

Taking Mathematical Thinking to the Next Level

Jo-An Vargo
Head of Primary School

Peggy McLean, our math consultant, was here on October 12 and 13. This was her fifth visit to the Primary School, and she and I were excited to observe our students' mathematical thinking. Our curricular initiative is yielding results.

PreS 4's teachers watched as Peggy led Mrs. Sobel and Mrs. Koch's students in an investigation of combinations. Peggy showed the students a worksheet with 12 plain western boots. The group decided the ways in which they would decorate the boots: yellow or red "buttons", blue or green "pictures", and white or black "lights." The challenge was to make each boot different by only one of the attributes used in their previous boot. This activity stretched our children to think about a task systematically. We knew that there would be a range of understanding, and we weren't looking for mastery. The students worked diligently, and their thinking was evident. This is a sophisticated task, and we were pleased with the level of understanding we observed.

Our teachers' work in preschool, kindergarten and first grade is paying dividends by the time our students reach second grade. Their understanding of numeration, place value and basic operations is impressive. The results of our beginning-of-the-year math assessment showed growth in the level of mastery demonstrated by all our students. And 57 percent of the grade scored with an accuracy of 90 percent or above!

Peggy noticed a different level of proficiency in mathematical problem solving in our third grade class. Our second grade students focused on problem solving last year, and the third grade teachers introduced a more formal unit of study that taught problem solving strategies this fall. Therefore, the team asked Peggy to demonstrate the steps we will expect our students to follow when they encounter a word problem this year: Find the question you must answer to solve the problem, identify the strategy you will use, solve the problem by showing your thinking and computation work and look back and explain each step that you used as you give your answer. This last step also may lead to a reworking of the problem if students discover an error. Our students approached this task with an understanding of what was required and a level of confidence in their ability to tackle the problem as a two-person team.

I include the three problems our third grade teams worked on to give you an understanding of the various levels of thinking required. Remember, the purpose of the lesson was to practice the recording of a formal problem-solving process, so we gave a range of mathematical problems in terms of their level of difficulty.

1. There were 36 students who went on a field trip to the museum. There were twice as many girls as boys. Three boys were wearing glasses. How many boys who went on the field trip did not wear glasses?
2. Mr. Olsen bought 3 presents. The first present he bought cost \$18. The second present cost \$7 more than the first present. The third present cost \$11 less than the first present. How much did Mr. Olsen pay for all 3 presents?
3. Wanda has three 2¢ stamps and two 3¢ stamps. How many different amounts of postage can she make using one or more of these stamps?