Manipulatives Box

Materials

- File folder
- Laminated numbers
- Number tiles
- Number puzzles
- Large-number calculator
- Coins (penny, nickel, dime, quarter)
- Number lines
- Base ten blocks
- Attribute blocks
- Counting beads, shapes, and toys
- Plastic or sandpaper numbers
- Math puzzles
- Tangram pieces
- Geoboards
- Box or tray
- Spinners
- Dice
- Legos
- Isometric dot paper
- Graph paper
- Geometric shapes of different colors and sizes

Description

Manipulatives are concrete objects that commonly are used in teaching mathematics. Every math curriculum comes with a set of math manipulatives that can be used with the entire class. Some students, however, will require manipulatives not commonly found in standard sets. One student, for instance, loved dinosaurs, so his teacher found a set of plastic Tyrannosaurus Rex toys and let him use them for counting, adding, and subtracting during math lessons. Although any student may benefit from special materials for any given lesson, students with disabilities, in particular, may need manipulatives (both commercial and teacher-created) to engage in daily lessons and understand abstract concepts.

Many different manipulatives are commercially available (see materials list and vendors for this adaptation), but it is also possible to make manipulatives for almost any purpose using materials you have around the classroom and the home (e.g., craft sticks, beans, straws, pennies, egg cartons, baby food jars, buttons). An excellent way to store and present them is to use a manipulatives box.

Directions

Give students time to explore the manipulatives you assign. Then, talk with them about why and how manipulatives will help them learn. You will also need to set ground rules for using the manipulatives. Talk to your students not just about using the manipulatives but also about practicing with them independently, sharing them, and even storing them.
Examples

Since it is difficult for Wylan, a student with cognitive disabilities, to generalize what he learns, his teacher gives him real coins and bills to work with in math class when other students are using play money.

Reggie, a first-grader with autism, uses toy cars from a manipulatives box when his class studies sets, subsets, and addition. Cars are Reggie's special fascination; therefore, he is most motivated when he can use these materials as part of the daily lesson.

While exploring and learning about edges, vertices, faces, or different shapes, Ryan, a student with cognitive disabilities, uses a set of wooden geometric shapes (e.g., sphere, cube, rectangular prism, cone) kept in a manipulatives box to complete his class work. He also takes these materials home so his parents can easily see what and how he is learning new math concepts and can help him more easily with his homework assignments.

In his idea-packed book, Differentiating Math Instruction, Bender (2005) shares one teacher's idea for using craft sticks to represent multiplication. In teaching the threes times tables, students use three sticks to make triangles on their desks. Then they count the sides (three). They are then prompted to say, “One triangle with three sides equals three sticks,” and then shorten it to “One times three equals three.” They continue by adding more triangles and then counting the sides. Students can tackle 4s by building squares, 5s by building stars, and 6s by building hexagons.

Keep in Mind

Just giving students access to manipulatives will not necessarily help them to learn new skills and competencies. Manipulatives should be carefully chosen for different activities. In addition, teachers must be sure to clearly explain (sometimes several times) the relationship between the abstract concept and the math manipulative. Finally, teachers need to carefully observe students and assess their understanding so it can be determined when and how to move from concrete to abstract, when to provide a different type of scaffolding or support, and when to provide more explicit teaching.

References/Recommended Reading


**Vendor**

**Learning Things**
http://www.learningthings.com/items.asp?Cc=0113
Hundreds of math manipulatives

**Web Sites**

**Math Playground**
http://www.mathplayground.com
Several “virtual” math manipulatives ranging from interactive fraction bars to geoboards to control with a mouse

**National Library of Virtual Mathematics**
http://nlvm.usu.edu/en/nav/vlibrary.html
Online activities using virtual manipulatives for K–12 students

**suite101.com (Math manipulatives for students in special education)**
http://specialneedssuite101.com/article.cfm/math_manipulatives
An article by Elizabeth Scott on using math manipulatives