

## Strand I – Global Mathematical Processes:

The student understands and uses mathematical processes.

**Benchmark (K – 12):** The student uses problem solving, reasoning and proof, communications, connections, and representations as appropriate in all mathematical experiences.

### Performance Standards:

Grades Kindergarten through twelve:

#### Problem Solving and Reasoning

- **Develops** resourcefulness and perseverance in problem solving in mathematics and other disciplines.
- **Recognizes** when to use previously learned strategies to solve new problems.
- **Develops and uses** strategies (e.g., breaking complex problems into simpler parts) for solving given problems.
- **Monitors, discusses, and reflects** on the process of mathematical problem solving.

#### Reasoning and Proof

- **Makes and investigates** mathematical conjectures and **uses** them successfully in developing and evaluating mathematical arguments and proofs.
- **Uses** the concept of counterexample to test the legitimacy of an argument.
- **Develops** a logical sequence of arguments leading to a valid conclusion or solution to a problem (e.g., statement/reasons, proof, informal proof, and algebraic steps).

#### Communication

- **Works** in teams to share ideas, to develop and coordinate group approaches to problems, and to communicate findings.
- **Communicates** mathematical thinking coherently and clearly to others.
- **Analyzes and evaluates** mathematical thinking and strategies of others.

#### Connections

- **Relates** applications to mathematical language in various modalities.
- **Identifies and connects** functions with real-world applications.
- **Identifies** how seemingly different mathematical situations may be essentially the same (e.g. the intersection of two lines is the same as the solution to a system of linear equations).
- **Investigates and explains** the mathematics required for various careers.
- **Recognizes and applies** mathematics in contexts outside the mathematics course.

#### Representations

- **Develops** a repertoire of mathematical representation (e.g. pictures, written symbols, oral language, real-world situations, and manipulative models) that can be used purposefully and appropriately interchangeably.
- **Selects, applies, and translates** among mathematical representations to solve problems.
- **Uses** representations to model and interpret physical, social, and mathematical phenomena.
- **Uses** manipulatives, calculators, computers, and other tools as appropriate in order to strengthen mathematical thinking, understanding, and power to build upon foundational concepts.