



Montessori Philosophy, Methodology, & Practice

This curriculum segment provides an in-depth study of the method behind the woman. Dr. Montessori was revolutionary in her ideas and philosophy, advocating that children are complete beings with unique abilities and that thoughtful education is the key to a peaceful, sustainable future. Discussions of Montessori philosophy center on the life of Dr. Montessori, the development of her method, the planes of development, and specific Montessori concepts, including the absorbent mind, sensitive periods, the prepared environment, normalization, the three-period lesson, and the Montessori materials. Learners will further their understanding of Montessori philosophy and methodology as they study the role of the teacher and the manner in which lessons are presented in the Montessori environment.

This portion of the program begins with a look at the life and influence of Maria Montessori and why her novel approach to education has had such a lasting effect. Her hands-on, individualistic approach and the manipulative materials used in the Montessori classroom are factors that make the method a success. An in-depth discussion of Dr. Montessori's journey in the development of her method provides learners with a strong framework for understanding the basis of Montessori philosophy and methodology. In addition to exploring Dr. Montessori's contributions to education, learners are introduced to other significant educational theories that influenced Dr. Montessori's work, including Pereira, Itard, Séguin, Rousseau, Froebel, and Owen.

The NAMC Early Childhood Classroom Guide provides Montessori educators, assistants, and administrators with valuable direction for the practical implementation of the Montessori curriculum, theory, and method to effectively lead the early childhood environment. The Montessori practical segment includes learning that focuses on the Montessori materials, the prepared environment, activities and presentations, the start of the school year, phasing in the Montessori curriculum, the typical day, and the role of the teacher. Learners are given the opportunity to reflect on specific practical applications of the Montessori method and contribute creative ideas of how they foresee implementing aspects of the method in their own classrooms.

Learner Outcomes:

Learners demonstrate thorough knowledge and application of Montessori philosophy with focus on the early childhood years. Learners are given practical guidance to achieve a high level of success in the Montessori classroom.



Child Growth & Development

This portion of the program documents a child's different periods of development and interests from the first year of life until age six. The discussion encompasses Montessori theory as well as an overview of the works of theorists including Freud, Erikson, Skinner, Watson, Piaget, and others. The learner will examine how a young child absorbs both positive and negative impressions from the environment. Included are discussions on how parents, teachers, and society must be aware of this early childhood sensitivity and the vital implication associated with an enriched positive environment.

In the first six years of life, children grow and develop very quickly. This involves changes in four major areas: physical, cognitive, social, and emotional development. An in-depth examination of each area is reviewed and discussed. Along with this, learners are introduced to Montessori's theory of the planes of development, the four distinct periods between birth and 24 years old during which children grow, develop, and learn. Other Montessori theories are also examined in this section of the program, including the levels of obedience, sensitive periods, and the development of abstract thought.

An examination of childhood development from before birth to the age of three provides learners with a foundation for understanding what occurs before children reach the early childhood stage. Topics of focus include the development of language, fine and gross motor skills, and relationships. This framework is then built upon as the discussion turns to the physical, cognitive, and social development of children in the 3–6 age range. Behavior and learning challenges are also discussed, providing learners with an understanding of some of the obstacles children in their care may face, including ADHD, dyslexia, neglect, and hostile behavior.

Learner Outcomes

Learners will be ready to apply their comprehension of the stages of human growth, development, and educational theories with emphasis on ages 3-6. Learners demonstrate knowledge of developmental and behavioral norms as well as potential recommendations for early intervention services. NAMC students learn how to enhance and support the child's development to meet the needs of the individual. Special attention concentrates on providing an environment where all children feel safe and accepted.



Classroom Management & Relationships

Focus in this segment centers on organizing a stimulating and harmonious classroom with an atmosphere of warmth and relaxation that invites participation and self-development. The goals are for learners to understand how to make the children feel comfortable and safe and that an organized environment saves time and helps children learn.

Preparing the environment to welcome the children, encourage their interaction, and help them develop physically, cognitively, and socially is key in a Montessori program. Teachers must consider all aspects of the environment: the material, the indoor space, the supplies and furniture, the outdoor space, and their own deportment. The theoretical and practical aspects of preparing the environment are explored thoroughly in this section. Learners are encouraged to reflect on the value of the prepared Montessori environment and to consider which elements they will include in their own classrooms.

The practical, day-to-day characteristics of teaching in an early childhood environment are also discussed in this section. Learners explore what a Montessori classroom is like at the start of the school year: how children are welcomed to their classroom, the materials that are presented at the beginning of the year, and how to phase-in the Montessori curriculum. They then consider the daily routines of the environment as they learn about a typical day, circle time, and the work period.

Montessori teachers play a vital part in putting the Montessori method into practice. They need to understand the rationale behind the method, including its history and special terms, and to understand the typical growth and development of young children. With this knowledge, learners can implement the ideas, materials, and techniques of the method when working with young children. The teacher's role as a guide, model, observer, record-keeper, parent ally, and professional educator is thoroughly examined. In the Montessori prepared environment, one of the teacher's most important responsibilities is to observe children to see how they spend their time and what attracts their attention and to make sure that they are being presented with the activities and materials they need. Learners come to appreciate that, with such a wide range of goals and activities happening at any one time, there needs to be ways to "scientifically" observe children regularly, both formally and informally. One of the key methods Montessori teachers use to assess the children's learning is through the three-period lesson. In almost every curriculum area of the early childhood environment, the teacher uses three-period lessons to present and then confirm the individual child's understanding of vocabulary and concepts. These observations of the children become written records that help to facilitate the children's learning in a positive and productive atmosphere. Learners also focus on record-keeping techniques, such as NAMC's Mastery Checklists, to record activities that the children have worked on, their accomplishments or challenges, their behaviors, interests, sensitive periods, and anything else the teacher needs to know to work with each and every child. These assessment

records detail each child's progress according to the scope and sequence of Montessori activities as outlined in NAMC's Montessori manuals. Thus, these detailed assessments help the learner to understand what guidance or instruction is required to assist the child in meeting the next steps in the curriculum. Strategies for guidance and communication are explored in depth. A systematic plan is essential to effectively manage all of these key areas to meet professional, government, and other institutional regulations.

Learners gain insights for exercising cultural sensitivity and developing strong parent/teacher relationships in support of the child's development. Family dynamics and the importance of a positive connection between home and the classroom are covered. Various methods are explored to support essential mutual trust and respect. Parents are presented as allies and focus is given to the value in establishing a strong connection with the child's family. Tools for developing a partnership with parents and communication strategies are discussed.

Awareness of community resources and professional associations for additional support for children and families are studied. Disruptive or atypical behaviors are considered. Special emphasis is placed on understanding the issues and cultivating guidance strategies and proactive solutions that may include the child, teacher, family, administrators, and community resources.

Learner Outcomes

Learners acquire knowledge and skills to establish a positive classroom rapport and to implement effective classroom strategies. Demonstrated leadership skills and understanding of professional standards and administrative functions are core goals. Equally important is the design and maintenance of a developmentally appropriate environment in response to the needs of the children. Learners are given the opportunity to demonstrate original and creative ways in which they will prepare both the inside and outside environments.

Learners show understanding of the significance that observation and assessment play in the Montessori environment through discussions, by honing their observation skills, by providing opinions on the value of observation, and through a detailed examination of record-keeping documents. Learners demonstrate evidence of personal growth through self-evaluation and introspection. They show understanding of conflict resolution and classroom management skills by considering practical scenarios. They acquire analytical techniques and tools for observing, documenting, planning, and recording the progress of children. Effective parent communication is an integral element of this process.



MONTESSORI 3–6 CURRICULUM

The Montessori early childhood curriculum is rich with educational activities and material that complement and enhance the natural learning process of children in this age group. Educators model behavior, activities, and materials that support all learning concepts within the prepared environment.

Through this exciting process of discovery, learners acquire capabilities for implementing the Montessori 3–6 curriculum that include a solid understanding of and proficiency in applying Montessori principles in the context of the curriculum, didactic materials, and presentations, utilizing a variety of instructional strategies and assessment methods.



Practical Life

Often referred to as the heart of Montessori education, practical life activities are the first to be presented to children in the Montessori 3–6 environment. These involve a series of increasingly challenging motor tasks concerning life skills and goals to which children are inherently drawn, such as cleaning a table, polishing shoes, or helping another child with a task.

As a child masters everyday tasks, she also advances her independence, body control and coordination of movement, concentration, self-expression, and sense of order. Practical life activities nurture healthy work habits, strong character and attitude toward social relationships, and a love and respect for community and the environment. At the same time, a child's self-worth and confidence increase each time she can say, "I can do it myself." Practical life naturally introduces "living peacefully," sometimes referred to as peace education, through lessons in grace and courtesy.

Learning in this component is focused on both the theory and the practical, hands-on aspect of practical life education. Learners explore the developmental and physical benefits of practical life activities, learning that the value of this work extends far beyond completing daily tasks. They are asked to consider real-life scenarios with practical outcomes and are encouraged to develop parent/teacher communications and creative activities that can later be used in their own classrooms.

Learner Outcomes

Learners are provided with applied resources, tools, and activities to educate children in the Montessori practical life curriculum that aims at fostering creative self-expression, self-esteem, respect, and a sense of community. This important work builds a solid foundation for the child's future learning in the Montessori 3-year curriculum for this age group.



Sensorial Development

The sensorial curriculum holds a significant place in Montessori methodology, and the sensorial materials were the first that Dr. Montessori developed for the children in her care. Before mathematics, before writing and reading, the children work to refine their senses. The theory behind the development of the sensorial materials is extensive and lays the foundation for much of the children's future work in language arts and in mathematics, especially as it relates to the decimal system and geometry. As the children refine their senses through the manipulation of specifically designed materials, they are learning to discriminate, judge, classify, compare, match, and grade.

One of Dr. Montessori's major contributions to the fields of education and childhood development was her theory defining sensitive periods in children. Sensitive periods are definite periods during which children reveal a heightened readiness and ability to learn particular skills or have particular experiences. During sensitive periods, children focus intently on objects in the environment relevant to that area of sensitivity and pay less attention to other objects, just like a thirsty child will seek water rather than food or a toy. Dr. Montessori determined that there is a period during which children are driven to develop their senses, and that this is the optimal time to support their development.

Human growth potential of the senses is at its height during the early years (age 2.5–5). Montessori "education of the senses" helps children discriminate, appreciate, and understand their world. Learners are introduced to the iconic and beautiful sensorial materials that were designed to isolate concrete examples of abstract concepts that are perceived through the senses, such as dimension, form, color, texture, sound, and scent. An array of activities concentrate on the nine senses – visual, tactile, auditory, olfactory, gustatory, thermic, baric, stereognostic, and muscular – to assist children in providing a framework for the information they derive from their environment. This is accomplished through the repeated manipulation of specifically designed materials. Learners come to understand how the groundwork for a child's intellectual life is established by refining the senses. In addition, learners will realize that this foundation provides the child with a structure and vocabulary for information he receives through his senses.

Many sensorial materials found in a typical Montessori classroom are influenced by Jean Marc Gaspard Itard and Edouard Séguin, who centered their research and pedagogy on the use and development of the senses to promote the intellectual advancement of children with disabilities. Dr. Montessori innovated and pioneered the design and use of sensorial material to isolate and refine the senses as an aid to the development of all children.

Learner Outcomes

Learners gain a deep understanding of the design, purpose, correct use, and order of sensorial materials and activities to aid the child's development. Key elements of Montessori theory are explored and understood: universal elements and isolated properties of the material, concrete to abstract learning, moving from simple to complex work, and control of error. Learners become proficient at presenting activities and maximizing the benefits of the Montessori sensorial material and curriculum in the context of the child's needs.



Music & Art Enrichment

Creative expression is a positive human endeavor and the joy it produces in children must not be underestimated. The NAMC curriculum recognizes the value of encouraging children to express themselves creatively, especially through music and art. The benefit of music education extends beyond an appreciation for art/music. Educators, behavioral scientists and researchers, medical doctors, and child development specialists confirm that musical training can significantly enhance child development in this sensitive period of musical receptiveness. Studies indicate that exposure to music, through listening, learning, and playing, has many beneficial effects for preschoolers. Active musical training in particular can improve problem-solving skills, physical coordination, poise, concentration, memory, self-discipline, self-confidence, ability to learn, and visual, aural, and language skills.

In the Montessori early childhood environment, specific areas are set up in the classroom so children may freely participate in art and music when they choose to do so. Music appreciation is part of the daily routine in the Montessori environment, with the inclusion of action songs and rhymes during circle time, for example. Art appreciation is fostered through a number of cross-curricular activities. Through practical life activities, children learn art skills and develop fine motor control with tasks such as cutting, weaving, and sewing. The sensorial curriculum helps children refine the senses — visual, tactile, and auditory — needed for the creation and appreciation of both art and music. Specific Montessori materials introduce children to concepts such as color, shape, and texture. Sensorial materials such as the Sound Cylinders and the Montessori Bells help refine tone and pitch and introduce the chromatic scale. In all areas of the curriculum, extension activities provide children with opportunities to further their understanding of concepts through art and/or music activities, whether it is designing a personal flag after studying the flags of the world or creating a pointillism-inspired painting after multiplying with the Dot Game in math.

Learners are introduced to the value of art and music from the onset of the program through discussions of the prepared environment and the daily routines of the Montessori classroom. A hands-on approach to music appreciation is explored with the study of

specific Montessori materials. Learners are also encouraged to consider how they will incorporate music and art in the classroom through discussions of practical applications and the development of their own activities.

Learner Outcomes

Learners acquire a comprehensive understanding of the benefits of music and art education in the early childhood environment. Through a study of theory, method, and materials, learners gain a basis for presenting a varied and rich art and music program that is implemented in a manner in keeping with Montessori methodology.



Language Arts

The goal of the language arts activities is to empower educators to guide children to become readers and writers — helping them develop crucial communication skills for education and self-expression. Literacy begins very early in a child's life and the importance of familial and social considerations are examined. A child who learns to read early and well and who develops a deep love of books receives invaluable gifts toward lifelong learning.

Learners come to understand that experiences in every area of the Montessori classroom provide natural extensions of the patterns of communication that the child has already absorbed during this sensitive period for language development. With each new word, conversation, story, song, poem, and rhyme, the child is learning language. An immersion in purposeful, specific language is central to the Montessori prepared environment.

Montessori revealed three key language curriculum components:

- She focused first on developing the skills children would need to write and read, rather than on writing and reading per se.
- She accepted as natural the development of writing before reading.
- She introduced reading only to children who were already writing.

The Montessori language curriculum is rich with activities and opportunities to refine language and communication skills. Activities are presented in a logical and systematic order to help the child continually build upon her prior knowledge. In language development, the child works on concepts related to oral language, writing, reading, and parts of speech.

Oral Language

Beginning with the oral language activities, the Montessori language work introduces the child to the idea that words are made of individual sounds that he already knows. These sounds are the building blocks of all spoken and written language. The Montessori environment increases and enriches oral language and prepares the child for writing and reading through vocabulary enrichment, language training, sound games, and visual discrimination.

Writing

Montessori discovered that writing comes naturally to the child before reading and that phonemic awareness is central to the development of writing. As children cultivate their ability to notice, identify, and use the individual sounds of spoken words, they are in fact learning to build words, or write. She also understood that in addition to the cognitive aspect of writing, children needed to physically prepare themselves to hold the pencil and form letters and words. The Montessori writing activities develop both of these skills.

Through work with specific Montessori materials, starting with the Metal Insets, the child builds his fine motor skills and learns to form letters. Similarly, the child builds his sound-symbol association starting with the Sandpaper Letters. With the teacher's guidance, the child moves toward building words, phrases, sentences, and ultimately stories using the Movable Alphabets. He continues to practice writing letters working with Greenboards and then by printing on paper.

Reading

Everything in the Montessori language curriculum prepares the child for reading: oral language development, vocabulary enrichment, sound-symbol association, and writing. Reading involves the movement outward, from the expression of one's own ideas to understanding the thoughts and ideas of others. It also involves the movement from the part to the whole, from simple to complex. Putting words together in an ordered and logical sequence requires concentration, understanding, and practice. This internal shift from memorizing symbols to understanding the meaning of words is carefully nurtured in the Montessori environment. Learners are given thorough, step-by-step instruction on the progression of the reading series, beginning with presentation of concrete CVC (consonant-vowel-consonant) words and culminating with the introduction of some of the spelling variations they will encounter in the English language.

Parts of Speech

This first foray into grammar is an exciting step for the young child. Early reading comprehension lays the groundwork for advanced work in the function of words, word analysis, and the structure of language.

Rather than deconstructing language, Dr. Montessori chose to show the child how to put phrases and sentences together to build comprehension. The child learns that she has already absorbed significant knowledge of language structures and patterns. Sensorial exploration encourages children to expand their knowledge of written language in new and exciting ways. Children are introduced to seven of the nine parts of speech: noun, article, adjective, conjunction, preposition, verb, and adverb. Work with the Parts of Speech activities develops the children's understanding of word classification and the function, relationship, and order of the parts of speech. With every step, the Montessori child gains an appreciation of the power of language.

Learner Outcomes

Learners acquire knowledge and techniques to create an environment in which children develop a strong language foundation and cultivate a love of literacy. Careful guidance and sequential presentation of a multitude of curriculum activities and material is learned and performed to help the young child develop an understanding of phonetic sounds, phonetic writing and reading, irregular or sight words, phonograms, blends, spelling variations, and the basics of grammar. Learners demonstrate knowledge of how oral language lays the

foundation for writing and reading and why Montessori focuses on presenting writing prior to reading. Necessary to their comprehension is the learners' familiarity with the Montessori materials central to language activities and their knowledge of how these materials are presented.

Learners examine the typical sequence of language acquisition and are given the resources and practical tools to enhance language development. Critical-thinking explorations and creative work help learners establish a thorough understanding of both the philosophy behind the Montessori language arts program and the methodology involved in presenting the program. Emphasis is placed on setting the framework to educate children in the skills borne of reading: critical thinking, sequencing, comprehension, vocabulary enrichment, and spelling. At the same time, learners must demonstrate an awareness that each child learns differently at his/her own pace.



Culture and Science

The culture and science curriculum further develops the foundation for Montessori cosmic education and peace. As children learn how all living things are interdependent, they come to value the integrity of all life. A peaceful approach aimed at harmony develops naturally from this understanding. Montessori teachers play a vital role in helping children learn, practice, and develop the skills to become peaceful global citizens.

The Montessori culture and science curriculum is an examination of the theories, activities, and materials designed for an integrated and practical approach to natural and social sciences. A detailed, lesson-based approach is taken with proven Montessori progression from concrete to abstract learning. Learners study to acquire the knowledge and practice required to give children an up-close and personal view of the world, taken first from the larger picture. A “stop and think about it” perspective sparks the imagination and provides a vital springboard to greater understanding of who we are and our place in the universe.

Culture

Geography

This is the scientific study of the earth, its features, and human settlement upon it. Physical and cultural geography offer an exploration of the real world. The Montessori curriculum provides activities to give children their first impressions of the whole (globe) followed by its parts (land and water features) through concrete representations followed by more interactive experiences with nature and science activities. A major component of this curriculum is the study of continents. Learners assimilate the theoretical principles, practical activities, and materials to hone their knowledge and ability to deliver a lively and inspiring curriculum that introduces children to life in different parts of the world.

History

Awareness of history for children begins with awareness of themselves within the bounds of time. By examining their own timelines from birth to the present, then looking at their family trees, children gain their first sense of history. In the Montessori classroom, the study of history demonstrates the interrelatedness of all people, their experiences, and their influence over each other and all things on earth over a long period of time. The Montessori educator has a remarkable opportunity to encourage cultural understanding in the context of history and at the same time to nurture the Montessori philosophy that children are the peacemakers of the future. Positive change is only possible with education, then action.

Sciences

Botany/Zoology

Exploring botany and zoology in the Montessori hands-on environment reinforces children's connection to the incredible natural world we live in and share. The NAMC curriculum is intended to cultivate their natural attraction to living things into a lifelong interest. The study of botany and zoology is child-centered, using live plants and animals as a knowledge and interest catalyst. Botany focuses on understanding the parts of the plant and their specialized functions. Zoology provides a study of the five classes of animals, focusing on their specific characteristics and needs. As children learn about the animals, they come to respect their needs, habits, and characteristics.

Both botany and zoology include naming and general classification, which speak to the children's sensitive period for language and aid in their movement from sensorial exploration to a more cognitive understanding. As children are presented with real examples, they are also given the specific language related to the plant or animal, providing a framework for foundational understanding and further study.

Science Experiments

Educated in medicine, psychiatry, and anthropology, Dr. Montessori viewed the world from the perspective of a scientist. She believed in developing the mathematical and scientific minds of young children to set the foundation for lifelong education, blending their natural curiosity with a scientific approach to exploration and discovery. The science activities of the NAMC curriculum are interesting and fun for young children.

Children naturally experience their environment and develop their own theories of how the world works. The Montessori environment facilitates daily experimentation through the use of and repetition with the Montessori materials and activities that foster trial-and-error problem solving. With a hands-on approach to prediction and analysis in each science experiment, these activities allow young scientists to construct their own understanding of the laws of nature.

Learner Outcomes

Learners access this abundant curriculum to present and to use as a springboard to encourage deeper exploration when children express a particular interest in a specific subject area. The Montessori teacher is prepared to do the important work of educating and inspiring young people to pursue their instinctive and unlimited quest for knowledge of the world around them. Design and management of the Montessori indoor and outdoor environment along with careful preparation of materials and activities directed at each child's natural tendency are goals of the Montessori educator every day. The science curriculum provides abundant opportunity for experiences in the natural world.



Mathematics

The Montessori method offers a wondrous, imaginative approach to education with emphasis on the child, and the curriculum is set out to facilitate individual learning with teacher guidance. Maria Montessori observed that, from birth, the child's mind is naturally inclined toward order, with the ability to assess, calculate, and measure. Montessori presents mathematical concepts in concrete ways that lead the child on the experiential path to mastering the abstract.

In the Montessori environment, children have abundant indirect preparation to work on mathematical concepts before ever touching the math material. Practical life activities such as pouring water from one vessel to another hone their ability to judge relative quantities. Sensorial activities prompt children to sort, grade, differentiate, compare, and contrast. Activities in all areas enable them to approach a task in a logical way and to concentrate until a task is completed or a problem is solved. In this sensitive period for order and precision, a proper foundation and explorative environment encourage an intrinsic enthusiasm and awareness of all things mathematical. When children are ready to explore mathematics, they do so at their own pace with the guidance of their teacher. With the manipulation of concrete materials and the ability to assess their own progress, children fully absorb and understand mathematical concepts.

In addition to being appropriately sized and esthetically alluring for the child, Montessori math materials each perform specific educational tasks representing particular math concepts. Materials are designed to help children make sensorial connections to abstract math concepts. Understanding is reinforced as the child works with other materials that present concepts in increasingly complex ways. This movement from simple to complex, along with the control of error essential to all Montessori math materials, underlines the importance of consistency in the Montessori educator's method of introducing and presenting curriculum activities. A logical, systematic, and sequential order of presentations leads the child to build upon prior knowledge.

Mathematics is truly exciting in the Montessori Early Childhood curriculum, providing sensory experiences for understanding and internalizing concepts of quantities, numeric symbols representing quantities, and synthesizing these concepts with increasingly complex mathematical operations.

Numbers to Ten

Numbers to ten focuses on presenting the child with the quantities 1–10, the corresponding numerical symbols, and the names representing these quantities. The learner comes to understand how certain sensorial materials and activities prepare the child to work with quantities to explore counting and sequencing numbers 1–10. Through gradual, incremental learning, the child builds his knowledge as he works with a variety of

hands-on materials that present the quantities, symbols, and their association in increasingly abstract ways. The child is also presented with the idea that zero is nothing. He then comes to understand that, conversely, zero has great importance in mathematics.

Introduction to the Decimal System

The decimal (or base 10) system curriculum activities include associating quantities and symbols, place value (categories), category naming (units, tens, hundreds, thousands), and exploring the dynamic function of the decimal system (i.e., discovering what happens when a category exceeds its maximum quantity of nine). Learners are given thorough, step-by-step instruction on presenting the framework, laws, and language of the decimal system, all by utilizing the concrete materials that were created to represent the system of numeration used by everyone today.

The Four Arithmetic Operations

The four operations (addition, subtraction, multiplication and division) build upon the framework laid with the decimal system work and mastery. With gradual, incremental steps, addition is presented followed by its inverse, subtraction. Next, the child discovers that multiplication is the same as adding the same quantity over and over again. This repetitive form of addition builds on a familiar process (addition) and reinforces the relationship between addition and multiplication. Multiplication mastery readies the child for its inverse, division. The Montessori child discovers that division is the process of equally sharing quantities. Vocabulary related to the four operations is incorporated into presentations as children work with static, then dynamic operations. It may be surprising to learn that children in the Montessori early childhood environment perform the four operations with quantities in the thousands. Previous work with the decimal system develops familiarity with four-category quantities. The four operations enable the child to further explore the decimal system and the process of working through an operation, which is the same for four-digit numbers as it is for one-digit numbers. The child fully experiences the process of each operation through repetition, internalizing the concepts related to the work. This lays the groundwork for later finding a quicker method of computing arithmetic facts and leads to memorization of those facts. As the child moves through the curriculum, there is a progression toward using more abstract materials. In the final stage of the curriculum, word problems move the child from learning the processes to understanding their applications.

Teens, Tens, and Hundreds

Teens, tens, and hundreds activities can be presented parallel to the decimal system activities, once the child has a solid understanding of working with nine in each category of the Gold Bead Material and the Large Number Cards. A combination of new and familiar materials provides the tools for the sensorial association of new quantities and numbers. Children develop a comfort and confidence using conventional names for numbers to 100 (e.g., “forty-five”).

Memorization

Memorization activities focus on the basic math facts for numbers 1–9, the foundation of the decimal system. These activities help the child learn by memory the math facts for all four operations. Once she memorizes these combinations, the child quickly realizes that she can solve any equation, regardless of how many digits it has, because she really is only ever working with the numbers 1–9. By this time, the child has had extensive practice solving arithmetic equations and is familiar with the processes involved. Learning the math facts by heart is a natural extension that the child instinctively progresses to as she becomes ready for more challenging and abstract work. As the learner develops an understanding for how basic math facts are taught in the Montessori environment, she can appreciate how the memorization activities link concrete experience to abstract work, providing a more efficient method of completing arithmetic equations and preparing the child for a higher level of difficulty. Materials also move from concrete to more abstract, always containing the ever-important self-checking (control) mechanisms to build strength and confidence. Repetition is crucial to memorizing the math facts, and having a variety of material allows the child to practice the work over and over again without getting bored with the material.

Learner Outcomes

Learners acquire the knowledge to execute a sequential, consistent, and child-centered approach to presenting curriculum activities using Montessori math material. Learners develop the necessary skills to demonstrate a thorough exploration of the decimal (or base 10) system, place value, and the four operations of math with visual, conceptual, and practical activities using didactic materials that are set out in a step-by-step sequence: a proven formula for success in the Montessori classroom. Presentations progress from concrete experiential activities to abstract conceptualization, problem solving, and memorization of facts. They learn, too, that activities may be adapted to meet specific learning styles or needs of the child. As with all Montessori activities, children are given the freedom to choose their work, deeply explore that which ignites their imagination, measure and celebrate their success, and move forward with more challenging experiences.