

COURSE PROFICIENCY OUTLINE
PHYSICAL SCIENCE – 393

5 Credits

Purpose

Physical Science is offered primarily to eleventh and twelfth grade students who have completed biology and who desire a thorough and systematic understanding of the fundamentals of physics and introductory chemistry. The outcomes of the course will include the development of the students' knowledge of the physical sciences, energy and our resources, and the improvement of the pupils' basic mathematical problem-solving skills and general-learning skills, and an awareness of the impact of science and technology on everyday life.

I. Student Outcomes 5.1, 5.2, 5.3, 5.4, 5.6, 5.7

- A. Students will demonstrate an understanding of the terminology, facts, concepts and applications of introductory physics and chemistry.
- B. Students will demonstrate the ability to use physical science learnings and materials in varied situations.
- C. Students will demonstrate an understanding of the physical sciences and technology and the interrelationships of humankind, energy and resources.
- D. Students will develop competencies in study and learning skills, in mathematical and problem-solving skills, in reading, writing, and listening skills, in basic science critical-thinking skills, and in laboratory manipulative and investigative skills.

II. Content 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7

A. Physical Science Basics

- 1. The Nature of Science
- 2. Physical Science Methods

B. Energy and Motion

- 1. Exploring Motion and Forces
- 2. Acceleration and Momentum
- 3. Energy
- 4. Using Thermal Energy
- 5. Machines

C. The Nature of Matter

- 1. Solids, Liquids, Gases
- 2. Classification of Matter
- 3. Atomic Structure & The Periodic Table
- 4. Chemical Bonds

D. Kinds of Substances

- 1. Elements and their Properties
- 2. Organic & Biological Compounds
- 3. Useful Materials

E. Interactions of Matter

- 1. Solutions
- 2. Chemical Reactions
- 3. Acids, Bases, and Salts

F. Waves, Light and Sound

- 1. Waves and Sound
- 2. Light
- 3. Mirrors and Lenses

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G. Electricity and Energy Resources

1. Electricity
2. Magnetism and Its Uses
3. Electronics and Computers
4. Radioactivity and Nuclear Reactions
5. Energy Sources

III. Activities and Materials

A. Text - Glencoe - Physical Science

B. Classwork

1. Lectures, note-taking, discussions, demonstrations, audio-visual materials and regular tests and quizzes will be utilized.
2. Physical science learning skills such as reading, writing, listening, basic mathematical problem-solving, the obtaining, processing and reporting of information, and science-learning skills will be utilized.

C. Laboratory Activities - developing an attitude toward safety

1. Metrics, measurement, density, other measures
2. Observations of a few sample chemical reactions
3. Studies of basic physics phenomena and their applications, in such areas as motion, mechanics, heat, electricity, light and optics.

D. Assignments - to be carefully checked and reviewed by the teacher and students utilizing high school academic level reading, writing, and science organization and thinking skills.

1. Readings - text and other sources, outlining and the organization of information
2. Written answers to questions
3. Laboratory and other reports utilizing varying techniques and methods
4. Science study-learning assignments
5. Simple problem-solving activities

IV. Evaluation

A. Students will be expected to complete classwork and homework learning assignments, laboratory work and reports, and make up work missed whenever it is practical to do so.

B. Students will be expected to demonstrate an acceptable level of proficiency in all of the goals and objectives of the course within the previously defined content and process areas.

C. The evaluation of student proficiencies shall consist of tests and quizzes, written assignments and reports, lab reports, and the teacher's regular observations of the student's proficiencies, involvement and learnings in laboratory activities and in the classroom environment.

D. Students will take a comprehensive final examination. This exam will count as 20% of the final grade.

E. The final grade represents the teacher's professional judgment of the student's performance and all of the aforementioned activities and/or requirements are included in the evaluative process.