Frog and Toad

Frog and Toad want to plant a garden. They have 5 tomato plants, 6 pepper plants, 7 onion plants and 6 corn plants. There is only room for 6 plants in each row.

How many rows will Frog and Toad need in the garden?

Grade Levels Pre-K-2

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Context

During the month of May, our Earth and Environment unit involved seed investigations and plant cycles. The children had been reading several *Frog and Toad* chapter books by Arnold Lobel in the classroom, and began planting a variety of seeds for a classroom garden. They had also been sharing about their family gardens. Our plant unit provided opportunities for the children to practice math skills in sorting seeds, measuring plant growth, graphing types of vegetable favorites and mapping out garden space.

What This Task Accomplishes

This task provides several solutions. Students need to "map out" the space in rows for their garden given the variety and numbers of plants. They can organize possibilities using trial and error, or by recognizing the solutions and how they are organized.

What the Student Will Do

Students will use their desk top as the garden and place color tiles or Unifix cubes in rows to represent the plants. Remember there can not be more than six plants in a row. As the children move the tiles around or draw the vegetables on their paper they will see the need to use a different strategy for the plants of which there are five and seven. Students will label the vegetables that are used in each row and indicate how many rows were used in the garden.

Time Required for Task

1-2 hours

Day 1 Read *Frog and Toad* stories to the children. (20 minutes)
Day 2 Sing *Frog and Toad's* Garden song. (10 minutes)
Day 3 Plant vegetable seeds in containers that have six spaces in them. (30 minutes)
Day 4 Map out the garden rows. (45 minutes)

Note:

Time was also spent showing pictures and discussing which vegetables grow above and below

the ground.

Interdisciplinary Links

The class enjoyed Eric Carle's big book,*The Tiny Seed* as a math/science introduction to our plant cycle theme. In language arts each child used the art techniques of paper tearing, tissue collage and watercolor to design a six page miniature book of this story. Science centers involved matching seeds in baggies to seed packages. Do the smallest seeds create the smallest flowers? The children keep growth charts. The children ate seed snacks during the month of May.

The class took a trip to the Audubon Nature Center to make comparisons of the different kinds of environments in which plants grow, including the pond, forest, field and swamp. Children can also do addition and subtraction problems with seeds. Example: If you had 20 seeds in a package and planted nine seeds, how many seeds would you have left in the package?

Teaching Tips

Remind the children that they must use all of the plants listed in the task. They may combine the plants in any combination to solve the problem. Remind the children that there is not room for more than six plants in a row.

Suggested Materials

- Color tiles or real seeds that are large (pumpkin, beans)
- Unifix cubes
- Construction paper
- Pencils
- Crayons

Possible Solutions

Four rows of six - which equals 24 plants.

Five rows with several different combinations of plants to equal 24 plants.

Note:

At the Practitioner and Expert levels the children might use the strategy of counting the total number of plants (24) to divide them into equal rows of six plants each. Some children might put the plants in equal rows of four. Young children often tend to want things to come out evenly rather than odd.

Benchmark Descriptors

Novice
This student did not find a solution. S/he did not count accurately when representing the vegetable plants. Although the student received assistance several times, s/he could not explain their mathematical sentence. S/he did not represent all the different plants in the garden.

Apprentice
This solution is not complete. The student did use a strategy, but did not count correctly to represent the plant total. S/he shows some evidence of mathematical reasoning, but did not carry out the mathematical procedure completely.

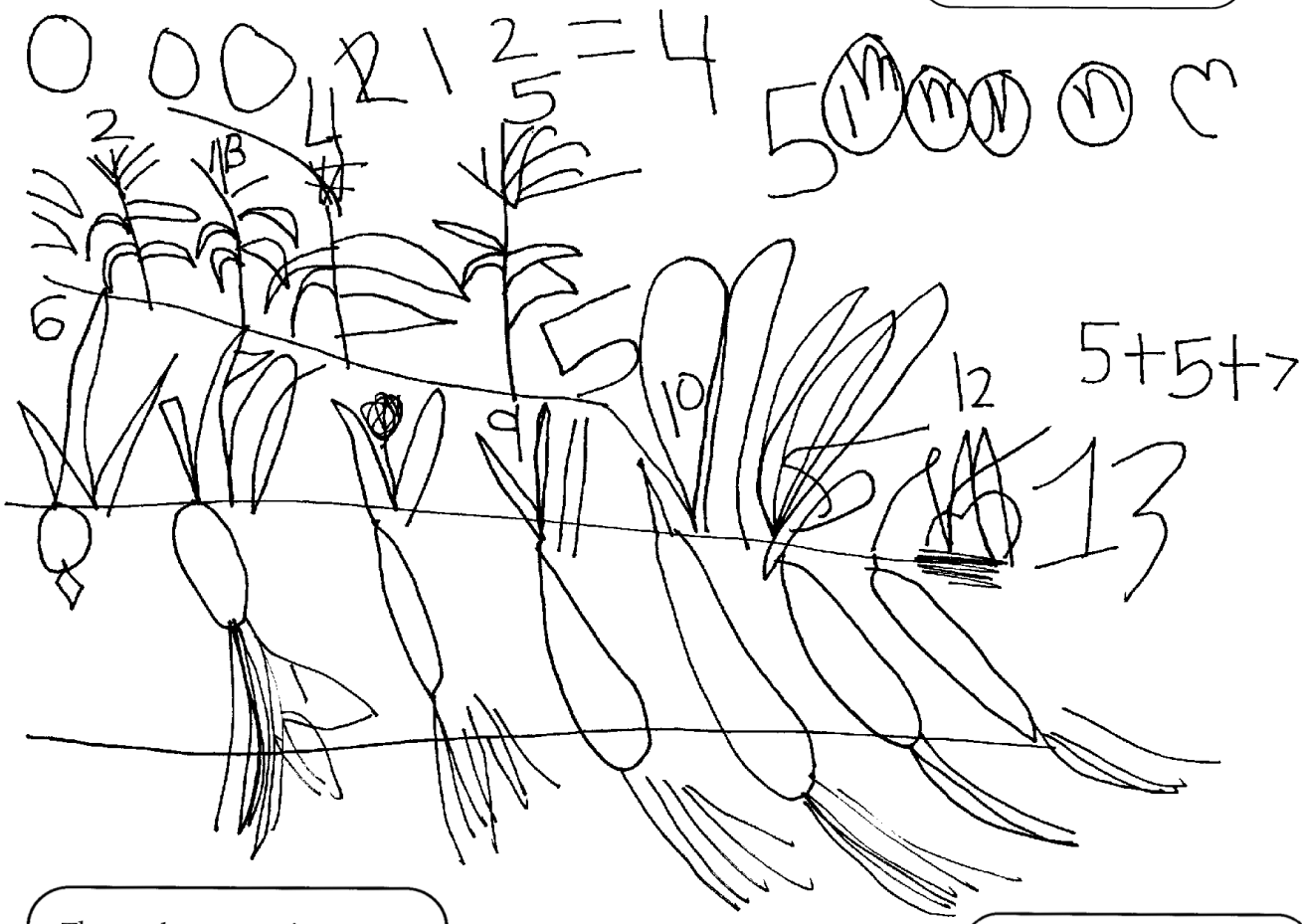
Practitioner
This student's solution reflects effective mathematical reasoning. A strategy was effectively used, and the explanation is clear and accurate. All plants were used, and the total plants equal 24.

Expert
This student showed a clear, detailed explanation of how the problem was solved. There was accurate labeling of how the plants in the garden were mapped out. The total of 24 plants is correct, and the student has a deep understanding of the term "equal". This indicates that the mathematical terminology and notations used to explain the problem are precise and appropriate.

Novice

The student does not complete his/her response, neglecting the last group of six vegetables.

It is unclear why the student is attempting this equation.

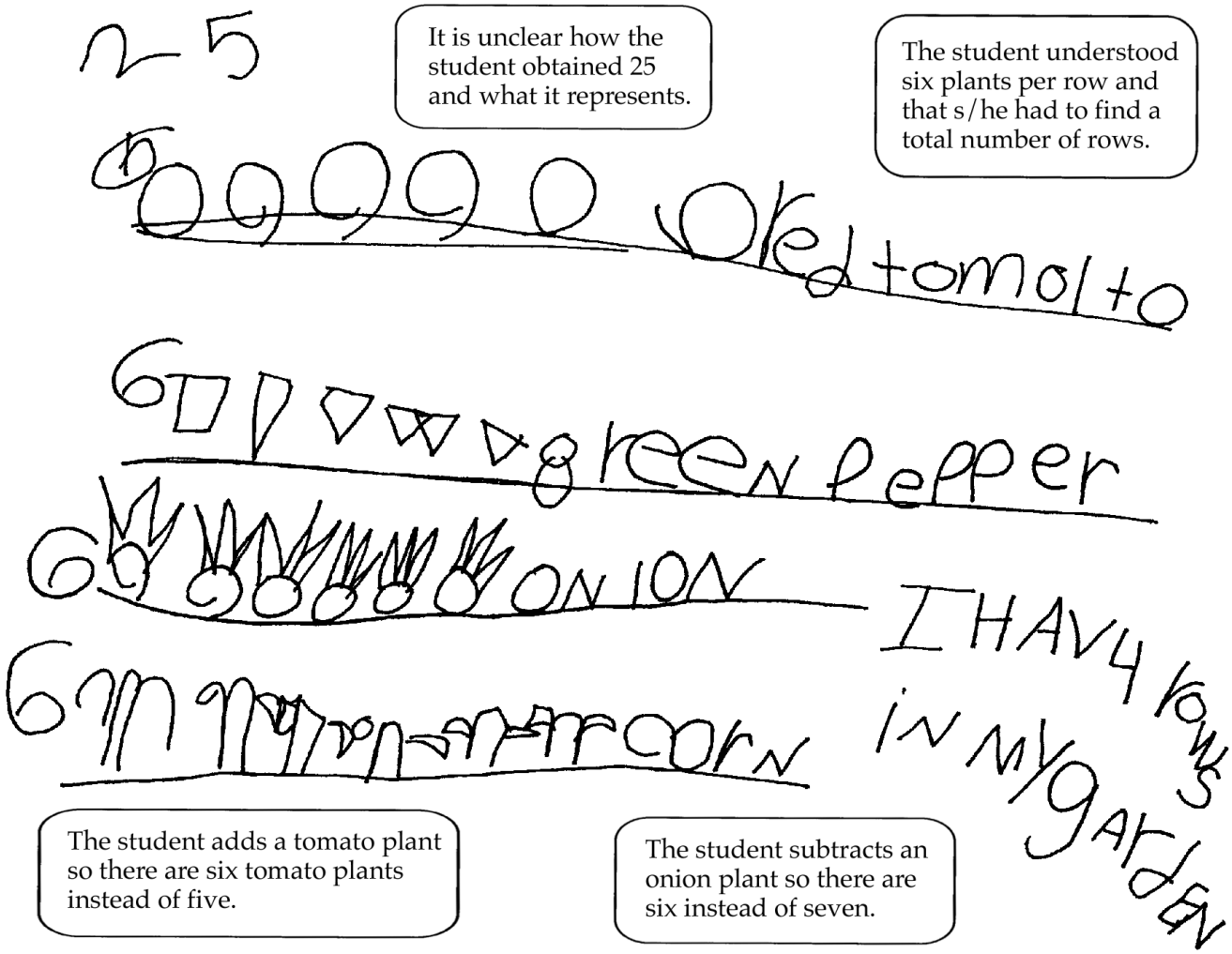


The student uses pictures to represent the different plants, and numbers to represent a cumulative total, though we are unsure why.

The student puts seven plants in the second row indicating the student misunderstood the six plant limit.

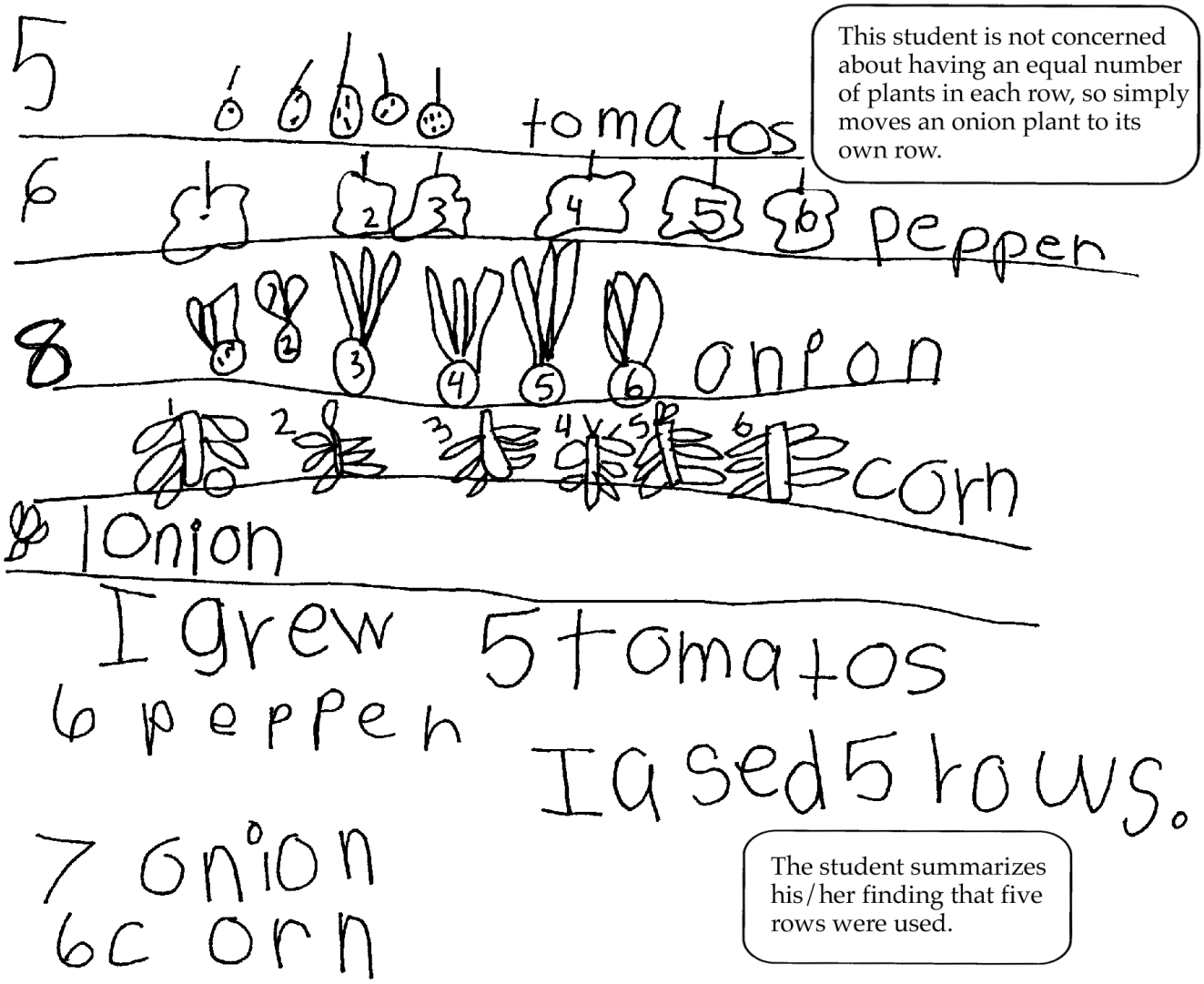
Frog and Toad

Apprentice



Frog and Toad

Practitioner

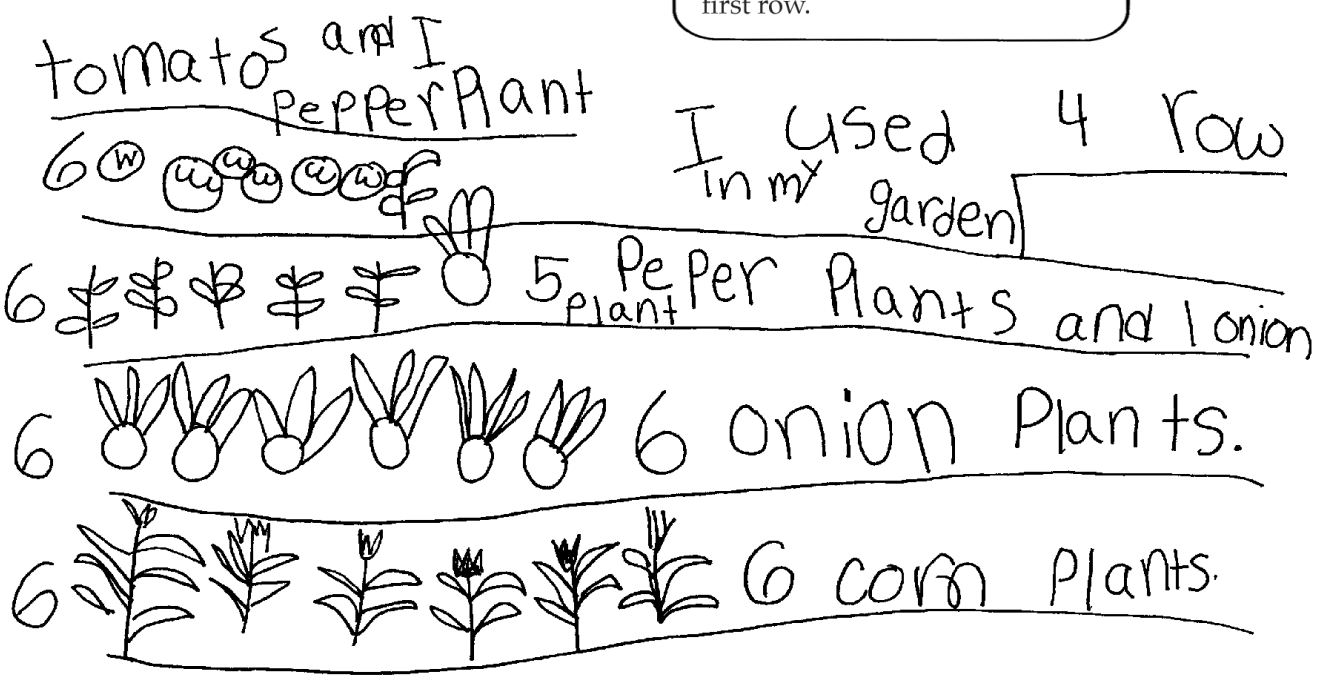


This student is not concerned about having an equal number of plants in each row, so simply moves an onion plant to its own row.

The student summarizes his/her finding that five rows were used.

Expert

This student is concerned with equivalence so s/he combines tomato and pepper plants in the first row.



24 Plants in all.

the rows are all eacol.

The student makes a mathematically relevant observation that there are 24 plants in all.

Clearly states a solution and comments that all rows are equal.