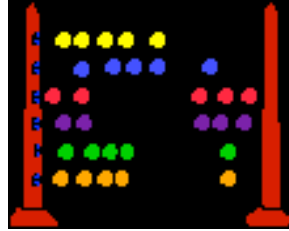


Using Manipulatives in Math



1. What is a manipulative?
 - objects used by students which enable them to actively learn a concept.
 - concrete materials that are used for "modeling" or representing math operations or concepts.
2. Why use manipulatives?
 - to build a strong foundation
 - to develop understanding of concepts
3. Which concepts are manipulatives useful in teaching math?
 - **Number concepts**
Counting, making sets, comparing numbers:
buttons, dried beans, pennies, paper clips, macaroni, soda caps, blocks, small toys, Unifix Cubes, craft sticks, store bought counters
Numeral recognition and writing numerals:
Number cards, dot pattern cards, felt or sandpaper numbers, clay, sand
 - **Place Value**
Unifix Cubes and place value mat, base 10 blocks, craft sticks and cans, place value kits, abacus
 - **Addition**
Unifix Cubes and place value mat, base 10 blocks, craft sticks
 - **Subtraction**
Unifix Cubes and place value mat, base 10 blocks, craft sticks
 - **Decimal Fractions**
Base 10 blocks, hundred grid, fraction number line



- **Multiplication**

*Facts: multiplication/division mat, ones squares,
Two-digit and Three-digit: base 10 blocks*

- **Division**

*Facts: multiplication/division mat, ones squares
Two-digit and Three-digit: base 10 blocks*

- **Common Fractions**

*overhead fractions squares and circles,
construction paper kits, two color counters, number line*

- **Geometry**

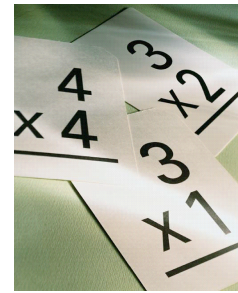
geoboard, shapes, toothpick and gumdrops

- **Measurement**

paper clips, Unifix Cubes, rulers, common measurable objects

- **Pre-Algebra**

*pre-algebra mat with two color counters, positive/negative number
line*



4. Teaching with Manipulatives



- Always let students use manipulatives when they are introduced to a new concept.
- Demonstrate with manipulatives on a magnetic board, flannel board, or an overhead projector
- Connect the use of manipulatives to the understanding of the operation of the answer.
- The purpose of using manipulatives is to help students understand a math concept, not to give them an easy way to get an answer. They must proceed from concrete to abstract to learn the concept well.
- Connect the use of manipulatives to abstract problems.
- Do not explain how to get the answer, explain the process, explore other ways of solving the problem, and then explain the answer.
- While teaching less concrete lessons, refer to the manipulative activities and demonstrate again if necessary.



- Allow students to play or explore new materials before teaching with them.
- Discuss appropriate behavior for using, storing, and distributing materials.

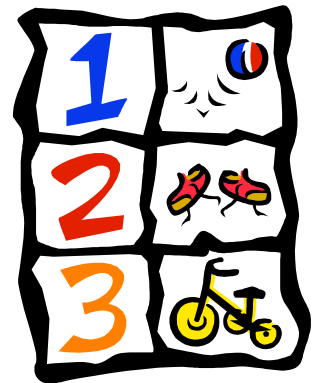
5. How Do I Manage All of these Manipulatives?

Storage

- Package for individual student use.
- Store in durable, labeled containers. Keep a spare parts container or bag.
- Use envelopes, resealable plastic bags, paper cups, plastic containers, shoe boxes, plastic storage boxes.

Distribution

- Students keep at desk
 - Teacher distributes *
 - Students pick up one row at a time
 - Distribute by rows or tables*
 - Pass container around room
 - Student distributes materials*
- * (my methods)



Expense

- Make alternatives
- Work in groups or with partners
- Buy or make manipulatives that will work for several concepts
- Store items in the library or one common place for access to anyone that needs them. (They should check out the materials for accountability sake).

Math Manipulative Websites

<http://nlvm.usu.edu/en/nav/vLibrary.html>

http://www.ct4me.net/math_manipulatives.htm

http://www.mathplayground.com/math_manipulatives.html

http://www.mathplayground.com/math_manipulatives.html

Hand Made Manipulative Instructions

<http://mason.gmu.edu/~mmankus/Handson/manipulatives.htm>

Article:

<http://teacher.scholastic.com/lessonrepro/lessonplans/instructor/burns.htm>

