DIALOGUE BOX

Strategies for Cover-Up

As these second-grade students discuss their strategies for the game Cover-Up, they see how others in the class approach this kind of missing-part problem.

Here's one from Graham's paper: They had 21 pennies, they covered some up, and they counted 7 that weren't covered. Think for a minute about how many they covered. [*Teacher writes "21 pennies, 7 not covered" on the chalkboard.*]

Lila: I got 14.

How did you get 14?

Lila: Well, I put 3 on the 7. That equals 10. Then I did 10 more. That equals 20. Plus 1.

So how did you get 14?

Lila: 3 and then 10, that's 13, and 1 more is 14.

The teacher writes:

$7 + 3 = 10$ $10 + 10 = 20$ $20 + 1 = 21$
$3 + 10 + 1 = 14$

Ping: I think it's 13.

You think it's 13? How did you get it?

Ping: I knew that 4 plus 3 equals 7. So first I did 21 minus 4. That's 17. Then I had to do 17 minus 3.

Where are you getting the 3?

Ping: I split the 7 into a 4 and a 3. So 17 minus 3 is 16, 15, 14. Oh, it's 14!

The teacher writes:

$21 - 4 = 17$ $17 - 3 = 14$

Temara: I went like this—8, 9, 10, 11, 12, 13, 14, 15, 16, 17 [*wiggles one finger for each number*], 18, 19, 20, 21. So it's 14.

How were you able to keep track of how many fingers you counted?

Temara: I was real careful. First I did 8, 9, 10, 11, 12, 13, 14, 15, 16, 17. That was 10 fingers, so I kept in my head that it was 10. Then I kept going, 18, 19, 20, 21, so 4 more. So it was 14.

The teacher quickly draws three hands with five fingers on each hand and writes the numbers above each finger.

Anyone have another way?

Jeffrey: It's kind of different. Mine's sort of like Temara's, except I made little marks while I counted and then I counted them.

Linda: I have a different way. I knew that three 7's is 21, so that means 7 goes into it three times. And 7 is one 7, and there's two 7's more. And I know 7 and 7 is 14.

Finding the missing part in Cover-Up is more difficult when the number of things not covered is relatively small compared to the number of things covered up, as in this problem. If 14 of the 21 pennies were showing, it would be easier to count up the number covered by 1's without losing track. Choosing a problem in which only 7 are showing encourages students to use numerical strategies rather than relying on counting by 1's. However, students who usually rely on counting by 1's will need to continue working on problems in which the covered number is relatively small. Encourage them to use grouping by 2's or to build from combinations they know. For example, if a student knows that $5 + 5 = 10$, provide a Cover-Up problem with 11 counters of which 5 are visible.