

Matching Marbles

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This month's Puzzle Corner activity fits in a category normally called logic problems. Logic problems usually don't require calculations of any sort, making them different from most other math problems. To solve these types of problems, logical or mathematical thinking must be used. *Matching Marbles* is a perfect example of this type of problem because to solve it, students must "think through" the problem, not mindlessly apply some arithmetic operation. Because of this focus on thinking, logic puzzles like this one are sometimes difficult for students who are too often fed a steady, but unbalanced, diet of computational problems in math classes. Ironically the computational focus of most math classrooms is diametrically opposed to what mathematicians do in their work—which usually focuses more on mathematical thinking than on computations. Mathematicians relish the opportunity to use a logical, thinking approach to solving the problems they encounter. Since mathematical thinking is so important to mathematicians and often lacking in mathematics classrooms, this activity is an ideal one to help students understand that mathematics is more than just doing calculations. Because of this problem's emphasis on mathematical thinking, students are challenged not only to provide the answer to this puzzle, but also to show how they got their answers using words and/or pictures. (For younger students, colored blocks or other manipulatives can be provided as aids to demonstrate students' mathematical thinking and/or problem-solving strategies.)

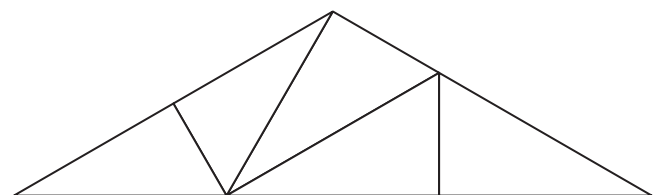
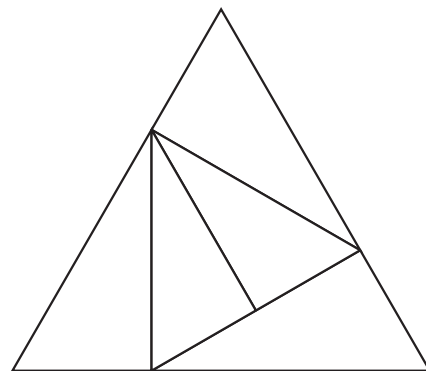
The word problem presented in this activity states that there are five blue marbles, two yellow marbles, four red marbles, and three green marbles in a bag. Without looking, marbles are pulled out of the bag one at a time and not replaced. Students are

challenged to determine how many marbles must be pulled out to guarantee that there are at least two marbles of the same color. (While it is possible that the first two marbles pulled out might match, this is not likely, and this certainly doesn't guarantee that you have two of the same color—so the answer is more than two.)

I hope that you and your class find this puzzle challenging, but enjoyable. The solution will appear in the next issue. If you need the solution before then, or have any other questions or comments, please contact me at dyoungs@fresno.edu or at the AIMS address found on the back cover of this magazine.

Last Issue's Puzzle

The Five-Triangle Puzzle challenged students to use five triangular puzzle pieces to make two larger triangles. The solutions are shown below.





There are five blue marbles, two yellow marbles, four red marbles, and three green marbles in a bag. Without looking, you pull out marbles one at a time and place them on a table. If you get lucky, you might pull out two marbles of the same color in the first two draws, but this is not likely.

The challenge in this puzzle is to determine how many marbles you would have to withdraw to *guarantee* that you have at least two marbles of the same color.

Using words and/or pictures, explain how you came up with your solution.

