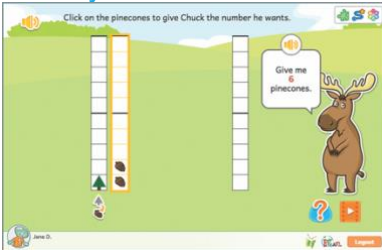


PLACE VALUE, STEP 9

Lesson Plan: Number Concept, Place Value, Step 9

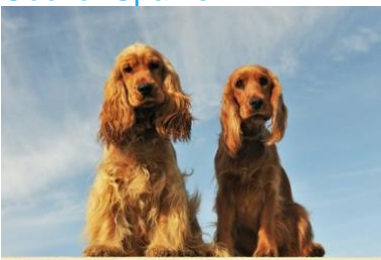
Activity Screen Shot



Theme Host: Chuck



Animal Friend: English Cocker Spaniel



OVERVIEW

Students develop an understanding for the subtraction of a one-digit number from a two-digit number.

PRINCIPAL LEARNING GOAL(S)

Students demonstrate profound understanding of the algorithm for subtraction involving two-digit numbers by being able to:

- use pine tree and pinecone counters as metaphors for tens and ones
- write an equation that represents the subtraction operation

PREREQUISITE KNOWLEDGE AND SKILLS

- Practiced counting pine trees and pinecones separately
- Wrote two digit numbers based on a count of pine trees/pinecones
- Wrote equations/subtractions that result in a two-digit number and involve the notion of “borrowing”

RESOURCES NEEDED

- ~19 large Lego blocks of the same size

POTENTIAL DIFFICULTIES

- Some students may carry out the exercise mechanically, not thinking in advance about either how to remove more pinecones than can currently be seen in their own pinecone counter, or whether they should first convert a pine tree to a full pinecone counter. On screen you will see this as pinecones that are being transferred instead falling to the right of the student’s pinecone counter and then reverting back to Chuck’s counter.

WARM UP ~ 3-5 MINUTES

- 1) Build one tower of 10 blocks. Adjacent build another tower of 8 blocks or less, e.g., 5 blocks. Tell the class that you want to remove x blocks from the two towers (x should be larger than the number of blocks in the second tower, e.g., $x > 5$, say 7).
- 2) Ask students if all x blocks can come from the small tower. When they say no, ask if all x can come from the full tower. When they say yes, do so. Point out that now

two incomplete towers represent a single number. Ask what to do, anticipating the suggestion of combining the two towers. Repeat this exercise a few times.

MAIN ACTIVITY ~ 20 MINUTES

Students are given counter representations of both a two-digit number and a one-digit number. They are asked to add the two numbers using the counter representations.

CONSOLIDATION ~15 MINUTES

To help students consolidate their new knowledge and make connections to prior learning, allow time for subsequent discussion. The questions below raise important issues:

- 1) *In which circumstances would we need to convert a pine tree into a full pinecone counter?*
Elicit from students the idea that a conversion is needed when the number of pinecones Chuck asks for is more than the number pinecones that you currently see.
- 2) *What happened when you converted a pine tree into a full pinecone counter?*
Elicit from students the idea that the number of pinecones became large enough to give Chuck all of the pinecones trees he asked for, and the number of pine trees went down by 1.
- 3) *If you have already demonstrated to your class the algorithm for subtraction beyond 9 using the notion of “borrowing”, ask students how the number of pine trees going down by 1 is related to the idea of “borrow 1 from the 10’s place”?*
Wait for students to draw the connection between the activity and the algorithm.

