EMBEDDED PROCESS STANDARDS

Problem-solving, Reasoning and Proof, Communication, Connections, and Representation are the NCTM process standards. These process standards highlight ways of acquiring and using mathematics knowledge and help give meaning to mathematics.

Mathematical knowledge is built through problem solving. Problem-solving means to engage in a task for which a solution is not known in advance. Engaging in these tasks allows children to apply and adapt strategies, to solidify and extend knowledge, and to stimulate new learning. The possible learning activities are meant to provide opportunities for children to engage and explore in problem-solving strategies that are embedded across this model mathematics curriculum.

Reasoning and proof must be a consistent part of all mathematics. Reasoning helps mathematics make sense to children when they are investigating conjecture and evaluating mathematical arguments. Systematic reasoning is a habit of mind that is developed throughout the curriculum activities and lessons using questioning techniques.

Communicating is an important component in all aspects of life. Children need to use the language of mathematics to organize and analyze their thinking, as well as to justify their reasoning. Part of communicating in mathematics is the ability to see the perspective of others and learn to evaluate their thinking. This interaction provides the opportunity for children to weigh the strengths and limitations of different approaches and develop critical thinking skills.

Making sense of the world around us requires the ability to make connections between varieties of contexts. Children must be able to recognize the connections between and among mathematical ideas. The ability to recognize how ideas in different areas are related helps children develop the understanding that mathematics is not a set of isolated skills. The integrated lessons in this model mathematics curriculum use the insights gained by children in mathematics to solve problems in other contexts.

Children need to represent ideas in ways that make sense to them; however, they need to use representations that allow for accurate communication with others as well. In order to model, interpret and communicate mathematical ideas, representations are used to organize and record solutions to problems.

Engagement in mathematical content is accomplished when instruction is designed through the use of these process standards. Children will gain a better understanding of mathematics and have longer retention of mathematical knowledge as they solve problems, reason mathematically, prove

mathematical relationships, participate in mathematical discourse, make mathematical connections, and model and represent mathematical ideas in a variety of ways.

"*Teaching is not a matter of pouring knowledge from one mind into another as one pours water from one glass into another. It is more like one candle igniting another. Each candle burns with its own fuel. The true teacher awakens a love for truth and beauty of mathematics in the heart — not the mind*."

— David R. Garcia, An Essay Well Worth Reading