

## Research on the Benefits of Manipulatives

Students with innovative, common sense, dynamic, tactile or kinesthetic learning styles learn best when involved in hands-on tasks, games or cooperative learning (McCarthy, 1987). While using manipulatives, students have fun, which has been proven to increase engagement, motivation and self-confidence. The **National Center for Accessing the General Curriculum** (2001), in a review of 14 studies, found that “use of manipulatives compared with traditional instruction typically had a positive effect on student achievement.” The effect was consistent across the board but especially beneficial for high-risk, learning disabled and limited English proficient students.

Manipulatives help students make the leap from intuitive to logical thinking, from the concrete to the abstract (Hartshorn & Boren, 1990). Studies have even found that first grade students need tangible objects to count correctly (Steffe, Thompson & Richards 1982), and that those who had manipulatives available during problem solving tasks or tasks with large addition problems scored much higher than those who did not have manipulatives (Steffe & Johnson, 1970; Carpenter & Moser, 1982). Simply put, mathematics achievement increases when manipulatives are used (Suydam & Higgins, 1977). Plus, a meta-analysis of 60 studies found that the long-term use of manipulatives was even more effective than short-term use (Sowell, 1989).

In every decade since 1940, the **NCTM** has encouraged active student involvement through the use of manipulatives at all grade levels. In fact, in their publication *Principles and Standards for School Mathematics* (2000), the **NCTM** explicitly recommends the use of manipulatives in the classroom. Classroom teachers also know that manipulatives work. In a recent survey on instructional materials, 85% of elementary school teachers and 67% of teachers who teach combined grade levels rated manipulatives as "highly effective" (National Education Association, 2002).

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