

Science - IB Programme

Science - IB Programme Courses

Advanced Middle Years Programme Biology 1

Advanced Middle Years Programme Biology is a survey of the animal, plant, and protist kingdoms, including consideration of the classification, distribution, and life processes of the major groups of each kingdom. Students will use scientific research methods to investigate scientific principles. Extensive laboratory work will be a part of the course, and students are required to submit written lab reports. Students will explore the skills used by practicing biologists and how biology can help solve environmental problems. This course has an associated Standards of Learning (SOL) test. Students will participate in this test to satisfy federal testing requirements.

Credits 1

Grades

9, 10, 11, 12

Course Designation

International Baccalaureate (IB),

Weighted (0.5W)

Schools

Gar-Field High School

Unity Reed High School

Prerequisites

None

Notes

The Virginia Standards of Learning (SOL) for Biology 1 do not require animal dissections. If a teacher uses this technique as an instructional strategy, students who object to these exercises will be provided with comparable alternative learning experiences.

Advanced Middle Years Programme Earth Science

Advanced Middle Years Programme Earth Science is designed for IB students who wish to concentrate on rigorous earth science principles and processes that will lead to more qualitative sciences. Students will investigate the natural sciences of astronomy, oceanography, meteorology, and geology. The IB internal assessment will serve as a guide as students apply the scientific method. This course has an associated Standards of Learning (SOL) test. Students will participate in this test only if they have not yet earned a verified credit for graduation.

Credits 1

Grades

9, 10, 11, 12

Course Designation

International Baccalaureate (IB),

Weighted (0.5W)

Schools

Gar-Field High School

Requirements

Enrollment in the IB Programme

Prerequisites

None

IB Biology 1 (HL)

IB Biology is the first year of an overview of the major principles and processes in the areas of molecular and cellular biology, genetics, ecology, and organisms. Laboratory work is an integral part of this course and students are required to submit written laboratory reports. Key points of the course are structure and function, universality versus diversity, and equilibrium within systems.

Credits 1

Grades

11

Course Designation

Higher Level (HL) ,
International Baccalaureate (IB),
Weighted (1.0W)

Schools

Gar-Field High School
Unity Reed High School

Prerequisites[IB Chemistry 1 \(SL\)](#)[Advanced Middle Years Programme Biology 1](#)**Notes**

This course may utilize animal dissection techniques as an instructional strategy. Students who conscientiously object to these exercises will participate in division-approved activities that provide comparable learning experiences.

IB Biology 2 (HL)

IB Biology 2 is an introduction to Advanced anatomy and physiology and plant biology. A review of IB Biology 1 principles and processes in the areas of molecular and cellular biology, genetics, ecology, and organisms is included. Students are required to take the IB examination at the end of the course. Laboratory work is an integral part of this course and students are required to submit written laboratory reports.

Credits 1**Grades**

12

Course Designation

Higher Level (HL) ,
International Baccalaureate (IB),
Weighted (1.0W)

Schools

Gar-Field High School
Unity Reed High School

Prerequisites[IB Biology 1 \(HL\)](#)**Notes**

This course may utilize animal dissection techniques as an instructional strategy. Students who conscientiously object to these exercises will participate in division-approved activities that provide comparable learning experiences.

IB Chemistry 1 (SL)

This course provides a general introduction to chemistry. The topics of study include atomic structure, ionic and covalent compounds, chemical equations, stoichiometry, gases, solutions, organic chemistry, and acids and bases. Students develop experimental design skills to collect and analyze data using graphical and statistical methods. Students will design and conduct experimental research projects and will have an emphasis on qualitative and quantitative study of substances and the changes they undergo. Laboratory investigations form a major component of the course as well as mathematical applications of stoichiometry in problem solving. All students must maintain a portfolio of laboratory work that is submitted to the IB examiners. IB Chemistry 1 meets the course requirements of Chemistry 1. This course has an associated Standards of Learning (SOL) test. Students will participate in this test only when they have not yet earned sufficient credit for graduation and/or satisfied federal testing requirements.

Credits 1**Grades**

10, 11, 12

Course Designation

International Baccalaureate (IB),
Standard Level (SL),
Weighted (1.0W)

Schools

Gar-Field High School
Unity Reed High School

Prerequisites

[Algebra 1](#)

One year of laboratory science

IB Chemistry 2 (SL)

This second-level course provides students with a comprehensive hands-on study of major chemical principles emphasizing laboratory experiences and research. Students study research techniques, Advanced problem solving, and synthesis of prior knowledge to investigate IB option topics. Participation in an interdisciplinary science research (Group 4) project is required. Laboratory investigations form a major component of the course, and all students must maintain a portfolio of laboratory work that is presented to the IB examiners. With a satisfactory IB exam score, students may receive credit for introductory college chemistry. Students are required to take the IB Chemistry Standard Level Exam and complete the required hours and assignments tied to the SL Chemistry Internal Assessment.

Credits 1

Grades

11, 12

Course Designation

International Baccalaureate (IB),

Standard Level (SL),

Weighted (1.0W)

Schools

Gar-Field High School

Unity Reed High School

Prerequisites

[IB Chemistry 1 \(SL\)](#)

IB Environmental Systems and Societies (SL)

This one-year course provides students with a perspective on the interrelationships between ecosystems and societies. Students will emerge from the class with an understanding of complex environmental issues in which the interaction between ecosystems and societies is central. Sustainability is the integrative theme of this course. Students will develop the capability to formulate an informed personal response to both local and global issues. Students will take the Earth Science 1 Standards of Learning assessment only when they have not yet earned sufficient credit for graduation and/or satisfied federal testing requirements. Environmental Systems and Societies can serve as a requirement for either a Group 3 (Individuals and Societies) course or a Group 4 (Experimental Science) course within the IB diploma program. 40 hours of lab work and participation in the Group 4 Project are required by the IBO.

Credits 1

Grades

11, 12

Course Designation

International Baccalaureate (IB),

Standard Level (SL),

Weighted (1.0W)

Schools

Gar-Field High School

Unity Reed High School

Prerequisites

[Advanced Middle Years Programme Biology 1](#)

IB Physics (SL)

IB Physics is an extremely fast-paced, rigorous course following the IB Standard Level curriculum. Building on their background from Advanced Middle Years Programme Physics, students will study mechanics, heat, electromagnetism,

light, sound, and modern physics in greater depth. Students will design and implement their own laboratory investigations and will be graded using IB assessment criteria. They will participate in the interdisciplinary "Group 4 Project" and will sit for the Standard Level examination at the end of the course.

Credits 1

Grades

11, 12

Course Designation

International Baccalaureate (IB),

Standard Level (SL),

Weighted (1.0W)

Schools

Unity Reed High School

Prerequisites

[Advanced Middle Years Programme Algebra 2 - Extended](#)