

WRHS Science Curriculum Syllabus

Course Name: Science Explorations and Interactions II

Grade Level: 10

Course Description:

While the first year of Science Explorations and Interactions provided students with an overview of the scientific process and an introductory chemical and biological topics, Science Explorations and Interactions II introduces many physical concepts through the study of Earth and Space science. In the first semester, students will learn about matter and energy in the Earth System and the evolution of the universe as well as geo-chemical processes, hydrology and geologic time. The second semester will focus on more advanced biological ideas, specifically the continuity of life, genetics and the theory of evolution.

Links to Student Expectations:

- All students will develop skills to utilize technology to gather, to evaluate, to assimilate, and to present information.
- All students will utilize critical thinking skills to identify and to provide resources to solve a problem.
- All students will be able to make decisions and solve problems using logical processes (e.g., scientific method, induction, deduction, syllogism, etc.)
- All students will develop skills to promote a sense of confidence in tackling the rigors of standardized tests such as the required MCAS and optional AP, SAT.

Interdisciplinary Connections:

Science Explorations II is a course that utilizes a variety of skills that have direct relationships to biology, chemistry, physics, and earth science and mathematics. Furthermore, the relationships between the sciences and daily life are stressed using concrete examples.

I. Essential Questions for Course

- How can the Laws of Motion explain physical phenomena?
- What affects the weather and how is it recorded?
- How can matter change and how can these changes be represented?
- What are the differences between mitosis and meiosis?
- How do animals grow and develop?
- How do traits get passed from one generation to the next?

- Is there a mechanism to ensure the continuity of life?
- How is it possible for organisms to change over time?

II. Student Objectives

- Force and Motion
 - To explain Newton's Laws of Motion.
 - To demonstrate the Law's of Motion in a lab setting.
- Atmosphere & Weather
 - To explain the water cycle and how it affects weather and weather patterns.
 - To identify the parts of the Earth's atmosphere.
- Chemical Reactions, pH and Balancing Equations
 - To understand basic types of chemical reactions.
 - To balance simple chemical equations.
 - To understand the pH scale and test the pH of common substances.
- Cell Reproduction
 - To explain why cells need to divide.
 - To explain the processes of mitosis and meiosis.
- Human Development
 - To understand the basic elements of animal reproductive systems.
 - To demonstrate an understanding of embryological development.
- Inheritance & Chromosome Theory
 - To explain the work of Mendel and its relationship to inheritance.
 - To solve simple genetic crosses.
 - To demonstrate an understanding of the Chromosome Theory of Inheritance.
 - DNA
 - To describe the structure of DNA.
 - To understand basic protein synthesis.
- Evolution
 - To explain how various areas of science show evidence of evolution.
 - To explain how Natural Selection can occur.

III. Suggestions for Instruction

- Brief Lectures
- Discussions
- Oral reviews and summaries
- Textbook reading-(Coordinated Science 1 & 2 [Cambridge] and Biology [Merrill])
- Worksheets
- Individual or small group laboratory experiments
- Videos

- CD ROM Interactive Activities

IV. Suggestion for Assessment

- Written assessments (with a variety of question types)
- Laboratory experiments
- Classroom presentations
- Individual long-term projects

V. Curriculum

- Force and Motion
- Atmosphere & Weather
- Chemical Reactions, pH and Balancing Equations
- Cell Reproduction
- Human Development
- Inheritance & Chromosome Theory
- DNA
- Evolution

VI. Lesson Extensions

- Possible small individual or small group projects to extend the materials presented in class.