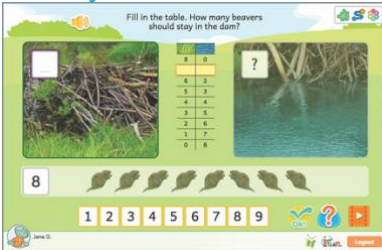


DECOMPOSE, STEP 3

Lesson Plan: Number Concept, Decompose, Step 3

Activity Screen Shot



Theme Host: Chuck



Animal Friend: Capybara



OVERVIEW

The focus of this step is on the patterns one sees when decomposing an integer into all possible sums of two smaller integers.

PRINCIPAL LEARNING GOAL(S)

- Learn that the two values in one row of a decomposition table are counts of objects in a partition into two subsets of an original set
- Reinforce understanding of the patterns visible in a decomposition table

PREREQUISITE KNOWLEDGE AND SKILLS

- Completed Step 2 in this Idea

RESOURCES FOR THE LESSON

- Lego Blocks

POTENTIAL DIFFICULTIES

- Students may have difficulty using the decomposition table so ask them to explain the patterns that they see.
- Students may use the pattern in the decomposition table mechanically, failing to associate the two numbers in a row of the table with counts of objects in the two subsets of an initial set so ask questions about counts of beavers at the dam and counts of beavers swimming.

WARM UP ~ 3-5 MINUTES

Make the beginning of a decomposition table on the board, two columns, many rows, and in the middle write a row with 4 and 1. Then hold up your left hand with four fingers separated and your right hand showing only one finger. Say to the class, "you are only allowed to use five fingers in total, so now hold up two hands and show me a way that is different from mine of having a total of five fingers". When all students have their hands in the air, go back to the board and call out the name of a student and write out the pairs of fingers the student is showing (Left hand, Right hand), the student's name and tell that student to lower his/her hands. Repeat this, but just recording names when a combination is already on the board. When all students have been

recorded say "go to Step 3 now and we will finish this up afterwards".

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) *Before we discuss the computer step, perhaps we should finish up what we started on the board. To begin, who can tell me what pair of numbers I should write in the table on the line above my pair?*

After this is done, you cross out that pair, and you ask, who can tell me what pair I should write just below my pair? You continue until all student pairs on the board have been used up. If the table is complete (all pairs from (5,0) to (0,5)) then say "well done". If there are pairs missing, you should ask the students, what pair(s) of numbers are missing from this table? Is there a pattern we can see to help us know any missing pairs? Try to get students to describe the pattern, but if none of them know what to say, move to the next step.
- 2) *Suppose we have these five Lego blocks, all on this piece of paper, and we have no Lego blocks on this other piece of paper.*

If I move one block from this piece of paper to the other piece of paper, how many will I have on each piece of paper? One at a time, move a few Lego blocks and keep asking this question. You are trying to elicit from the students the statement that one pile always goes down by one block, and the other pile always goes up by one block, so that the total number of blocks remains the same (5 in this case). Get them to state that this is what they see in the table, and then to use it to fill in any missing row(s).
- 3) *Quickly put the tables for 5, then 6, and then 7 on the board.*

Ask the students how many rows there are in the table for breaking 5 into two parts. Write the answer (6 rows) underneath that table, and then ask the students how many rows there are in the table for breaking 6 into two parts. Write the answer (7 rows) underneath that table and then ask the students how many rows there are in the table for breaking 7 into two parts. Write the answer (8 rows) underneath that table. Ask the students if they see a pattern, and what the pattern is (the number of rows is one larger than the number that is being split into two parts). Ask them how many rows the table for 20 or 100 would have (use whatever large number you feel confident they will have some knowledge of).

