Sammy’s Chipmunks and Squirrels Observations

Task: For a science project, Sammy observed a chipmunk and a squirrel stashing acorns in holes. The chipmunk hid 3 acorns in each of the holes. The squirrel hid 4 acorns in each of the holes it dug. They each hid the same amount of acorns, although the squirrel needed 4 fewer holes. How many acorns did the chipmunk hide?

* 8.EE.C.7.A – Give examples of linear equations in one variable with one solution, ~~infinitely many solutions, or no solutions.~~ Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form *x* = *a*, *~~a~~*~~=~~*~~a~~*~~, or~~*~~a~~*~~=~~*~~b~~* results (where *a* and *b* are different numbers).

Pre-Requisite:

Prior to completing the task, teachers should use class time to practice the skills related to the standard. Activities could include simplifying expressions using the distributive property, collecting terms across the = in an equation, and looking at numerical values in a table, identifying a linear pattern in a table of values and representing the general rule using a variable.

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| --- | --- | --- | --- | --- |
| Input | 2 | 3 | 4 | *x* |
| Output | 5 | 8 | 11 | ?? |

Instruction:

Start by having students read the task. Students need to organize the facts into two categories: the facts of the problem and the conditions that must exist for the answer to be correct. Make sure the conditions are written on the board as this will need to be constantly referred to throughout the problem. Elicit from students strategies to solve the problem. Once strategies have been listed or discussed, start by having students act out the problem with beans or manipulatives. Students should make piles based on the total amount of acorns buried. Consider making a pictorial representation of piles on chart paper. Students should start to see that 12 acorns is a common number buried. At this point, stop and have a conversation as to whether or not this is the answer. Refer to the conditions as the discussion takes place.

Following the discussion, ask students if it is realistic to continue to use the beans. Lead a discussion to get students to transition to a table. Transfer the pictorial representation of the acorns into the table. On their own, have students complete the table until they can justify their answers based on the conditions. During this time, and throughout the lesson, expect and challenge students to determine different ways without fully extending the table. Students can determine that 12 is one less hole, 24, is two less holes, 36 is three less, and so on.

Once the table is developed, transition into the equation. If students are not ready to develop the equation, then give them the equation $3x=4(x-4)$. Have the students break down the equation so that they can connect it to the written task. For example, students should determine that 3*x* is from the fact the chipmunk hides three acorns per hole.