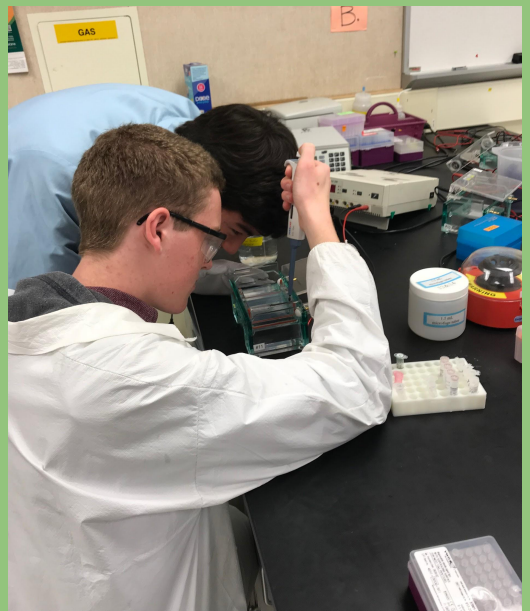
MVLA Science Department Presentation 2023 - 2023



MVHS Science Dept.

2023

Together we create greatness

MVHS Science Teachers

15 Amazing Science Teachers...

- Gina Dunsmore - Physics (Coordinator)
- David Cmaylo - Bio
- Anthony Gallego - Chem
- Ann Nguyen - Bio & Anatomy
- Lyuda Shemyakina - Bio & Pre-Science
- Megan Mendoza - Bio
- Stephen Widmark - Physics
- Jeff Panos - Chem
- Christine Yow - Chem
- Oscar Lopez-Figueroa - ES & Chem
- Jack West - Physics
- Simon Huynh - Chem & Bio
- Jonathan Bower - APES & Bio
- Katie Johnson - APES & Bio
- Sukhraj Sohal - Bio & Chem

MVHS Science Classes

ELD:

- Pre-Biology
- Pre-Environmental Science

College Prep:

- Biology
- Chemistry
- Physics
- Anatomy & Physiology
- Environmental Science

AP/Honors:

- Honors Biology
- AP Biology
- Honors Chemistry
- AP Chemistry
- Physics
- Physics AP1
- Physics APC: Mechanics & EM
- AP Environmental Science

MVHS Science Pathways

9th Grade	10th Grade	11th Grade	12th Grade
- Biology - Biology H -Co-Taught Bio -Pre-Bio/Pre-Enviro (ELD)	- Chemistry - Chemistry H - Environmental Science -Pre-Bio/Pre-Enviro (ELD)	- Chem/Chem H - Physics - AP Physics 1 - AP Biology - AP Chemistry - AP Environmental Science - Anatomy & Physiology - Environmental Science	- Physics - AP Physics 1 - AP Physics C - AP Biology - AP Chemistry - AP Environmental Science - Anatomy & Physiology

✴ **These are recommended pathways, open access allows students to self-select path.**

✴ **9th grade students are placed in Bio, BioH, or Co-Taught Bio.**
Exceptions made only after meeting w/ all stakeholders: parents, counselor, dept coordinator, ES teacher, Bio teacher, SPED teacher, & ELD teacher to ensure student's needs are met.

Instructional Materials

- Instructional Materials by Course

Some of our Strengths

Dept decision making based on WASC goals with a focus on student & staff wellness.

Passionate & hardworking teachers who are involved in all aspects of school (coaching, clubs, ASB, etc.)

Commitment to student diversity and inclusivity in science courses (9th grade bio, co-taught bio, anatomy pre-science)

NGSS alignment with rigorous, relevant and inquiry-based curriculums that focus on crosscutting concepts, disciplinary core ideas & science/engineering practices.

Strong alignment & collaboration throughout dept (course team alignment in curriculum, grading & assessment and vertical alignment of science skills.)

Excellent preparation for for students in a wide range of post-secondary paths.

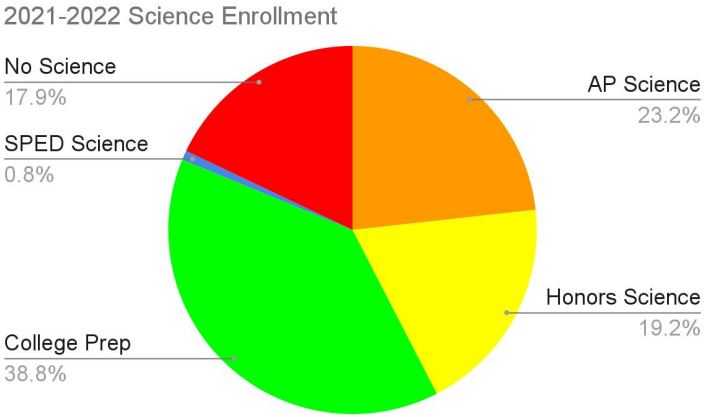
Science Goals: Key Results: GPS

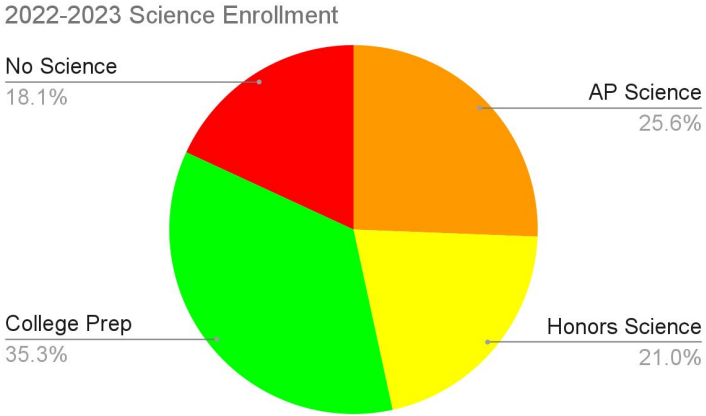
Where do we need to go?	How will we measure success?
Science Goal 1 / WASC Goals 2&5 Diversify Science Offerings	• 1 new non-AP science elective offered in 2019-2020
Science Goal 2 / WASC Goals 2&5 Help Eliminate Freshman Tracking in Science	• All 9th graders take Biology (honors, cp, co-taught) with case by case exceptions reviewed by all stakeholders. • Environmental Science serves 10-12 grades.
Science Goal 3 / WASC Goals: 1,2&5 Meet enrollment recommendations of NGSS Ca. Framework HS 3-Course Model and the UC System.	• 90% of regular ed students take 3 years of science: Bio, Chem, Physics. • 70% of regular ed students take 4 years of science: Bio, Chem, Physics, & Elective.
Science Goal 4 / WASC Goals: 2,4&5 Design curriculum & adopt materials aligned to NGSS Ca. Framework HS 3-Course Model & provide literacy training to help students access curriculum & materials.	• Courses increase alignment with NGSS/HS 3-Course Model by 20% each year. • Dept adopts materials aligned with NGSS/HS 3-Course Model • Dept incorporates literacy supports & skills in all science classes to help students access the materials & curriculum.
Science Goal 5 / WASC Goals: 3 Dept. Commitment to Staff and Student Wellness	• Science teachers incorporate wellness activities in class at least once a month. • Science teachers share and post crisis/wellness resources in science classrooms • Dept discussions & decision making hold student wellness as a priority.

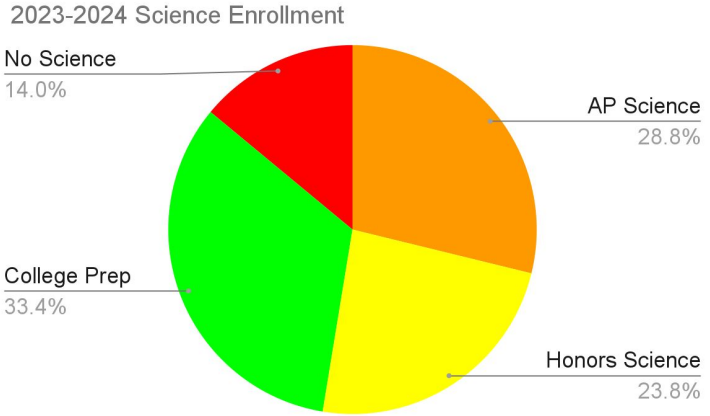
Science Data *source	2021-22	2022-23	2023-24
# MVHS Students	2319	2202	2200
# Science Courses Taken	1903 (82.1%)	1803 (81.9%)	1892 (86%)
# AP Science Course Taken	539 (23.2%)	564 (25.6%)	634 (28.8%)
# Honors Science Courses Taken	445 (19.2%)	462 (21.0%)	523 (23.8%)
Students taking Double Science	112(4.9%)	126 (5.7%)	170 (7.7%)
Students taking Triple Science	15(0.7%)	5 (0.3%)	19 (0.9%)
% Students Graduating w/ 2 Science Classes *(*minimum graduation requirement for MVLA)*	12.4%	10.8%	TBD
% Students Graduating w/ 3 Science Classes *(*minimum recommended for UC/CSU acceptance)*	25.3%	25.1%	TBD
% Students Graduating w/ 4 Science Classes	49.1%	52.4%	TBD
% Students Graduating w/ 4+ Science Classes	13.1%	11.5%	TBD

Science Dept Data

Enrollment



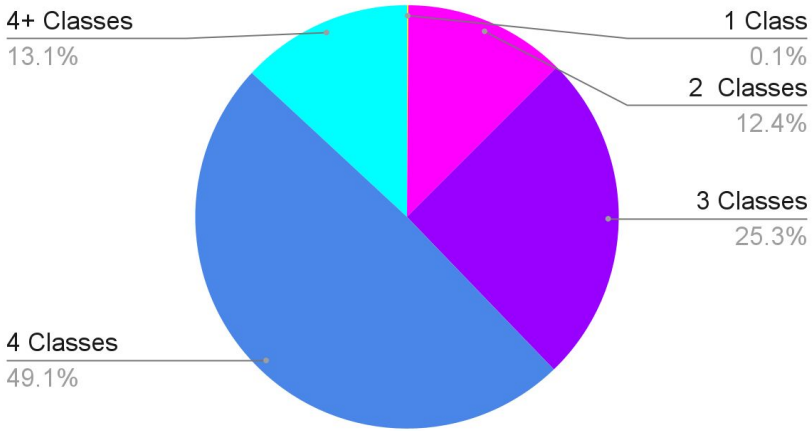




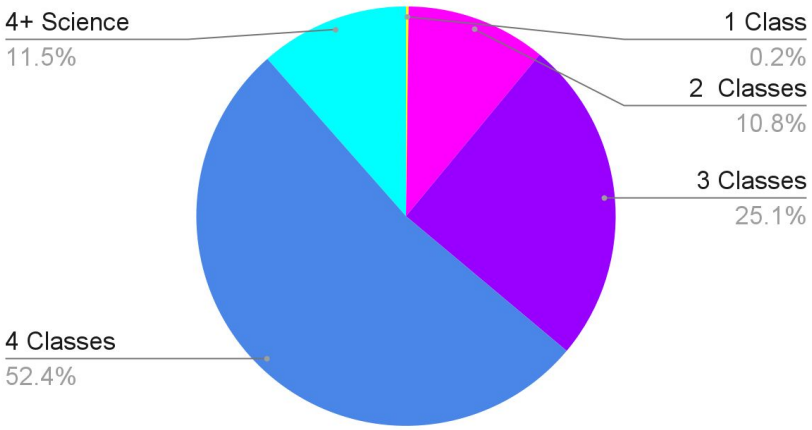
Science Dept Data

#Science Classes Completed by Graduation

2021-2022 #Science Classes Taken

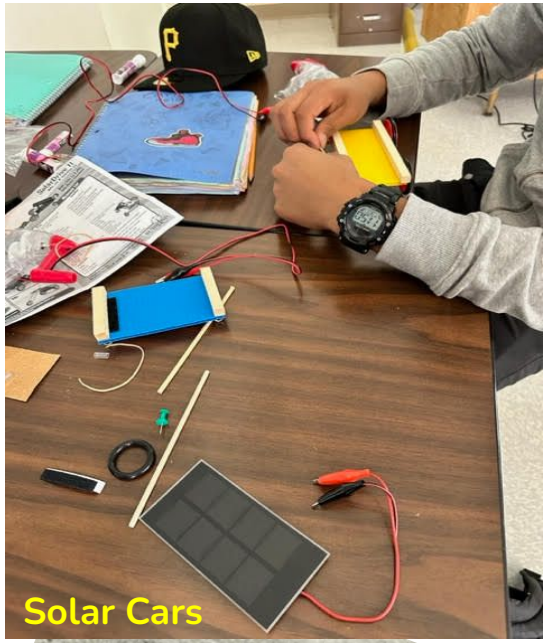


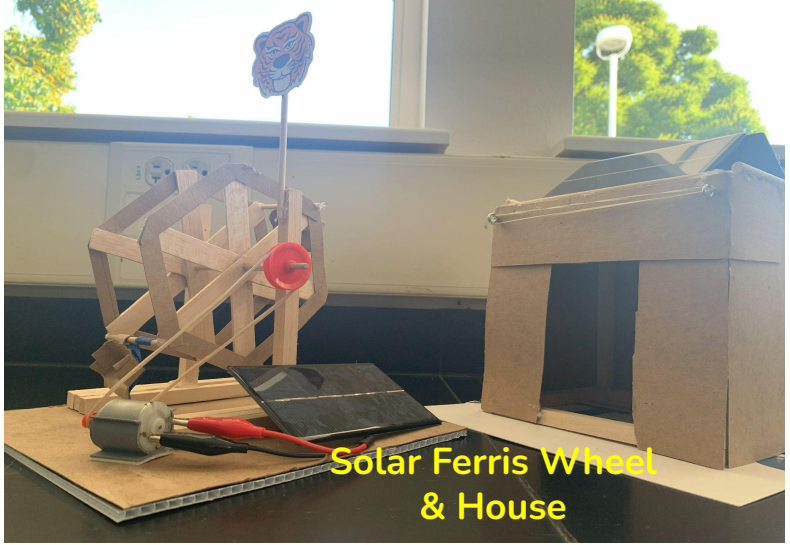
2022-2023 #Science Classes Taken



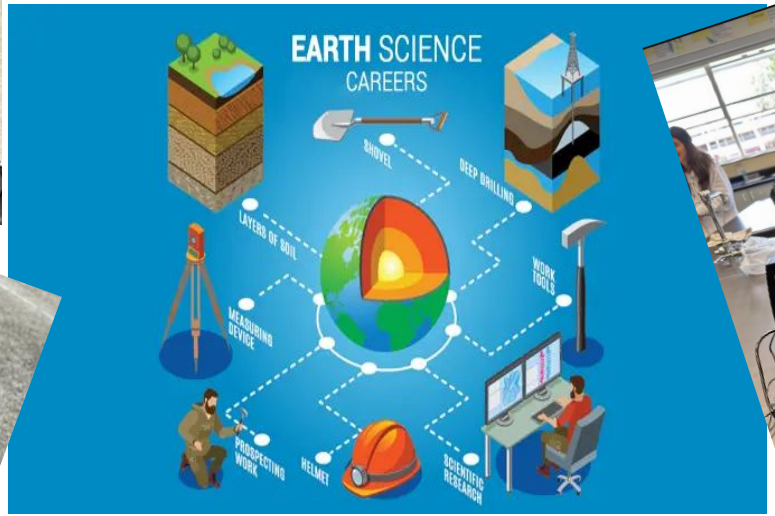
What We Are Excited About

Pre-Science


Solar Cars


Solar Ferris Wheel & House


New Microscopes

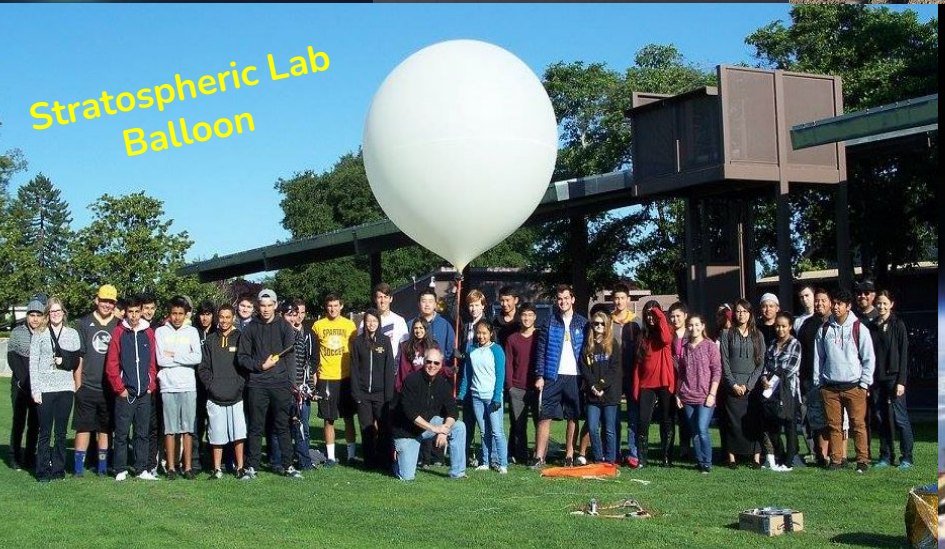


Physics


Bolide Meteor
All-Sky Camera

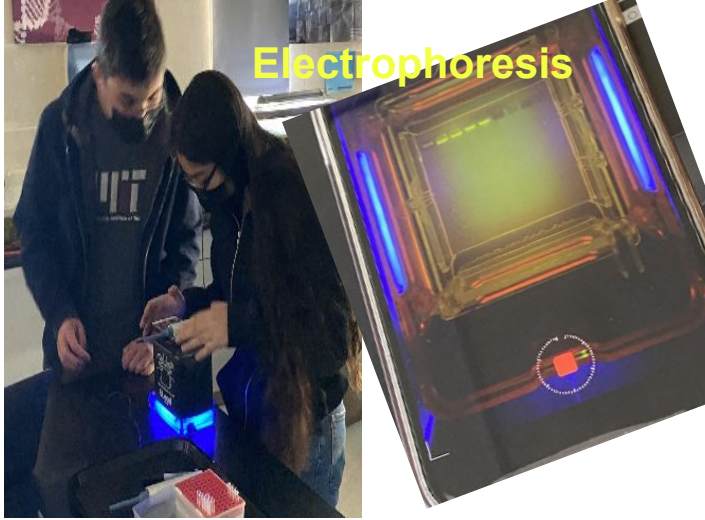

Radio Telescope

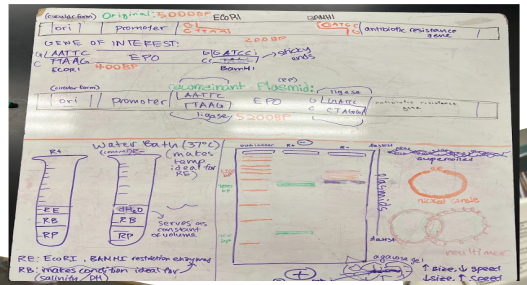

High-Powered
Rocket Program

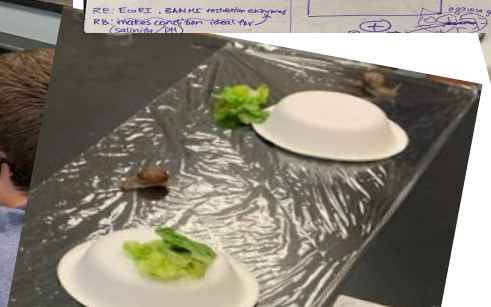

Stratospheric Lab
Balloon

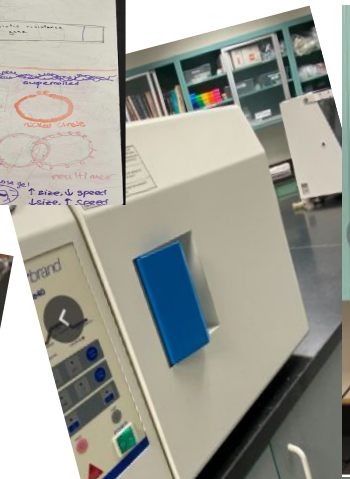

Walk on Water

Biology

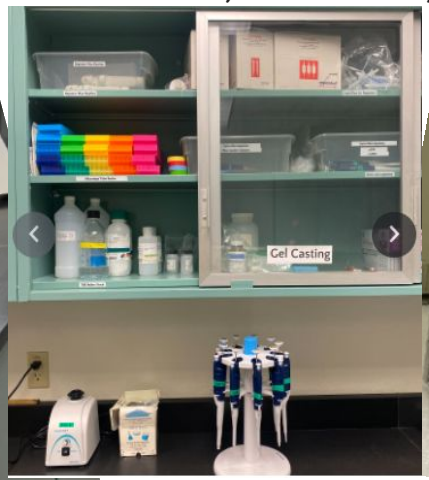




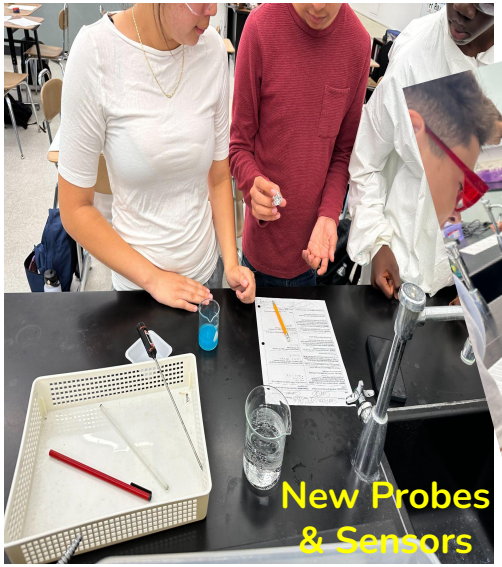


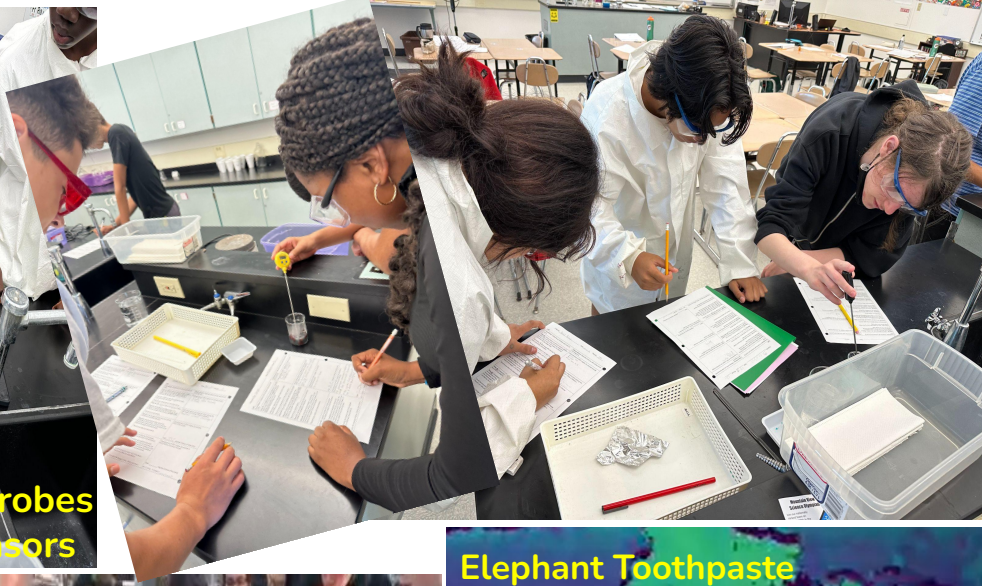


Updated Bio-Tech Program:
new freezers, incubators, shakers

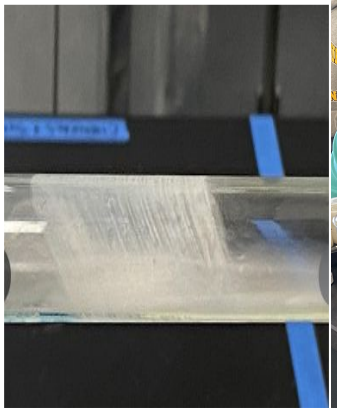


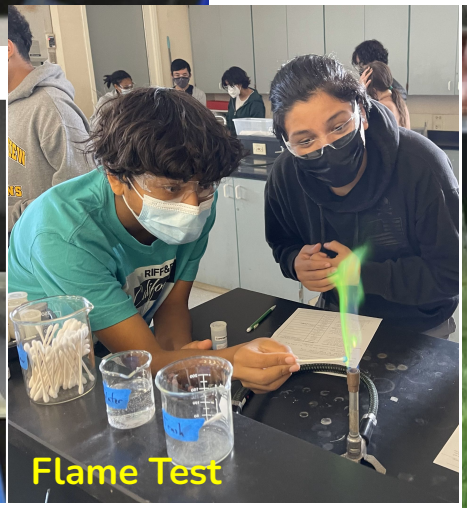
Chemistry





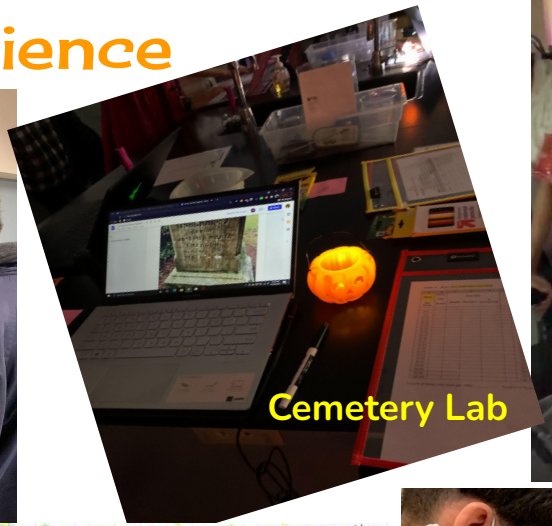
Graham's Law



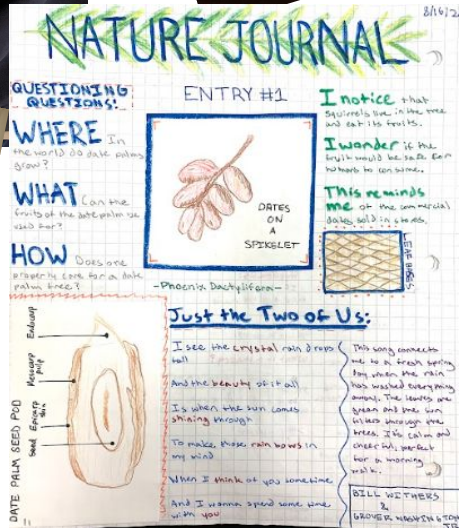


Environmental Science

Eco-Columns

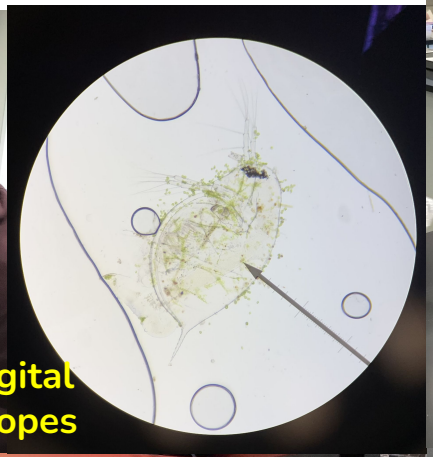


Cemetery Lab

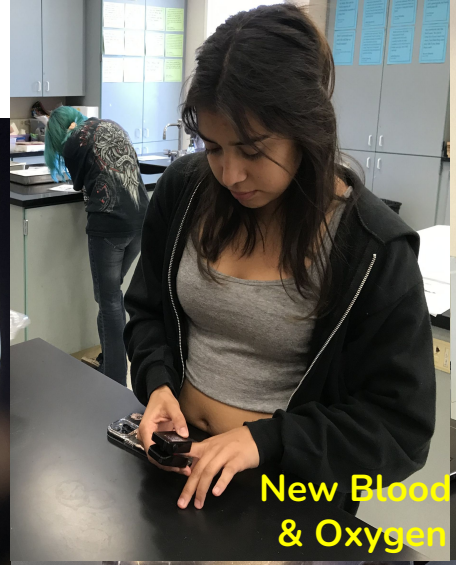


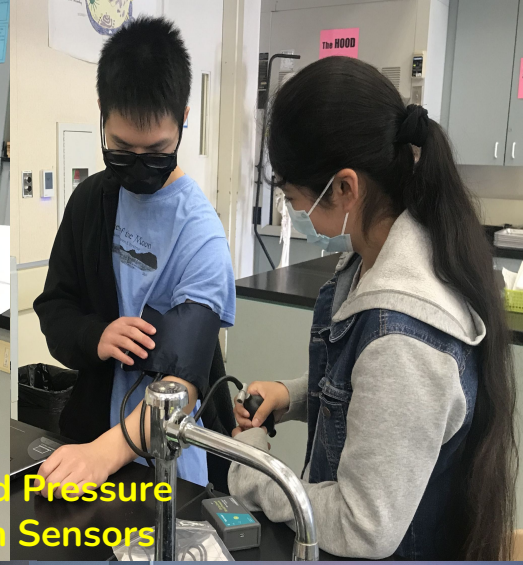
Life in the Deep Lab

Anatomy & Physiology



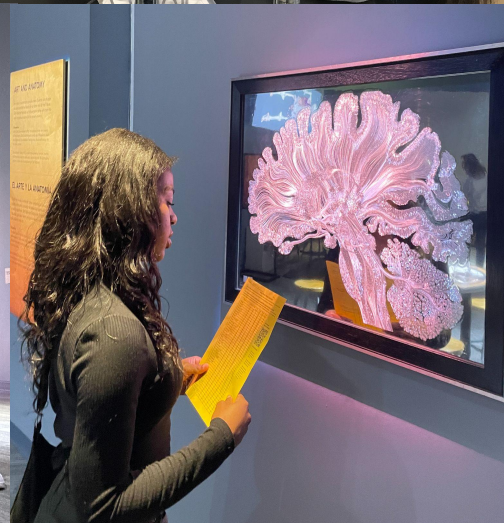
New Digital Microscopes



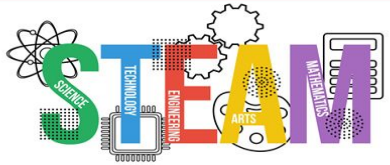


New Blood Pressure & Oxygen Sensors

Field Trip to Tech Museum



STEAM Week 2023



Date	Activity	Description
Monday-Friday 12/4-12/8	Library Display of STEAM Projects (all day)	• The library will display STEAM projects during STEAM week. • Students can view the displays Mon-Fri during library hours.
Monday 12/4 Schedule A (all)	Guest Speaker Day (periods 1-7)	• Guest speakers periods 1-7. Talks last 25-30 min w/optional Q&A. • STEAM classes are invited to attend presentations in the Theater. Other classes can watch presentations via live stream. • Included speakers should represent all STEAM fields. The presentations should highlight the speaker's path to their STEAM career. Sharing how they overcame challenges/hardships is encouraged.
Tuesday 12/5 Schedule B (odd)	Computer Gaming Presentation (periods 1-7)	• Computer Science students go to Math classes to present computer gaming. • Math teachers can sign up to participate.
Wednesday 12/6 Schedule C (even)	STEAM Fair (lunch)	• STEAM depts and community partners will gather in the Quad at lunch and host hands-on STEAM activities. • Prizes and or snacks can be provided at each activity to encourage student participation.
Thursday 12/7 Schedule B (odd)	STEAM Club Arena (lunch)	• STEAM Clubs gather in the Quad at lunch and host informational tables or hands-on activities to encourage participation in STEAM clubs.
Friday 12/8 Schedule C (even)	Open Art Studios (lunch)	• Visual arts program hosts open art studios in their classrooms at lunch • Students can participate in hands-on art projects, watch live demonstrations, and view art projects on display.

Collaborations

- LA Science Dept
- Foothill / De Anza Community Colleges
- NASA
- Spalding All-Sky Camera Network
- Grassroots Ecology
- Google
- Tesla
- Nuro
- SMaRT Station
- National Science Teachers Association
- California Association of Science Educators
- American Association of Physics Teachers
- STEP UP: Physics Together

Some of Our Challenges

Space! We have 71 science sections, 15 teachers, 2 student teachers & only 12 classrooms. Equipment needs to be shared and moved. Prep time/space is limited.

Full NGSS alignment & implementation. Publishers are behind in producing good NGSS aligned materials.

Success in getting underrepresented students in APES, but still need better representation in other AP classes.

Lab help. Increased labs/projects & lack of space makes having a lab tech for **each** site a priority.

Welcome to LAHS Science!

The Spirit Of The Next Generation Science Standards

"Just reciting science facts or principles is not what we want children to be able to do. We want them to be able to go out into the world and make sense of novel phenomenon."

Brett Moulding
Director Partnership for Effective Science Teaching and Learning, NGSS Writer

LAHS Science: Our Course Offerings

- **Traditional Courses offered at two or three different levels**
  - Environmental Science, Biology, Chemistry, and Physics
- **Unique courses taught by teachers passionate about the content:**
  - Forensics
  - Biotechnology
  - ASI - added a second section!
  - Human Biology
  - Agricultural Ecology

How Does Diversity In Course Offerings Benefit Students?

- Science courses designed for developing students
- More choices for honors and advanced placement courses
- Flattens the traditional bimodal distribution of students in science courses
- Passionate and dedicated teachers in our department foster what is most important…a focus on students and learning.

Los Altos High School Science Department

Lisa Cardellini - Forensics & Biology H

Karen Davis - AP Physics 1 & Physics C

Darren Dressen - Chemistry H & ASI

Linda Hambrick - Environ Sci & Biology

Dr. Tory Johnson - AP Biology & ASI

Heather Laederich - APES & Biology H

Trina Mattson - Chemistry & Chemistry H

James Mok - Chemistry & AP Chem

Archana Venugopal - Biology & Biology H

Silja Paymer - AP Physics 1 & Environ Sci

Elizabeth Pyle - Biology & Chemistry

Adam Randall - Physics & AP Physics C

Jacob Russo - Biotech & Agro Ecology

Christina Schramm - Human Biology

James Stiltner - Chemistry & Biotech

Greg Stoehr - APES & Biology H

Challenges and Areas For Growth

- Significant changes in staffing in the science department
- Part-time laboratory technician
- Vertical alignment
- Increasing underrepresented students in advanced courses*
- Full Implementation of NGSS/Choosing textbooks…
- Equipment needs, replacement & repair
- Pursuing passion over resume concerns

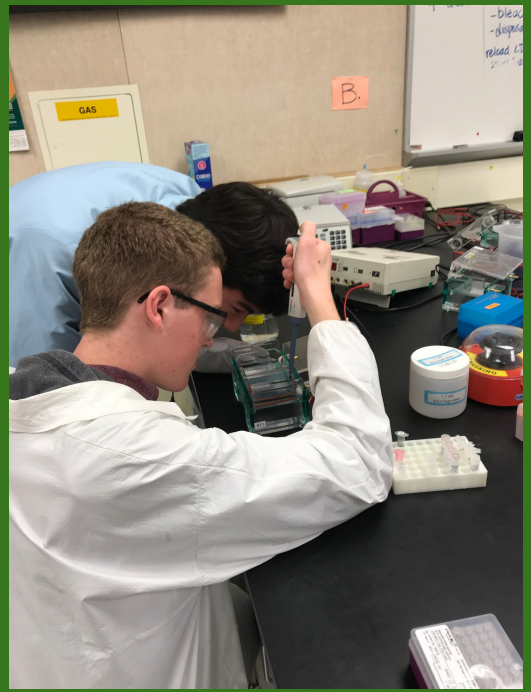
LAHS Science Department Highlights

- Science teachers pursuing learning opportunities
- Creativity and collaboration are front and center
- Dozens of MVLA Foundation Innovation Grants are a critical part of maintaining current, engaging, and relevant instruction
- Student lab-techs
- Biotech almost everywhere

LAHS Science Department Highlights

- ASI students are making serious strides
- STEAM Week, other guest speakers, clubs, mentors and the Synopsis Championship
- We now have an outdoor learning lab
- Science and culinary students are collaborating in exciting ways

ASI - Advanced Science Investigations



Two ASI students analyzing results of an experiment using gel electrophoresis

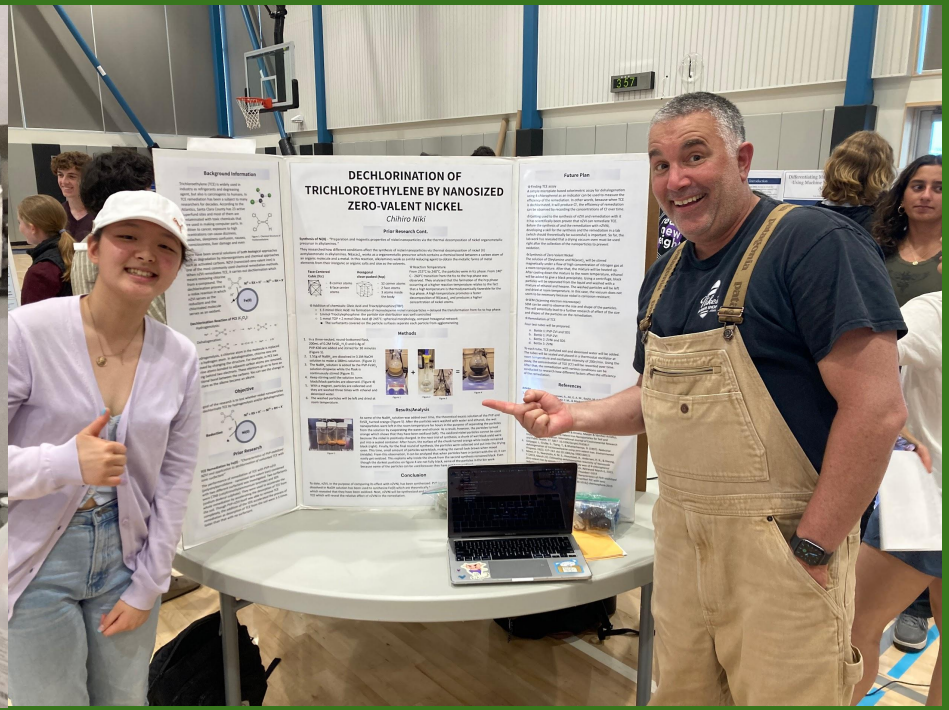
YEAR	Synopsys Fair Participants	State Fair Qualifiers	# of Awards
2021	25	4	15
2022	27	2	11
2023*	44**	5	18

* Program has expanded to two classes and approximately 50 students.
** 36 ASI students also presented research in person at two different conferences in England.

The Co-Teaching Model Is Working

- **Human Biology**: Michael Rasmussen (SPED) and Christina Schramm (Science)
- **Agricultural Ecology**: Ben Walker (SPED) and Jake Russo (Science)
- **Environmental Science**: Stefaan Lodge (SPED) and Silja Paymer (Science)

Thank you!


DECHLORINATION OF
TRICHLOROETHYLENE BY NANOSIZED
ZERO-VALENT NICKEL
Chihiro Niki
Prior Research Cont.
Background Information
Methods
Future Plan
References

Questions?

Thank you.