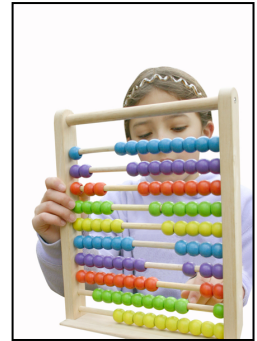


Using Manipulatives in Math

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1. What are manipulatives?
 - 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 patterns, 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 and 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**
 - *fraction 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, paper, or whiteboard.
- Connect the use of manipulatives to the understanding of the operation.
- The purpose of using manipulatives is to help students understand a math concept, not to give them 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& Organization

Organizing & Storing BJU Press Math Manipulatives

<https://youtu.be/awVq8ynP9ss>



Expense

- Make alternatives
- Work with partners
- Buy or make manipulatives that will work for several concepts

Websites and Resources:

- National Library of Virtual Manipulatives
http://nlvm.usu.edu/en/nav/grade_g_2.html
- Computing Technology for Math Excellence
http://www.ct4me.net/math_manipulatives.htm
- MathFun.com
<http://www.mathfun.com/Manipulatives.htm>
- Scholastic Article
<http://teacher.scholastic.com/lessonrepro/lessonplans/instructor/burns.htm>
- mathplayground.com
http://www.mathplayground.com/math_manipulatives.html
- Hand Made Manipulative Instructions
<http://mason.gmu.edu/~mmankus/Handson/manipulatives.htm>
- KidZone Math Word Problems
<http://www.kidzone.ws/MATH/wordproblems.htm>
- Base Ten printables
<http://mason.gmu.edu/~mmankus/Handson/manipulatives.htm>
- Lists and lists of links for virtual manipulatives
<http://www.emints.org/ethemes/resources/S00000592.shtml>
- paper rulers
http://www.vendian.org/mncharoty/dir3/paper_rulers
- nets
<http://gwydir.demon.co.uk/jo/solid/cube.htm>
- *Teaching Children Mathematics & Mathematics Teaching in the Middle School* (NCTM)
- *Elementary and Middle School Mathematics*- John A Van De Walle