Marshmallow Peeps® all in a Row

Marshmallow Peeps® come 10 in a package. Each Peep is 2 inches long.

How long will a train of 10 Peeps be if they are lined up in a row with 1/2 inch between them?

Grade Levels Pre-K-2

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Context

Around Easter, Marshmallow Peeps® are readily available in stores. Also around this time of year our class has an "Egg Week", when many of our daily activities are related to eggs.

What This Task Accomplishes

This age group looks forward to the special candy associated with Easter, so they readily relate to the problem. How the students approach the solution reflects their spatial sense as they attempt to visualize the situation of the row of Peeps with spaces in between. If they make a precise model and measure it, this shows their measurement skills. If they solve the problem by adding the whole numbers and then the fractions, this shows their number and operation sense along with the level of their skill with respect to fractions and related notation.

What the Student Will Do

In solving this problem, the students were encouraged to use rulers or yardsticks if they wished. They were also encouraged to represent Peeps with manipulatives or paper cut outs. They were asked to make a drawing to show that they understood the problem. They were also asked to write a sentence giving their solution, and to show with equations or words how they figured out their solution.

Students might set out manipulatives along a ruler or yardstick, make and then measure a scale model of the rows of Peeps, count along a ruler or yard stick, count along a drawing, or calculate the lengths of the Peeps and the lengths of the spaces separating them.

Time Required for Task

45 minutes

Interdisciplinary Links

As noted above, this task fits well with the season.

Teaching Tips

I bought several packages of Marshmallow Peeps® and showed the class a package of 10 (the Peeps come arranged in two rows of five). The class was pleased to know that they would each get to eat a Peep at the end of the problem solving session. If Marshmallow Peeps® are not available during the time of year you do this problem, other items can be substituted, such as cookies, Saltines, matchbox cars or pogs.

Before attempting the task, I reviewed with students what a half-inch is, the notation for writing one-half, and noted that when it is typed a slash is used in place of a horizontal line.

I had not anticipated that students might try to create a scale drawing of the row. Students who tried this soon discovered that the row of Peeps did not fit on a single page. Another time I might make available ticker tape rolls, or reduce the number of Peeps in the problem to six, providing 12" x 18" paper on which students can more easily record their solutions. If you decide to change the number of Peeps in the task, I recommend making up a package of Peeps arranged in two rows of three so as to retain the spatial challenge of the problem.

The task could also be rewritten to create other tasks. For instance, if enough Peeps are bought so everyone in the class can eat one, how many packages must be purchased and how much will this cost? How much does each Peep cost?

Suggested Materials

- Paper (that the students can cut into Peeps)
- Stencils
- Packages of Marshmallow Peeps®
- Manipulatives
- Ticker tape rolls
- Rulers and yardsticks
- Pencils
- Paper (to record solutions)

Possible Solutions

There is only one correct solution, which is 24 1/2 inches. Strategies used to arrive at the solution will vary.

Benchmark Descriptors

Novice
The Novice will deal only with one part of the problem, and count the lengths of Peeps only without allowing for the half inch between them. The Novice will use little or no math language, and the solution will lack correct reasoning.

Apprentice

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The Apprentice will attempt to deal with both parts of the problem, the length of the Peeps and the length of the spaces between them. However, the Apprentice will fail to arrive at a correct answer for a variety of reasons. Some might incorrectly assume that there will be 10 spaces if there are 10 Peeps, despite the evidence in their drawings, and arrive at the incorrect solution of 25 inches. Some who use a yardstick also arrived at 25 inches as a solution, as they rounded their solutions to the nearest inch. Those who attempt to create a scale drawing may get bogged down by constraints of the paper length, which leads to inaccuracies. Others miscalculate because they become confused with doubling and halving in the same problem.

Practitioner
The Practitioner understands that the lengths of the Peeps and distances between them need to be added. They correctly calculate the solution by doing this and using their drawings of the problem. The Practitioner will use math language, but it may lack sophistication. The drawings are labeled, and the reader can follow the student's correct reasoning.

Expert
The Expert fully understands the problem by representing the problem visually, and clearly calculating the solution efficiently. The Expert may deal with whole numbers and fractions separately, or may choose to deal with mixed numbers. The Expert's equations show more advanced knowledge of how to use fractional notation, and how to accurately represent calculations.

Novice

The student neglects to consider the 1/2-inch in between each chick.
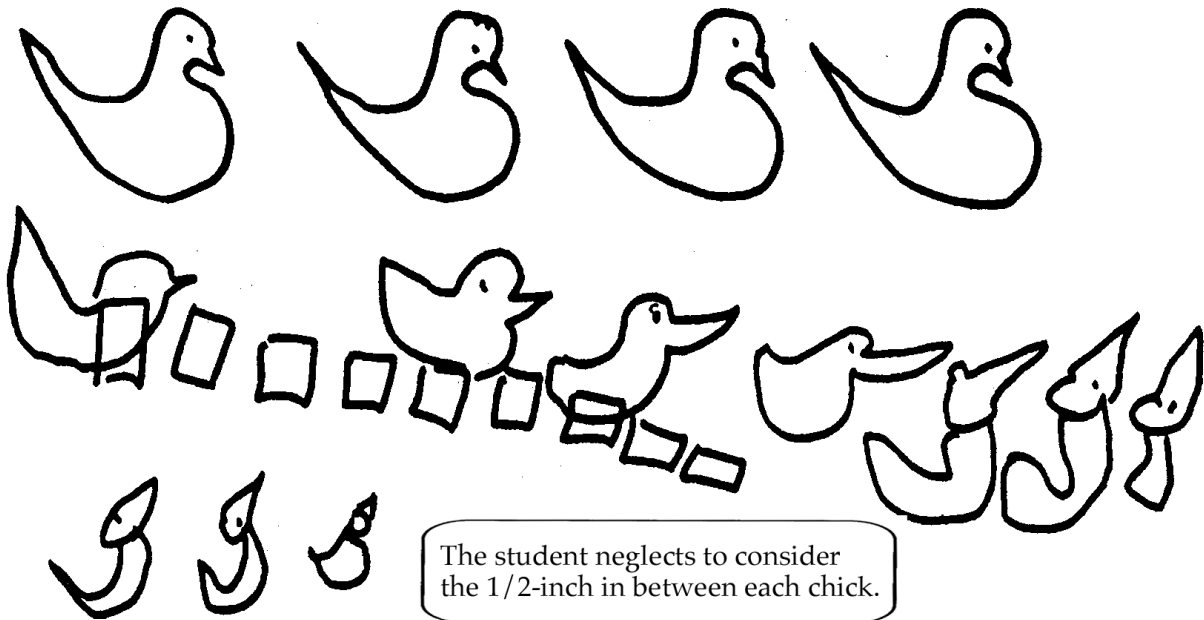
$$2+2+2+2+2+2+2=20$$

This equation is incorrect. There are 7 two's, not 10.
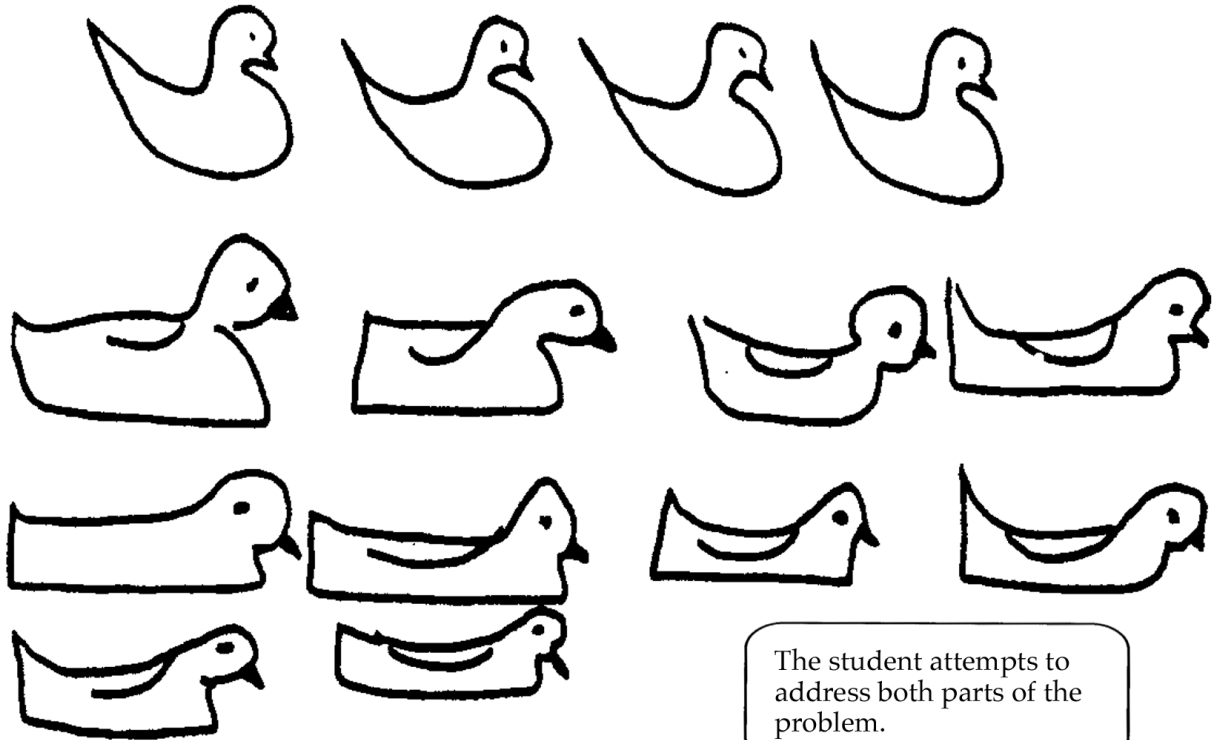
I C onted d y tos.

the train of peeps will de 20¢

The student confuses the symbol for cents and the symbol for inches.

Apprentice

The student uses some language to communicate.

The student shows the ten chicks.

The student attempts to address both parts of the problem.
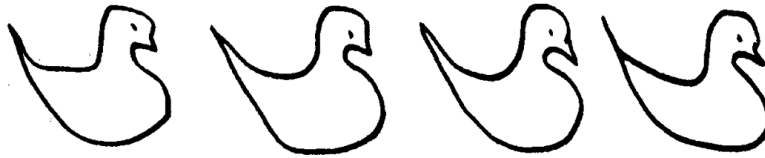
My line was 24 inchs long.

$$4 + 4 + 4 + 4 + 8 = 24$$

$$2+2+2+2+2+10+4 = \overset{24}{} \quad 8+2+10+4=24$$

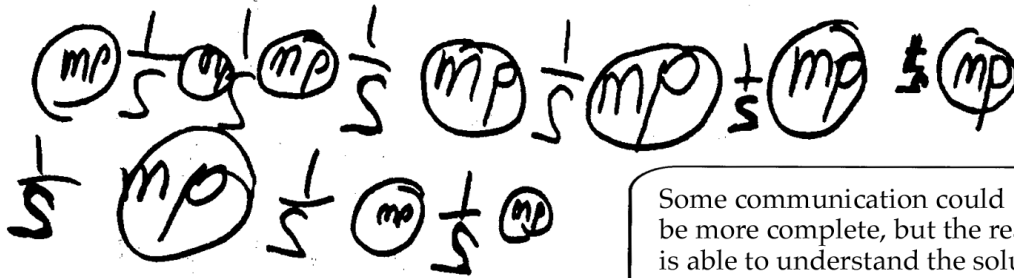The student does not clearly communicate how his/her solution was obtained.

The student's solution is incorrect.

Practitioner

The student creates an accurate diagram.

Some communication could be more complete, but the reader is able to understand the solution.

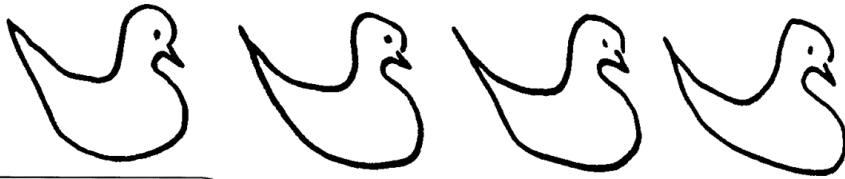Although the student has some reversals, the student uses accurate notations.

10 +10 +1⁊ = 5⊥

The student addresses both parts of the problem and achieves a correct solution.

I think there are 5⊥5 inches in the train of peeps.

Expert

The student shows an excellent command of computation.

This student has an efficient and sophisticated strategy.

$$10" \times 2" = 20" \qquad 20" + 4\frac{1}{2}" = 24\frac{1}{2}"$$

The train was twenty-four half inches long.

The student uses accurate and precise math language and notation.