

# Science - Cambridge Programme

## Science - Cambridge Programme Courses

### AICE Biology (A Level)

This course is a second year of the AICE Level Biology curriculum that incorporates lab experience as an integral component of its study. The curriculum involves a detailed examination of major biological themes, along with one of four optional units: mammalian physiology; microbiology and biotechnology; growth, development, and reproduction; and applications of genetics in a more comprehensive manner. Students will sit for external exams that contribute to the Advanced International Certificate of Education Diploma and present a possibility for students to receive college credit for an introductory biology course.

**Credits** 1

**Grades**

11, 12

**Course Designation**

Advanced Level (A),

Cambridge,

Weighted (1.0W)

**Schools**

Brentsville District High School

**Prerequisites**

[AICE Biology \(AS Level\)](#)

### AICE Biology (AS Level)

AICE Biology is an accelerated and rigorous course that follows an international, Advanced level curriculum. This course is lab-oriented, with a curriculum designed to give students a foundation in biological concepts as well as the opportunity to utilize principles of experimental design in laboratory inquiry and on a required independent student project. The course covers major biological topics. Students will be prepared to sit for a practical test and external examinations leading to Advanced International Certificate of Education Diploma and an Advanced Placement qualification.

**Credits** 1

**Grades**

11, 12

**Course Designation**

Advanced Subsidiary Level (AS),

Cambridge,

Weighted (1.0W)

**Schools**

Brentsville District High School

Potomac High School

**Prerequisites**

[IGCSE Biology](#) or [Biology 1](#); [IGCSE Chemistry](#) or [Chemistry 1](#); [Algebra 2](#) or [IGCSE Geometry](#)

**Corequisites**

Advanced Biology Laboratory; [Algebra 2](#) or [Advanced Algebra 2](#)

### AICE Chemistry (AS Level)

AICE Chemistry is an accelerated and rigorous course that encompasses the AP Chemistry curriculum and enriched AICE topics. This course is lab-oriented, with a curriculum designed to give students a foundation in chemistry concepts as well as the opportunity to utilize principles of experimental design in laboratory inquiry and on a required independent student project. The expanded curriculum enables students to pursue Advanced studies of analytic

separation techniques, biochemistry, and spectroscopy. Students will be prepared to sit for external examinations in theory and practical assessments leading to an Advanced International Certificate of Education Diploma and an AP qualification.

**Credits** 1

**Grades**

11, 12

**Course Designation**

Advanced Subsidiary Level (AS),

Cambridge,

Weighted (1.0W)

**Schools**

Brentsville District High School

**Prerequisites**

[IGCSE Chemistry](#) or [Chemistry 1](#); [Algebra 2](#) or [IGCSE Advanced Algebra 2](#)

## AICE Environmental Management (AS Level)

This accelerated Cambridge course has a strong human dimension and is concerned with both local and global issues. The curriculum encompasses the four traditional subdivisions of the global environment, including the lithosphere, hydrosphere, biosphere, and atmosphere. The course develops in students a strong understanding of the Earth's natural systems and the effects of human activity on these systems. Students are challenged to think about important environmental issues and to look to themselves for possible solutions. An important component of the practical assessment is an Individual Research Report based on issues for the course of studies. Students will take the Earth Science 1 Standards of Learning assessment only if they have not yet earned credit for graduation. Students will be prepared to sit for an external examination leading to the AICE Diploma and an Advanced Placement qualification.

**Credits** 1

**Grades**

11, 12

**Course Designation**

Advanced Subsidiary Level (AS),

Cambridge,

Weighted (1.0W)

**Schools**

Brentsville District High School

Potomac High School

**Prerequisites**

[IGCSE Biology](#) or [Biology 1](#); [IGCSE Chemistry](#) or [Chemistry 1](#); IGCSE Algebra 2 or [Algebra 2](#)

## AICE Physics (AS Level)

AICE Physics is an accelerated and rigorous course that encompasses the AP Physics curriculum and enriched AICE program topics. This course focuses on the Advanced study of topics in general physics, Newtonian mechanics, matter, oscillations and waves, electricity and magnetism, and modern physics. The inquiry-based approach emphasizing principles of experimental design, scientific problem solving, and research skills requires students to use principles and concepts that are taught and to apply them in a logical, reasoned, and deductive manner to their work. Independent research is a required part of the program. Students will be prepared to sit for external examinations in theory and practical applications leading to an Advanced International Certificate of Education Diploma and an AP qualification.

**Credits** 1

**Grades**

11, 12

**Course Designation**

Advanced Subsidiary Level (AS),

Cambridge,

Weighted (1.0W)

**Schools**

Brentsville District High School

Potomac High School

**Prerequisites**

[IGCSE Physics](#) or [Physics 1](#); [IGCSE Chemistry](#) or [Chemistry 1](#)

## IGCSE Biology

This laboratory-based course includes a curriculum designed to give students a foundation in biological concepts as well as the opportunity to utilize principles of experimental design in laboratory inquiry and on a required independent student project. IGCSE Biology includes, but is not limited to, characteristics and classification of living organisms; organization and maintenance of organisms; reproduction, inheritance, and the continuity of life; and the relationships of organisms to one another and to their environment. This course has an associated Standards of Learning (SOL) test. Students will participate in this test to satisfy federal testing requirements. 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

**Course Designation**

Cambridge,

Weighted (0.5W)

**Schools**

Brentsville District High School

Potomac High School

**Prerequisites**

None

**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.

## IGCSE Chemistry

This course is lab-oriented, with a curriculum designed to give students a foundation in chemistry concepts as well as the opportunity to utilize principles of experimental design in laboratory inquiry and on a required independent student project. The course will include the major principles of chemistry: structure of matter, chemical and physical properties, periodic trends, molar and stoichiometric relationships, chemical reactions and equilibria, chemical kinetics, electrochemistry, thermodynamics, acid-base theory, and organic and environmental chemistry. Assessment will include an external examination and coursework evaluations by the teacher. 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

**Course Designation**

Cambridge,

Weighted (0.5W)

**Schools**

Brentsville District High School

Potomac High School

**Prerequisites**

[IGCSE Biology](#) or [Biology 1](#); IGCSE Algebra 1 or [Algebra 2](#)

## IGCSE Physics

This course offers a combination of theoretical and practical studies such as mechanics that analyze motions and forces; study of energy with applications to work and power; thermodynamics; properties of waves (light and sound); electricity and magnetism; and atomic physics leading to an understanding of the basic principles of physics. Investigations will be student designed and tested emphasizing principles of experimental design, inquiry based

discovery, and scientific problem solving. Independent research is a required part of the program. IGCSE Algebra 2 must have been successfully completed or the student must take IGCSE Advanced Algebra 2 concurrently. Assessment measures will include external student examination and course evaluations by the teacher.

**Credits** 1

**Grades**

10, 11

**Course Designation**

Cambridge,

Weighted (0.5W)

**Schools**

Brentsville District High School

Potomac High School

**Prerequisites**

[Algebra 1](#); [IGCSE Geometry](#) or [Geometry](#) or concurrent enrollment in [IGCSE Advanced Algebra 2](#)