



The Key Elements to Mathematics Success and the English Language Learner (ELL)

- **SOLVE** – A step-by-step procedure to attack word problems, dissecting the English language by identifying key words needed to solve the problem, and mapping out a plan with pictures and phrases to ultimately arrive at a well thought out answer. Steps can be written in students' native language while they are still becoming familiar with the process of SOLVE and gradually transitioning into English only.

The steps of SOLVE have been modified slightly for use with ELL students. The modified steps provide additional support and involve verbal communication about the process, which is a vital link for the ELL student:

S - Underline the question. TPIAMTF (this problem is asking me to find) – **THE** _____. The students cannot just restate the question if they are made to start a sentence with *the*.

O - Circle the necessary facts. When writing out the necessary facts, be as brief as possible and teach the students abbreviations right away (\$, #, lb, cm, pkg. etc.).

L - Choose an operation and discuss a plan out loud. – +, •, /

$$\frac{\text{number of nuts}}{\text{total}} + \frac{\text{number of bolts}}{\text{number of boxes}} = \frac{\text{total}}{\text{answer}}$$

V - Estimate the answer out loud. Then use the set-up created in the L step to carry out the plan.

E - Choose your answer.

- **Cooperative Pairs** – Working, questioning, and communicating with others regarding mathematics at all stages of learning. Activities are done in an interactive setting, encouraging language development along with mathematical development. This includes the pairing of ELL students who speak the same language(s) with others who may be at varying stages of their English language development.
- **Modeling with Manipulatives** – Students participate in activities leading to the discovery of on-grade-level mathematical concepts. Through this process, they develop mathematical understanding while exploring ways of expressing their discoveries in English. Manipulative use is consistent throughout the program. The appearance of each manipulative, their meaning, as well as the language used to describe the actions of these manipulatives remain the same throughout.
- **Word Walls** – Updated through the use of KEMS lessons, new math vocabulary words (and their meaning/pictorial representation) are added for every new concept as they are discovered. The Word Wall is an interactive tool for all learners and provides an additional language resource for ELL students. Additionally an Operation Word Wall is created by each class and used for solving word problems throughout the year. As an added resource, words can be written in both English and the native language of the learner. Pictures/descriptions are also encouraged next to words wherever appropriate.
- **Video Clips of Each Lesson** – Available for use in class at www.KEMSmath.com, the video clips can help overcome the significant classroom language barriers ELL students face. These video clips, though in English, show key vocabulary words as a way of familiarizing students with appropriate vocabulary used to build a concept.