

## Science Requirements

### Regents Diploma

In order to obtain a Regents Diploma, a student must earn **3 units of science credit** plus a grade of 65% on at least one science Regents examination. (Usually Earth Science or Living Environment)

### Advanced Regents Diploma

In order to obtain an Advanced Regents Diploma, a student must earn 3 units of science credit and a grade of at least 65% on three science Regents examinations. One credit must be a life science credit and one credit must be a physical science credit.

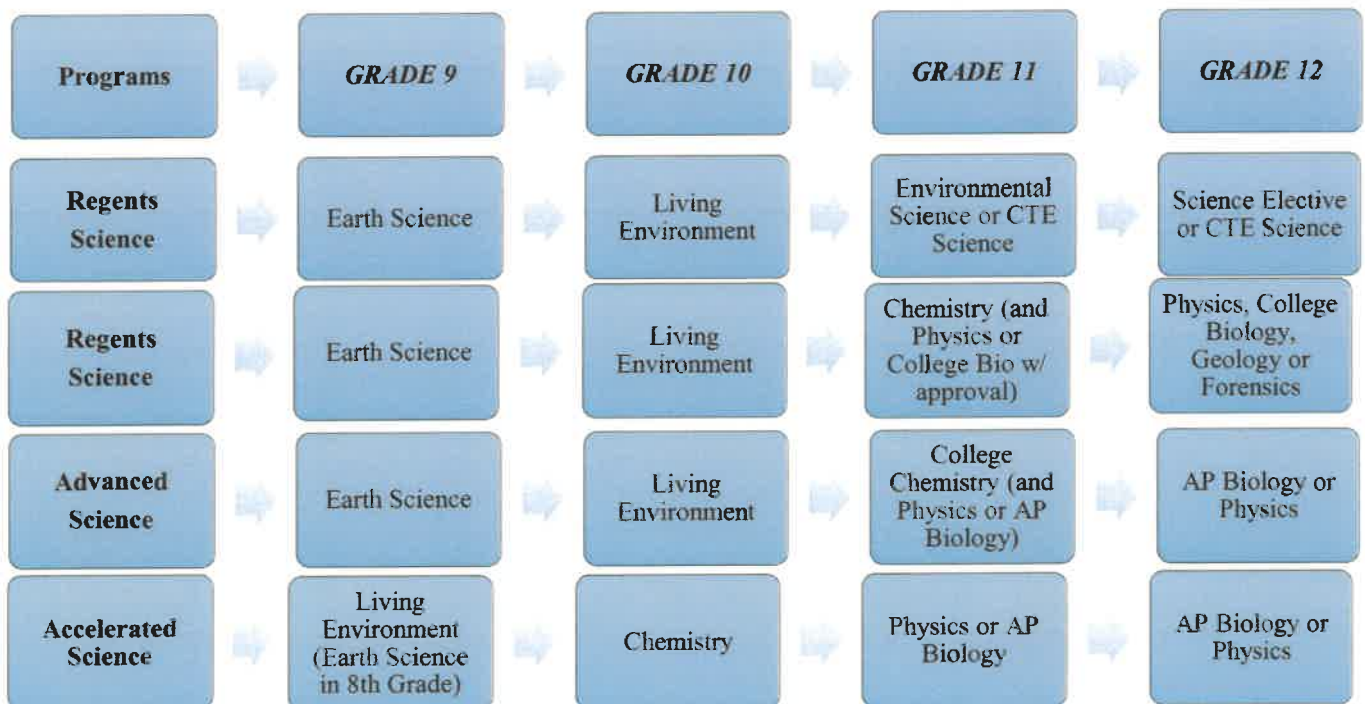
The traditional pathway is as follows:

- Earth Science
- Living Environment
- Chemistry and/or Physics

### Typical Science Progressions

**Note:**

*These are typical progressions in science used at WAJ; however, students may customize progressions to their desired Program of Study-pending administrative approval.*



**Chemistry***Credit: 1**Weighting: 0***Course Description**

This is a one year Chemistry course that includes a 1200 minute laboratory component. This laboratory component is a requirement for the Regents exam given in June. Some of the major topics covered are: Atomic structure and Chemical Bonding, Mathematics of Chemistry, Physical Behavior of Matter, The Periodic Table, Acids and Bases, Oxidation and Reduction, Kinetics, Organic Chemistry and Nuclear Chemistry.

**Course Requirements**

Algebra, Earth Science, Living Environment; 80% average in previous science content (exceptions to be approved by HS counselor and chemistry teacher)

**Forensic Science 141***Credit: 1**Weighting: 4***Course Description**

For the non-science major, an introduction to the basic scientific theory and techniques used in criminal investigation. Topics include proper handling and preservation of crime-scene evidence; glass, soil, fingerprint, drug and paint chip examination, hair analysis; cloth, fiber, the uses of spectrophotometry, chromatography, and other instrumental methods in evidence analysis. Also, the description of serological techniques, DNA profiling, and toxicological techniques. Course covers sufficient inorganic and organic chemical concepts for students to gain an elementary understanding of the various analytical techniques.

**Course Requirements**

Prerequisite: 80% GPA in the science content area.

**Forensics***Credit: 1**Weighting: 0***Course Description**

Forensics is available as an upper level science elective; this course provides an introduction to the basic scientific theory and techniques used in criminal investigation. Course topics include: proper handling and preservation of crime scene evidence including glass, soil, fingerprints hair, fibers, blood and paint. The course is designed for the high school student to develop an understanding of the methods used by forensic scientists including observation, measurement, data collection, hypothesis development and evaluation of evidence.

**Course Requirements**

*None*

**Earth Science***Credit: 1**Weighting: 0***Course Description**

This is a one year Earth Science course that includes a 1200 minute laboratory component. This laboratory component is a requirement for the Regents exam given in June. Some of the major topics covered are: Rocks and Minerals, Plate Tectonics, Earth's History, Meteorology, Climate, and Astronomy.

**Course Requirements**

*None*

**Environmental Science***Credit: 1**Weighting: 0***Course Description**

Environmental Science is a year-long course designed to show thematic connections between science, technology, and society. Students will gain an understanding of the basic causes of major environmental issues and examine them from ethical and economic standpoints. Students will apply prior scientific knowledge to current environmental issues and will become better-informed citizens and decision-makers.

**Course Requirements**

None

**Anatomy and Physiology***Credit: 1**Weighting: 0***Course Description**

Anatomy and Physiology is a study of the structure and function of the human body. Topics covered in the course include the study of cells, tissues and organs in the following systems: integumentary, skeletal, muscular, nervous, endocrine, circulatory, digestive, respiratory, excretory and immune. Emphasis is on interrelationships among systems and regulation of physiological functions involved in maintaining homeostasis. This course is designed for students with an interest in the human body or wishing to pursue a career in a health related field.

**Course Requirements**

None

**General Biology 101***Credit: .5 (4 college credits)**Weighting: 4***Course Description**

This course provides an introduction to the basic foundations and concepts of biology, including the nature of life; the cell, energy, and the chemical phenomena that life depends on. Biology 101, in conjunction with its second semester companion course, gives an overview of the whole field of biology and is the first course for students who want to major in the life sciences. Laboratory exercises provide opportunity for reinforcing major themes discussed in class, as well as an opportunity to conduct inquiry-based investigations.

**Course Requirements**

Prerequisite: 80% or higher in prior science coursework and Earth Science and Living Environment Regents

**General Biology 102***Credit: .5 (4 college credits)**Weighting: 4***Course Description**

This course is a continuation of BI 101 and provides an introduction to the basic foundations and concepts of biology, including zoology, genetics, and evolution. Students entering the course must be trained in the use of a compound microscope and be familiar with the concepts of cell anatomy, cell division, protein synthesis and animal reproduction. Laboratory exercises provide opportunity for reinforcing major themes discussed in class, as well as an opportunity to conduct inquiry-based investigations. NOTE: Lab includes animal dissection

**Course Requirements**

Prerequisite: 80% or higher in prior science coursework and Earth Science and Living Environment Regents

**General Chemistry 101***Credit: .5 (4 college credits)**Weighting: 4***Course Description**

A comprehensive introduction to chemical theories. Major topics include dimensional analysis, atomic structure, chemical formulas, names and equations, stoichiometry, ideal gas laws, periodic properties of elements, chemical bonding, and molecular geometry

**Course Requirements**

Completion of Algebra II with a grade of 75% or better or completion of MA 110 (College Algebra); 80% GPA in science content overall

**General Chemistry 102***Credit: .5 (4 college credits)**Weighting: 4***Course Description**

A continuation of General Chemistry with emphasis on systems at equilibrium. Major topics include properties of solid, liquid, and gaseous matter, phase changes, solution characteristics, chemical kinetics, chemical equilibrium, acid-base equilibria, thermodynamics, and electrochemistry.

**Course Requirements**

Prerequisite: CH 101 with a grade of C or better; 80% in science content area overall

**Living Environment***Credit: 1**Weighting: 0***Course Description**

The Living Environment is a high school level biology course which includes a 1200 minute laboratory component. Curriculum follows the New York State P-12 science learning standards. This course is specifically designed to prepare students for the Living Environment Regents Exam. Topics covered in this course include: scientific inquiry, cell structure/function, genetics, growth and reproduction, the human body, and ecosystem dynamics.

**Course Requirements**

None

**Physics***Credit: 1**Weighting: 0 (or 2 if taken as an "Upper Level Academic", 4<sup>th</sup> year science course)***Course Description**

This is a one year Physics course that includes a 1200 minute laboratory component. This laboratory component is a requirement for the Regents exam given in June. Some of the major topics covered are: Mechanics, Energy, Electricity and Magnetism, Wave Theory, and Modern Physics. This course relies heavily on math skills and a solid understanding of scientific measurement.

**Course Requirements**

Algebra and Geometry

**AP Biology***Credit: 1**Weighting: 5***Course Description**

AP Biology is the equivalent of a two-semester college introductory biology course normally taken by science majors during their first year of college. AP Biology is designed to be taken by students after successful completion of high school biology and chemistry. If the student has not yet taken chemistry, then it must be taken concurrently with AP biology. The course goal is to provide students with the conceptual framework, factual knowledge, and analytical skills necessary to deal critically with the rapidly changing science of biology. Primary emphasis will be on developing an understanding of biological concepts such as science as a process, personal experience in scientific inquiry, and recognition of unifying themes that integrate the major topics of biology. AP Biology differs from regular high school biology through the use of a college-level text, a greater range and depth of topics covered, a faster pace of instruction, and more sophisticated laboratory work.

**Course Requirements**

Biology and Chemistry

**Introduction to Agriculture, Food, and Natural Resources (AFNR)***Credit: 1**Weighting: 0***Course Description**

Introductory course in Agriculture, Food, and Natural Resources that offers a wide range of agricultural opportunities and the potential pathways of study in AFNR. Students use their introductory knowledge and skills to further their agricultural education. Practical skills and applications are woven into the course activities to develop students' future employability. Students will experience hands-on activities, projects, and problems involving communication in the science of agriculture, plants, animals, natural resources, and agricultural mechanics. Incorporating items relating to everyday agriculture, future preparation through CTE, the science of agriculture, the science of food, and natural resources. The course includes agricultural education, which is a combination of agriculture and groups such as FFA (Future Farmers of America), communication methods, science processes, natural resources, plants and animals, and agricultural mechanics.

**Course Requirements**

None

**Animal Science***Credit: 1**Weighting: 0***Course Description**

Students will learn the principles of agriculture, animal science, and related career options, along with learning activities that involve background and social issues of animal science, animal anatomy, physiology, behavior, nutrition, reproduction, health, selection, and marketing. In addition, students will acquire skills in understanding animals' needs, allowing them to consider the perceptions and preferences of individuals within agriculture in the local, regional, and world markets. Students will learn the characteristics of animal science and work on projects and problems similar to those of animal science specialists, veterinarians, zoologists, livestock producers, and industry personnel. Students will learn the connection between animal science lessons and FFA (Future Farmers of America) components essential to an informed agricultural education student.

**Course Requirements**

None

**Plant Science**

*Credit: 1*

*Weighting: 0*

**Course Description**

The plant science course provides a foundation of plant science knowledge and skills where students will be able to experience various plant science concepts through the study of plant anatomy and physiology, classification, and the fundamentals of planting and harvesting. Students will learn to apply scientific knowledge and skills to use plants in agronomic, forestry, and horticultural industries. Therefore, discovering the value of plant production and its impact on the individual, local and global economy. The course intends to build on the Introduction to Agriculture, Food, and Natural Resources foundation. Units of study included in Plant Science include mineral soils, soilless systems, anatomy and physiology, taxonomy, the growing environment, plant reproduction, surviving a harsh climate, and crop production and marketing.

**Course Requirements**

*None*