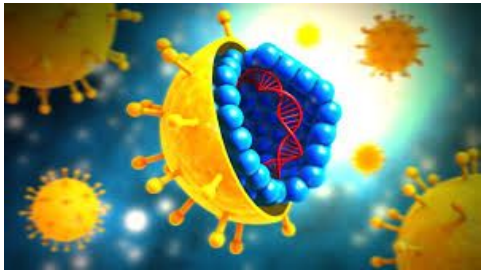
Science Department Classes

Information on Core and Elective Science Classes

Medical Careers and Terminology

Medical Careers and Terminology is an exploratory class for any student that has or might have interest in the medical field and would like to learn more about healthcare careers. This is a project-based class.

- All students 9th - 12th grade are welcome.
- One semester elective



Infectious Disease & Immunity

Prerequisite Course: Biology (open to grades 10-12)

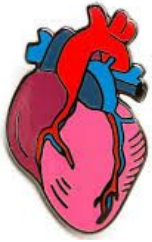
One semester elective

This class will focus on the mechanisms of infectious disease and how it is a disruption to homeostasis.

Do you want to learn about:

★ Famous epidemics and pandemics?
★ Infectious agents such as: bacteria, viruses, fungi, protozoa, prions, and parasites?
★ The history and science of diseases such as HIV?
★ Human immunity, the role of vaccines, and how our bodies fight infection?

Assessments will include quizzes, projects, labs, and some presentations.



Anatomy & Physiology

Prerequisite: Biology, Chemistry is recommended

Year long academic elective open to grades (10-12)

This course explores the organ systems comprising the human body by emphasizing physiological mechanisms and a thorough understanding of human anatomy.

An emphasis is placed on the interrelatedness of systems such as the skeletal, muscular, nervous, and cardiovascular, and endocrine systems.

Highly recommended for those pursuing a career in the medical or health science fields, and has a significant laboratory component, including a culminating fetal pig dissection.

Environmental Dynamic ECOLOGY

- This is a PROJECT & LAB based class for students interested in the health of the planet, ecology, & environmental studies.

Environmental Topics covered in this 1 semester course include:

Biomes and Climate: We begin the semester with research on the different biomes around the world. This is a more indepth unit on concepts learned in Biology and Earth Science..

National Parks: In this unit we look at the beauty and importance of our National Parks. We will take virtual field trips. Land use and conservation efforts will also be addressed.

Biodiversity: This unit is packed full of discovery. We will focus on conservation and threats to life on our planet.

Nature Study/Ecology: We will be conducting a semester long project that will take us outside every week. Attendance is important, many of the labs and observations will take place in class. Ecological principles will be reinforced with observations and activities we do in our outdoor classroom.

Content will be assessed through: Labs, vocab quizzes and projects. This course is typically offered in the fall semester only.

- *Different than the Middle school class.*
- Prereq: Biology

Environmental Sci. & Sustainability

- *Different than the Middle school class.*
- Prereq: Biology

- This is a PROJECT & LAB based class for students interested in the health of the planet, sustainable practices, & environmental studies.

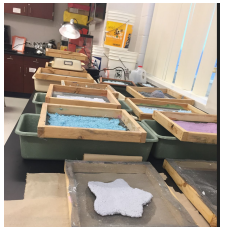
Topics covered in this 1 semester class include:

Land Use & Population Dynamics: In lab, we model and recreate mining practices, sustainable farming, population dynamics and sustainable practices.

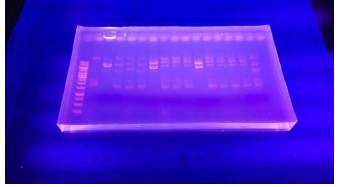
Energy Resources and Climate Change: Through research, labs, and video, we will investigate our world's energy use, look at effects of climate change, and search for solutions and compromises in how we obtain

Water: We will learn about types of water pollution, complete stream testing, discuss water management and conservation techniques.

Air: Through projects and labs we will look at the health effects and issues associated with air pollution .our energy.



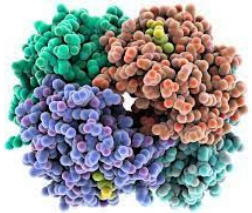
Content will be assessed through: Labs, vocab quizzes and projects. This course is typically offered in the spring semester only.

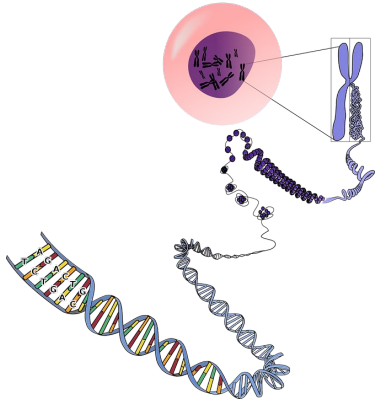


Genetics

- **Prerequisite Courses**: Biology and Chemistry
- **Type of Class:** One semester science elective
- **Focus:** The study of genetics (science of genes and heredity) and its applications in biotechnology.

<u>Do you want to learn about:</u>





- Famous discoveries and experiments in the field of genetics?
- Molecular genetics → DNA, RNA, Mutations, etc.?
- Transmission genetics → How do we inherit traits?
- Genetic technology → DNA fingerprinting, Genetic engineering, and more?
- This class is meant to explore what YOU want to know about genetics.

This class focuses on exploring real world scenarios, examples, case studies, and data about genetics phenomena. You will work in small groups as scientists to learn about, test, and explain how traits are inherited and how technology can help us learn about our bodies and solve problems.

Assessments for this class will include quizzes, tests, labs, and projects.

Organic Chemistry

Students learn about carbon based molecules, their reactions and applications to our daily lives.

This is a one semester, lab based course. Grades are primarily based on labs, quizzes and tests.

Prerequisite: Chemistry or Honors Chemistry

Designed for anyone who wants to learn more chemistry, this class is recommended for any student planning to major in a medical or science-related field.

Materials Science and Engineering

Semester long, grades 10-12, no prereqs

Units of study: Intro, Metals, Polymers, Ceramics, and Composites.

Frequent labs, small project or two, and short quizzes are used to determine grade.

We hit a variety of topics with many real-world examples.

Take a look at the materials around you!

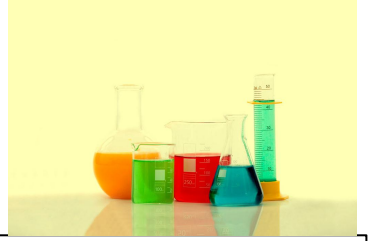
- Why did Ford switch to an aluminium frame on the F-150?
- How do we make and process plastics?
- What metals can we replace in circuit boards to make computers faster?
- What new gadgets are our troops using to keep them safe?
- What advances are making products lighter from sports equipment, to cell phones, to cars?
- Are materials safer now?
- What materials help with sustainability?

Forensic Science

- Semester class
- 11th & 12th grade students
- Prereqs - Bio & Chem

Forensic science is the application of scientific principles to criminal investigation - which means using chemistry, biology, and physics to solve crimes! We look at how hairs, fibers, fingerprints, shoe prints, handwriting, toolmarks, and more can be used to put a suspect and victim in contact with each other, put a suspect at the scene of a crime, or put a weapon in the hand of a suspect. We will study famous cases, have guest speakers, and do labs. This class is open to all levels of science and interest in forensic science!

Honors Chemistry vs. Regular Chemistry



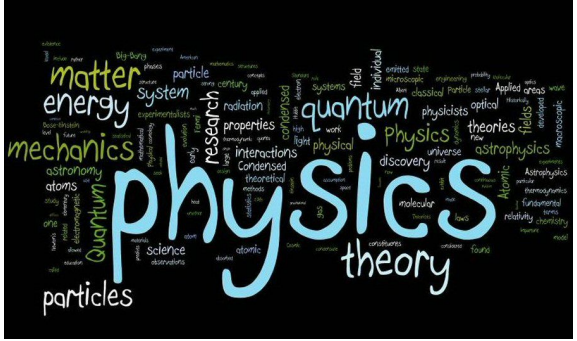
Honors

- For students on a college-prep pathway
- Students are able to use math skills; specifically algebra (B+ or greater recommended)
- Faster pace; some more content
- Lab based class

Regular

- Slower pace; less content
- Math skills are reviewed as needed
- Want to learn chemistry, but need a balanced schedule
- Does not qualify for HHS Science Honor Cord

Honors Physics vs. Regular Physics



Honors

- For students on a college-prep pathway
- Students are able to use math skills; specifically algebra and some right triangle trig (B+ or greater recommended)
- Faster pace; deeper content
- Prerequisite for AP Physics
- Lab based class

Regular

- Slower pace; less content
- Math skills are reviewed as needed
- Want to learn physics, but need a balanced schedule
- Does not qualify for HHS Science Honor Cord


AP Biology


AP Biology is the equivalent of a two-semester college biology lab course that will prepare students for STEM and life science-related majors.

Topics include: evolution, cellular processes, energy and communication, genetics, information transfer, ecology, and interactions

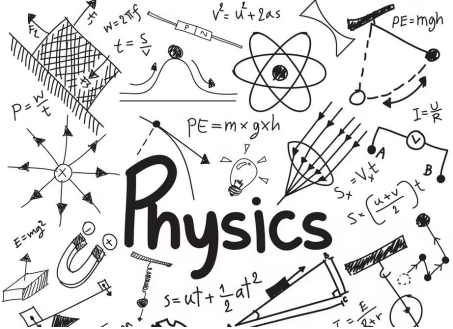
Prerequisite Courses: Biology & Honors Chemistry (open to grades 11-12)

<u>Do you want to learn about:</u>

- ★ How organisms capture and use energy by studying algae in the lab?
- ★ Cell communication and how cancer develops?
- ★ DNA and how it is used to track evolution through time?
- ★ Biotechnology by making bacteria glow in the dark?
- ★ How to question, think, observe, analyze, argue, and write as a biologist?

AP Chemistry

- AP Chemistry teaches the first year of college level chemistry and chemistry lab.
- Students may earn up to 8 college-level chemistry credits after taking the AP exam in May.
- Prerequisites: Honors Chemistry & Algebra II (may take math concurrently)
- Students must also register for the 1 semester AP science lab that accompanies this course.
- Recommended for any student who enjoyed Honors Chemistry or is planning to major in a science or engineering field.



Should I take AP Physics 1 or AP Physics C?

- **Both classes have Honors Physics as a prerequisite.**
- **AP Physics C also requires Calculus concurrently.**

AP Physics 1

- AP Physics 1 is an algebra-based, introductory college-level physics course that explores Newtonian mechanics through guided inquiry and modeling based learning, students will develop scientific critical thinking and reasoning skills.

AP Physics C - Mechanics

- This course is designed for students needing a strong physics background for anticipated college work. In this course, Newtonian Mechanics will be constructed using both conceptual and mathematical modeling, including some calculus; therefore a strong background in mathematics is required.

Science Honor Cord

- 10 semesters (5 credits)
  - In HHS classes only
- 2 semesters of Honors Chemistry
- 2 Semesters of Honors Physics, AP Physics I or AP Physics C
- All semester grades must be a 3.0 or higher
- **Test-outs and DEEP program classes do not count toward the 10 semesters**

SCIENCE COURSES

COURSE NUMBER	COURSE NAME	CREDITS	GRADE LEVEL	PREREQUISITE	MEET REQ. OF:
43251S	Biology A	0.5	9 - 12		NCAA
43261S	Biology B	0.5	9 - 12	Biology A	NCAA
43231S	Earth Science A	0.5	9 - 12		NCAA
43241S	Earth Science B	0.5	9 - 12	Earth Science A	NCAA
43361S	Chemistry A	0.5	10 - 12	Biology & Geometry (math may be concurrent)	NCAA
43371S	Chemistry B	0.5	10 - 12	Chemistry A	NCAA
43461S	Honors Chemistry A	0.5	10 - 12	Biology & Adv. Geometry or Algebra II (math may be concurrent)	NCAA
43471S	Honors Chemistry B	0.5	10 - 12	Honors Chemistry A	NCAA
43401S	Physics A	0.5	10 - 12	Biology & Geometry (math & Biology may be concurrent)	NCAA
43411S	Physics B	0.5	10 - 12	Physics A	NCAA
43481S	Honors Physics A	0.5	9 - 12	Biology & Algebra II (math & Biology may be concurrent)	NCAA
43491S	Honors Physics B	0.5	9 - 12	Honors Physics A	NCAA
430630	Anatomy & Physiology	1.0	11 - 12	Biology, Chemistry is strongly recommended	NCAA
431631	Environmental Science: Dynamic Ecology	0.5	10 - 12	Biology	NCAA
431632	Environmental Science: Sustainability	0.5	10 - 12	Biology	NCAA
43841S	Forensic Science	0.5	11 - 12	Biology and Chemistry/Honors Chemistry (may be concurrent)	NCAA
43881S	Genetics	0.5	11 - 12	Biology & Chemistry	NCAA
43871S	Infectious Disease & Immunity	0.5	10 - 12	Biology	NCAA
43822S	Materials Science & Engineering	0.5	10 - 12		NCAA
43702S	Medical Careers & Terminology	0.5	9 - 12		
43812S	Organic Chemistry	0.5	10 - 12	Chemistry or Honors Chemistry	NCAA
43911S	Science Issues through Film & Lit	0.5	11 - 12	Biology & Earth Science	
430930	AP Biology	1.0	11 - 12	Honors Chemistry (may be concurrent)	CC, NCAA
43721S	AP Science Lab – Biology	0.5	11 - 12	AP Biology – taken concurrently	
431030	AP Chemistry	1.0	11 - 12	Honors Chemistry, Algebra II	CC, NCAA
43711S	AP Science Lab – Chemistry	0.5	11 - 12	AP Chemistry – taken concurrently	
438320	AP Physics I	1.0	10 - 12	Honors Physics	NCAA
431140	AP Physics C - Mechanics	1.0	10 - 12	Honors Physics or AP Physics I, Calculus (math may be concurrent)	CC, NCAA