

# SCIENCE PROGRAM

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District 200 high schools consider scientific thinking to be one of the cornerstones of a quality education. Understanding the scientific process, practicing experimentation, recording observations, and evaluating results are fundamental skills that provide a broad understanding of science and its impact on our society. District 200 high school graduation requirements do not require specific courses, but the preferred sequence of course selection is Biology, Chemistry, and Physics. While most students should follow such a sequence, the science program is intended to be one of choice. Therefore, other sequences of courses within the science department can be designed to accommodate the specific interests and abilities of the student or any post-secondary plans that may require specific courses or sequences.

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## **ADVANCED PLACEMENT Biology (A)**

**Length:** *Two Semesters*

**Prerequisite:** *Biology (A), Chemistry (A)*

**Qualifies for:** *Applied Technology Credit*

*This course is subject to a consumable fee.*

Advanced Placement Biology is intended for students who are considering a major in biology, biotechnology or the health fields. The course includes content from three general areas: molecules and cells, heredity and evolution, and organisms and populations. Advanced Placement Biology is designed to be the equivalent of a college introductory biology course taken by biology majors. If successfully completed, it offers students the possibility to take upper-level biology courses, or courses for which biology is a prerequisite, as a college freshman.

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## **ADVANCED PLACEMENT CHEMISTRY (A)**

**Length:** *Two Semesters*

**Prerequisite:** *Chemistry (A) or consent of instructor*

**Recommended Prerequisite:** *Concurrent enrollment in Pre-calculus*

**Qualifies for:** *Applied Technology Credit*

*This course is subject to a consumable fee.*

Advanced Placement Chemistry is designed to be the equivalent of the general chemistry course usually taken during the first college year.

Students are expected to attain an in-depth understanding of fundamentals and a reasonable competence in dealing with chemical problems. The course should contribute to the development of the students' abilities to think clearly and to express their ideas, orally and in

writing, with clarity and logic. The college course in general chemistry differs qualitatively from the usual first secondary school course in chemistry with respect to the kind of textbook used, the topics covered, the emphasis on chemical calculations and the mathematical formulation of principles, and the kind of laboratory work done by students. Quantitative differences appear in the number of topics treated, the time spent on the course by students, and the nature and the variety of experiments done in the laboratory.

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## **ADVANCED PLACEMENT PHYSICS C (A)**

**Length:** *Two Semesters*

**Prerequisite:** *Physics (A), Calculus or Concurrent Registration in Calculus or consent of instructor.*

**Qualifies for:** *Applied Technology Credit*

*This course is subject to a consumable fee.*

Advanced Placement Physics C ordinarily forms the first part of the college sequence that serves as the foundation in physics for students majoring in the physical sciences or engineering. The sequence is parallel to or preceded by mathematics courses that include calculus. Methods of calculus are used wherever appropriate in formulating physical principles and in applying them to physical problems. Strong emphasis is placed on solving a variety of challenging problems, some requiring calculus.

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## **ASTRONOMY (I)**

**Length:** *One Semester*

**Grades:** *10, 11, 12*

**Prerequisite:** *Algebra 1*

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*This course is subject to a consumable fee.*

Astronomy is designed to explain and enhance understanding of the physical properties of the universe, with particular emphasis on our solar system, our galaxy, and our ability to use observational techniques and equipment to

explore planets, stars, and other celestial objects and phenomenon. Topics include the historical development of astronomy, the structure, position, and motion of objects within the universe, the life-cycle of celestial objects, and the question of life within the universe.

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## **BIOLOGY (A)**

***Length:*** Two Semesters

***Grade:*** 9

***Prerequisite:*** Teacher recommendation

*This course is subject to a consumable fee.*

Biology A level is a laboratory-based course which includes an in-depth study of the definition of "life" from a scientific vantage point. Topics include the interaction of humans and other biota within the biosphere, the chemical nature of life, the cellular composition of all-living things, genetics, and biotechnology. Second semester surveys scientific theories on the origin and diversification of life, classification of organisms, and human systems. Students should be prepared for accelerated, in-depth content learning in addition to extensive reading, individual and group projects, and writing.

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## **BIOLOGY (I)**

***Length:*** Two Semesters

***Grade:*** 9

*This course is subject to a consumable fee.*

Biology includes an in-depth study of the scientific way of knowing and the definition of "life" from a scientific vantage point. Topics include the chemical nature of life, the cellular composition of all-living things, genetics, and biotechnology. The second semester surveys scientific theories on the diversification of life, classification of organisms, human systems, and the interaction of humans and other biota within the biosphere. Students should be prepared for daily assignments including significant reading, projects, and writing.

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## **CHEMISTRY (A)**

**Length:** Two Semesters

**Grades:** 10, 11, 12

**Prerequisite:** Algebra 1, Concurrent enrollment in Algebra 2 & Trigonometry  
*This course is subject to a consumable fee.*

Chemistry, A level, is a rigorous course that requires students to be self-directed, have motivationally strong study skills, and have strong reading comprehension skills. The course is designed to give students an opportunity to study many traditional chemical topics at an advanced level with regard to lab work, class discussion, and homework.

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## **CHEMISTRY (I)**

**Length:** Two Semesters

**Grades:** 10, 11, 12

**Prerequisites:** Algebra 1

*This course is subject to a consumable fee.*

Chemistry (I) is a laboratory-based course designed for the college bound student. Major topics covered include: the structure of matter, chemical change and chemical reactions, organic chemistry, energy, and acid/base interactions. Students will utilize learning approaches that include hands-on work, reading strategies, and written expression. Students should be prepared to employ math skills, complete daily homework, and work cooperatively with others. Scientific reasoning and problem solving, as well as some self-directed learning are expected.

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## **EARTH SCIENCE (I)**

**Length:** Two Semesters

**Grades:** 10, 11, 12

*This course is subject to a consumable fee.*

Earth Science is the study of the relationship of Earth within the solar system and universe as well as the physical nature of earth itself. Students explore topics including the origins of the planet, the geological methods for determining the age of geologic objects, the methods by which mountains, plains, valleys, and bodies of water are created and changed, and the interaction of organisms and the physical planet. Emphasis is placed on learning

strategies, organizational skills, note taking, and laboratory skills.

## **Environmental BIOLOGY (I)**

**Length:** Two Semesters

**Grades:** 11, 12

**Prerequisite:** Biology (I or A)

**Recommended Prerequisite:** Chemistry or concurrent enrollment in Chemistry

*This course is subject to a consumable fee.*

Environmental Biology is a second year biology course designed for juniors and seniors who wish to investigate both local and global environmental issues. The principle goal is to facilitate the development of a literate environmental citizen capable of making informed decisions regarding the environment. Traditional book work is combined with weekly field studies and data collection with an emphasis on problem solving and critical thinking. During first semester, students investigate the plants, animals, and water ecology of local ecosystems. Second semester students explore global issues such as world population, biodiversity, pollution, and mankind's relation to the environment.

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## **FOOD SCIENCE (I)**

**Length:** One Semester

**Grades:** 10, 11, 12

**Qualifies for:** Science or Elective Credit

*This course is subject to a consumable fee.*

Food Science includes the science of the production, processing, preparation, evaluation, and utilization of food. Students use scientific methods to conduct laboratory experiments. Emphasis is on laboratory experiments that develop understanding of how basic biology, chemistry, physics, physiology, and technology affect the foods we eat.

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## **GEOLOGY (I)**

**Length:** One Semester

**Grades:** 10, 11, 12

**Prerequisite:** One year of high school math

*This course is subject to a consumable fee.*

Geology introduces students to the fundamentals of the Earth's composition and physical

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character. Topics include landforms and their evolution, plate tectonics, the fossil record, and the physical properties and composition of rocks and minerals. Atmospheric dynamics such as wind, rain, heat, and climate are also covered extensively, including laboratory experiences designed to measure heat, motion, force, and porosity.

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## **LIFE SCIENCE (I)**

**Length:** *Two Semesters*

**Grade:** *9*

**Prerequisite:** *Teacher recommendation*

*This course is subject to a consumable fee.*

Life Science is a lab-based study of life from every vantage point, including molecular, cellular, and whole organism. The course introduces the study of interactions and interrelationships of living things and their environment. Topics include, but are not limited to, the classification of organisms, the scientific nature of life, and the scientific theories on the diversification of life.

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## **PHYSICS (A)**

**Length:** *Two Semesters*

**Grades:** *10, 11, 12*

**Prerequisite:** *Algebra 2 & Trigonometry*

**Recommended Prerequisite:** *Concurrent enrollment in Precalculus*

*This course is subject to a consumable fee.*

Physics A level provides a background in the physical laws that describe our universe. Areas of study include motion, forces, energy, light, electricity, magnetism and optics. This course relies heavily on laboratory experimentation and mathematical modeling.

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## **PHYSICS (I)**

**Length:** *Two Semesters*

**Grades:** *10, 11, 12*

**Prerequisite:** *Algebra 1*

**Recommended Prerequisite:** *Concurrent enrollment in Algebra 2 & Trigonometry*

*This course is subject to a consumable fee.*

Physics, I level, is designed for college-bound students. It gives students an understanding of

major concepts of physics in a laboratory setting. An understanding of algebra is required to solve problems presented in this course. Topics include: forces, energy, motion, waves, light, and electricity.