



Connecting Practice and Research  
in Mathematics Education

# Professional Learning Guide

## Manipulatives

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Manipulatives are physical, 3-dimensional objects that students use to increase their understanding of, and connections between, mathematical concepts. Although manipulatives are suggested for all strands, using manipulatives such as algebra tiles and 3-dimensional solids can be particularly effective to support student learning of algebra and measurement concepts.

**“Manipulatives should be used effectively and selectively as a means of facilitating the ongoing transition from the concrete (physical and visual) stage in student learning, to the more abstract knowledge and deep understanding.”**  
**Kamii, Lewis, & Kirkland**

### **In your classroom, this means:**

- considering manipulatives as an integral part of your instructional plan;
- incorporating appropriate concrete materials;
- choosing manipulatives that assist in achieving the lesson’s goals;
- ensuring students are familiar with the manipulative(s) and understand the guidelines for their use;
- supporting students’ use of the manipulatives;
- including assessment and evaluation of the manipulative(s) that emphasize the development of the mathematical processes;
- encouraging students to use manipulatives to make connections among concepts and between concepts and procedures;
- ensuring that manipulatives are used to focus on important mathematics.

### **Considerations**

Manipulatives are a useful tool to help students construct their understanding of concepts through meaningful investigation. They are crucial for visual and kinesthetic learners, and are beneficial for all students as they move from the concrete to the abstract stages of mathematics.

For more information, go to:

<http://www.edu.gov.on.ca/eng/studentssuccess/lms/files/tips4rm/TIPS4RMDDevMathLit.pdf>

page 22 – Concrete Materials

## My Personal Reflection and Plan

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To what extent do I use manipulatives to assist my students as they move from concrete understanding to abstract knowledge and deeper understanding?

- occasionally       fairly often       at every opportunity

What are two reasons I'm not using manipulatives at every opportunity?

What can I do to overcome obstacles when using manipulatives to support student learning?

How do I communicate to students the importance of using manipulatives to deepen their understanding of the mathematical concept?

Other ideas and thoughts I have after hearing the comments of my peers:

## Next Steps

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Lesson from TIPS4RM that I will teach to focus on manipulatives:

Lesson Goal:

I am making the following adjustments to this lesson:

Adjustment	Rationale
<ul style="list-style-type: none"><li>•</li> <li>•</li> <li>•</li></ul>	

The manipulatives students will use and their purpose are:

Manipulative	Purpose
<ul style="list-style-type: none"><li>•</li> <li>•</li> <li>•</li></ul>	

Other notes:

## Lesson Debrief

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The manipulative(s) students used:

Evidence that students improved their understanding by using the manipulatives:

### Reflection

- What went smoothly?
  
  
  
  
  
  
  
  
  
  
- What created challenges?

If I were to teach this lesson another time, I would:

Other ideas and thoughts I have after discussion with my peers: