

An Introduction to Montessori Philosophy and Materials

“The child should live in an environment of beauty.”

Maria Montessori

What is the Montessori method?

A good way to learn about how the Montessori philosophy works is to observe a classroom in action. On their first visit, many adults are not quite sure what's going on. The Montessori classroom environment is like nothing they've ever seen. There are children as young as three and as old as six in the same room.

At times, the adults in the classroom are just observing what is going on, or working with a single child. Most of the children are busy, working with various hands-on materials. They seem unusually independent, putting away materials they have finished with, and then making their own decision about what to do next.

The environment is beautiful with many colors. The materials on the shelves have an intriguing appearance and texture, just begging to be touched. The furniture is child sized. Children can easily reach the sink and the coat hooks. Two children appear to be enjoying a snack that they served themselves. Many seem unusually focused on what they're doing, sometimes repeating an activity, concentrating for long periods. No one seems bored.

Other aspects of the Montessori philosophy may not be immediately obvious. There's an emphasis on cooperation and respectful behavior. The adults in the classroom speak to the children at their own level in a calm voice. If a child wants to use a material that another child is working with, they learn to wait patiently for their turn. Children are rarely interrupted if they're concentrating on an activity. The materials are carefully designed so that the children can identify when they have made an error and correct the mistake on their own.

All of the children's senses are used in the educational process.

Another unique aspect of the Montessori method is that it is international. Maria Montessori spent many years working with children in her native Italy, in India, and traveling all around the world, sharing what she had learned in working with young children. Today Montessori schools and training centers can be found worldwide. Although all Montessori classrooms are different in some ways, the basic materials you find in any classroom are the same regardless of the country you might find them in.

All the materials in a Montessori classroom are organized into one of five curriculum areas:

- Practical Life
- Sensorial
- Language
- Math and
- Cultural

Montessori materials are carefully sequenced so that each activity has an orderly and logical process to follow. This allows children to organize their thinking and problem solving skills in a clear way, and to absorb this knowledge through their senses. As Aristotle said, “There is nothing in the intellect which was not first in the senses.”

In a Montessori classroom, the teacher is often referred to as a directress or guide. She observes each child on a daily basis and determines when each is ready to move on to the next level of abstraction. She is not teaching the child as much as assisting the child in teaching herself by introducing new concepts as soon as she is ready, and giving him the tools to discover the knowledge on his own.

Practical Life Materials

“These words reveal the child’s inner needs; ‘Help me to do it alone’.”

Maria Montessori

Small children have many life skills that they need to learn to achieve

independence. Children develop a sense of pride when they are able to do things for themselves. In a hurried world, adults often will tie a child's shoes or zip up his coat to save time. Respecting a child's desire to be independent is a cornerstone of Montessori philosophy. Children are given many opportunities to learn practical life skills in a Montessori classroom.

Dressing Frames

A variety of "dressing frames" are found in the early childhood classroom. These include zipper frames... button frames.... buckle frames... bow tie frames... snap frames, and others. Observing a child practicing with a dressing frame provides an opportunity to see the joy of repetition. Realizing that they are practicing a difficult small muscle skill important to day-to-day life is a powerful motivator for children.

Silver Polishing

Silver polishing is a task most adults would not expect to see a 3 or 4 year old engaging in, but children love the activity. Polishing silver is not only beautiful, it provides the child with small motor development. Many of the activities in a Montessori classroom focus on developing a child's small and large motor skills and eye hand coordination. Other objects such as shoes, copper, and wood are also polished.

Hand Washing

The hand washing activity follows a logical sequence that includes getting the water... wetting the hands... soaping... washing... rinsing... nail cleaning... drying, and cleaning up. Small children love working with water.

Spooning and Pouring Activities

Many practical life activities challenge the children to control their small hand muscles to complete delicate tasks such as spooning objects from one container to another, learning to pour beans from one pitcher to another and back, to pouring water from a variety of containers with progressively smaller openings. Spilling is not a

problem, because the children have the skills to clean up their own work.

Sweeping

Caring for the environment is the responsibility of every child.

Learning to sweep and use a dust pan... wash a table... water plants, and even arrange flowers are all common practical life activities.

Walking on the Line

All early childhood classrooms have a line laid out on the floor in an elliptical or circular pattern. The line is used to define the area for children to sit during daily gatherings of the whole class. Children may also use the line for gross motor activities, learning to control their bodies as they walk around, carefully following the line.

Control of Movement

Montessori classrooms offer children many opportunities to learn to control the movement of their body as well as other objects in the classroom. This girl has used the Red Rods to lay out a maze and carefully step to the center without touching any rod. This activity improves balance.

Children who are struggling to accomplish a task are given the time and space to do it themselves. If they need help, they are given only the assistance they need to complete the task on their own.

Sensorial Activities

“Education is a natural process carried out by the child and is not acquired by listening to words but by experiences in the environment.”

Maria Montessori was one of the first educators to recognize that children learn best when they are engaged in hands-on activities. She believed that children need to move freely in their environment and to investigate whatever interests them. For these reasons, Montessori insisted that the classroom be beautiful. Through years of observation she was able to develop a curriculum that appealed to all of a child's senses.

Knobbed Cylinders

A familiar sight in any Montessori early childhood classroom is the knobbed cylinders. There are four different sets of knobbed cylinders, each varying in dimensional characteristics. The child learns to discern between subtle variations in width, breadth, depth, and height by removing the cylinders and replacing them in the proper slots. This activity provides a clear example of the concept of control of error. If the child places any cylinder in the wrong slot, it will be impossible to complete the task without correcting his error.

Pink Tower

The Pink Tower is ten pink cubes which range from a large cube to a very small cube. Children learn to see and feel the concept of decreasing size in three dimensions. Often a child will experiment with alternate ways to assemble this work.

The Red Rods

The red rods require the child to align one end of each rod to see how each rod increases in size. Here the child begins to see the concept of unit measurement as each rod increases by the length of the smallest rod. Montessori developed the materials through years of observation, carefully guiding children to move from concrete materials to gradually more abstract materials, introducing new concepts with each step.

Color Boxes 1 –2 –3

The color boxes progressively develop a child's sense of color and color relationships. The first color box includes three matching pairs of primary colored tablets to introduce the concept of the primary colors and their names.

The color box 2 includes 22 color tablets, which can be mixed and matched to develop an understanding of color.

Color box three introduces the concept of different hues of each color. The challenge is to arrange the tablets in the order of increasing darkness or lightness.

Knobless Cylinders

Like the knobbed cylinders, the knobless cylinders challenge the child to differentiate objects of increasing dimension. Four sets of knobless cylinders provide the child with different dimensions to evaluate. These cylinders are more challenging and abstract than the knobbed cylinders. The control of error is reduced since the child does not have individual slots to insert each cylinder. He must determine the correct pattern solely through comparison.

Constructive Triangles

Five sets of triangles increase the abstraction of learning about geometric shapes. Color coded sets of triangles include black lines indicating the side that needs to be matched to create a new geometric shape. This control of error allows the child to create new shapes on his own in a meaningful way. The child learns through her eyes and hands, geometric concepts that she will need to understand many years into the future.

Binomial Cube

The binomial cube introduces in a simple geometric set of blocks, the algebraic equation $(a+b)^3$. Although children are not yet ready to learn algebraic equations, they can see through this set of three dimensional blocks what happens when this equation is solved. Although this activity is much more abstract and complex than some of the earlier activities, it too has a color coded control of error to allow the child to correct her own mistakes in assembling the cube.

Sound Cylinders

Building auditory skills is an integral part of the Montessori curriculum. The sound cylinders come in two sets of six hollow cylinders that are color coded blue and red. The child chooses a blue cylinder and tries to match the sound it makes with one of the red cylinders. By using the sound cylinders, children learn to distinguish subtle changes in volume.

Bells

Two sets of bells are used by the student to learn the diatonic scale from middle C to high C. The child is free to experiment with the bells to make her own music or to ponder the relationships between the notes.

Touch Materials

A variety of materials are available that stimulate the sense of touch. These include the touch boards that show the child the difference between rough and smooth.

Baric Tablets

This girl is working with a blindfold while holding the Baric Tablets, learning to identify subtle differences in weight.

Tasting Jars

Two sets of dropper bottles are used to teach the four basic taste senses: salty, sweet, bitter, and sour.

Smelling Bottles

In a similar manner as the tasting jars, children are given the opportunity to compare and match the odors of two sets of smelling bottles.

Language Activities

“The child, in fact, once he feels sure of himself, will no longer seek the approval of authority after every step.”

Young children have a natural ability to learn language skills that diminishes as they grow older. Emphasis is placed on learning the sounds each letter makes rather than the alphabet. Throughout the curriculum, children are developing the small motor skills they will need to be a successful writer and the auditory and visual tracking skills necessary for learning to read.

Language Cards and Sound Games

The child learns that snake begins with a “ssssss” sound, that bird begins with a “bh” sound, or that girl begins with a “gh” sound and so on.

Sandpaper Letters/Sand Tray

Once children are familiar with the basic sounds, they are ready to begin working with sandpaper letters. Tracing the sandpaper letter with her index and middle finger, this girl learns to draw the letter.

Sand Tray

As they become comfortable with the sandpaper letters, they can practice their letter writing skills in a tray of sand. The tactile experience of drawing letters and then erasing them with a simple shake of the tray is enjoyable for small children.

Moveable Alphabet

Children practice writing simple words and short sentences using the moveable alphabet. The consonants and vowels are in contrasting colors to assist children in learning the function of each letter. Once the child is comfortable with the beginning letter sounds, small objects and word cards are used to introduce short words.

Small Metal Insets

Although tracing small insets on paper can build a child's understanding of the concept of portions and of geometric shapes, the primary purpose of this activity is to provide practice in pencil handling skills. As the insets get smaller, the child's skill increases. This activity gradually prepares a child for the complex task of writing letters.

Handwriting Practice

Progressively more difficult writing challenges are provided to each child as they become ready. Writing with chalk on an unlined chalkboard is followed by practice with writing on a lined chalkboard. Once that skill is mastered, writing with a pencil on paper is introduced.

Phonograms

In order to learn how the written language works, a child needs to learn common letter combinations that make certain sounds. This boy is learning some common phonograms by matching the sounds to cards.

Magic Moment

At some point in the process of learning the mechanics of writing letters, learning beginning letters sounds, practicing phonograms, and other language activities, the child has what Montessori called a “magic moment.” Suddenly, the skills come together in the child’s mind and she begins to read words on her own. This is an exhilarating moment for the child as the world of reading suddenly is within reach. Montessori students often tell people that they taught themselves to read. Indeed, they practiced and learned most of the necessary skills on their own.

Grammar Symbols

As children build their vocabulary, they begin to sense that there are different functions that words play. Montessori developed grammar symbols to assist children in learning the parts of speech. Practicing creating sentences using grammar symbols helps children absorb the structure of language. A black triangle represents the solid concept of a noun. Adjectives are small dark blue triangles because an adjective is used to describe a noun. A red ball represents a verb. The color red and the ball shape were chosen to remind the child that a verb is a word that communicates action.

Math Activities

“The first essential for the child’s development is concentration. The child who concentrates is immensely happy.”

Most adults who were taught in traditional educational settings, are fascinated by the power of the Montessori math curriculum. Giving the child the opportunity to see and feel the concept of one bead, ten beads, a hundred beads – even a thousand beads, lays a foundation for a rich understanding of mathematics. As the child becomes more comfortable with each material, the concept of numbers becomes more and more abstract. Like the language curriculum, when the abstract symbols of numbers are introduced, the child has a deep understanding of what each symbol represents.

Number Rods

Identical to the red rods in size and shape, the number rods add alternating colors of red and blue to further develop the concept of units and of the difference between even and odd. As the child becomes comfortable laying out the number rods, she can begin to associate a numeral card with each rod.

Cards and Counters

Once a child becomes proficient in his understanding of counting to ten, he can move on to the cards and counters. Laying out the counters to match the number cards confirms that the child understands the order of the numbers and can accurately represent the quantity with the counters. This activity also graphically emphasizes the concept of odd and even. Odd numbers always have a single counter left at the bottom. If the child is short a counter or has too many he knows that an error has been made and needs to be corrected.

Golden Beads-Decimal System

Golden and color coded beads are the basis of many of the Montessori math materials. At first the beads are used to match visual representations of large numbers with number cards. As she becomes ready to move on to more abstract activities, she learns to add and subtract and even multiply and divide through the use of these hands-on materials.

Stamp Game

The stamp game moves these mathematical concepts to a higher level of abstraction to practice more difficult math problems. Instead of a hundred beads, a color-coded red stamp is used.

Fraction Materials

The concept of various fractions is introduced using specially **designed metal fraction insets**. **The abstract meaning of $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, and so on** becomes easy for any child to grasp.

Cubing Materials

Many of these materials along with a progression of higher order materials are also present in the elementary curriculum. Here, two eleven year olds are solving a cube root problem using three dimensional Montessori materials.

Cultural Activities (Science, History and Geography)

“The essential thing is to arouse such an interest that it engages the child’s whole personality.”

Montessori is built on a philosophy of respect for all cultures. Often parents or other people from countries around the world visit the classroom, share native dress, and read stories so the children can learn about other cultures. Here children learn about Nigeria, where it appears on the map of Africa and traditional dress. In this classroom, one child’s mother talks about her Vietnamese

background. The children sample some typical Vietnamese food as well.

The Montessori cultural curriculum covers art, history, science, and music.

Air, Land and Water

Children learn to categorize the natural habitats of animals and objects according to air, land, or sea.

Rocks

Identifying and classifying different types of rocks is a popular activity. Children like to learn large words and what they mean such as igneous, sedimentary, and metamorphic.

Geography

As you become more familiar with Montessori materials, you begin to see the elegant philosophy behind how each activity works to build the child's understanding of the world around her. Matching and tracing activities continue to build the child's ability to identify and name individual states, countries within continents, and continents within a world map.

Music

Songs are a regular part of the activities on the line. Many songs help to build community in the classroom by singing about the height, age, color of clothing, and birthdays of each child.

Peace Curriculum

Most classrooms have a peace corner where children can choose to go for quiet time to read or to take advantage of some of the activities from the peace curriculum.

Days and Month

The days of the week and the months of the year are emphasized daily in most Montessori classrooms.

Timelines

From the age of 3 through high school, the Montessori curriculum emphasizes the concept of time to help children organize historical information. In the pre-school classroom, the timeline is first introduced as a way to describe the child's own life. Here, this boy's birthday is celebrated using an annual timeline representing the earth orbiting the sun. The children recite the months of the year as he walks around the sun.

A pre-history timeline is presented to assist the child in picturing very long periods of time and the major changes in earth's history.

All the cultural materials are connected and integrated using a timeline of life. Showing children how life as we know it came into being and how it is all interconnected, builds a deeper respect for life and for the importance of being responsible stewards of these gifts. In Montessori terms, this is called "Cosmic Education."

Conclusion

“When dealing with children, there is greater need for observing than of probing”

The Montessori method has been tested and revised for over a century. Montessori educators are specifically trained in the science of observation and child development. They study the philosophy of the Montessori method and the sequence of each material. They learn to use this knowledge to guide each child’s physical, emotional, and intellectual growth. With that guidance, each child is continually challenged and encouraged to learn. All children have a natural love of learning. The Montessori classroom nurtures that love of learning and gives each child the confidence to take on the many challenges that life presents to him.