Activity B.5: More Practice Counting Up and Down/Addition and Subtraction

Special Note: There are two variations for this lesson. Both variations are setup so that you can introduce two important concepts: negative numbers and relative position. In modeling a problem, first students need to establish a starting point and then all other numbers flow from that point. If you do not want to introduce these concepts in this manner or at this time modify the exercises to just use the tokens for 1→5 and then begin on the first step.

Because children are working on separate staircases, their steps are different heights. They learn an important aspect of our numbering system: that the counting sequence is the same whether or not you are counting the exact same type of objects.

Learning Objectives:

1) Count and recognize "how many" in sets of objects.
2) Develop understanding of relative position of numbers on a number line.
3) Understand meanings of addition and subtraction and the relationship between the two operations.
4) Introduce the concept of zero and "below zero" (optional).

Examples of Skills Accomplished:

1) 0 + 1 = 1; 1 + 1 = 2, etc.
2) 1 + 2 = 3; 3 – 2 = 1 (adding an amount and then subtracting the same amount gets you back to where you started from).
3) 3 + 0 = 3.
4) 2 – 3 = a negative number.

Setup:

1) Distribute staircases 3x, 4x, 5x, and 6x evenly around Zillio.
2) Assign learners to each staircase. You may wish to have the learners who work at a quicker pace assigned to the 3x and 4x staircases that have more steps.
3) Give each learner one foam card.

Maximum Number of Players for Small Group Activities: 1-4

Players Positions: Standing

Grey foam logs: In

Activities:

Variation A:

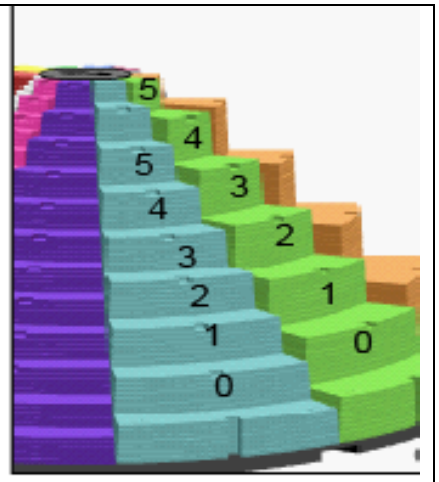
1) Each learner puts a zero in the notch on the second step of his/her staircase.

2) He/she then puts the tokens numbered one through five in the notches on the steps above zero on his/her staircase.

3) Each learner places a finger on the step labeled zero.

4) You call out a number between zero and five, inclusive. Each learner moves his/her finger up and down his/her staircase so his/her finger rests on the appropriate step. Repeat several times (for example call out 0 – 1 - 2 – 3 – 2 – 3 – 4 – 5 – 4 - 3).

5) You can specify no movement by repeating a number (for example 0 – 1 – 2 – 3 – 3 - 5 – 4 – 4 – 2).



Variation B:

1) Use the same setup as in 1) → 3) above.

2) Rather than announcing step numbers, announce the number of steps for each player to add (move his/her finger up) or subtract (move his/her finger down) and then have the learners tell you what that result is (what step they are on now). For example beginning at zero, +1, +2, -1, +3 will have the learners move to the 1st, 3rd, 2nd , and 5th steps on their respective staircases.

3) Introduce the concept of below zero (if learners are ready to abstract). Do this by calling out a series of moves that result in dipping below zero occasionally (landing on the unlabelled first step on the staircase). Usually at least one of the learners will note that he/she is below zero. Just say "yes, it is called a negative number" and continue. This helps the learners understand that zero is not the lowest possible number in our numbering system and that the same principles of addition and subtraction apply across zero.

4) Replace all tokens except those on the 3x staircase which will be used for reference as learners transfer their skills to paper.

<table>
<tr><td colspan="2">Observe and Assess:

1) Observe the ease with which the learners match an instruction with the correct move.

2) Review the worksheets for common errors to inform you of further instruction needed.</td></tr>
<tr><td>Group Discussion:

1) What direction do you move when you subtract?

2) When you move up to a higher number, what operation are you using?

3) Give learners several word problems that involve simple addition or subtraction. Allow them to model the problems on Zillio if helpful.</td><td></td></tr>
<tr><td>Transition to Paper:

1) Assign the reproducible as either class work or homework. The number range in the reproducible is greater than the number range modeled in the hands-on activities. If desired, allow students to place tokens on the 2x staircase in sequence, number side up, or use a number line at their desks to help them solve these problems.</td><td>Hint: Often learners do not have to be seated at ZILLIO. As long as it is setup in the room, they can recall the exercises and visualize the solutions. If they are having trouble visualizing the solutions, allow them to return to the kinesthetic format.</td></tr>
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zillio

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Name: _____ Date: _____

a) 2 + 1 = 3	**b)** 3 + 1 = 4
c) 4 - 2 = 2	**d)** 12 + 2 = 14
e) 7 - 5 = 2	**f)** 10 + 7 = 17
g) 9 - 3 = 6	**h)** 14 - 3 = 11