

THE CONNECTION



Fostering the Mathematical Mind

Maria Montessori believed that every human mind has characteristics of being mathematical. She observed that the mind has the propensity towards exactness, order, and precision. We estimate, calculate, seek exactness and perfection, and are drawn to repetition until we feel satisfied. We face the desire to know something so well that, eventually, practice leads to abstraction. There is the idea that mathematics is a subject that must be taught, but Montessori believed these tendencies already exist in each person. Montessori described the need to follow the child's nature in *The Secret of Childhood*:

“That irresistible impulse which unites a child with the objects about him during the sensitive periods is actually a love for his environment. It is not simply an emotional reaction, but an intellectual desire or love which enables a child to see and hear thus develop. A natural desire which children have to observe can be called in Dante’s words ‘the intelligence of love.’” (p. 103)

Thus, it only makes sense for us to serve the child's natural propensity to have a mathematical mind. At Athens Montessori, we offer scientifically researched materials that serve the child's sensitive periods. Rather than using pencil and paper, we begin with real objects the children can touch. By using these manipulatives, the child starts to perceive size, quantity, sequence, and patterns. We want to give the child pure, isolated impressions to make math intelligible for the child. Over time, and with lots of repetition, he/she can begin to form abstractions. For example, after counting objects to 100 numerous times (as pictured above), the child will be able to hear the words “one hundred” and have a real idea of what that quantity means.

Through following the child's natural tendencies, we foster a true love for mathematics. It makes sense to the child and sparks curiosity to learn more, leaving him/her confident and ready to dive deeper into mathematical concepts.

February Events:

- 10: AMPs Meeting at 8:45 AM
- 13: Elementary Overnight
- 17: Skate Night at 5 PM
- 20: School Closed: Teachers at Montessori Conference
- 21: AMS 5K/10K Race at 8:30-10:30 AM

March Events:

- 3: AMPs Meeting at 8:45 AM
- 3, 4, 5: Parent Teacher Conferences – School out at 1 PM
- 9-13: School Closed: Spring Break
- 17: Skate Night at 5 PM

Notes from the Office:

Please remember to keep your child with you once you sign him/her out. Our parking lot can get busy during pick up, and our children's safety is of utmost importance. Please be with all of your children as you escort them to the car so everyone stays safe and sound!

Mathematics

PRIMARY (3-6)

At the primary level, we offer real materials the children can touch and manipulate while they explore quantities. TOP LEFT: A child practices addition with beads. Each bead has a certain number of units (1-10). For $9+1$, she can get the 9 bead and the unit, count them, and write the sum. TOP RIGHT: This child is learning how to make teens. Through getting the 10 bar and either one unit, two, etc, he is able to make teens. BOTTOM: On the 100th Day of School, children counted 100 objects. They also danced 100 dances during movement time and counted to *cien* with Sra. Elizabeth during Spanish.



LOWER ELEMENTARY (6-9)

After lots of experience with manipulatives in Primary, Lower Elementary children are able to abstract mathematical ideas. TOP LEFT: These children practice division with the stamp game. Here, stamps have quantities listed: 1, 10, 100, and 1000. The children know what each quantity means, so they no longer have to get out 100 beads to get the concept. TOP RIGHT: To teach the concept of time, the guide uses sticks to explain Roman Numerals. Children learn that the months of September-December are named for the Roman Numerals 7-10. This helps them understand that math is and always has been a large part of human culture. BOTTOM: Third year children focus on sides and angles of triangles by measuring and calculating their relationships.



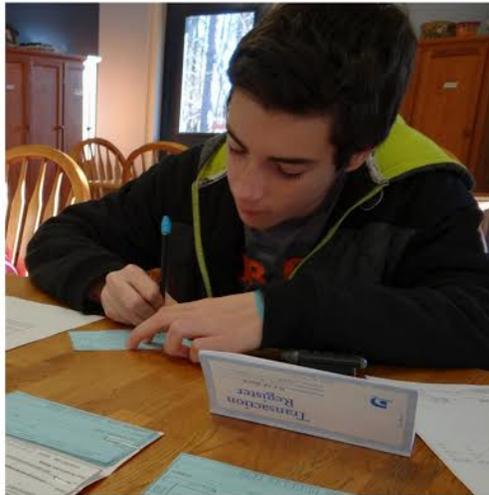
Mathematics

UPPER ELEMENTARY (9-12)



As the children continue in the Montessori environment, their ability to abstract increases even more, and they can take the concepts they have mastered with them wherever they go. On their trip to Tybee Island, the children used math every day to investigate horseshoe crabs and invertebrates, learn more about the tidal creek, and create pollution solutions. Number crunching and mental math are now second nature to these children, and they can dive deeper into sciences and mathematical operations thanks to their strong foundation in math.

THE MIDDLE SCHOOL (12-14)



Middle School students practice practical applications of math by writing checks, paying bills, and balancing their checkbooks during the week of their long financial project.

Representative students of the AMS Middle School met with Athens First Bank and Trust Branch Manager and Personal Banker for tips and guidance during the process.



Middle School Math Project

Middle School Mathematics is integrated throughout the program and real world applications run parallel to the students' weekly pre-algebra, algebra, and geometry program goals. Individualized instruction enables the instructor to track each student's progress as they proceed at their own pace, taking quizzes and mastery tests before setting new goals.

In addition to individual and group lessons, students have the opportunity to use higher-order thinking to solve real world problems, from practical money transactions and accounting to algebraic relationships. Each year, our students participate in a weeklong internship with local businesses and a weeklong financial project. Both experiences provide real life applications in mathematics and economics.

We currently have students interning at these local business sites:

UGA Biological Sciences, Main Street Vet, Barberitos Main Office, Vision Video, Athens Clarke County Storm Water, Sugar n' Spice Café, Wild Intelligence, Georgia Natural History Museum, and Bear Hollow.

While part of our class is interning, the remaining student body participates in the financial project and continues to manage our yearlong pizza business enterprise. The financial project exposes students to the working world in which they learn about taxes, credit, supply and demand, and practice managing a bank account.

In reflection of their experience with the financial project, this is what one of our Middle School students wrote:

"In this year's financial project I have learned a lot about the working world. I now know how to write a check and start a bank account. I think that this project has helped better prepare me for adulthood. In addition, my persona for this project was an epidemiologist, a career I researched and am now interested in. If it wasn't for this project, I may never have learned about the role of an epidemiologist. I enjoyed the field outings because it provided a very hands-on experience. At the Athens First Bank and Trust, I got to see all the security measures a bank takes and was curious about the contents of the safety deposit boxes. At Vision Video, I learned it used to be a pizza place, but the business had to adapt and change. Though the digital age has made it challenging for movie rental places, Vision Video has managed to stay open through friendly and dedicated service. Though my budget was fictional, it felt very real to manage my own bank account. I also can better appreciate the expenses my parents and all other adults have to pay, such as insurance and taxes." ~Odile Vidrine, age 13

AMPs News:

-The AMS 5K/10K "Moving for Montessori" race is coming up on Saturday, Feb. 21. The Race Committee has been working hard on gathering community sponsors, family sponsors, and race participants. This year, the tee shirt is partially designed by AMS students! Additionally, there will be a new, free Kids' Fun Run for children ages 7 and below. The Kids' Fun Run will take place on the field below the solar panels. The Moving for Montessori race promotes healthy lifestyles, the school in the community, and helps raise funds for AMS.

-The Auction Committee is hard at work on this year's event. It will be Saturday, April 18th and helps raise funds for the school. It is also a chance for parents and staff to enjoy fellowship while the kids are elsewhere. Childcare is available for AMS students.

-Some new families have joined AMS in the middle of the school year and the Mentor Committee has provided them with mentors from existing AMS families to help answer their questions and make them feel welcome.

-On January 20th, there was a Teacher Workday and AMPs provided a homemade lunch for the staff and teachers. The lunch helps to show them how much they are appreciated and gives them a chance to enjoy each other's company.

"Obviously the love of order in children is not the same as that of adults. Order provides in adults with a certain amount of external pleasure. But for the small children it is something quite different. It is like the land upon which animals walk or the water in which fish swim. In their first year they derive their principles of orientation from their environment which they must later master. And since a child is formed by his environment he has need of precise and determined guides and not simply some vague constructive formulae."

-Maria Montessori, *The Secret of Childhood*