
*The Mission of the Mathematics & Science Academy is to provide a rigorous & innovative academic program focused upon mathematics & science which inspires & empowers students to pursue STEM-related careers & to make significant contributions to the global community.*

*The Vision of the Mathematics & Science Academy is to exemplify the best in mathematics and science education through the integration of 21st century skills, current technologies, and authentic applications that inspire and engage students who will become STEM professionals contributing to a global community through innovative achievements, leadership, and service.*

# The Mathematics & Science Academy
# Ocean Lakes High School

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# The Mathematics & Science Academy

**The Mathematics & Science Academy (MSA)** opened in 1996 to provide students who have demonstrated a strong interest and proficiency in mathematics and science an environment where they can extend their knowledge beyond the typical high school curricula. Offering unique courses in math, science, technology, and English, the program gives students the latitude to pursue a broad spectrum of specialty areas while meeting the challenges of rigorous, academic, STEM-related studies.

The Mathematics & Science Academy courses are designed to challenge students with advanced mathematics and science curricula, integrated technologies, technical reading and writing, and extensive problem-solving and research opportunities. Students are able to complete the requirements for the Mathematics & Science Academy and the Advanced Studies diploma by taking at least six courses each year and maintaining at least a 3.0 Grade Point Average.

The Mathematics and Science Academy is driven by a vision of instructional excellence that leads students to pursue STEM careers. In support of that effort, the program adopted the **Autonomous Learner Model.** This educational framework is designed to help learners work towards the goal of independent or autonomous learning. Its six aspects are:

**Orientation** – Self-discovery, collaboration, leadership, self-efficacy, Growth Mindset;

**Individual Development** –Inter/intra personal understanding, learning skills, use of technology, university/ career awareness, organizational and productivity skills, creative and critical thinking, problem solving;

**Enrichment** – Courses, explorations, investigations, cultural activities, community service, excursions, camps;

**Exploration** – Guided exploration beginning in the classroom in which students are expected to dig deeper. This is framed in a variety of formats: individual projects, group projects, mentorships, presentations, assessment of self and others;

**Investigation** – Student-chosen, teacher-accepted research ending with a mini-product or presentation;

**Seminars** – Small group presentations of futuristic, problematic, controversial, general interest or advanced knowledge.

Through this lens, MSA students begin in ninth grade developing the requisite research skills for the production of competitive, significant and publishable products. Students hone these skills each year, participate in an annual symposium, explore STEM topics and careers through mentorships, interviews and research, and eventually complete a formal proposal and capstone project. Students complete a research project or independent study of a real world problem with the end result being a product that offers a solution or that demonstrates scientific inquiry into a research question associated with that problem. A presentation of final product or research is made to an appropriate school or community audience.

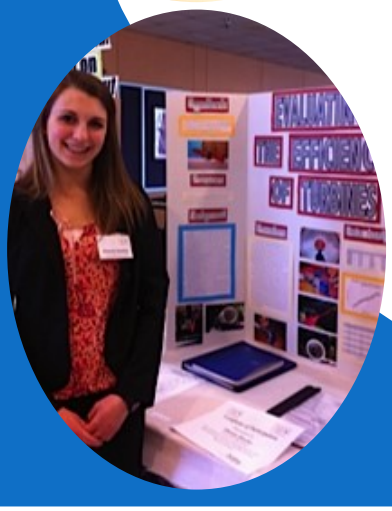
To be eligible to apply, students must complete Algebra I during middle school. Eligible eighth grade students are encouraged to obtain an application from their middle school guidance counselor or the VBCPS website. Completed application packets include a student profile sheet, an Admissions Agreement, parent, teacher, and counselor recommendation forms, student transcripts, most recent report card, and standardized test scores. All applicants participate in an Entrance Examination. Acceptance is competitive with 125 students selected from over 500 annual applicants. Ninth grade applications may be considered provided seats are available and all application procedures have been followed.

Completed applications typically are due late January or early February of the eighth grade year. Students accepted into the program become fulltime *Dolphins* and are provided transportation by the school division.

# The Autonomous Learner Model

The Autonomous Learner Model (ALM) is a program designed to help learners work towards the goal of independent or autonomous learning. The model was originally developed to meet the diversified cognitive, emotional and social needs of gifted and talented secondary students but has now been adapted to a variety of educational settings.

The components of ALM align with the vision of the Mathematics and Science Academy which seeks to develop the scientific knowledge and research skills in all of our students that will enable them to produce competitive and significant products now and in their future professional STEM careers.

# Mathematics & Science Academy

## Student Schedule Framework **

| | 9th Grade | 10th Grade | 11th Grade | 12th Grade |
|---|---|---|---|---|
| | Mathematics<br>MG Honors English 9<br>MG Chemistry<br>{World Hist/Geog 1<br>AP Human Geography<br>Foreign Language<br>Health/PE 1<br>Elective | Mathematics<br>MG Honors English 10<br>MG Molecular Biology<br>{World Hist/Geog 2<br>AP European History<br>AP Human Geography<br>Foreign Language<br>Health/PE 2<br>Elective (Optional) | Mathematics<br>Honors or AP English 11<br>MG Physics or AP Physics 1<br>{VA & US History<br>AP US History<br>MG Integrative STEM<br>Foreign Language<br>Elective (Optional) | Mathematics<br>Honors or AP English 12<br>{AP Physics 2<br>AP Physics C or other<br>MG Science Electives-1 credit<br>{VA & US Government<br>AP US Government<br>Economics & Personal Finance<br>Elective (Required 6th class)<br>* Capstone Project<br>Elective (Optional) |

***Mathematics choice depends on credit earned in middle school and achievement in 9th grade.***

***See below for recommended paths.***

| | | | | |
|---|---|---|---|---|
| **Entering With: Algebra I** | **MG Advanced Algebra** | **MG Geometry** | **MG Precalculus** | **AP Calculus AB or BC** |
| **Entering With: Geometry** | **MG Advanced Algebra** *(Two sophomore options to be considered are affected by final 9th grade math performance, teacher recommendation & career plans)* | **1. MG Precalculus** | **AP Calculus AB or BC** | **MG Multivariable Calculus (s)**<br>**MG Differential Equations (s)**<br>**Mathematical Modeling**<br>**AP Statistics**<br>**Computer Architecture** |
| | | **2. AP Statistics** | **MG Precalculus** | **AP Calculus AB or BC** |
| **Entering With: Algebra II/ Trig** | **AP Statistics** (Students who received less than an "A" in Alg II/Trig should consider purging it before arriving to high school and taking the MG Adv. Alg. course.) | **MG Precalculus** | **AP Calculus AB or BC** | **MG Multivariable Calculus (s)**<br>**MG Differential Equations (s)**<br>**Mathematical Modeling**<br>**Computer Architecture** |

**NOTE: * The Capstone Project is a required component of the MSA program. Although it carries one credit, it does not count towards the 6-class rule; (s) denotes a semester class. The brace, {, indicates a choice is made.**
****Courses and requirements may change as needed to meet state, local, Program and student needs.**

## Additional Guidelines

- Academy students select the most appropriate course(s) from the bracketed selections and must take a minimum of six classes each year. The Capstone Project counts as a credit, but it does not count as one of the six classes.
- Graduation requirements not offered within the Mathematics & Science Academy curriculum will be met from courses available in the established curricula at Ocean Lakes High School.
- Once accepted into the Academy, no mathematics or science summer school credit will satisfy Academy program requirements.
- MSA students must complete Algebra I during middle school years. At least one full credit of mathematics must be taken each high school year which must include one credit of AP Calculus. In addition, a statistics course must be completed by the end of tenth grade. The sequence of mathematics courses each student follows is dependent upon the student's coursework prior to entering Ocean Lakes High School and achievement in Academy mathematics courses.
- The four-year science sequence includes Magnet Chemistry (9th), Magnet Molecular Biology (10th), Magnet Physics or AP Physics 1 (11th), and a full credit of magnet science electives (12th). The magnet science elective should correlate with career interests. If an Academy student desires to take an AP science course in the senior year, the requirement for a full credit of magnet science may be decreased to one-half credit. AP Physics 1 may replace Magnet Physics only if the student agrees to take the AP exam for the course and secures the Academy Coordinator's permission.
- Although three years of a foreign language are required, four years are recommended.
- A cumulative 3.0 GPA must be maintained. Students whose GPA drops below 3.0 will be subject to academic probation. In the event that successful completion of all program requirements becomes impossible, the student will be required to exit from the program. Students who exit the program must return to their zoned high school.
    - Students who meet the graduation requirements for the Academy program will have exceeded the state-mandated requirements for the Advanced Studies Diploma. Students will receive both a Mathematics & Science Academy seal and the Governor's seal on their diploma.

# College & University Acceptances

**MSA Academy**
**Class of 2017**
**Accepted $3,661,500**
**in Scholarships!**

Advanced Technology Institute
Arizona State University
Art Institute of Arlington
Auburn University
Baltimore International College
Bauder College
Boston University
Bowie State University
Bridgewater College
Brown University/Brown Medical School
Bryant and Stratton College
Bryn Mawr College
Bucknell University
California Polytechnic Institute
University of Southern California
Calvin College
Carnegie Mellon University
Case Western Reserve University
College of Charleston
College of William & Mary
Christopher Newport University
Clearwater Christian College
Clemson University
Coastal Carolina University
University of Colorado
Columbia University
Cornell University
Culinary Institute of America
Dartmouth College
DePaul University
Drexel University
Duke University
East Carolina University
ECPI University
Elizabeth City State University
Embry University
Emory University
Ferrum College
Flagler College
Florida Institute of Technology
Florida State University
Florida Tech
University of Central Florida
University of Florida
University of West Florida
Fordham University
Free Will Baptist Bible College
Gallaudet University
George Mason University
Georgia Institute of Technology
University of Georgia
Greensboro College
Hampden-Sydney College
Hampton University
Harvard University
Howard University
Albertson College of Idaho
University of Illinois
Illinois Institute of Technology
Indiana Institute of Technology
International Masonry Institute
University of Iowa
Jacksonville University
James Madison University
Johns Hopkins University
Johnson C. Smith University
Johnson and Wales University
Kansas State University
Lehigh University
Liberty University
Longwood University
Lynchburg College
Mary Baldwin College
Maryland Institute College of Art
University of Maryland
Marymount University
Manhattan College
University of Mary Washington
Massachusetts Institute of Technology
Mercer University
Methodist University
Miami International University
University of Miami
Michigan State University
University of Michigan
Middlebury College
Morgan State University
Naval Academy Preparatory
University of Nebraska
New York University
Norfolk State University
North Carolina A&T
North Carolina State University
University of North Carolina at Chapel Hill
Northern Illinois University
Northwestern University
Ohio State University
Old Dominion University
Olivet Nazarene University
Pennsylvania Culinary Institute
Pennsylvania State University
University of Pittsburgh
Princeton University
Purdue University
Radford University
Randolph College
Randolph Macon College
Randolph Macon Woman's College
Rensselaer Polytechnic Institute
Rice University
University of Richmond
Roanoke College
Rochester Institute of Technology
St. Francis College
St. Mary's College
Seton Hall University
Shenandoah University
Smith College
University of South Carolina – Aiken
University of South Florida
Southampton College
Stanford University
University of Tennessee
Texas A & M University
Tidewater Community College
Trinity College
Trinity International University
Tufts University
Tulane University
Tuskegee University
Universal Technical Institute
U.S. Air Force Academy
U.S. Coast Guard University
U. S. Merchant Marine Academy
U.S. Military Academy
U.S. Naval Academy
Villanova University
University of Virginia
University of Virginia at Wise
Virginia Commonwealth University
Virginia Military Institute
Virginia Polytechnic & State University
Virginia Wesleyan University
Wake Forest University
University of Washington
Washington & Lee University
Wesleyan College
Wesleyan University, CT
West Virginia University
West Virginia Wesleyan College
Wheaton College
University of Wisconsin
Yale University

# Academy Student Profile

| | Academy Class of 2016 | | | | Academy Class of 2017 | | |
|---|---|---|---|---|---|---|---|
| | SAT I Data | | | ACT Data | SAT I Data | | ACT Data |
| | Critical Reading Score | Writing Score | Math Score | Composite Score | Critical Reading Score | Math Score | Composite Score |
| Academy Average | 605 | 603 | 643 | 29.4 | 657 | 679 | 28.8 |
| OLHS Average | 558 | 529 | 571 | 25.6 | 574 | 565 | 25.1 |
| VBCPS Average | 514 | 490 | 511 | 22.8 | 557 | 534 | 23.0 |
| Virginia Average | 520 | 498 | 517 | 23.3 | 561 | 541 | 23.8 |
| National Average | 494 | 482 | 508 | 20.8 | 533 | 527 | 21.0 |

| University Selection Trends | |
|---|---|
| Ivy League Universities | 4 % |
| National Competitive Universities | 75 % |
| Public Universities | 87 % |
| Private Universities | 9 % |

OLHS School Report Card

## *Academy and Advanced Academic Timeline*

| | |
|---|---|
| November 16, 2017 | MSA Open House at Ocean Lakes High School 6:00 p.m. - 8:30 p.m. |
| January 10, 2018 | DEADLINE for all academy programs and advanced academic programs applications to be completed online for students attending Virginia Beach City Public Schools or to the appropriate program coordinator for students not attending Virginia Beach City Public Schools. |
| January 16, 2018 | **Mathematics & Science Academy Testing**<br>Location: **Ocean Lakes High School Cafeteria**<br>5:00 - 7:30 p.m. - *Doors open at 4:45 p.m.*<br>Only Students From: *Corporate Landing Middle, Home Schooled, Kempsville Middle, Landstown Middle, Larkspur Middle, Lynnhaven Middle, Princess Anne Middle, Salem Middle, Virginia Beach Middle* |
| January 18, 2018 | **Mathematics & Science Academy Testing**<br>Location: **Ocean Lakes High School Cafeteria**<br>5:00 - 7:30 p.m. - *Doors open at 4:45 p.m.*<br>Only Students From: *Bayside Middle, Brandon Middle, Great Neck Middle, Independence Middle, Old Donation School, Plaza Middle* |
| January 23, 2018 | **Mathematics & Science Academy Make-up Testing , Private Schools and High Schools**<br>Location: **Ocean Lakes High School Cafeteria**<br>5:00 - 7:30 p.m.- *Doors open at 4:45 p.m.* |
| February 16, 2018 | All High School Notification Letters Mailed |
| February 23, 2018 | All High School Appeals Deadline |
| February 28, 2018 | Student Letters of Intent to Accept and Attend a High School Academy Program or Advanced Academic Program DEADLINE. |

# Academy Specific Courses

## ENGLISH

*Magnet Honors English 9*

*Magnet Honors English 10*

## SCIENCE

*Magnet Chemistry*

*Magnet Geology*

**Magnet Molecular Biology*

**Magnet Physics*

**Magnet Astronomy* (s)

**Magnet Analytical Chemistry* (s)

**Magnet Biochemistry* (s)

**Magnet Human Anatomy* (s)

**Magnet Human Physiology* (s)

**Magnet Meteorology (s)*

**Magnet Microbiology* (s)

**Magnet Organic Chemistry* (s)

## MATHEMATICS

*Magnet Advanced Algebra*

*Magnet Geometry*

*Magnet Precalculus*

**Magnet Mathematical Modeling*

**Multivariable Calculus* (s)

**Differential Equations* (s)

**Magnet Computer Architecture* (s)

## TECHNOLOGY

*Magnet Integrative STEM*

**IMPORTANT ACADEMY DATES**

**October 12: City Wide Academy Night**

**November 16: MSA Open House @ OLHS (6 pm)**

**AN IMPORTANT NOTE:** An asterisk signifies this course has been reviewed by a committee of educators, including university personnel, and deemed to be college level work. Therefore such courses carry weighted GPA credit equivalent to Advanced Placement courses. All VBCPS Advanced Placement courses are open to Academy students as well.

# MATHEMATICS & SCIENCE ACADEMY
## Ocean Lakes High School

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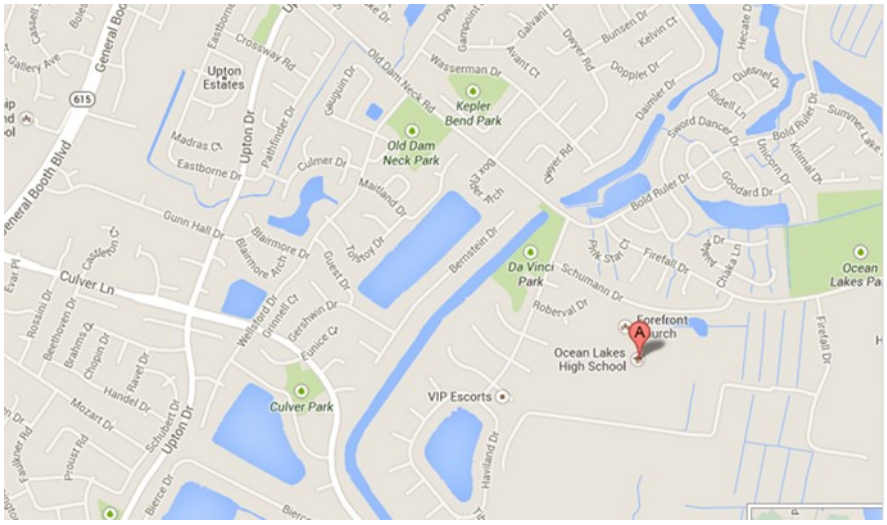
Blog: http://blogs.vbschools.com/msacademy-dolphinwatch/

Facebook: http://tinyurl.com/MS-Academy-OLHS

School Website: http://www.oceanlakeshs.vbschools.com/




VIRGINIA BEACH CITY PUBLIC SCHOOLS
AHEAD OF THE CURVE