

# **THOSE MYSTERIOUS MONTESSORI MATERIALS: THE ROAD FROM CONCRETE TO ABSTRACT THINKING**

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All children and most adults learn best through direct experience and the process of investigation and discovery. Most students do not regain or truly grasp much of what they “learn” through memorization. Asking a child to sit back and watch a teacher perform a process or experiment is like asking a one year old not to put everything into his mouth. Children need to manipulate and explore everything that catches their interest. It is ironic that most schools still teach primarily through lecture, textbooks, and workbooks, with students still spending their days at a desk praying for the bell to ring.

Dr. Montessori recognized that concrete learning apparatus makes learning much more rewarding. The Montessori learning materials are not the method itself, they are simply tools that we use to stimulate the child into logical thought and discovery. The Montessori materials are provocative and simple; each carefully designed to appeal to children at a given level of development.

An important concept is that for each age level of the Montessori curriculum there is an extensive collection of carefully defined educational materials that are the equivalent of the chapters in a traditional textbook. Each material isolates and teaches one concept or skill at a time. In developing the materials, Dr. Montessori carefully analyzed the skills and concepts involved in each subject and noted the sequence in which children most easily master them. She then studied how children seemed to be able to most easily grasp abstract concepts and designed each element to bring the abstract into a clear and concrete form.

The materials are displayed on low open shelves that are easily accessible to even the youngest children. They are arranged to provide maximum eye appeal without clutter. Each has a specific place on the shelves, arranged from the upper left-hand corner in sequence to the lower right, following their sequence in the curriculum. The materials are arranged in sequence from the most simple to the most complex and from the most concrete to those that are most abstract. Because of the order with which they are arranged in the environment, children can find precisely what they need whenever they wish.

Each of the Montessori materials is designed to allow children to work independently with only the slightest level of introduction and ongoing support from the teachers. This is made possible by a built-in design element, the “Control of Error,” which allows students to determine for themselves if they have done each exercise correctly.

The materials can be used repeatedly at different developmental levels. Each material has multiple levels of challenge. Lessons are brief introductions after which the children repeat the exercise over many days, weeks, or months until they attain mastery. Interest leads them to explore variations and extensions inherent within the design of the materials at many levels over the years.

For example, the Trinomial Cube, which presents a complex and challenging three-dimensional puzzle to the five year old is used to introduce the elementary child to the algebraic concept of the exponential powers of polynomials.