

ACTIVITY IA4.5: The Double-decker Bus with the Bead Rack

Intended learning: To learn non-count-by-one strategies in the range 1 to 20.

Instructional mode: Longer, productive practice for individuals, groups or whole class.

Materials: An arithmetic rack for each student and one for the teacher.

Description: Establish the story context of a double-decker bus driving around the classroom. At one stop, five passengers get on; at the next, two get off, and so on. Then pose tasks imagined within the bus story. *There were nine people sitting on the bus. Use your rack to show me what that might have looked like. The bus stopped at a stop and seven more people got on the bus. How many people are on the bus now? How did you figure that out?* A student might explain: 'At first I had nine on the top deck and seven on the bottom deck. I just moved one person from the bottom to the top deck so that there would be ten. That left six on the bottom deck. That means there are sixteen altogether on the bus'. Use the teacher rack to demonstrate the student's strategy. *Did anyone figure it out a different way? Which strategy was quicker?*

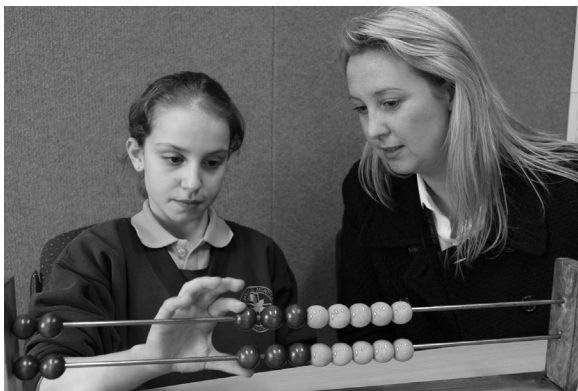


Photo 4.5 Making doubles on the arithmetic rack

Responses, variations and extensions:

- The double-decker bus has proven a great story context for developing addition and subtraction with the arithmetic rack. Activities with the context can be developed over many weeks of lessons. Other possible contexts include children sitting on bunk beds at a sleep-over, or arranging books on two shelves.
- The arithmetic rack works best as a setting for addition and subtraction tasks once students have facility with building numbers on the rack with a few pushes only.
- Initially students may count-on each time to find the sum or difference. If this persists, prompt with *Can you determine the answer without counting by ones?* If appropriate for the problem: *Is there any way colour can help you?*
- As students develop facility in using non-count-by-ones strategies, begin naming the student strategies. *Oh, I see, you used the near double. With eight on the top row and seven on the bottom, you saw the two sevens and one more [slide the one slightly apart to highlight the double seven pattern] to make fifteen.*
- Strategies to highlight include doubles, near doubles, 10-plus, 5-plus and compensation.
- Teachers and students may notate their strategy on an empty number line or with a series of equations, to keep a record of the strategies. This can facilitate meaningful closure discussions at the end of the activity as students review the strategies that emerged during the activity.