Thinking Strategies

Mathematics is a creative activity.

Mathematics in the elementary school often has computation as a focus. Even though national and state guidelines suggest a broadening of the mathematics curriculum, many educators and parents cling to the belief that mathematics is about becoming skillful at performing paper and pencil computations rapidly, so that it can be done without thought. A different perspective considers mathematics to be a creative activity in which students are constructing patterns and relationships.

Emphasis should be on making sense.

With the advent of inexpensive calculators and computers, the need for high levels of proficiency with complex computations such as multi-digit long division has diminished. On the other hand, estimation and mental arithmetic have assumed more central roles. A goal of school mathematics should be the development of an inter-related web of meanings which allow a person to move around easily in the world of mathematics; to approach tasks in a variety of ways. This suggests that the elementary school mathematics curriculum should place emphasis on making sense of mathematics relationships and being able to reason flexibly. Thinking strategies as described below should be central to the mathematics curriculum.

Thinking Strategies:
Double + 1
Making ten
Compensation

Thinking strategies are one way we can encourage students to build fundamental relationships and develop efficient ways of adding. For example, many students find it easy to learn doubles because of symmetry. Knowing doubles can be a basis for solving many problems by converting a task to one involving doubles. A student might find 6 + 7 by thinking 6 + 6 and one more. This is called the **doubles-plus-one** thinking strategy. A doubles minus one thinking strategy is equally useful.

Ten becomes a benchmark number.

When considering 9 + 7, students have a variety of ways of determining the sum. **Making Ten** is one thinking strategy that has proven to be quite powerful. Using this thinking strategy, a student might reason that by taking one from seven and putting it with the nine, the task is changed to 10 + 6 which can then be seen as 16. A student who uses this method has obviously constructed ten as an abstract unit and forms the intention of making ten. Thus, for such students, ten has become a benchmark number that has special significance. If a student has not constructed ten as a mathematical object, she or he will not see this strategy as a