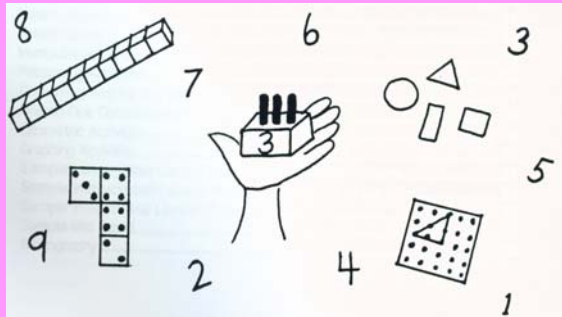


## Manipulatives: Motivating Mathematics



## Overview

- Preparation of the project involves the selection and purchase of appropriate and meaningful mathematical manipulative materials.
- Students are introduced to the various manipulative during their instructional mathematics class.
- A Mathematics Lending Library is established to allow students to check out the materials for home use.
- Workshops for parents introduce them to the materials and how they are used.

## Goals

- To motivate, enhance, and enrich students' interests in mathematics through the use of meaningful hands-on manipulative mathematics materials.
- To reinforce, improve, enhance and enrich the students' acquisition of mathematical concepts.
- To provide an opportunity to improve and enhance parent participation.
- To familiarize teachers with the current practices and uses of manipulatives for instructional purposes.
- To assist teachers in the selection and purchase of meaningful and motivating manipulative materials.
- To assist teachers in setting up a Mathematics Manipulative Lending Library.

## How Can Manipulative Materials Be Used?

- To introduce a new mathematical concept.
- To reinforce previous learning.
- To provide concrete representations of abstract ideas.
- To provide for individual learning styles.
- To foster creative thinking processes.
- To provide experience in problem solving situations.
- To provide opportunities for students to become active participants in their own learning experiences.
- To provide opportunities for students to exchange viewpoints with their classmates.
- To diversify the educational activities.
- To enhance interest and motivation for learning new concepts.

## Helpful Hints for Using Manipulatives

- Consider the pedagogical and physical criteria when selecting meaningful materials
- Plan and prepare in advance for the activity.
- Make a trial run, try using the materials before the lesson.
- Make sure there is an adequate amount of the materials that will be used.
- Make sure that the materials are in working order, no broken or missing pieces.
- Provide adequate time for using the materials, do not hurry or rush the activity.
- Encourage students to think for themselves.
- Try to allow for and encourage group interaction.
- Provide follow-up questions and answer time.
- Share your ideas and successes with your peers.

## Criteria for Selecting Manipulatives

- The materials should facilitate learning.
- The materials should provide a clear representation of the mathematical concept.
- The materials should be developmentally appropriate.
- The materials should be of high interest and motivational.
- The materials should be adaptable, that is, they should be able to be used for more than one purpose.
- The materials should be durable.
- The materials should be appealing and attractive.
- The materials should allow for easy storage.
- The materials should be of reasonable cost.
- The materials should be safe for students to use.

## Manipulative Materials



## Suggested Manipulative Materials

- Abacus
- Attribute Blocks
- Beads
- Clocks
- Color tiles
- Counters
- Counting frames
- Cuisenaire Rods
- Dominoes
- Fraction sets
- Geoblocks
- Geoboards and bands
- Linking cubes
- Measuring containers
- Money kits
- Number boards
- Number lines
- Number tiles
- Pattern blocks
- Place Value Kits
- Rulers
- Scales
- Sorting materials
- Tangrams
- Thermometers
- Unifix cubes

## Setting Up a Mathematics Lending Library

- Step 1
  - Carefully select and purchase the materials
- Step 2
  - Catalog and package the materials in appropriate containers, boxes or bags.
  - Number each package of materials
  - Secure a library lending card pocket to each package.
  - Label library cards with name and number of the manipulative package
- Step 3
  - Introduce students to the various materials during appropriate instructional class periods.
- Step 4
  - Send letters home to parents explaining the Mathematics Lending Library policies.
  - Schedule Parent Workshops to familiarize parents with the materials
- Step 5
  - Allow students to check out the materials
- Step 6
  - Evaluate the success of the Mathematics Lending Library

## Suggestions for Checking In/Out Materials

- Designate specific days for checking in/out materials.
- Allow small groups of students to check in/out the materials at a time.
- As students check out the materials, they must write their name on the library card found in the package's card pocket.
- Place the student's library cards in alphabetically order in an index box.
- Use a Bulletin Board to facilitate keeping track of the materials. Library card pockets with the students' names can be stapled on the bulletin board. As students check out the materials, they simply place their library card in their card pocket.
- Periodically check the manipulative materials to be sure all pieces are in working condition.
- Students may only check out one manipulative package at a time.
- Manipulative packages must be returned within ten days from the date of checkout.

## Checking In/Out Materials



## Checking In/Out Materials

