

**Subject Area:** Elementary Math

**Grade Level(s):** K-5

**Title of Approach:** Manipulatives

**Description of Approach:**

- Utilizing concrete materials or objects in helping students to visualize concepts and construct meaning
- Gives students a concrete representation of an abstract idea
- Gives a hands-on approach to learning

**References:**

1. Reimer, K., & Moyer, P.S. (2005). Third-graders learn about fractions using virtual manipulatives: A classroom study. *The Journal of Computers in Mathematics and Science Teaching*, 24(1), 5-25.
2. Furner, J.M, Yahya, N, & Duffy M.L. (2005). Teach mathematics: Strategies to reach all students. *Intervention in School and Clinic*, 41(1), 16-23.
3. DeGeorge, B., & Santoro, A.M. (2004). Manipulatives: A hands-on approach to math. *Principal*, 84(2), 28.

**How to Information:**

Adding:

1. given two numbers (37 + 68) to add together
2. make pile of 37 blocks (3 tens and 7 ones) and a pile of 68 blocks (6 tens and 8 ones)
3. take all ones blocks (7+8) and make tens out of it (1 ten and 5 ones)
4. add new ten to existing tens (6+3+1=10)
5. trade tens for 100 block
6. equals 105

Other Manipulatives to Use:

- Pattern Blocks:
  - i. Multicolored, multi-shaped blocks that form amazing patterns
  - ii. Helps students to identify different shapes and finding and understanding pattern lines
  - iii. K-8
- Base 10 Blocks:
  - i. Multi-colored blocks arranged in values of ones, tens, hundredths, and thousandths
  - ii. Teaching place value, number concepts, operations, and measurement
  - iii. K-6
- Cuisenaire Rods
  - i. Multi-colored rods arranged in different lengths

- ii. Opportunities to introduce, investigate, and reinforce key math topics, such as- addition, subtraction, geometry, measurement, multiplication, division, and more
  - iii. K-6
- Colored Tiles
  - i. brightly colored square tiles
  - ii. modeling important math concepts to develop basic arithmetic skills,
  - iii. logical thinking, and algebraic and geometric understanding
  - iv. Useful for activities in patterning, counting, sorting, measuring, probability, fractions, estimation, and place value
  - v. K-8
- Tangrams
  - i. Brightly colored tiles in a variety of shapes
  - ii. Used for area, proportion, and spatial visualization activities
  - iii. 4-8
- Geoboards
  - i. Squares with pegs to use rubber bands to make shapes
  - ii. Used to make shapes
  - iii. K-8
- Unifix Cubes
  - i. Colorful, interlocking cubes
  - ii. An ideal way to demonstrate number relationships, measurement concepts, and much more
  - iii. K-6
- Fraction Circles
  - i. Helps students grasp fraction concepts with these colorful circles
  - ii. 2-8
- Learning Clocks
  - i. Demonstrate the time with this easy-to-read clock
  - ii. 1-4
- Attribute Blocks
  - i. Blocks in an array of sizes, colors, and shapes
  - ii. An ideal tool to strengthen logic and problem-solving skills
  - iii. K-6
- Money
  - i. An array of coins and bills
  - ii. Useful for grasping the idea of money
  - iii. 2-6
- Balances and Weights
  - i. A scale with weights in a variety of sizes
  - ii. Used for understanding volume, measurement, and weight concepts
  - iii. K-12
- Measuring Spoons and Cups

- i. A set of spoons and cups for measuring
  - ii. Used for understanding volume, measurement, and weight concepts
  - iii. K-12
- Rulers
  - i. A piece of plastic or wood with measurements of inch, centimeter, and, millimeter
  - ii. Used for measuring length
  - iii. 2-12
- Hundred Number Chart
  - i. A chart with numbers in line from 1 to 100
  - ii. Used to understand counting, skip counting, and patterns
  - iii. K-6
- Everyday objects
  - i. dry pinto beans
  - ii. dry pasta
  - iii. M&Ms
  - iv. buttons
  - v. Used for sorting, counting, addition, subtraction, fractions, multiplication, and division
  - vi. K-12

**Implications for Practice/Other Considerations:**

- use appropriate manipulatives for different concepts
- use mainly for initial concept and then fade away

**Additional Links:**

- ETA Cuisenaire Math Catalog  
-[www.etacuisenaire.com](http://www.etacuisenaire.com)
- National Library of Virtual Manipulatives  
-<http://nlvm.usu.edu/en/nav/vlibrary.html>

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