Singapore Mathematics and Science rank first in the world in the Trends in International Mathematics and Science (TIMSS) studies. We are revamping Prealgebra to College Algebra adapting the Singapore Mathematics Problem Solving Framework. We also involve the Theory of Constraints (TOC) and Thinking Process tools. The Framework is deeply rooted in underlying mathematics principles of effective problem solving methods, that is represented in a pentagon of interrelated components: Concepts, Skills, Processes, Metacognition, and Attitudes. Great emphasis is placed on the aspect of learning the concepts numerically, graphically, algebraically and analytically. The key feature of the model method is illustrated in rectangular bars which are pictorial representations of the models applicable to both arithmetic and algebra topics helping students learn the mechanics involved in solving word problems. This concrete-pictorial-abstract approach is depicted by the part-whole and comparison models. In elementary and intermediate algebra geometrical interpretations of topics such as factoring deepen students’ understanding. TOC is used to transcend the student from pictorial to logical thinking approach showing the logical connection between the assumptions and the unknown/s. (Received September 14, 2013)