

Science for 9th Grade

Freshman students will be enrolled in Earth Science. Earth Science is the study of four main units: astronomy, geology, meteorology, and oceanography. Earth Science involves the study of the interrelationships between the earth system, earth processes, and human impact. Students will be involved in a variety of inquiry activities, ranging from hands on lab activities to models and simulations. Student will learn to interpret maps, charts, and tables, and use technology to organize and analyze data.

Why Earth Science?

- Only through Earth Science education can students understand and appreciate our complex planet. Nearly everything we do is connected in some way to Earth: to its land, oceans, atmosphere, plants, and animals.
- Our lives and civilization depend upon how we understand and manage our planet.
- Earth Science encourages students to think about global issues but take action locally by making sound decisions about issues.
- Earth Science is truly an interdisciplinary approach to understanding earth systems.
- Earth Science poses questions that are exciting for students and addresses issues they encounter daily or will encounter in the future.

Earth Science Course Availability

Students may register for 2 levels of Earth Science; Research and Academic level.

Academic Earth Science – This course addresses the Earth Science SOL standards and is designed as a challenging course requiring advanced reading and writing skills.

Research Earth Science – This is designed as a rapidly paced, challenging course that requires advanced academic skills. **Students are REQUIRED to participate in science research performed within the classroom. In addition, students will be expected to perform independent research after modeling of the research process has been conducted. In order to receive credit for the Research Earth Science course, students are expected to complete all assignments related to the research part of the curriculum.**

Research Biology - The Science Department strongly recommends that all honors 9th grade students enroll in Research Earth Science so they have the background knowledge and experience in science research needed to be successful in Research Biology. See the back for a detailed description of the Research Biology curriculum and expectations.

Research Biology

A limited number of ninth graders may enroll in Research Biology if they meet the following criteria:

- Recommendation by their 8th grade science teacher
- Parent approval
- High level of achievement in 8th grade HONORS science
- Mastery of concepts and content of middle school science courses with an emphasis on 7th grade life science
- Mastery of the research skills learned in Research Earth Science
 - Scientific writing using appropriate APA format
 - Ability to use Microsoft Excel to generate tables and graphs
 - Data collection and analysis using descriptive statistics
 - Ability to use data and scientific knowledge to develop and communicate conclusions

In order to receive credit for the research Biology course, students are expected to complete all assignments related to the research part of the curriculum.

As educators, we have identified common characteristics of students who are successful in Research Biology:

1. **Highly Motivated:** These are the students who DO NOT need to be reminded to do their homework or to use and check their agendas. These are students who do not procrastinate and can schedule long-term project work around their busy lives.
2. **Highly ORGANIZED:** Of all of the changes from Kindergarten to 12th Grade, the “Quantum Leap” is from 8th – 9th grade. Students that are extremely well organized do not have difficulty keeping track of assignments or meeting deadlines.
3. **Gregarious & Inquisitive:** Students need to be able to ask for assistance, seek out advice from experts in the field, make phone calls, and visit college/university libraries to gather information about their research project.
4. **Abstract thinking/synthesis/analysis:** Students should be able to comprehend abstract concepts, analyze data, and draw conclusions. They must be very knowledgeable about experimental design and data analysis.
5. **Independent Learner:** Honors Biology students must be able to work independently without too much assistance from parents or other adults.
6. **STRONG Math Skills:** Students should be enrolled in Algebra II in their freshman year so they will be successful in Chemistry as sophomores. They need strong math skills in order to complete complex statistical analyses of data.
7. **STRONG Writing Skills:** Scientific writing is very different from the writing done in English class. Students must be able to write clearly in the 3rd person, accurately cite sources using APA standards, and be able to communicate scientific information clearly.