The Montessori model is rooted in human development and centers independence and agency within a social community to foster a sense of purpose and collective responsibility.

OVERVIEW

The Montessori model is rooted in human development and neuroscience, and it is underpinned by the belief that children are naturally curious, learn from their surroundings, and desire independence. Recognizing that children are intrinsically capable, the Montessori model creates learning experiences that empower children to drive their own learning and master academic and social skills for school and life.

Named for its founder, Italian doctor, anthropologist, and educator Maria Montessori, who founded the Association Montessori International (AMI) in 1929, Montessori is practiced in an estimated 16,000 schools worldwide. AMI In the U.S., Montessori is represented by AMI affiliate AMI/USA and the American Montessori Society (AMS), as well as the Montessori Accreditation Council for Teacher Education (MACTE), which accredits teacher education programs. AMI/USA, AMS, MACTE While there are multiple organizations that offer support in implementing a Montessori model, here we share the details of the model as defined and shared by the National Center for Montessori in the Public Sector (NCMPS), which works to increase equitable access to Montessori models in public education. NCMPS

The U.S. Montessori community has identified “essential elements” for Montessori schools, emphasizing:
- Montessori-trained teachers
- Mixed-age groupings
- Uninterrupted work periods
- High degree of student choice
- Montessori materials

NCMPS Essentials Elements for Montessori
MPPI Montessori Essentials
The Montessori Approach
Public Montessori
# What Makes This Model Innovative?

<table>
<thead>
<tr>
<th>Whole-Child Focus</th>
<th>Active Self-Direction</th>
<th>Customization</th>
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<tbody>
<tr>
<td>The Montessori model is rooted in human development and neuroscience and supports each child's cognitive, emotional, social, and physical development.</td>
<td>The high degree of freedom allows children to drive their own learning. This supports intrinsic motivation and agency, as well as self-regulation and independence.</td>
<td>The Montessori model recognizes that each and every child is unique and allows children to learn at their own pace and in their own style.</td>
</tr>
</tbody>
</table>

## DESIGN

### Goals

The Montessori model aims to support the natural development of children to fulfill their potential to become independent and agentic humans to create a better world, by supporting each child's cognitive, social, emotional, and physical development.

<table>
<thead>
<tr>
<th>Executive Functioning Skills</th>
<th>Social-Emotional Development</th>
<th>Academic Achievement</th>
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<tbody>
<tr>
<td>Students develop strong executive functioning skills, including self-regulation, working memory, planning, and inhibitory control. These behavioral developments also contribute to academic achievement, as students are able to concentrate, complete tasks, follow instructions, and cooperate with peers.</td>
<td>Students develop socially and emotionally, including a strong sense of self and purpose, social problem-solving skills, healthy relationships, a strong sense of community, responsibility, and resilience. These social-emotional developments also support self-confidence, intrinsic motivation, and agency.</td>
<td>Students are offered learning materials that help them build the knowledge and skills needed to develop academically and intellectually. They build knowledge in language, mathematics, history, and science. In addition, students develop transferable cognitive skills such as creativity, independent thinking, and problem-solving.</td>
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Experience

Children in Montessori classrooms are introduced to new elements of the highly detailed, scaffolded curriculum via interactive lessons and presentations given by the teacher, individually or in small groups. Thereafter, children are mostly free to choose work from lessons they have had, or to ask for new ones. Teachers observe children's work and progress, and then provide new lessons according to their interest and ability. ► Montessori Discovery

At any given time in a Montessori classroom, children are engaging in different learning activities and modalities. Most children will be working independently while the teacher delivers personalized lessons to children across age and ability, allowing the needs and abilities of all children to be met. Teachers check in with and support children in meeting state standards and expectations, and students' interest and activity typically goes well beyond standardized curriculum.

Mixed-Age Groupings

The Montessori model groups children in mixed-age groups, typically in three-year age bands, as children share similar developmental characteristics across certain age bands. The grade bands are matched to developmental stages, articulated in the four stages of development observed by Maria Montessori. While the four planes cover development through age 24 (the state of “maturity”), the model focuses on development through age 18. ■ The Four Planes of Development

Multi-year age groupings offer several well-established benefits:

● Peer teaching and learning naturally emerges from the structure, giving younger children models and older children opportunities to mentor and support.
● Classroom relationships, culture, and norms are more easily established and maintained, since only one-third of the class is new every year.
● Differentiated instruction is easier to achieve, since children have access to curriculum and work across a wide range of ability and development.

While schools may use varying multiage configurations, typically, Montessori classrooms are “looped” into three-year age groupings corresponding to developmental phases:

● Infant & Toddler: ages 0-3 ► Montessori: Infants & Toddlers
● Early Childhood: ages 3–6 (PK3-K) ► Montessori: My Day (Early Childhood)
● Elementary: ages 6–9 (Grades 1-3) and 9–12 (Grades 4-6), sometimes combined ► Montessori: The Elementary Years
● Secondary: ages 12–18 (Grades 7-12), often grouped as 12-15 and 15-18 ► Montessori: Secondary Programs
Montessori Materials for a High Degree of Student Choice

The Montessori model gives children a high degree of freedom to choose what to work on, where to work on it, for how long to work on it, and with whom to work on it. In addition to honoring individual progression, this freedom allows children to engage in learning that interests them, leading to more engagement, sustained attention, and intrinsic motivation. Children do not “earn” these freedoms, as is typical in many models that have high degrees of freedom for young children. In the Montessori model, all children are afforded these freedoms and are taught how to handle their freedoms with responsibility.

Montessori materials are specially designed instructional materials that enable hands-on, self-directed learning. Each material is designed for a specific age band, with their unique developmental needs in mind. Some materials are designed to teach a particular concept or skill, while others are multipurpose. All Montessori materials are designed for children to engage with at their own pace, without adult support, to develop confidence while mastering concepts and skills.

At the early childhood (PK3-K) level, Montessori materials have a concrete, sensorial quality and a built-in “control of error,” which allows the child to determine if she has done the exercise correctly—for example, a geometric piece may not fit or a counting unit may be left over. These self-correcting materials give children immediate feedback about their progress, allowing them not only to explore and learn with minimal adult intervention, but also to build independence, problem-solving skills, confidence, and the ability to learn from mistakes. Montessori materials further allow children to learn using movement, touch, sight, and sound. At the Elementary (grades 1-6) level, materials appeal to children’s powers of reason and imagination and are designed to inspire longer explorations and independent work.

Example: The binomial cube is a three-dimensional puzzle that only fits together in one way, which makes it self-correcting. The cube is a visual representation of the binomial theorem. While the material is used in early childhood, it prepares children for algebraic concepts later in their development.

Classrooms typically have just one set of each material, which promotes the development of social and emotional skills such as turn-taking, delayed gratification, and conflict resolution. Children understand that, if a material is not on the shelf, it is being used and not available. This allows for students to engage with each material for as long as they want, without the pressure to return it for someone else to use.
Supporting Structures
Montessori works best as a holistic system, fully implemented in all of its elements, which work together in mutual reinforcement. For full implementation, schools must make shifts in various school elements, most notably in curriculum and instruction, adult roles, school culture, schedules, and space.

Schools must implement Montessori curriculum and pedagogy, in which teacher observations of the child guide learning.

Implementing Montessori means adopting the Montessori curriculum presented in Montessori teacher training (see Adult Roles section below). The curriculum has been aligned with Common Core and other national standards by NCMPS, and states with their own standards can use the tool as a basis for their own alignments. Montessori Curriculum to Standards Alignment

Montessori teachers make continuous observations and formative assessments of children’s work and mastery of skills and content in order to present the appropriate next steps in the curriculum. Instruction in a Montessori classroom is typically independent or in small groups. Since interest is a key factor in Montessori education, teachers give lessons in a manner that presents just enough information to pique curiosity. Students then decide to pursue knowledge alone or in self-formed groups. Teachers assess student progress via observations and detailed record keeping. Montessori Assessment Playbook

The lead teacher must be Montessori-trained with a credential at the age level being taught.

Montessori teacher training is an intensive study of the complete Montessori curriculum and pedagogy, and conventionally trained teachers can’t be expected to implement the model without training. Training typically extends over two or three summers, or a full academic year, and it covers Montessori philosophy, how to properly use Montessori materials in the classroom, human development, and mastery of the observational skills necessary to guide each child’s learning appropriately. Montessori credentials from programs affiliated with AMI or AMS, or accredited by MACTE, are the most widely recognized. More information about teacher preparation can be found at the NCMPS resource: Teach Montessori.

In a Montessori class, you do not see a teacher at the front of the room giving direct instruction. Instead, you see children learning independently or in small groups, freeing the teacher to observe each child and offer support as needed. In fact, “teachers” are often called “guides” in Montessori environments to denote a movement away from a “sage on the stage” to a
“guide on the side.” Their role is to observe children and keep detailed records that enable them to introduce challenging and developmentally appropriate lessons and materials based on each child's unique interests, abilities, and social, emotional, cognitive, and physical development. Observation and the Teacher

In order to allow the teacher to give uninterrupted lessons to a single child or a small group, Montessori classrooms at the PK-6th grade levels are typically staffed with a second adult “assistant” who supports the other children in their independent activity. The assistant is not required to be Montessori-credentialled, but there are training workshops for assistants.

Uninterrupted work periods are critical to implementing the Montessori model.

Uninterrupted work periods are blocks of “free choice” time wherein students work on tasks they choose, at their own pace, without interruption. When they decide they are finished or interested in a new activity, they clean up their materials and select a new activity. This extended block of uninterrupted work time builds children’s ability to concentrate and the freedom to choose materials and activities that foster the development of coordination and independence.

A 3-hour morning work period and a four-hour afternoon work period are typical. The following periods of uninterrupted work are recommended for each age level:

- Infant & Toddler: At minimum, a daily 2-hour work cycle. The time block allows for adult-assisted mealtime, snacks, hygiene, and nap/rest routines.
- Early Childhood and Elementary: At minimum, a 2-hour work cycle, 4 days per week. A 3-hour uninterrupted work cycle, 5 days per week, is optimal.
- Secondary: At minimum, a 2-hour work cycle for core curricular subjects (math, English, history or humanities, sciences, and additional world languages).

Public schools may need to make adjustments or accommodations to their schedules and make use of pull-out “specials” to allow for full implementation.

The physical space must be child-centered to support self-directed learning.

Montessori emphasizes the “prepared environment”—a classroom environment that recognizes the power of the physical space to support or
SPACE & FACILITIES

hinder independence and learning. To enable child-directed work, all aspects of the classroom, from furniture to materials, must be intentionally designed to be accessible and foster independence. Furniture should be appropriately sized to the ages of children in the classroom. Materials should be accessible, age-appropriate, and specially designed for self-direction. There should be enough space in the class for students to move around freely and work independently or in groups. The space should be uncluttered, aesthetically appealing, and ignite curiosity.

Implementing Montessori requires an upfront cost for purchasing required curricula and materials.

Schools interested in implementing the Montessori model need to budget for the initial purchase of Montessori curriculum and materials, but they will have less need for replacement and changes in following years.

BUDGET & OPERATIONS

IMPLEMENTATION

Supports Offered

The National Center for Montessori in the Public Sector offers the following supports to make public Montessori programs equitable, accessible, and sustainable to disrupt racism, poverty, and structural inequality and to transform lives and societies for peace and justice. AMI/USA, AMS, and other Montessori organizations offer Montessori teacher training and professional development relevant to all Montessori schools, whether public or private.

School Start Up and Technical Assistance

Cost Associated

NCMPS offers support for new schools and for programs adding levels or expanding their scope. This includes:

- Program design and modeling
- On-site and remote consulting
- Summer staff development and orientation
- Multi-day assessment of Essential Elements
- Training and coaching for leaders, coaches, and teachers

Learn More
Impact
A growing body of research supports the effectiveness of Montessori education over a range of outcomes, including academic achievement, executive functioning skills, social-emotional development, and more.

Children in Montessori perform better academically than non-Montessori peers, controlled for variables commonly predictive of school performance.

- A longitudinal study of students in Milwaukee Public Schools found students who attended a Montessori preschool and elementary school performed significantly better on the math and science scales of the ACT and WKCE compared to a control group matched on gender, race/ethnicity, socioeconomic status, and high school attended (Dohrmann et al., 2007).
- A multi-year, mixed-method study of Montessori education in South Carolina’s public schools found that, when compared to non-Montessori public school students across the state, Montessori students were more likely to have met or exceeded the state standards in each of the four subjects. After matching Montessori students to demographically similar non-Montessori students and controlling for student demographics and previous test scores, researchers found that Montessori students scored significantly higher on ELA state standardized tests than non-Montessori students across all three years of the analysis. (Culclasure et al., 2018)
- A longitudinal study of randomized lottery-based admission to two public Montessori magnet schools found children who attended Montessori preschool and elementary schools performed better on academic and pre-academic assessments compared to non-Montessori control group children (Lillard et al., 2017).
- In addition to increasing academic outcomes, Montessori preschool also equalized outcomes among subgroups that typically have unequal outcomes. The study found that
the difference in academic achievement between lower-income Montessori and higher-income conventionally schooled children decreased over time, to the point that it was not statistically significant by the end of the study (Lillard et al., 2017).

**Children in Montessori develop stronger executive functioning skills.**
- A study mentioned above also found that Montessori children scored higher on executive functioning skills compared to non-Montessori peers (Lillard et al., 2017).
- A three-year study of Montessori kindergarten students in South Carolina public schools found that Montessori children develop stronger self-regulation in that they:
  - need less supervision to solve conflict;
  - are more likely to be proactive in using problem-solving strategies when engaged in cognitive tasks;
  - can monitor their own learning for correctness;
  - can inquire, ask questions, and seek out information when the task is not fully understood;
  - recognize academic areas in which they perform well and react positively to them; and
  - recognize the good work of peers and use the knowledge for self-judgment of their own performance (Montessori Life, 2010).

**Children in Montessori develop socially and emotionally.**
- A study mentioned above also found positive impacts on socio-emotional measures when comparing children in Montessori preschool and elementary classrooms to children in control groups (Lillard et al., 2017).
- Research on parent aspiration and motivations revealed that parents highly value their child’s holistic development. The attributes that Montessori parents most valued include:
  - Moral development: know right from wrong, be respectful and kind, and take responsibility;
  - Behavioral development: able to complete a full day, pay attention, complete tasks, follow instructions, cooperate with peers, concentrate and focus; and
  - Emotional development: possess confidence in self and confidence to explore, stay internally motivated to learn, and can say what they want/know/feel (AMI, 2018).

**Contact**

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## RESOURCES

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<tr>
<td><strong>NCMPS Website</strong></td>
<td>Website for the National Center for Montessori in the Public Sector (NCMPS).</td>
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<tr>
<td><strong>AMI Website</strong></td>
<td>Website for the Association Montessori Internationale (AMI).</td>
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<tr>
<td><strong>AMI/USA Website</strong></td>
<td>Website for the Association Montessori Internationale USA (AMI/USA).</td>
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<td><strong>AMS Website</strong></td>
<td>Website for the American Montessori Society (AMS).</td>
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<tr>
<td><strong>MACTE Website</strong></td>
<td>Website for the Montessori Accreditation Council for Teacher Education.</td>
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<tr>
<td><strong>NCMPS Essential Elements</strong></td>
<td>An overview of the essential elements of the Montessori model.</td>
</tr>
<tr>
<td><strong>MPPI Montessori Essentials</strong></td>
<td>A 2-page overview of the essential elements of the Montessori model.</td>
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<td><strong>The Montessori Approach</strong></td>
<td>A video that explains how the Montessori model supports human development to prepare children for life.</td>
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<td><strong>Public Montessori Video</strong></td>
<td>A video by NCMPS showing what public Montessori looks like.</td>
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<tr>
<td><strong>Montessori Discovery</strong></td>
<td>This video shows a real</td>
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<tr>
<td><strong>The Four Planes of Development</strong></td>
<td>An overview of the four planes of development, which is</td>
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<tr>
<td>Montessori Classroom and How Children Direct Their Learning</td>
<td>foundational to the Montessori approach.</td>
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<tr>
<td>Montessori: The Elementary Years</td>
<td>A look inside a Montessori elementary classroom.</td>
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<tr>
<td>Montessori: Secondary Programs</td>
<td>A look inside a Montessori secondary classroom.</td>
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<td>Montessori Curriculum to Standards Alignment</td>
<td>A comprehensive alignment between Montessori curriculum and nationally recognized standards.</td>
</tr>
<tr>
<td>Montessori Assessment Playbook</td>
<td>A strategy manual with tools for implementing assessment grounded in the Montessori model.</td>
</tr>
<tr>
<td>Teach Montessori</td>
<td>A Montessori job posting board and training center locator.</td>
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<tr>
<td>Observation and the Teacher</td>
<td>A video explaining the role of teacher observation in the Montessori model.</td>
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<td>Essential Elements Rubric</td>
<td>A rubric by NCMPS for schools to assess the implementation of Montessori components across various domains.</td>
</tr>
<tr>
<td>Montessori Outcomes</td>
<td>(Dohrmann et al., 2007) A longitudinal study of the experience in the Milwaukee Public Schools by AMI/USA.</td>
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</table>
Montessori in South Carolina (Culclasure et al., 2018)
A study of Montessori education in South Carolina’s public schools to evaluate data about academic and behavioral outcomes.

Montessori Preschool Outcomes (Lillard et al., 2017)
A longitudinal study that suggests that Montessori preschool has the potential to elevate and equalize important outcomes.

Montessori Parent Aspirations & Motivations (AMI, 2018)
A research summary by AMI to understand what Montessori parents value.

Montessori Census
A database of Montessori schools (public and private) in the U.S. and around the world.

Montessori Guide
A website sponsored by AMI/USA with free resources that demonstrate what quality Montessori looks like.

Self-Regulation in Montessori Classrooms (Montessori Life, 2010)
A study that revealed positive results for Montessori children in ratings of self-regulation and academic performance.