

A Montessori Curriculum

Scope and Sequence

Age 3 - 12

This curriculum guide is a simplified version of a comprehensive set of five curriculum guides developed by Tim Seldin, president of the Montessori Foundation. They were developed with an eye to national standards and curricular trends in the United States, with the goal of ensuring that all necessary skills and knowledge are covered by the practicing Montessori educator.

The following is a brief overview of The Montessori core curriculum in the areas of language arts, mathematics, social studies, science, sensory training, and practical life for students age 3 through the Upper Elementary level. Please keep in mind that this only represents an overview of the course of study, and is not meant to be complete. Since students progress at their own pace, it is not possible to divide up the curriculum by grade levels. Also, we have not included descriptions of additional curriculum that may be available in the arts, music, physical education, and foreign language.

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A Montessori Curriculum - Reading and Language Arts

Pre-Reading

Due to our multi-age classroom design, our youngest students are constantly exposed to the older children in the class who are already reading. The total environment of the Primary classes (3 to 6 years-old) tends to create and reinforce in our young children a spontaneous interest in learning how to read. We begin to teach reading as soon as that interest is first expressed.

Using a total immersion approach, we help the youngest children to develop a highly sophisticated vocabulary and command of the language.

The children are taught through many early approaches to listen for and recognize the individual phonetic sounds in words.

We introduce the children to literature by reading aloud and discussing a wide range of classic stories and poetry.

We help our youngest students to recognize the shape and phonetic sounds of the alphabet through the 'sandpaper letters:' a tactile alphabet.

Reading

The development of the concept that written words are actual thoughts set down on paper. (This takes children much longer than most people realize.)

Sounding out simple three or four-letter phonetic words. (Typically before age 5)

Early exercises to practice reading and to gain the concept of a noun: labeling objects with written name tags, mastering increasingly complex words naming things that interest them, such as dinosaurs, the parts of a flower, geometric shapes, the materials in the classroom, etc.

Learning to recognize verbs: normally exercises in which the child reads a card with a verbal "command" printed out (such as run, sit, walk, etc.) and demonstrates his understanding by acting it out. As the child's reading vocabulary increases, verbal commands involve full sentences and multiple steps: "Place the mat on the table and bring back a red pencil."

Reading specially selected or prepared small books on topics that really interest the child, such as in

science, geography, nature or history.

Interpretive reading for comprehension at ever increasing levels of difficulty, beginning in the early elementary grades and continuing until high school graduation.

Use of the library and reference books on a daily basis for both research and pleasure.

An introduction to the world's classical children's literature at increasing depth and sophistication.

Handwriting

Control of the hand in preparation for writing is developed through many exercises, including specially designed tasks in the use of the pencil. Such exercises begin with very young children and extend over several years so that mastery is gradually, but thoroughly, attained.

The young children practice making letters from the time of their first initial "explosion into writing" at age 3 or 4:

Moveable Alphabets' made up of easily manipulated plastic letters are used for the early stages of phonetic word creation, the analysis of words, and spelling. They facilitate early reading and writing tasks during the period when young children are still not comfortable with their own writing skills. Even before the children are comfortable in their handwriting skills, they spell words, compose sentences and stories, and work on punctuation and capitalization with the moveable alphabets (Age 4-6).

At first, by tracing letters into sand.

Later, by writing on special tilted, upright blackboards: unlined, wide-lined, and narrow-lined.

Later, by writing on special writing tablets, becoming comfortable with script.

Cursive writing (Typically around age 5)

Word Processing (Normally beginning around age 6)

Calligraphy (Whenever the child is interested, often around age 10)

Composition

At an early age, before handwriting has been mastered, the children compose sentences, stories, and poetry through oral dictation to adults and with the use of the moveable alphabet. Once handwriting is fairly accomplished, the children begin to develop their composition skills. They continue to develop over the years at increasing levels of sophistication.

Preparing written answers to simple questions.

Composing stories to follow a picture series.

Beginning to write stories or poems on given simple themes.

Preparing written descriptions of science experiments.

Preparing written reports.

Learning how to write letters..

By age 9, research skills and the preparation of reports become major components of the educational program. Students research areas of interest or topics that have been assigned in depth, and prepare both formal and informal, written and oral reports.

Creative and expository composition skills continue to develop as the children advance from level to level. Students are typically asked to write on a daily basis, composing short stories, poems, plays, reports, and news articles.

Spelling

Children begin to spell using the moveable alphabet to sound out and spell words as they are first learning to read. They 'take dictation' - spelling words called for by the teacher - as a daily exercise. The sequence of spelling, as with all language skills, begins much earlier than is traditional in this country, during a time when children are spontaneously interested in language. It continues throughout their education.

Learning to sound out and spell simple phonetic words.

Learning to recognize and spell words involving phonograms, such as ei, ai, or ough.

Developing a first "personal" dictionary of words that they can now spell.

Learning to recognize and spell the "puzzle words" of English: words that are non-phonetic and are not spelled as they sound.

Studying words: involving compound words, contractions, singular-plural, masculine-feminine words, prefixes, suffixes, synonyms, antonyms, homonyms.

Grammar

The study of grammar begins almost immediately after the child begins to read, during the sensitive period when he is spontaneously interested in language. It continues over several years until mastered. The idea is to introduce grammar to the young child as she is first learning how to put thoughts down on paper, when the process is natural and interesting, rather than waiting until the student is much older and finds the work tedious.

We introduce our children to the function of the parts of speech one at a time through many games and exercises that isolate the one element under study. Montessori has assigned a geometric symbol to represent each element of grammar. (For example, verbs are represented by a large red circle.) The children analyze sentences by placing the symbols for the appropriate part of speech over each word.

Once students have mastered the concrete symbols for the parts of speech, they perform more advanced exercises for several years with grammar boxes set up to allow them to analyze sentences by their parts of speech.

Sentence analysis: simple and compound sentences, clauses, verb voices, and logical analysis of all sorts of sentences are studied using many different concrete materials and exercises. This normally begins about age 5 and continues over several years.

Students continue their study of language from the mid-elementary years onward, reviewing as well as engaging new concepts and skills: tenses, moods, irregular verbs, person and number, the study of style, the study of grammatical arrangements in other languages.

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Mathematics

Students are typically introduced to numbers at age 3: learning the numbers and number symbols one to ten: the red and blue rods, sand-paper numerals, association of number rods and numerals, spindle boxes, cards and counters, counting, sight recognition, concept of odd and even.

Introduction to the decimal system typically begins at age 3 or 4. Units, tens, hundreds, thousands are represented by specially prepared concrete learning materials that show the decimal hierarchy in three dimensional form: units = single beads, tens = a bar of 10 units, hundreds = 10 ten bars fastened together into a square, thousands = a cube ten units long ten units wide and ten units high. The children learn to first recognize the quantities, then to form numbers with the bead or cube materials through 9,999 and to read them back, to read and write numerals up to 9,999, and to exchange equivalent quantities of units for tens, tens for hundreds, etc.

Linear Counting: learning the number facts to ten (what numbers make ten, basic addition up to ten); learning the teens ($11 = \text{one ten} + \text{one unit}$), counting by tens ($34 = \text{three tens} + \text{four units}$) to one hundred.

Development of the concept of the four basic mathematical operations: addition, subtraction, division, and multiplication through work with the Montessori Golden Bead Material. The child builds numbers with the bead material and performs mathematical operations concretely. (This process normally begins by age 4 and extends over the next two or three years.) Work with this material over a long period is critical to the full understanding of abstract mathematics for all but a few exceptional children. This process tends to develop in the child a much deeper understanding of mathematics.

Development of the concept of "dynamic" addition and subtraction through the manipulation of the concrete math materials. (Addition and subtraction where exchanging and regrouping of numbers is necessary.)

Memorization of the basic math facts: adding and subtracting numbers under 10 without the aid of the concrete materials. (Typically begins at age 5 and is normally completed by age 7.)

Development of further abstract understanding of addition, subtraction, division, and multiplication with large numbers through the Stamp Game (a manipulative system that represents the decimal system as color-keyed "stamps") and the Small and Large Bead Frames (color-coded abacuses).

Skip counting with the chains of the squares of the numbers from zero to ten: i.e., counting to 25 by 5's, to 36 by 6's, etc. (Age 5-6) Developing first understanding of the concept of the "square" of a number.

Skip counting with the chains of the cubes of the numbers zero to ten: i.e., counting to 1,000 by ones or tens. Developing the first understanding of the concept of a "cube" of a number.

Beginning the "passage to abstraction," the child begins to solve problems with paper and pencil while working with the concrete materials. Eventually, the materials are no longer needed.

Development of the concept of long multiplication and division through concrete work with the bead and cube materials. (The child is typically 6 or younger, and cannot yet do such problems on paper without the concrete materials. The objective is to develop the concept first.)

Development of more abstract understanding of "short" division through more advanced manipulative materials (Division Board); movement to paper and pencil problems, and memorization of basic division facts. (Normally by age 7-8)

Development of still more abstract understanding of "long" multiplication through highly advanced and manipulative materials (the Multiplication Checkerboard). (Usually age 7-8)

Development of still more abstract understanding of "long division" through highly advanced manipulative materials (Test Tube Division apparatus). (Typically by age 7-8)

Solving problems involving parentheses, such as $(3 \times 4) - (2 + 9) = ?$

Missing sign problems: In a given situation, should you add, divide, multiply or subtract ?

Introduction to problems involving tens of thousands, hundreds of thousands, and millions. (Normally by

age 7.)

Study of fractions: Normally begins when children using the short division materials who find that they have a "remainder" of one and ask whether or not the single unit can be divided further. The study of fractions begins with very concrete materials (the fraction circles), and involves learning names, symbols, equivalencies common denominators, and simple addition, subtraction, division, and multiplication of fractions up to "tenths". (Normally by age 7-8)

Study of decimal fractions: all four mathematical operations. (Normally begins by age 8-9, and continues for about two years until the child totally grasps the ideas and processes.)

Practical application problems, which are used to some extent from the beginning, become far more important around age 7-8 and afterward. Solving word problems, and determining arithmetic procedures in real situations becomes a major focus.

Money: units, history, equivalent sums, foreign currencies (units and exchange). (Begins as part of social studies and applied math by age 6.)

Interest: concrete to abstract; real life problems involving credit cards and loans; principal, rate, time.

Computing the squares and cubes of numbers: cubes and squares of binomials and trinomials. (Normally by age 10)

Calculating square and cube roots: from concrete to abstract. (Normally by age 10 or 11)

The history of mathematics and its application in science, engineering, technology & economics.

Reinforcing application of all mathematical skills to practical problems around the school and in everyday life.

Basic data gathering, graph reading and preparation, and statistical analysis.

Sensorial exploration of plane and solid figures at the Primary level (Ages 3 to 6): the children learn to recognize the names and basic shapes of plane and solid geometry through manipulation of special wooden geometric insets. They then learn to order them by size or degree.

Stage I: Basic geometric shapes. (Age 3-4)

Stage II: More advanced plane geometric shapes-triangles, polygons, various rectangles and irregular forms. (Age 3-5)

Stage III: Introduction to solid geometric forms and their relationship to plane geometric shapes. (Age 2-5)

Study of the basic properties and definitions of the geometric shapes. This is essentially as much a reading exercise as mathematics since the definitions are part of the early language materials.

More advanced study of the nomenclature, characteristics, measurement and drawing of the geometric shapes and concepts such as points, line, angle, surface, solid, properties of triangles, circles, etc. (Continues through age 12 in repeated cycles.)

Congruence, similarity, equality, and equivalence.

The history of applications of geometry.

The theorem of Pythagoras.

The calculation of area and volume.

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History & Geography

Physical Geography

The Primary Globes (Age 3-5): specially prepared globes for the very young child that isolate single concepts of globe study-how land and water are shown, and the corresponding shapes of the continents that they learned from the puzzle maps.

The Puzzle Maps (Age 3-7): These are specially made maps in the forms of intricate, color-coded, wooden jigsaw puzzles representing the continents, the countries of each continent, and the states of the U.S. They are presented to the children at an early age, and are at first enjoyed simply as challenging puzzles. Soon, however, the children begin to learn the names of given countries, and by age 6 are normally very familiar with the continents of the globe, the nations of North America, South America, and Europe, along with most of the states of the U.S. As soon as the children can read they begin to lay the puzzle pieces out and place the appropriate name labels to each as a reading and geography exercise.

Land & Water Formations: materials designed to help the very young child understand basic land and water formations such as island, isthmus, peninsula, strait, lake, cape, bay, archipelago, etc. At first, they are represented by three-dimensional models of each, complete with water. Then the children learn to recognize the shapes on maps, and learn about famous examples of each.

Transference to maps: Introduction to written names and various forms of maps, along with early study of the flora, fauna, landscapes, and people of the continents.

Maps and compass: Introduction to longitude and latitude, coordinate position on the globe, the Earth's poles, the magnetic poles, history and use of the compass, topographic maps, global positioning satellite devices, electronic charts.

An introduction to humankind's search to understand how the Earth was formed, from creation stories to the evidence of contemporary scientific research: origins, geologic forces, formations of the oceans and atmosphere, continental drift and tectonic plates, volcanoes, earth quakes, the ice ages and the formation of mountain ranges. (Age 6)

The study of coasts and land relief's: hills, mountain ranges, volcanoes, valleys, plains, etc.; their formation, animal life, and effect on people.

The study of the hydrosphere: ocean, rivers, lakes, the water cycle. (By age 8)

Cultural Geography

Countries are studied in many ways at all levels, beginning at about age 3-4. A number of studies are held every year to focus on specific cultures and to celebrate life together: an example being Chinese New Year, when a class might study China, prepare Chinese food, learn Chinese dances, and participate in a special dragon dance parade. Anything that the children find interesting is used to help them become familiar with the countries of the world: flags, boundaries, food, climate, traditional dress, houses, major cities, children's toys and games, stamps, coins, traditional foods, art, music, and history. This interweaves through the entire curriculum. These studies culminate in our annual

Study of the regions, culture, and natural resources of the United States, including geography, climate, flora and fauna, major rivers and lakes, capitals, important cities, mountains, people, regional foods, traditions, etc. This begins in the primary and continues at increasing depth at each level.

The detailed study of one nation at a time. Focus moves over the years from one continent to another, as

the children's interest leads them. All aspects of the nation are considered: geography, climate, flora and fauna, major rivers and lakes, cities, mountains, people, food, religions, etc.

Economic Geography

Natural Resources of the Earth.

Production: How natural resources are used by humankind.

Imports and Exports: The interdependence of nations.

History & the needs all people share

The basic needs of man are food, shelter, clothing, defense, transportation, culture, law, religion or spiritual enlightenment, love, and adornment. (This study begins at age 5-6 and continues throughout the curriculum.)

The concept of time and historical time is developed through many activities and repeated at deeper complexity from age 5:

Telling time on the clock

Time-lines of the child's life

Time-lines showing the activities of a day, week, month, year

Family trees

Time-line of the Earth's history

Time-line from 8,000 B.C. to 2,000 A.D. to study ancient to modern history

The story of the evolution of the planet and its life forms over the eons is first studied at about age 6, along with an overview of human history. This is repeated throughout the curriculum in increasing depth of study.

Each year the child continues to study and analyze the needs, culture, technology, and social history of various periods in history. The trends of human achievement are charted, such as the development of transportation, architecture, great inventions, and great leaders.

By age 8, students begin to study the earliest humans, ending with an introduction to the first farmers. They consider early societies in terms of how they organized themselves to meet the common needs of all peoples: food, clothing, shelter, defense, transportation, medicine, arts, entertainment, government, and religion.

The Upper Elementary level (ages 9-12) history program follows a three-year cycle of thematic study. Students study whichever themes are being presented that year regardless of their age. In year 1 of the cycle, the class will focus on the creation of the universe, formation of the earth, evolution of life, and early human civilizations. These topics were first introduced at the lower elementary level. At this level, students will go into considerably greater depth and prepare increasingly sophisticated projects and research reports.

Continuing the three-year cycle of thematic history study at the Upper Elementary level (ages 9-12), in year 2 of the cycle, the class will focus on ancient civilizations, including the Mesopotamian cultures, Greece, Rome, ancient China, Byzantium, ending with an introduction to the Middle Ages.

In the third year of the three-year cycle of thematic history study at the Upper Elementary level (ages 9-12), the class will focus on American studies, including an introduction to the history of the United States,

American folk culture, technology, children's literature, government, and geography. The class will also consider Pre-Colombian Central and South American cultures, the Native American peoples of North America, the age of exploration, and the immigrant cultural groups who came to America from Europe, Africa, Asia, and Latin America.

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Science

Differentiation between living and non-living things. (Age 3-4)

Differentiation between animals and plants; basic characteristics (Age 3-5)

Observation of animals in nature.

First puzzles representing the biological parts of flowers, root systems, and trees, along with the anatomical features of common animals. These are first used by very young children and puzzles, then as a means to learn the vocabulary, then are related to photos and/or the "real thing," then traced onto paper, and finally with labels as a reading experience.

Nomenclature Cards:

Botany: identifying, naming, and labeling the parts of plants, trees, leaves, roots, and flowers.

Zoology: identifying, naming, and labeling the external parts of human beings, insects, fish, birds, and other animals.

Introduction of the families of the animal kingdom, and identification and classification of animals into the broad families. Introduction to the basic characteristics, life-styles, habitats, and means of caring for young of each family in the animal kingdom. (Age 5-7)

Introduction to ecology: habitat, food chain, adaptation to environment and climate, predator-prey relationships, camouflage, and other body adaptations of common animals.

Advanced elementary biology study: the names and functions of different forms of leaves, flowers, seeds, trees, plants, and animals. This usually begins with considerably more field work collecting specimens or observing.

Study of evolution and the development of life on the Earth over the eons. (Age 6 and up)

Study of the internal parts of vertebrates: limbs, body coverings, lungs, heart, skeleton, reproduction. (Age 5-8)

Advanced study of plants in class, greenhouse and garden: experimenting with soil, nutrients, light, etc. (Age 6 and up)

More advanced study of the animal kingdom: classification by class and phyla. (Age 7 and up)

The plant kingdom: Study of the major families of plant life on the Earth and classification by class and phyla. (Age 7 and up)

Life cycles; water, oxygen, carbon-dioxide, and nitrogen. (Age 7 and up)

Introduction to chemistry: Begins at age 6 and continues throughout the elementary science curriculum

The three states of matter

Basic atomic theory

How elements are created through stellar fusion

Elements and compounds

Mendelov's table of the elements

Basic molecular theory: Building atomic models

Physical and chemical changes

Research into the elements and continued study of the periodic table

Introduction to chemistry lab experiments

Animal behavior: detailed observation. (Age 9 and up)

Anatomy: Systems of the animal and human body. (Age 9 and up)

Health and nutrition. (Age 9 and up)

Ecology: Advanced study of the interrelationships of life forms. (Age 9 and up)

Development of skills in careful observation, recording and describing, and use of increasingly sophisticated techniques of measurement.

Development of skills using common scientific apparatus: microscopes, telescopes, hand lens, collecting field specimens, dissecting, preparing displays.

Development of field science skills: tracking, listening, observing.

Development of scientific inquiry skills: forming hypothesis, designing experiments, recording results.

Study of the great inventions; machines and technology and their effect on society throughout history.

Study of the great scientists.

Introduction to the physical sciences: (Age 10-12)

Geology and mineralogy

Meteorology

Astronomy and cosmology

Elementary physics: light, electricity, magnetic fields, gravity, mass.

Preparing and analyzing all sorts of graphs and data displays; basic statistics.

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Practical Life Skills

One of the first goals is to develop in the very young child a strong and realistic sense of independence and self-reliance. Along with love and a stable environment, this is the child's greatest need. This area of the curriculum focuses on developing skills that allow the child to effectively control and deal with the social and physical environment in which he lives. There is a growing pride in being able to "do it for myself." Practical life begins as soon as the young child enters the school and continues throughout the curriculum to more and more advanced tasks appropriate to the oldest students.

Early Tasks (Age 3-5)

Dressing oneself

Learning home address and phone number

Pouring liquids without spilling

Carrying objects without dropping

Carrying liquids without spilling

Walking without knocking into furniture or people

Using knives and scissors with good control

Using simple carpentry tools

Putting materials away on the shelves where they belong when finished

Working carefully and neatly

Dusting, polishing and washing just about anything: floors, tables, silver

Sweeping and vacuuming floors and rugs

Flower arranging

Caring for plants and animals

Table setting-serving yourself-table manners

Folding cloth: napkins, towels, etc.

Simple use of needle and thread

Using common household tools: tweezers, tongs, eye-droppers, locks, scissors, knives

Increasingly precise eye-hand coordination

Simple cooking and food preparation

Dish washing

Weaving, bead stringing, etc.

This process continues logically so that older students will learn such practical tasks as:

Caring for animals

Dog training

Sewing

Cooking complex meals

Working with tools

Making simple repairs

Basic auto maintenance

Getting around on their own: Metro, buses, cabs, hiking

Self-defense

Computing tax forms

Making consumer purchase decisions, comparison shopping, budgeting

Maintaining a checkbook

Applying for a job

Earning spending money

Mastering test taking strategies

Caring for young children

Interior decorating

Making clothes

Furniture refinishing

Wilderness survival

Running a small business enterprise

Gardening

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Sensory Training

These are exercises in perception, observation, fine discrimination, and classification that play a major role in helping our children to develop their sense of logic and concentration. They begin at age 3 and are a major area of concentration typically through age 5.

Discrimination of length, width, and height

Discrimination of volume

Discrimination in multiple dimensions

Discrimination among color tones

Discrimination among geometric shapes for shape and relative size

Discrimination among solid geometric shapes by sight and touch

Solving of complex abstract puzzles in three dimensions

Discrimination of intensity and nature of sounds

Discrimination among musical tones

Discrimination of texture by touch

Discrimination of weight by touch

Discrimination of temperature by touch

Discrimination of scents

Which, in the older students, lead to such exercises as:

Precise observation of the natural world

Culinary discrimination

Artistic appreciation

Architectural appreciation

Musical appreciation

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