Science Department

Science is a method of understanding how nature works in earth, space, life and physical systems through the utilization of tools of inquiry and by employing the process skill of questioning, hypothesizing, predicting, testing and drawing conclusions. Two years of science are required for graduation from Helena High School. All students are encouraged to take more courses than the minimum requirement. The science flow chart, illustrated below, shows the wide range of available courses. Students are encouraged to seek the assistance of their parents, counselors, science teachers, and math teachers in planning the most effective science program to meet their needs. (Flow chart below.)

Minimal Science Graduation Requirements

2 years of science required for graduation
3 years of science recommended for most colleges/universities

	Grade 9	Grade 10	Grade 11th and 12th Grade
Required Courses (Choose one)	Earth & Space Science H Earth & Space Science	Biology 1 AP Biology *Chemistry 1	
Electives:			*AP Environmental Science *Biology 2 *Physics *Chemistry 1 *AP Chemistry
***Prerequisites and/or teacher recommendation**			

Earth and Space Science

Freshman select one of the two options in the Earth and Space Sciences. Earth and Space Science, the study of the abiotic environment, is an essential part of a complete science education. The most challenging options are Honors Earth and Space Science. Freshman wishing to enroll in Honors Earth and Space Science should have a high interest in science and a minimum 3.00 GPA with B's or better in previous science and math courses. A higher level of commitment and effort is required of the honor student. Students not qualifying for Honors Earth and Space Science should enroll in Earth and Space Science. Both Earth and Space Science and Honors Earth and Space Science are designed as college preparatory courses.

4100 Earth and Space Science

Required Grade: 9
Full Year – 1 Credit

Earth and Space Science will engage students in five branches including meteorology, hydrology, geology, oceanography, and astronomy. In these areas of study, students will be posing questions; developing models; experimenting, analyzing, and interpreting data; applying mathematics; solving problems; engaging in argument from evidence; and obtaining, evaluating and communicating information. Presentations, demonstrations, labs, Earth and Space Science related films and projects form the basis for instruction.

4101 Earth and Space Science – Honors

Elective Grade*: 9
Full Year – 1 Credit

Honors Earth and Space Science is designed to challenge the advanced science student. The course will cover the four areas of Earth and Space Science with lectures, demonstrations, and general lab work. Students will also be exposed to more challenging assignments involving more rigorous math, additional reading, independent lab work, research projects, and technology. A higher level of commitment and effort is required of the honors student. Honors Earth and Space Science is recommended for freshman skilled in science, math, reading, and writing.

Prerequisite: Grades of "B" or better in Math, Science and English, completion of the application process and the consent of the honors instructor.

Biology

Biology is the study of living things and is an essential part of a complete science education. Sophomores select one of two options for their first year in Biology. The majority of the students will enroll in standard Biology I. The most challenging class is AP Biology. This course has limited enrollment and students interested in enrolling should check the prerequisites in that course's description. Students with good attendance, behavior, and strong work habits will be considered first. Biology II is offered to those students who have successfully completed Biology I or AP Biology and have interest in pursuing a career in a science related field. All Biology courses meet the laboratory science requirement for graduation.

4200 Biology 1

Required Grade: 10
Full Year – 1 Credit

Biology I is a survey course in the Life Sciences which will help the student to develop an understanding of living things and their relationship to one another. Areas of study include cells, heredity, microbes, plants, invertebrate animals, chordate animals, ecology, and biotechnology. Extensive laboratory work, dissections, demonstrations, lectures, tests, and projects are some of the approaches used to teach the major concepts and evaluate student performance.

4306 AP Biology

Elective Grades*: 10 – 12
Full Year – 1 Credit

AP Biology is a course offered to 10-12 grade students and covers the requirement of 10th grade science. The AP Biology course covers topics typically found in a first-year college biology course and advances the student's understanding of concepts normally covered in high school biology. This is an intensive course with 150 objectives and 12 labs to be completed before the AP test date at the end of May. Students that take AP Biology will retain and apply content learned to develop advanced inquiry and reasoning skills, such as designing a plan for collecting data, analyzing data, applying mathematical routines, and connecting concepts in and across domains. This course is also created to aid in preparation for the AP Biology exam. Prerequisites- Completion of Algebra I and Honors Earth Science; Concurrent enrollment in Chemistry.

4300 Biology 2

Elective Grades*: 11 – 12
Full Year – 1 Credit

This is an intense lab-oriented class providing in-depth experiences of a variety of biological fields. Units of study include advanced genetics; biotechnology theory and laboratory techniques; populations genetics; comparative anatomy to include animal dissections; animal and plant physiology; and ecological problems. Students interested in careers in the health allied fields; veterinary medicine, biology, genetics, and science in general are encouraged to enroll in this college preparatory class. Student assessment in this class includes written tests and assignments; laboratory assignments, dissections, laboratory practical tests, formal laboratory write-ups; computer simulations; and projects. Because of the extensive lab work, this class requires excellent attendance and disciplined classroom behavior. Students will provide non-latex gloves for dissection and a $5 lab fee.

Prerequisite: A grade of "C" or better in Biology 1 or AP Biology and approval of the student's Biology I or AP Biology instructor.

Chemistry

4310 Chemistry 1

Elective Grades*: 10 – 12
Full Year – 1 Credit

Chemistry is a survey course dealing with the composition, structure, properties, and energy changes of substances through laws that unite these phenomena into a comprehensive system. The concepts are developed in an exciting and intellectually challenging manner through extensive laboratory investigation. Emphasis will be placed on the importance of chemistry in everyday life and the interdisciplinary impact chemistry has on our scientific heritage. Student performance in this college preparatory course is evaluated on the basis of objective testing, laboratory performance, and project completion. A lab fee will be assessed to cover the purchase of individual safety goggles.

Prerequisite: Due to the importance of the development of analytical skills, concurrent enrollment in or completion of Algebra 2 or Pre-Calculus is required.

*This elective can be used to fulfill the graduation requirement.

4420 AP Chemistry

Elective Grades*: 11 – 12
Full Year – 1 Credit

AP Chemistry is an elective science course that will be offered to 11-12 grade students. It is designed to be taken after the completion of Chemistry 1 and upon successful completion of Algebra 2. The course follows the AP curriculum and is designed to investigate and develop a deeper understanding of the concepts normally covered in a first-year college chemistry course as well as to prepare students to take the AP Chemistry Exam. Students who take this course are expected to take the AP Chemistry Exam in May. Students who take AP Chemistry should expect an accelerated pace and may require additional work or lab time outside of the regular class period. Students will build deeper understanding of chemistry concepts by engaging in inquiry-based laboratory experiences that require detailed quantitative analysis and written laboratory reports.

Prerequisites: Chemistry 1 and completion of Algebra 2.

4501 AP Environmental Science

Elective Grades: 11 – 12
Full Year – 1 Credit

AP Environmental Science is designed for students seeking a challenging college level science course at the high school level. Perquisites include obtaining a grade of C or better in Earth Science, Biology and Algebra I. The goal of this course is for students to understand, through investigations, the interrelationships in the natural world. Topics covered include Earth systems and resources, the living world, populations, land and water use, energy resources and consumption, pollution and global change.

This course is recommended for students pursuing careers in natural resources and those who have an interest in the relationships between humans and the natural world.

Physics

4400 Physics

Elective Grades*: 11 – 12
Full Year – 1 Credit

Physics is the study of the relationships of matter and energy. Laboratory experiences are used to teach such topics as motion, heat, sound, wave mechanics, light, magnetism, and electricity. In addition to lab work, discussions, demonstrations, and creative projects will be part of the course. Recommended for college bound students who plan to major in science or a science related field.

Prerequisite: Successful completion or concurrent enrollment in Algebra 2 or Pre-Calculus.

*This elective can be used to fulfill the graduation requirement.