

Curriculum Outline



Campbell High School

Character – Courage – Respect – Responsibility

Course & Level: Physical Science

Department: Science

Teacher: Michele Mitnitsky

Grade level: 9

Description of Course:

This course examines the principal foundations of chemistry and physics, and provides the basic skill sets necessary to continue achievement in other disciplines of science. Topics include laboratory investigation techniques, the collection, analysis, and presentation of data, the classification, states, and properties of matter, the structure and nature of the atom, chemical interactions, the fundamental principles of gravity, force interactions, and energy, light, the electrospectrum and waves. The successful student will also apply basic algebra skills. This course meets 0.5 credit State requirement and 0.5 CHS Physical Science requirements for graduation.

School – Wide Expectations:

Academic:

1. Read, write and speak effectively
2. Exhibit critical thinking and problem solving skills
3. Use resources to obtain information and facilitate learning

Civic/Social:

1. Work cooperatively in an atmosphere of mutual respect
2. Exhibit personal responsibility

The school-wide expectations are incorporated into all courses at Campbell High School. Underlined words in the following text illustrate this alignment between the school-wide expectations and the course curriculum.

Core Competencies and State Standards:

1. **Scientific Knowledge-** Students will demonstrate scientific knowledge in content areas using appropriate terminology both in an oral and writing format.

PS 1 *All living and nonliving things are composed of matter having characteristics properties that distinguish one substance from another.*

PS 2 *Energy is necessary for change to occur in matter. Energy can be stored, transferred and transformed, but cannot be destroyed.*

PS 3 *The motion of an object is affected by forces.*

PS4 *The growth of scientific knowledge in Physical Science has been advanced through the development of technology and is used (alone or in combination with other sciences) to identify, understand and solve local and global issues.*

2. **Scientific Investigation and Technique-** Students will investigate, solve, explain solutions, and evaluate scientific problems through the scientific process.

SPS1 – *Scientific Inquiry and Critical Thinking Skills (INQ)* **SPS2** – *Unifying Concepts of Science* **SPS3** – *Personal, Social, and Technological Perspectives* **SPS4** – *Science Skills for Information, Communication and Media Literacy*

3. **Scientific Research-** Students will research, review and interpret significant scientific developments.

SPS1 – *Scientific Inquiry and Critical Thinking Skills (INQ)* **SPS2** – *Unifying Concepts of Science* **SPS3** – *Personal, Social, and Technological Perspectives* **SPS4** – *Science Skills for Information, Communication and Media Literacy*

Suggested Texts and Media (Software, A/V, etc.):

1. Textbook and ancillary materials (concept development sheets, labs, etc.): *Physical Science*, Wysession, Frank, Yancopoulos
2. NOVA DVD's: *Newton's Dark Secrets*, *Mythbuster's Episodes*: "Penny Drop" (terminal velocity, kinematics) *Bill Nye the Science Guy* Episodes: "Measurement", "Atoms", "Chemical Reactions", "Magnetism"
3. Prentice Hall Test Bank software

The science curriculum at Campbell High School is a dynamic document, reflecting the nature of the subject. It addresses ever-changing areas of study, such as genetics and quantum physics, as well as the fundamentals, such as the Periodic table and Newton's Laws of Motion. Scientific Research is an important component for each course at Campbell. The analysis and interpretation of recent scientific information and articles will vary appropriately with grade level and course difficulty.

We utilize a variety of instructional resources beyond the identified textbooks and materials throughout the school year to enhance your student's educational experience. Parents/Guardians are welcome to review the available resources throughout the school year by contacting their student's teacher. Due to religious or moral objections, alternative assignments may be available upon request. Please contact the classroom teacher for further details.

Suggested Instructional Strategies:

1. Lecture, Discussion and Demonstration – Students are expected to take notes from lecture, power point presentations and demonstrations. Use of demonstrations as a way to guide student inquiry. Students are encouraged to ask questions and discussion is an integral part to the inquiry process. Through this, students are encouraged to think independently and 'outside of the box' in order to exhibit critical thinking and problem solving skills.

2. Lab, Investigation – Exploratory or investigation labs allow students to ask their own questions about a particular concept. Students also use labs to explore different concepts with expected outcomes. Some labs will be completed individually or cooperatively.

3. Projects – Students are expected to use prior knowledge learned as well as research to create projects that are meaningful and fun. Students are expected to present projects to class through various forms such as posters, oral presentations, and power points. One example of this is Periodic Table Project. Students research the elements on the table and present their uses, compounds, periods, groups, electron configuration, valence electrons, etc.

4. Current Events – Students are expected to research recent discoveries or current events in physical science. They present them to the class for group discussion.

Suggested Assessment Strategies:

1. Quiz / Test – Typically 75% multiple choice, true/false, or matching and 25% open response (a mixture of problem solving, essay, and graphical analysis).

2. Lab Report – In order to demonstrate competency in the Scientific Investigation requirement, students communicate lab outcomes in the Campbell High School Lab Report Format revised to be appropriate for freshmen.

3. Project – Students are assessed on oral and written presentations.

4. Informal Groupwork – Various modes of formative assessment in which students work on a particular problem in groups of two to four. Groupwork encourages peer learning, strengthens topical skill sets through teaching, and promotes collaboration and community. Examples of groupwork include Data Analysis, oral presentations and Problem Solving.