CAROLE'S COMMENTARY
PROBLEMS WITHOUT NUMBERS

Dear Colleagues,

For many years, I have been interested in what makes the learning of math more accessible, interesting and entertaining to all students and adults. So, every Carole's Commentary contains a reference to a well-known thinker, a book, a paper, a song, an art creation, a research study, or ?

Here is a 1909 book authored and self-published by S. Y Gillian: *Problems Without Figures*: *For Fourth Grade to Eighth Grade and for Mental Reviews in High Schools and Normal Schools.* I discovered this book about 5 years ago. (You can download the book at no cost, Note that grammar and syntax vary from what we teach today.) In the introduction, Gillan writes:

> "Every problem in arithmetic calls for two distinct and widely different types of work: First, the solution, which involves a comprehension of the conditions of the problem and their relation to one another, second the operation. First we decide *what to do*, this requires reasoning. Then we do the work; this is a merely mechanical process, and the more mechanical the better."

What is remarkable about the book is that each problem asks for a **solution strategy,** only. Numbers necessary for a solution are NOT given. Students found this quite interesting and liked many of the "weird" problems! And, the fact that Gillian's words in 1909 have been repeated for more than a century in many publications focusing on problem solving, and, in particular, the design and use of solution strategies, and the evaluation of solutions in problem contexts. In all cases, arithmetic computations are only one tool available for solving problems.

Gillam's work has had a major influence on my thinking, research, and writing. Download the book and share the problems with your students.

Try this Gillan problem:

> # 96. In a box of marbles some are red, some white, and the others blue. If you are told the total number, also the sum of the red and the white, and the sum of the blue and the white, how can you find the number of each color?

Happy Solving!

Carole