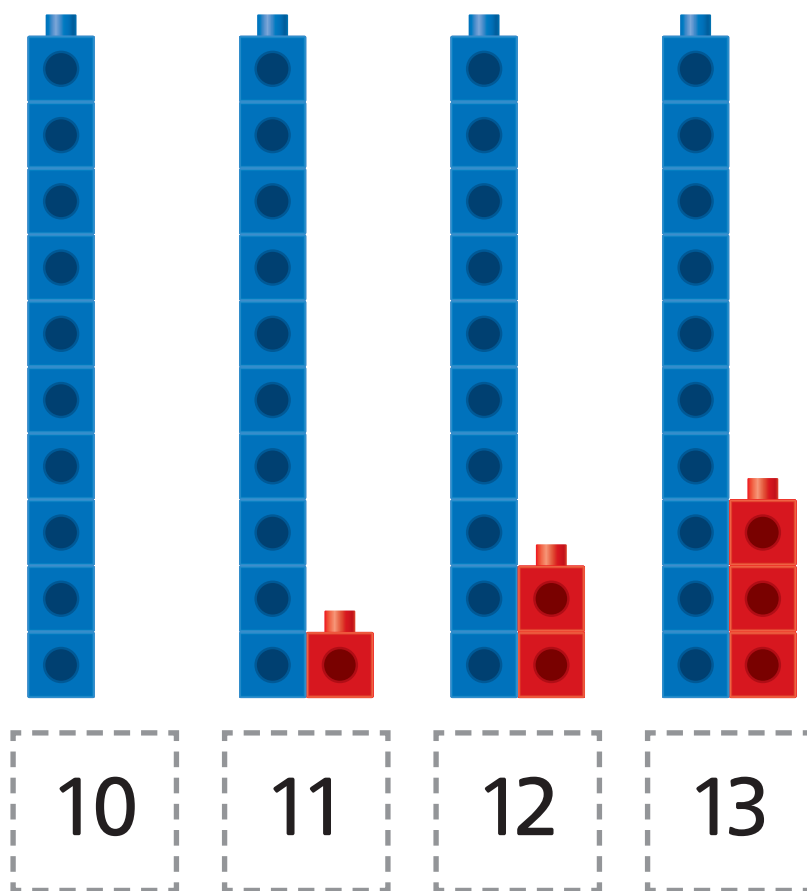
Sarah: And the new one's always red.

Tammy: I noticed something about color too. They all have blue. The same blue.

Yoshio: It's like a stripe [he gestures across the towers].

Teacher: I'm hearing that every tower has the same number of blue cubes. Let's use our towers to check.

For each tower, the teacher counts to 10, breaks it in two, and reviews how that arrangement matches the Teen Number Card below it. Some students tell her she doesn't need to count the blues, there are 10; others start to predict how many reds there will be before she counts them.



Teacher: Now we have another way that shows the teen numbers. Take another minute to look and think. What do you notice?

Lisa: Every number starts with 10 blue.

Russell: I noticed something. The number under the red is the same.

Teacher: I'm not sure what you mean. Can you say more?

Russell: It's hard to

Russell comes up to the display.

Russell: This card says 11. And see? The number 1, and there's one red. And this is the 12 card and it has a 2 and there are *two* red.

Teacher: Aaah. I think I see what you mean. Russell is saying that, here's the card for 13, and it has a 3 on it. And if you look at the cubes, there are 3 red cubes. Is that right?

Russell nods.

Teacher: That reminds me a little bit of what Jennifer was saying earlier.

She looks to Jennifer, with a questioning look.

Jennifer: Um. I'm not sure.

Teacher: It reminded me of when you were saying 16 is 10 and 6 and 17 is 10 and 7. Let's try this. What if I cover the cubes above 18?

The teacher puts a piece of paper over the cubes.

Teacher: Think about what Russell said. . . . What do you think the cubes under my paper look like?

Kyle: Oh! 10 and 8. They all have 10 blue, we know that. And it's 8 because *eighteen*.

Russell: [agrees] I think there's 8 red because there's an 8 on the card.

The teacher reveals the towers and rephrases Kyle's and Russell's ideas for the class.

In this discussion even students who count (or count on) to determine the number of cubes in a given tower (or pair of towers) are making general observations about the teen numbers (e.g., a stripe of 10 blue cubes; one more red cube in each tower). Some students see the 10 in each number, no matter the representation. And some are beginning to connect those representations to the way the teen numbers are written (e.g., we write 13 because the number has one ten and three ones). Because most kindergarteners are still thinking and working in ones, the cube representations show all the ones but they also reveal the structure of the teen numbers. This model helps students build an understanding of a foundational idea of place value – that ten ones can be thought of as one group of ten or one ten.