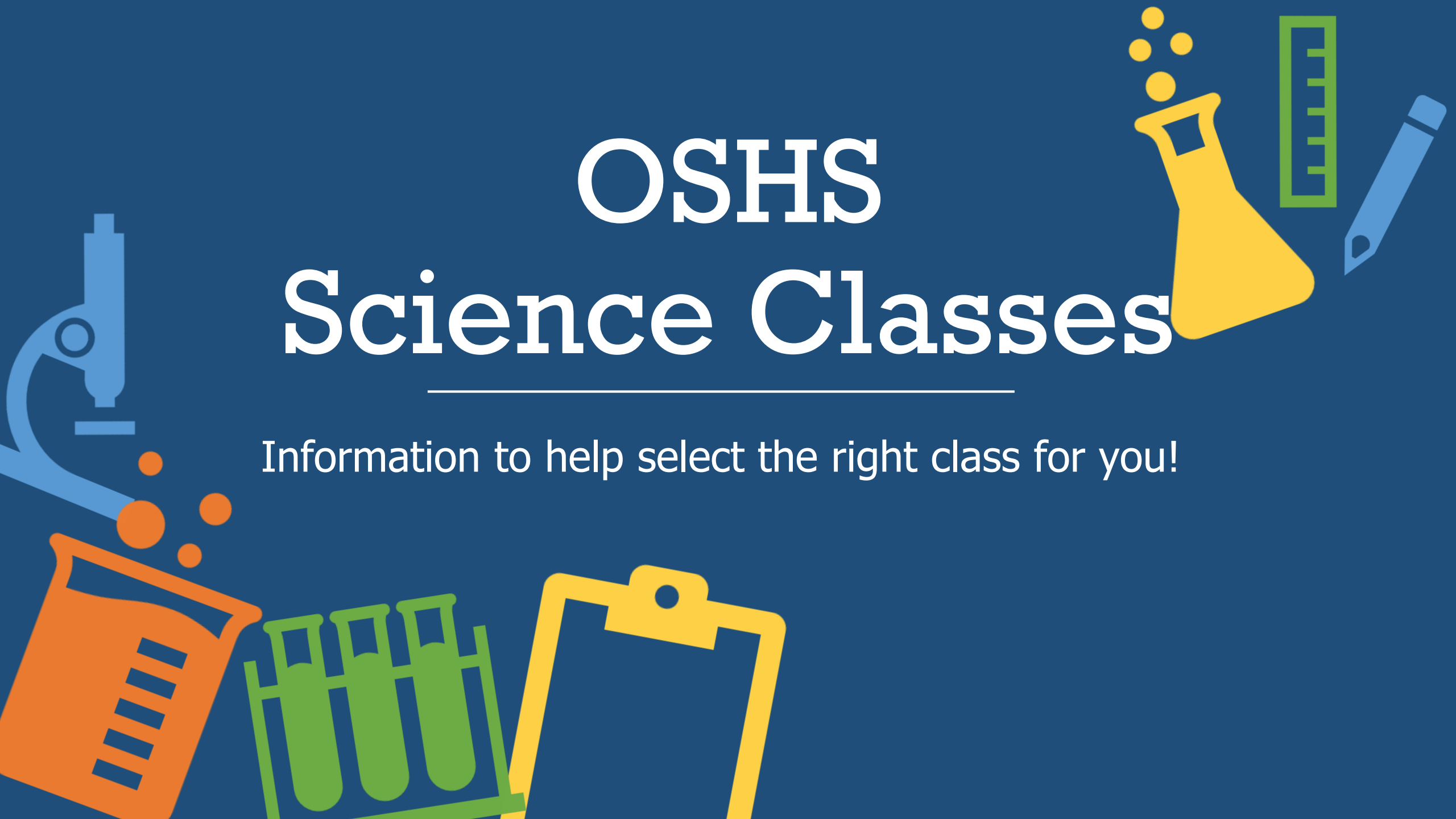


OSHS Science Classes

Information to help select the right class for you!



Two types of science classes...

Biological Sciences

- 9th grade:
 - General or Honors Biology*
- 10th grade:
 - Physical Science
 - General or Honors Chemistry*
- 11th and 12th grades:
 - Anatomy & Physiology
 - AP Biology*
 - AP Environmental Science*
 - College Biology
 - Genetics and Biotechnology I & II
 - Horticulture I & II
 - Student Naturalist

Physical Sciences

- 9th grade:
 - General or Honors Biology*
- 10th grade:
 - Physical Science
 - General or Honors Chemistry*
- 11th and 12th grades:
 - AP Chemistry*
 - AP College Physics I*
 - Astronomy
 - College Chemistry
 - Physics
 - Physical Science Investigations
 - Earth Science

* Weighted Credit

Physical Science

- Grade: Usually only 10th graders
- 2 Semesters (1.0 Credit)
- This course explores basic concepts of chemistry and physics by emphasizing problem solving in investigations. Students utilize technology to collect and analyze data in the study of matter, chemical change, energy, motion, electricity, magnetism, sound and light.



General Chemistry

- Grade Level: 10, 11, 12
- Two Semesters - 1.0 credit
- Prerequisite: Gen. or Honors Biology
- Chemistry is the study of properties and changes in matter. This study includes the particles that compose matter and how elements and compounds interact. Conceptual understanding is built through visualization, laboratory observation and mathematical representation.
- Concurrent enrollment in Geometry or higher math is recommended.
- Teacher recommends: Needs to be on level for math with a C or better.

Honors Chemistry

- Grade Level: 10, 11, 12
- Two Semesters - 1.0 credit
- Prerequisite: Gen. or Honors Biology
- Honors Chemistry is a comprehensive introduction to the properties and interactions in matter. Course content includes topics from general chemistry, with additional concepts in greater detail at an accelerated pace.
- Guided Enrollment Note: Concurrent enrollment in Honors Algebra II or higher math is strongly recommended.
- Teacher recommends: Above average math competencies.

Biological Sciences...

- Anatomy & Physiology
- AP Biology*
- AP Environmental Science*
- College Biology
- Genetics and Biotechnology I & II
- Horticulture I & II
- Student Naturalist

* Weighted



Anatomy and Physiology

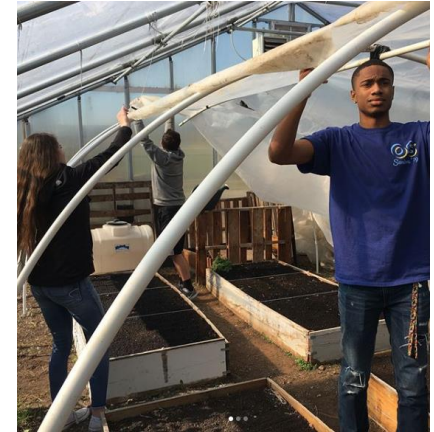
- Grade Level: 11, 12 Two Semesters - 1.0 credit
- Prerequisite: Biology, and concurrent or previous enrollment in Chemistry recommended
 - Chemistry content is not essential but is helpful in places. However, it gives evidence that the student is willing to tackle a rigorous course of study. For that reason - more students struggle with this class if they have never taken Chemistry.
- This class is designed for the college-bound student who is considering a career in a professional medical field. The course offers an in-depth study of higher vertebrate anatomy using human models and diagrams. Insight into the functions of human systems is gained through laboratory study of living tissues, dissection and physiology instrumentation.

Teacher's Notes:

- The content is not difficult to understand but the challenge comes in memorizing the large volume of content. Success in this course requires memorization and knowing vocabulary intensive material.
- A disciplined routine of study is needed to master the material.

AP Environmental Science

- Grade Level: 11, 12 Two Semesters - 1.0 credit Weighted
- Prerequisite: Biology and Chemistry
- This lab and field-based course provides students with concepts required to understand the natural world; aims to identify and analyze environmental problems; evaluates the relative risks associated with these problems, and examines solutions for reducing and/or preventing them.
- Teacher's Notes: Learn about how amazing our planet is AND how much we've messed it up AND how we're trying to undo the damage.
- Go check out Instagram **WittersCAPES** to see what we learn about and some of what we do in the class.
- You will work with our OS Farm and grow salads in winter, run a hydroponics project in the classroom, participate in a solar oven design competition, and get outside to explore regional wild places. Basically, the goal is to learn how to see the world with new eyes! (and get college credit through College Now or AP)



AP Biology

- Grade Level: 11, 12
- Two Semesters - 1.0 credit – Weighted
 - This is a dual credit course through JCCC or students may take the AP Exam for college credit.
- Prerequisite: Chemistry
- This course is designed to be the equivalent of a college intro biology course. Students in this course will build a conceptual framework, the factual knowledge and analytical skills to deal critically with the rapidly changing science of biology and to appreciate science as a process.
- Teacher's Notes: AP Bio is the ultimate "life" experience! We explore all aspects of life from molecular to environmental and students will learn how small changes can have big effects in living organisms.
- Who takes AP Bio? A college bound student who wants to pursue a science major in college or who simply wants the opportunity to earn college credit while receiving a weighted grade.

College Biology

- Grade Level: 11, 12
- Two Semesters - 1.0 credit – Not weighted
- Prerequisite: Chemistry
- This course is for students who desire to complete their college requirement for a natural science credit. The course is structured around contemporary modern biological science concepts and biotechnological principles that are on the forefront of scientific research.
- The course has a dual credit option at JCCC.
- Teacher's Notes: This course will move at a fast pace and will also involve independent outside study to complete the requirements for dual enrollment for JCCC. Students will be expected to complete a rigorous course of study with an emphasis on both reading and writing skills.

Genetics and Biotechnology

Genetics & Biotech I

- Students will review & strengthen their knowledge of genetics & heredity, study the history & uses of biotechnology, & see how the 2 areas are combined to harness living organisms for the benefit & betterment of human life.
- Topics of study: Microbiology, bacteria, embryology, vaccines, infectious disease, stem cells, genetic engineering, biomedical advances with a strong emphasis on bioethics.



Genetics & Biotech II

- Students continue to look into global health issues & use genetics & biotechnology to address these issues.
- Topics of study: Food & Agriculture – history & evolution of food, genetics of lactose intolerance, fermentation, GMOs, biofuels. Crime and Addiction – the biology of the brain, genetics of addiction, & forensic science
- Capstone project – identify and analyze a global health crisis of your choice

Horticulture I

- Grade Level: 10, 11, 12
- One Semester - 0.5 credit Prerequisite: Biology
- This course is designed for the student who is interested in plant studies.
- Topics: growth and care of greenhouse plants, woody plants, lawns & those plants grown for food, with an emphasis on environmentally safe methods of pest control. Projects include: plant propagation, hydroponics, soil testing, gardening and landscape, pest management, conservation and composting.
- **Not for College Now credit.**
- Teacher's notes: Willing to work hard in non-traditional activities. (i.e. Gardening)

Horticulture II

- Grade Level: 10, 11, 12
- One Semester - 0.5 credit Prerequisite: Horticulture I
- This course is designed for those interested in advanced plant studies. The topics covered in the introductory course will be pursued in greater depth, with an emphasis on individualized projects. Students learn from guest speakers who present topics in various areas of specialty and from several field trips.
- **Not for College Now credit.**

Student Naturalist



- Grade Level: 11, 12. Two Semesters - 1.0 credit. Prerequisite: Biology
- Students will use the outdoors as a classroom (field work) when weather permits to study ecology, biology, natural history and survival skills. Students will work with and practice all aspects of animal care and handling of exotic animals housed in the classroom. Students will organize and make oral presentations to peers and district elementary students ("Animal Talks"). Students are required to participate in a community service project each quarter.
- Teacher's Notes: Students who enroll in this class should have a sense of adventure as well as have a willingness to grow and overcome fears.



Physical Sciences

- AP Chemistry*
- AP College Physics I*
- Astronomy
- College Chemistry
- Physics
- Physical Science Investigations
- Earth Science

*Weighted Class



AP Chemistry

- Grade Level: 11, 12 Two Semesters - 1.0 credit. Prerequisite: Chemistry or Honors Chemistry. Weighted course.
- This course emphasizes chemical calculations, the mathematical formulation of principles, a variety of laboratory experiences, and a focus on the conceptual analyses of chemical processes. Advanced topics include Thermochemistry, Kinetics, Equilibrium, Acid/Base, and Electrochemistry.
- Note: Physics and Honors Algebra II are recommended prior to AP Chem
- Teacher's Notes:
 - Students who take this class have an interest in pursuing a career in the sciences after high school, they enjoyed the first year chemistry course and they are prepared for the rigor of a college course in high school.
 - AP Chem is one of the more difficult courses at South. However, through its completion you will be prepared for a similar university course or you will earn credit for the course so that you do not even have to take it in college. AP Chemistry covers two semesters of university chemistry in one high school year, whereas college chemistry covers the first semester of university chemistry in one high school year.

College Chemistry

- Grade Level: 11, 12. Two Semesters - 1.0 credit. Prerequisite: Chemistry or Honors Chemistry
- This course is tailored for students planning to pursue a career or further study in a science-related field and for those who desire to complete their college requirement for a physical science credit. This is an in-depth study of inorganic chemistry. Topics and lab work are based on material offered in a first semester college chemistry course. Lab work is utilized to develop basic concepts that will be covered during classroom discussions.
- Students will experience General Chemistry 101 from JCCC, but spread out over a full school year. Many topics from HS chem class will be revisited, along with several new topics at the college level.
- Teacher's Notes: Students who do well in this class are successful in general/honors chemistry and are comfortable with algebra and higher level mathematical equations. Students not planning on majoring in science in college, can earn college credit through this course.
- Class has the option to be taken for college credit through JCCC.

Physics

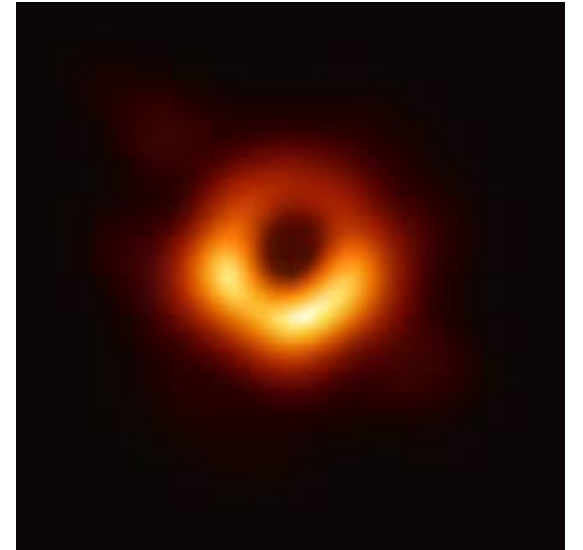
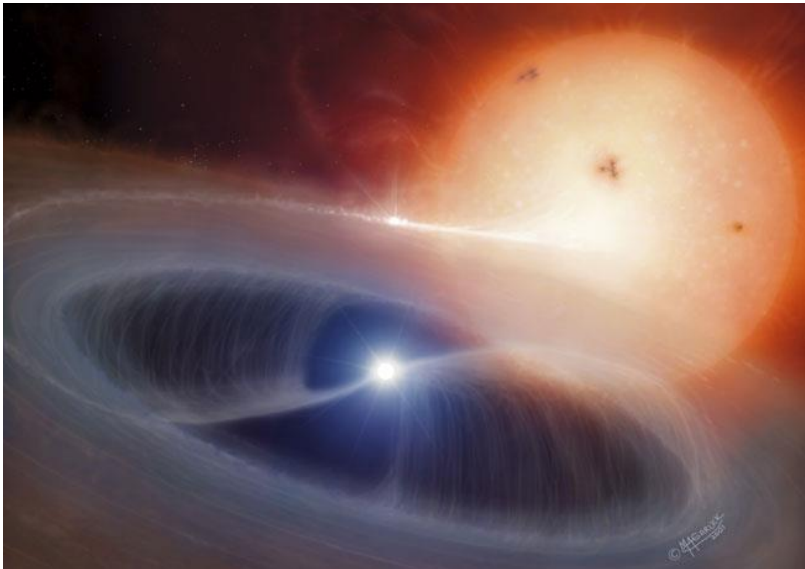
- Grade Level: 10, 11, 12. Two Semesters - 1.0 credit. Prerequisite: Algebra II
- Note: Advanced Algebra II is strongly recommended prior to or concurrent with Physics.
- This course places emphasis on learning how to develop concepts and relate them to one another through laboratory experiences. Topics include: kinematics (1 & 2 dimensional), forces, vectors, projectiles, circular motion, gravity, energy, momentum, waves, sound, electricity & magnetism, light.
- Teacher's Notes: Students in this class show a willingness to work and an interest in learning about how things work. We do many labs to help learn and apply concepts. There is a decent amount of math in this class. You should be able to solve an equation such as the following for any variable: $d=vt+0.5a(t^2)$. You should also be comfortable with using SOH CAH TOA and Pythagorean Theorem to solve right triangles.
- If any students have questions about the class, please see Mr. Robinson in room 1212.

AP College Physics I

- Grade Level: 11, 12. Two Semesters - 1.0 credit. Prerequisite: Honors Algebra II. Weighted course.
- Goals for this class: to conceptualize Mechanics, Dynamics, Uniform Circular Motion, Rotation, Conservation of Energy and Momentum, Waves and Sound. The students will gather data to derive the major mathematical representations for each of the topics above. Application of these mathematical concepts to problems is the focus of the class.
- Teacher's Notes: Students who take this class would be very successful in math and be taking at least Pre-Calculus concurrently. The student should also have an interest in the Physical Sciences. AP Physics 1 will go in greater depth on topics and the problems, quizzes and exams will be more challenging. The pace of the course is quite challenging to most students.

Astronomy

- Grade Level: 11, 12. One Semester - 0.5 credit
- This course will take you on an exploration of our Universe. Topics we delve into include Coordinate Systems, Constellations, the Moon, Eclipses, the Sun, Stellar Evolution, Formation of Solar Systems, Our Solar System, Galaxies and Black holes, and Space Exploration.



Physical Science Investigations

- Grade Level: 11, 12. One Semester - 0.5 credit. Prerequisite: Biology
- This course includes topics of study expanding students' previous physical science knowledge by offering new applications of concepts in a real world perspective. Applications will include engineering, environmental, biological, chemical, and technological sciences.
- Teacher's Notes: This class is primarily for seniors who need half of a science credit to graduate and **this class is only for students who have met with and have been enrolled in this class by their counselor.**

Earth Science

- Grade Level: 11, 12. One Semester - 0.5 credit.
Prerequisite: Biology or Honors Biology
- Earth Science offers students a look at the natural processes that occur on Earth. Topics encompassing geology, the internal and external processes that shape the surface and the interior of the Earth (mineral formation, rock cycle, plate tectonics, mountain building, geologic time), and meteorology including atmospheric structure, weather forecasts and extreme weather. Students will also explore the impact of humans on the natural environment.
- Teacher's Notes: If you are looking for a full year of science credit, this class pairs nicely with Astronomy (also one semester).

