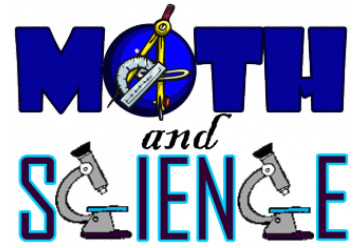


West Orange High School

Institute for Mathematics and Science

IMS 9 & 10 NEWSLETTER



March 2025

Our IMS students have been busy and hard at work!. We are happy to share the events of the past two months as well as what we are looking forward to for the remainder of the school year.

The New Jersey Mathematics League (NJML) has wrapped their competitions for the year, turning their attention to preparing for the [Essex County Mathematics League](#) (ECML) meet in May. The IMS top cumulative contestants across the year were Timothy Koch, Jeremy Cerruto, Nava Brickman, and Rhyan Watt! Great job to all that participated.



The tenth grade IMS students had the opportunity to attend Engineering Career Day, hosted at Rutgers University by the [NJSPE](#). We learned about how to become an Engineer (college application process, licensing) as well as various applications of the specialties of the field, which included “Wind Wizards,” bridge replacement and inspection, water treatment, accessibility, and flood control. Students took advantage of learning from various college representatives about programs they offer and the aspects involved in applying.

The ninth grade IMS students visited the NJIT campus and the school’s Makerspace, where they toured the available machinery. Students participated in an interactive and collaborative activity where they built a structure and tested its structural integrity. The IMS 9 group also visited Drone Advanced Air Mobility Lab for a drone demonstration and participated in a campus and admissions tour.



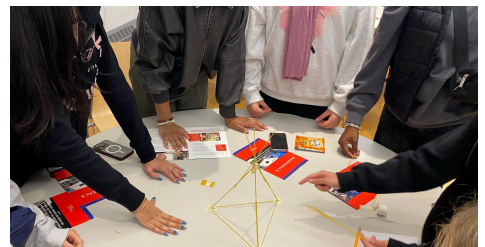
Our program will host a second Networking Event in May for all IMS students as well as an end of program celebration for IMS 10 students in June. We look forward to a strong finish to the year!

Sincerely,

Dr. Jessica Nuzzi

IMS Program Coordinator

jnuzzi@westorangeschools.org



IMS School Counselor News

Madelin Fernandez-Perez, School Counselor

Although the groundhog saw his shadow predicting 6 more weeks of winter, we are excited to see our students continuing to work diligently these next few weeks. As the third marking period comes to an end, it gives our students continued opportunities to demonstrate their capabilities. We encourage our students to utilize the [GPA CALCULATOR](#) in their [NAVIANCE](#) account as a chance to self-reflect and make goals for



themselves during these last few months of the school year. Feel free to reach out to your child's school counselor and/or teacher if you have any questions about your child's progress. Grade 9 students will be taking the NJSLA state test in May for Mathematics and Language Arts. We encourage students to get plenty of rest and enjoy a good breakfast before testing. A testing schedule will be emailed via Naviance in the future with additional information.

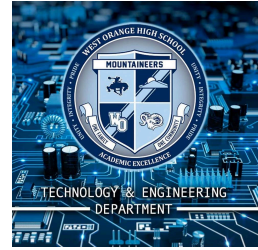
School Counselors have met with students to discuss 2025-2026 classes. Each student received a copy of their course requests in order to have a continued discussion with their parent/guardian. A letter will be provided to students and families in June that lists classes to which your child is registered. As a component of the IMS program, each 9th grade student is required to select a STEM elective designed to provide students with practical and experiential application of their learning from the core math and science classes. We are so proud of the many accomplishments our IMS students have achieved and encourage them to keep up the good work!



Technology & Engineering

Mrs. Gardner, Teacher of Engineering

Dear families,



Introduction to Engineering

Since the change of the semester, Intro to Engineering students have been learning about the engineering design process and how to apply it. Students have already completed a mini project intended to practice using the design process on small cars that we raced down a ramp. The students made observations about whose car designs went the fastest and proposed design changes they could make to improve their own cars based on those observations. Students are currently completing an iterative design process to a large scale project, designing a model structure that if built to full size in our West Orange community will serve a need they've identified. Following instruction in the standard forces and loads engineers design for, and ways they use these forces to maintain building stability, students began designing their own models. These model structures are subjected to rigorous real world testing as construction is completed for performance in high winds, small earthquakes, and large snowfall events that accumulate weight on roofs.

Principles of Engineering

Sophomores in this year long class just completed a fixed wing glider project, which they designed, built, and flew in the school hallway. Students felt that the confines of the hallway made the required 20 foot long flight more of a challenge, and engaged in many iterations and small design changes. This year, I decided to challenge students to use AI to propose a glider design with the exact same criteria and constraints as the project they had just completed. They had to build the glider exactly as the AI directions suggested and fly those designs to compare to their work. The reflective consensus was that the AI designs gave some creative suggestions that students had not previously considered, however the designs were not great at factoring real-world conditions and material properties into the suggestions. Students commented on the AI system as being a nice tool for helping brainstorm ideas but that they felt more confident in their own abilities to make observations and adjustments in real-time for their engineering design. Now that students have a sense of how lift works, as well as the other forces of flight, we are constructing large remote-controlled airplanes with 5' wingspans.

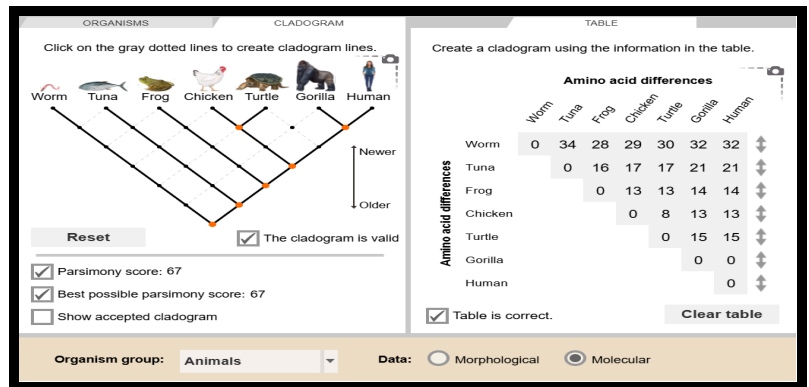


Honors Biology IMS 9

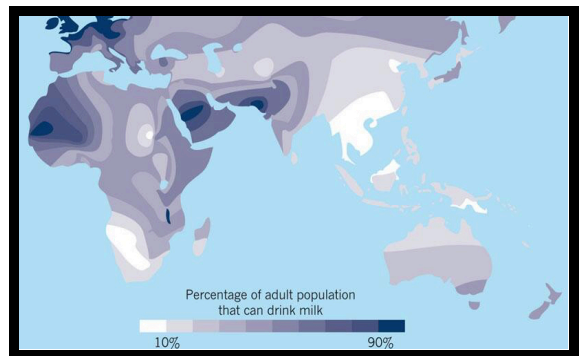
Tagen Jacobus, Teacher of Biology

Hello IMS Families,

Marking Period 3 flew by! During this time we concluded the Genetics & Inheritance unit and are just about finished with the Natural Selection and Evolution unit. Students have explored two new interactive, GIZMOS: one on antibiotic resistance and a second on cladograms. This is an interactive and virtual simulation platform which models actual science practices. Cladograms are meant to model evolutionary relationships. The image to the right shows entered data (right) and the cladogram that is created (left) due to the manipulation of the data and connections between points.



Did you know that about a third of the global adult population is lactose tolerant? This means that more of the population is intolerant, which was not always the case as it was even more common to be tolerant in the past. Through a case study, students thoroughly explored the coevolution between genes and culture. We used data and maps to understand different populations that have these different mutations, allowing members to digest lactose into adulthood. Producing the lactase enzyme due to a mutation is beneficial for survival.



Best,

Mrs. Jacobus

tjacobus@westorangeschools.org

Honors Algebra II IMS 9

Katherine Bryant, Teacher of Mathematics

Dear families,

March and April are dedicated to completing the Inverse and Radical Functions Unit. The students will learn how to solve equations that contain radicals. In this unit, the students will also learn about constraints to equations and extraneous solutions.

Then they will move on to the Exponential and Logarithm unit. The students will learn how to solve exponential and logarithmic equations. In this unit, the students will also learn about exponential growth and decay and how it is used in the real-world. This includes applications such as annual interest rates, the country's population increase/decrease, and vehicle depreciation.

Honors Geometry & Analysis IMS 9/10

Samantha Heller, Teacher of Mathematics

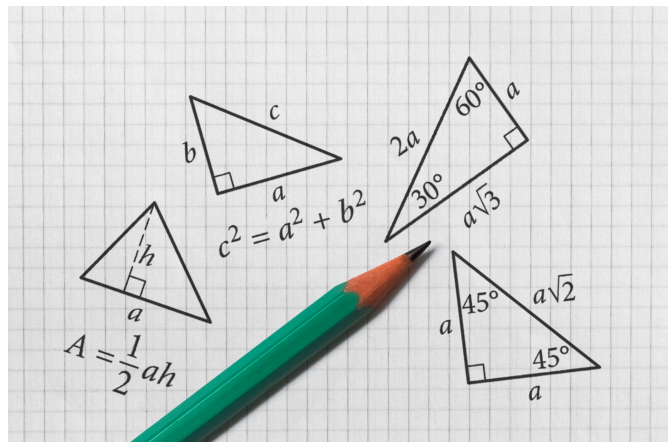
Hello IMS students & families!

We have made great progress in our Geometric Analysis over the past few months. We have successfully developed a solid understanding of Similar Triangles. More specifically, students are now able to identify similar triangles and use various theorems to set up proportions to solve complex problems. We have also been working on a Performance Based Assessment (PBA) about famous fractals, one of which is called the Sierpinski Pyramid. With this project, students were able to successfully see the geometric patterns that were used to create each type of fractal. As an extension, students learned about the history behind fractals and where they occur within nature.

In the next few months, we will continue to analyze right triangles. We have already covered Geometric Mean, the Pythagorean Theorem (and its converse), and Special Right Triangles. To complete our Right Triangles unit, we will focus on Trigonometry and its applications. This topic will be used throughout the rest of students' mathematical careers and can be useful in various industries. For the remainder of the year, we will focus on extending our studies to circles and polygons. I am excited to build our geometry knowledge and look forward to all that the next few months have in store!

Happy Spring!

Ms. Heller



Honors Chemistry IMS 10

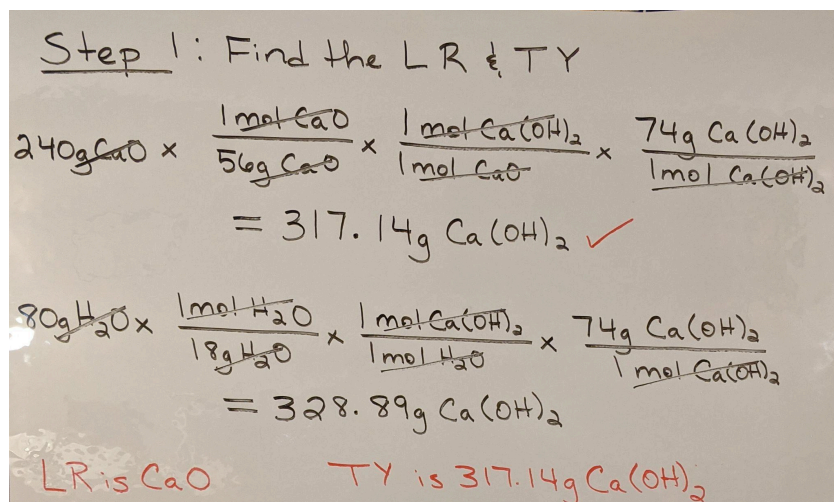
Mrs. Hodges , Teacher of Chemistry

thodges@westorangeschools.org

Hello IMS Families and Friends,

The students are at a pivotal part of the school year. For much of the year we have been setting the foundation for the topic that we are currently studying...STOICHIOMETRY.

Stoichiometry is the process of determining how much product is produced in a chemical reaction or how much of the reactants are needed to produce a desired amount of product.



The students have to use their knowledge of atoms, molecules, reactions, and mole calculations to complete stoichiometric analysis. It is a very important and challenging topic that I'm sure they will master.

Best Regards,

Ms. Hodges

Honors Precalculus IMS 10

Dr. Jessica Nuzzi, Teacher of Mathematics

Hello IMS families!

We are well on our way to being fully prepared for Calculus after reviewing, extending, and mastering function analysis topics from Algebra 2. Students are working hard to understand the commonalities among all function families and their graphic and algebraic representations.

We will now take our “deep dive” into rational functions, which will be followed by exponential and logarithmic functions, so that when they approach these functions next year, they will be confident and competent in their work.

Students will be applying their knowledge to real world scenarios, for which they will research and document connections between these function types and the ways they exist in our everyday lives. There are many connections between Precalculus topics and real world applications. I hope students can appreciate how this knowledge can inform their future lives.

It has been great to see and hear the students working hard in the classroom, interacting with each other to learn more deeply and to make sense of their experiences. Students are encouraged to continue advocating for themselves, apply to the Mathematics Honors Society in the coming weeks, and prepare for the ECML county-wide contest.

Sincerely,

Dr. Nuzzi

