

## SCIENCE

If you have any specific questions, feel free to direct them to  
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### Science Graduation Requirements

**Required Courses:** Three science courses are required to graduate

#### 1) PHYSICAL SCIENCE

Options are: Physical Science 9 A & 9 B - **or** - Honors Physical Science 9 A & 9 B  
-**or**- Basic Physical Science 9 A & 9 B

#### 2) BIOLOGY

Options are: Biology A & B -**or**- Honors Biology A & B -**or**- Basic Biology A & B

#### 3) CHEMISTRY OR PHYSICS

Options are: Chemistry A & B -**or**- Honors Chemistry A & B -**or**- Basic Chemistry A & B  
-**or**- Physics A & B -**or**- Honors Physics A & B

#### **Required State Assessments:**

The Minnesota GRAD Science Exam

### ADVANCED STUDY

**AFTER** completing appropriate course prerequisites, the following courses are suggested for advanced study:

Advanced Biology: Anatomy & Physiology (10-12)

Advanced Biology: Botany (10-12)

AP Biology (11,12)

AP Chemistry (11,12)

AP Environmental (10,11,12)

AP Physics (10,11,12)

Note: steps are not years, just the order that classes should/could be taken. Yellow highlights show required science courses for graduation. Doubling up can happen each year.

1<sup>st</sup> step: Some level of **Physical Science**

Basic Physical Science  
Physical Science  
Honors Physical Science



2<sup>nd</sup> step: Some level of **Biology** (non AP)

Basic Biology  
Biology  
Honors Biology

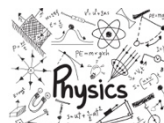


3<sup>rd</sup> step: Some level of **Chemistry or Physics** (non AP)

Basic Chemistry  
Chemistry  
Honors Chemistry



Physics  
Honors Physics



Electives after #1 & #2 could be

AP Environmental  
Adv. Biology: Anatomy  
Adv. Biology: Botany

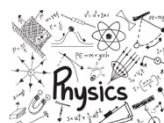


4<sup>th</sup> step: Some level of Chemistry or Physics (non AP) OR/AND

Basic Chemistry  
Chemistry  
Honors Chemistry



Physics  
Honors Physics



Electives after #1, #2 & #3 could be

AP Biology  
AP Chemistry  
AP Environmental  
AP Physics  
Adv. Biology: Anatomy  
Adv. Biology: Botany



**Advanced Biology: Anatomy** - is designed for students with a great interest in biology who wish to expand their knowledge in the areas of human anatomy and physiology. Students pursuing a health related or medical career may be particularly interested in this class. In term A, living structures will be studied in depth from the cellular level through the macroscopic level; special emphasis is placed on malformations, malfunctions, and diseases. The integumentary, skeletal, muscular, digestive, circulatory and immune systems are covered. Mini-units are also done on medical terms, the history of medicine, and alternative forms of medicine. Term B continues our study of living structures as we learn about the respiratory, endocrine, urinary, reproductive, nervous, and special senses. In addition, an investigative research project related to a controversial issue in medicine is done. Systematic dissection of a fetal pig occurs throughout both terms.

**Advanced Biology: Botany/Horticulture** - This two term course is offered in the spring. It introduces the student to the great variety of plants in the surrounding world and their significance both environmentally and economically. This course has a strong laboratory component and you must be ok with working outside and getting your hands dirty! Greenhouse work will be part of the course along with individual and/or group research. Numerous home landscaping and plant care topics will be covered.

**AP Biology:** Advanced Placement Biology's primary goal is to provide students with a challenging college level course and prepare the student for the national AP Biology Exam given in mid-May. Students enrolled in this course are encouraged to take the exam. Based on performance on the exam, students may be granted college credit and/or advanced placement at the discretion of the college or university. The course will include topics regularly covered in a college biology course for majors. The two main goals of AP Biology are to help students develop a conceptual framework for modern biology and an appreciation of science as a process.

#### **AP Chemistry -**

- It is taught at a college level and will prepare you to take the AP Chem exam.
- The course moves quickly and requires a significant amount of homework.
- Covers topics in depth building on your knowledge from 1st year Chemistry
- Labs are robust and model the type of labs you will perform in college
- Content is delivered through lecture and team work.
- Upon successful completion of the AP Chem exam in May, a student can earn two semesters of college credit.

**AP Environmental:** AP Environmental Science is an introductory college-level course in environmental science. The class and exam focus on seven main topics: Earth Systems and Resources, The Living World, Populations, Land and Water Use, Energy Resources and Consumption, Pollution, and Global Change. In this class you will explore and investigate the interrelationships of the natural world and analyze environmental problems, both natural and human-made. You'll take part in laboratory investigations and field work. Skills you will learn by taking this class include: 1. Explaining environmental concepts and processes; 2. Analyzing data, visual representations, and writings; 3. Applying quantitative methods in solving problems; 4. Proposing a solution for an environmental problem and supporting your idea with evidence; and 5. Analyzing a research study to identify a hypothesis. This course helps to prepare students interested in a possible career in the area of environmental science.

**AP Physics** - AP Physics is an introductory college-level physics course that completes the development of topics begun in or not treated in the Honors Physics course such as: constrained Newtonian systems, further development of Conservation Laws applied to energy and momentum of systems, Circular Motion, Center of Mass, Torque and Rotational Mechanics, Universal Law of Gravity and Orbital Motion. Through inquiry based learning and laboratory experiences, students will develop scientific critical thinking and reasoning skills and also learn how to use multilevel physics problem solving approaches. Data analysis of mathematical models for experimental questions are also developed. Students will be prepared for either the AP Physics 1 Exam and/or those students who have had Calculus will be given calculus based problems topics to prepare for the AP Physics C mechanics exam.