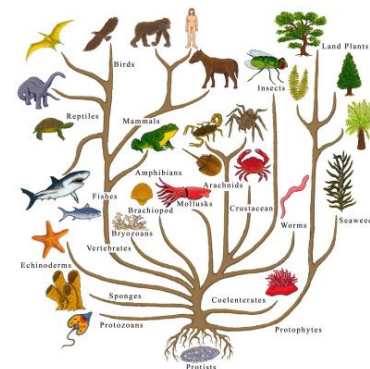


**“THERE MUST BE PROVISION FOR THE CHILD TO HAVE CONTACT WITH NATURE; TO UNDERSTAND AND APPRECIATE THE ORDER, THE HARMONY AND THE BEAUTY IN NATURE.”**



**M**aria Montessori recognized that the child possessed

a natural desire to make sense of his world, and how much he appreciated doing so. There are millions of species on our planet. It would be difficult if we just tried to describe and name each one individually, and there would be a rather large disconnect in the universal understanding of our world; for this reason, we classify. In the Montessori classroom, particular attention is given to the skill of classification. To classify is to organize objects by their similar or dissimilar characteristics. Classification activities lay the foundation for the child to understand the complex way we organize the entire living world, all while developing his thinking and reasoning abilities. Carl Linnaeus was a Swedish botanist, physician, and zoologist who devised the first cohesive system for classifying specific species. His system classified nature within a hierarchy, starting with kingdoms and moving on down through phylum, class, order, family, genus, and species. At each level, the classification becomes more and more specific but nonetheless, in it's most basic form, it is still the process of looking for universal similarities. The ability to manipulate objects is essential to internalizing the concepts of classification. Therefore, the materials throughout the Montessori curriculum aid greatly in strengthening the child's ability to reason logically and abstractly.

In the early years, the child will classify endlessly; he might sort beads or rocks or shells, taste a variety of foods, smell a variety of scents, feel a variety of textures, sort sound cards or experiment sinking and floating objects. The child goes on to the elementary classroom and finds he is classifying in every area of the curriculum. In Language, he will alphabetize words or sort them by sounds; classify nouns by person, place, or thing, gender, common or proper, singular or plural;

classify words by their part of speech and so on. In Geography, the child will classify countries by continent, states by region, types of clouds and weather; in history he will classify using the fundamental needs chart or looking at time periods.

In his study of botany and zoology, the child begins to understand classification from a scientific standpoint. The child will who previously focused on very obvious characteristics, like color, size, and shape will move on to more advanced classification work including living and non-living, and detailed characteristics of plants and animals. He is able to look at objects with more discrimination: he may notice that while oranges, lemons, and limes are different in color, they are all citrus fruits. Or he may realize that insects, while varying widely in appearance, all have three body parts and six legs. The biology materials are rich with imagery and serve as a springboard for great discovery. The classified nomenclature is critical to the study of botany and zoology. Other materials include the Six Kingdom Chart, Living and Non-Living, Plant and Animal sorting activities, and the Food Chain chart, as well as lessons that identify the parts and types of various animals and plants. The Animal Kingdom Chart presents the identification and classification of animals into the broad families, and introduces to the child a variety of lessons that illustrate the basic characteristics, lifestyles, habitats, and means of caring for young of each family in the animal kingdom. The Plant Kingdom



Chart serves the study of the major families of plant life on the Earth and classification by class and phyla. The child must experience the natural world as his awareness develops. When he is outside, his knowledge awakens his mind; his senses are stimulated, he can explore by touching, seeing, hearing, and when safe, even tasting. Such exploration creates a sense of awe and wonder that will be of great importance throughout his life. These encounters will develop a profound appreciation in the child from a young age and naturally, he will grow to be respectful of his environment, forever honoring our great Mother Earth.

**“EDUCATION IS A NATURAL PROCESS CARRIED OUT BY THE CHILD AND NOT ACQUIRED BY LISTENING TO WORDS BUT BY EXPERIENCES WITH THE ENVIRONMENT.”**

**MARIA MONTESSORI**

**“THERE MUST BE PROVISION FOR THE CHILD TO HAVE CONTACT WITH NATURE; TO UNDERSTAND AND APPRECIATE THE ORDER, THE HARMONY AND THE BEAUTY IN NATURE....SO THE CHILDREN MAY BETTER UNDERSTAND AND PARTICIPATE IN THE MARVELOUS THINGS WHICH CIVILIZATION CREATES.”**

**MARIA MONTESSORI**

**T**he intense love of the environment within each child is “the secret of all man’s progress and the secret of social evolution”. A child’s exploration of unspoiled nature stimulates his powers of observation, develops patience, fosters creativity, and instills a sense of calm and connectedness.

Maria Montessori said, “But if for the physical life it is necessary to have the child exposed to the vivifying forces of nature, it is also necessary for his psychical life to place the soul of the child in contact with creation, in order that they may lay up for himself treasure from the directly education forces of living nature.” She placed a great emphasis on nature and nature education and felt that the outdoor environment should be an extension of the classroom. When we sow the seeds of knowledge in our classrooms, we include plants as a vital part of the biosphere. Botany in the Montessori classroom serves as the foundation of basic knowledge and connection to plants, and the importance of plants in relation to the whole environment.

In the Children’s House, the child has already learned the names of many of the flowers, trees, birds, and mammals that surround them in the world, as well as the parts of flowers and the very beginnings of biological classification. The child becomes aware of the living organisms in our world. As the child continues on to his elementary years, his botany studies deepen. The child will examine the main characteristics of plants and focus on each plant with particular focus on its needs, structure and function. He will embark on a study of roots, stems, and leaves,



flowers and fruits. The child will discover what a plant needs to survive by understanding the life cycle of plants. The curriculum provides lessons on the preservation and propagation of plants, as well as the care of plants, pollination and fertilization. The child is exposed to the system of scientific classification with materials such as the Five Kingdoms Chart and the Plant Classification Chart. He will also understand the various uses plants have for human and animal life. The child is encouraged to look at the many ways plants provide for our needs, and the connections are endless. The child's botany studies are supported by experiments, projects and research and parallels their studies in geography, history and zoology. The goal in providing the child with these lessons is that he gains an understanding of the interdependence of all life forms and the role humans must assume to protect and preserve life on Earth.

A garden is ideal to provide an experience to the child as he acquires an understanding of plants. It allows for "real things" to be explored and aligns with the concrete to abstract model. The practical life area may also serve the child in his botany studies through food preparation, flower arrangements, seed sowing, making compost, and watering the plans in the environment. There is always an opportunity to take the child outside, for botany studies, and for life:

Human needs and the manner in which they are fulfilled depend upon the environment itself. The availability of things, the climate, the unique plants and animals of an area, dictate human life. It is reflected in the social customs, the work done by the people, the food we eat, the clothes we wear and the way in which we carry out our tasks of daily living. So in the environment the child finds the seeds of all elements of culture, and the basis of all human knowledge. Love for the environment cannot be offered to the child through instruction, it is learnt through living.

The interest in nature is a natural thing in every human being since the beginning of time. ‘To delight in the wonder of the natural world at such a tender and impressionable age is to become a steward of the earth in the years to come.’ In Montessori’s world view, humans are a part of their environment and she saw them as one with it. We should celebrate our unique ties to the physical and ecological makeup of our surroundings. Children are guided by nature, by natural tendencies, and we should value this. Botany in the Montessori classroom aids the child in developing a deep understanding of his environment, thus allowing him to develop a *spiritual peace in which he [and all men] could live together in harmony with nature.*

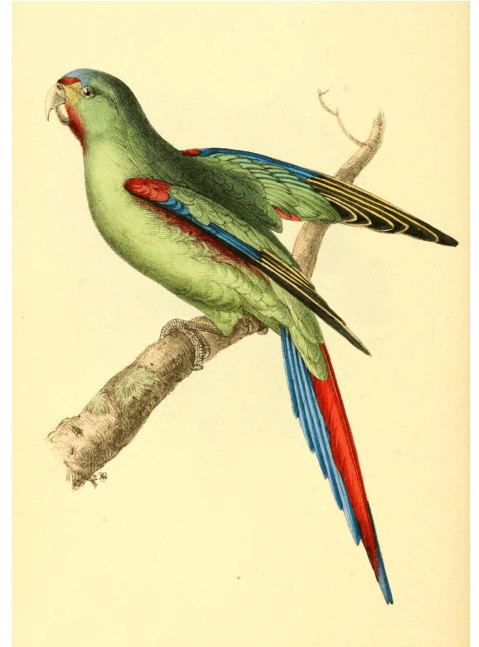
**“WHOEVER TOUCHES THE LIFE OF THE CHILD  
TOUCHES THE MOST SENSITIVE POINT OF A WHOLE  
WHICH HAS ROOTS IN THE MOST DISTANT PAST AND  
CLIMBS TOWARD THE INFINITE FUTURE.”**

MARIA MONTESSORI



**“THE FIRST DUTY OF AN EDUCATOR IS TO  
STIR UP LIFE, BUT LEAVE IT FREE TO  
DEVELOP.”**

MARIA MONTESSORI



**H**uman beings have been zoologists for as long as there have been human beings. As humans, we are intricately tied to animal life: we have depended on many of them for food, work, and friendship throughout our evolution and history. Zoologists research everything they think to ask about animals, including their anatomy and interrelationships, their physiology and genetics, their distributions and habitats. Montessori wanted the child to develop a view of the world as a whole and to see the interdependence of all life.

From this grand view, careful steps are taken during the elementary years to deepen an understanding of life. “This is an area in which it is a pure joy in following the child’s natural interest; the child is naturally fascinated by ‘real and living things’.” The study of Zoology in the elementary classroom focuses on the

**ZOOLOGY**

“The scientific study of the behavior, structure, physiology, classification, and distribution of animals.”

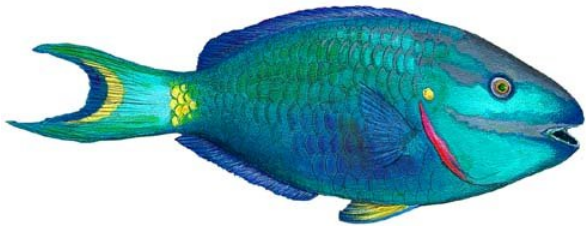
classification of animals, the form and function of animals, animal anatomy, adaptation, and the interdependencies of animals and plants.

The Montessori principle remains: present the child with real examples before enlarging on concepts and facts. A class pet can provide a wonderful experience for the child throughout his studies; he can learn to care for it, observe its growth, as well as form a connection with it. It will serve him quite well as he embarks on his study of animals in the classroom.

The child first looks at what it means for something to be living and at some general aspects of animal study. He then gains an understanding of the differences

between vertebrates and invertebrates. It progresses to an introduction to the five classes of vertebrates and their skeletal structures. The external parts of the vertebrates are presented with nomenclature; more in depth research is supported by the Animal Kingdom Charts and "first knowledge" questions. With these materials, children explore how and where animals live, what they eat, their life cycles and physical characteristics. The system of scientific classification is formally introduced, and children learn that both vertebrates and invertebrates can be classified using this system. The nomenclature for the major phyla of invertebrates is then presented, and students do independent research on these animals.

In zoology, the child will study the classification of living organisms and follow an evolutionary path through history. Each animal group serves as an example of how living organisms moved out of the primordial sea to live on the land and then adapted to the environmental changes that have occurred over the ages. Therefore, the study of invertebrates parallels their introduction to the Time Line of Life in history, since our earliest fossil record of life on Earth is that of invertebrate forms. The Animal Kingdom Charts and "first knowledge" questions also supplement invertebrate work. The child will then return to the vertebrates, looking at the internal parts of five classes. His research will expand to projects that include scientific classification as well as information on the circulation, respiration, skin type, skeletal structure, reproduction, method of movement, nutritional needs and habitat of the animal they are researching. This study of the five classes of vertebrates also parallels Time Line of Life studies, as these classes are presented in the order in which fossil evidence shows that they appeared on Earth.



The cultural subjects give the child an understanding of unity. The child gains an understanding of the interrelatedness of all things; both living and non-living. A great appreciation and sense of wonder unfolds as *the harmony of creation is revealed.*