Raisins

Just last week, you did an investigation to determine the average number of raisins in a 1 1/2-ounce box of Sun-Maid® Raisins. This weekend I saw an advertisement for Sun-Maid® Baking Raisins, which claim to be more plump and more moist than regular raisins.

Using your prior knowledge, determine the number of Sun-Maid® Baking Raisins you would expect to find in a 6 oz. bag.

Also...

Since I like to bake gingerbread-people and decorate them with raisins (I add eyes, a mouth and 3 buttons to each cookie), if I bought a 6 oz. package of Sun-Maid® Baking Raisins, how many cookies could I expect to be able to decorate?

Grade Levels 6 - 8

Raisins

Just last week, you did an investigation to determine the average number of raisins in a 1 1/2-ounce box of Sun-Maid® Raisins. This weekend I saw an advertisement for Sun-Maid® Baking Raisins, which claim to be more plump and more moist than regular raisins.

Using your prior knowledge, determine the number of Sun-Maid® Baking Raisins you would expect to find in a 6 oz. bag.

Also...

Since I like to bake gingerbread-people and decorate them with raisins (I add eyes, a mouth and 3 buttons to each cookie), if I bought a 6 oz. package of Sun-Maid® Baking Raisins, how many cookies could I expect to be able to decorate?

Context

We had been working on a statistics unit in my sixth-seventh multi-age classroom. We had done a data collection lesson in which each pair of students were given an 11/2 oz. box of Sun-Maid® raisins. They had to estimate the number of raisins in the box before opening the box. They could then open the box and reconsider their original estimate. They then counted all the raisins and recorded their findings on a class data sheet. We then practiced frequency tables, stem and leaf plots, and box and whisker plots. With the data organized and analyzed, students then were asked to determine the number of raisins in a "typical" 1 1/2 oz. box.

Two days after doing this lesson, I was reading a magazine and came across an ad for a six oz. package of Sun-Maid® Baking Raisins. I thought it would be interesting to see if my students could use their prior knowledge to estimate the number of raisins in this six oz. package.

Including the cookie decorating element in the task provided more math and added interest to the task. The students really enjoyed this task and I was pleased with the quality of their work.

What This Task Accomplishes

This task gives students the opportunity to use the statistical measurements gathered in a previous lesson, together with ratios to determine the number of raisins in the new package. They are able to make some decisions as to the predicted size difference between plain raisins and "moister, plump" baking raisins. There was the opportunity to use the language of statistics as well as a variety of mathematical representations.

What the Student Will Do

Students referred to the representations they had made in the previous lesson to determine the number of raisins in the 1 1/2 oz. box. They then set up a ratio to calculate the number of raisins in the six oz. box. Knowing that there are six raisins needed for each cookie, they then determined the number of cookies that can be decorated. These numbers would work if the regular raisins were the same size as the baking raisins. Students must make some conjecture as to the comparative size of the two types of raisins.

Time Required for Task

Part one of the task took one, 60-minute class period and part two took another 60-minute class period. Students then finished writing their responses as homework.

Interdisciplinary Links

This activity could be connected to a unit on consumerism. Are the advertised raisins more expensive? Are they really bigger? Heavier? Do they really bake better? Students could bake some cookies and find out. How environmentally conscious is the packaging? Which raisins are a better deal? What other factors would affect your decision about which package to buy? The possibilities are endless.

Teaching Tips

I recommend doing the exploratory task described in the first part of the task before giving this assessment task. It worked out well having pairs of students share small boxes of raisins (as I had 24 pairs of students). You would want to have at least 20 pieces of data for a meaningful analysis. You could add another step to the task by having every student study a 1/2 oz. box, pairs study the one 1/2 oz. size and then do this assessment task.

Suggested Materials

- 1 1/2 oz. boxes of raisins for each pair of students
- Six oz. bags of baking raisins (to validate solutions)
- Graph paper
- Calculators
- Rulers
- Chart paper (for class data collection)

Possible Solutions

There were about 95 raisins in a "typical" 1 1/2 oz. box of Sun-Maid® raisins. I have not yet been able to find the new Sun-Maid® Baking Raisins in the store, so I am not sure how many there are in the package. You can probably find them in the store now and count them for confirmation.

Benchmark Descriptors

Novice
This student has only partial understanding of the task. His/her decision to use guess and check is inappropriate as there is no way to check his/her guesses. There is no evidence of mathematical reasoning. There are a number of cookies given, but there is no supporting evidence to inform the reader as to the source of this figure. The reasoning that 40 raisins in a six oz. bag would equate to 46 raisins in a 6 1/2 oz. bag is faulty. The student uses the word "straight" for strategy and uses odd syntax "one and a half", "six and a half." There is very little correct use of mathematical language. The attempt at a box and whisker plot is improperly scaled.

Apprentice
This student does not inform the reader as to how s/he "knows" there are 97 raisins in the 1 1/2 oz. box. The box and whisker plot supports this statement, but the student never calls attention to the representation. In order to demonstrate full understanding of the task, the student would have to consider that these raisins are "plumper", and therefore there should be fewer in an ounce. The last sentence in the piece has no relevance to the task and states a rather obvious observation. There is no mathematical language beyond some very basic language of arithmetic (divided, amount).

Practitioner
This student addresses all aspects of the problem, including the fact that these raisins should be expected to be larger, therefore there should be fewer per ounce. The student decides that the new raisins would be twice the size of the others and carries out accurate calculations based on this assumption. This student explores the relationship between the number of raisins and grams, but does not acknowledge the fact that like grapes, raisins are not all the same size. The student uses strong mathematical language, especially on the second page. S/he includes two mathematical representations, one to organize data and another to highlight the central tendencies of the data.

Expert
This student refers to the last task done to inform the reader about the assumptions, which are being used as the basis for calculations. Using strong mathematical language throughout the solution, the student clearly shows a deep understanding of the problem. The strategy leads the reader directly to the solution and demonstrates sound reasoning throughout the solution. The reader does not need to infer how or why decisions were made. The mathematical representation communicates the prior research conducted by the student and the chart on page two shows a comparison of results using two sets of data collected. Realizing that there is not one correct answer for this problem, the student gives the reader a range of the number of cookies that one could expect to decorate using this package of raisins.