OFFICE OF CURRICULUM, INSTRUCTION & PROFESSIONAL DEVELOPMENT

HIGH SCHOOL COURSE OUTLINE

Department	Science	**Course Title**	Physical Science 1-2		**Course Code**		4011
Abbreviation	Phy Sci 1-2	**Grade Level**	9,10,11, or 12		**Grad Requirement**		Yes
Course Length	2 semesters	**Credits/Semester**	5	**Required**	X	**Elective**	
Prerequisites	None						
Articulated with LBCC	No	**Articulated with CSULB**	No				
Meets UC "a-f" Requirement	No	**Meets NCAA Requirement**	Yes				

COURSE DESCRIPTION:

Physical Science 1-2 is an integrated, laboratory based approach to science instruction in Physical and Earth science. Fundamental; principles of physics, chemistry, and earth science are explored in a constructive method of teaching as they relate to environment and technology. A thematic approach is used to integrate the different science disciplines into a study of astronomy, physics, meteorology, tectonics, and ecology. Successful completion of this course will credit ten units toward high school graduation requirements.

GOALS: (Student needs that this course is intended to meet)

- To provide a practical experience in and a conceptual framework of introductory physical and earth science.
- To provide experiences that promotes student success and esteem through challenging applications of physical and earth science activities.
- To enhance critical skills.
- To equip students to competently address the ethical issues of a rapidly advancing technological society.
- To expose students to availability of high school course work in physics, chemistry, and biology, and other electives based in science.

PERFORMANCE OBJECTIVES:

Students will:

- demonstrate and apply an awareness and practical knowledge of laboratory safety.
- recognize the fundamental physical and earth science concepts of: matter, energy, time and space; forces; universal laws; sound & light; electricity & magnetism; work & energy; chemistry, inorganic & organic; weather & climate; plate tectonics; and man's interrelationship with his environment.

- use the scientific method of inquiry and recognize that our current understanding of science laws and hypotheses is based on experimentation leading to theories, that the current knowledge guides future inquiry.
- describe, explain, and apply the physical science principles to everyday life activities as these relate to science.
- describe, explain, and apply the earth science principles to everyday life activities as these relate to science.
- discriminate between relevant and irrelevant data through problem solving, laboratory activities, and projects.
- apply previous knowledge learned in physical and earth science to previously un-encountered situations.
- recognize misconceptions with the use of the scientific method and replace them with logical conclusions.
- discuss current events related to science and technology using appropriate scientific principles.
- relate the historical scientific knowledge to ethical issues using library and internet research projects.
- debate the environmental and economic concerns such as energy resources, nuclear waste disposal, greenhouse effect, and ozone layer issue using an integrated scientific approach.
- demonstrate a realistic view of the rewards and challenges of continuing their education in science.
- design valid experimental procedures for laboratory project work.
- accept the challenge of laboratory-based science classes with confidence provided by completing this introductory course in physical science.

OUTLINE OF CONTENT AND TIME ALLOTMENT:

Subject	Suggested Time	District Standards
1. Measurement a. English unit b. metric, Basic SI units	12-14 days	ES #3-1b PS #1-2a
2. The universe a. stars & galaxies b. constellations c. quasars, nebulae, & novae d. the H-R diagram	12-14 days	
3. The solar system composition and formation a. Sun b. comets, asteroids, and meteoroids c. planets & natural satellites d. Earth as a planet e. space exploration: man-made objects	12-14 days	ES #2-2 a-h ES #1-1a, 1b.

4. Historical perspectives a. The Greeks, Copernicus, & Galileo b. Tycho Brahe, Kepler's Law , and Newton's Laws	12-14 days	PS #3-1b
5. Forces a. Strong atomic, weak atomic electromagnetic, and gravity b. F=ma c. linear motion 1. distance 2. speed 3. velocity 4. acceleration c. Newton's Law of Universal Gravity	12-14 days	PS #3-1a
6. Spectroscopy a. emission spectroscopy b. absorption spectroscopy	6-7 days	
7. Attributes of matter a. volume b. mass c. density d. buoyance e. specific gravity f. momentum	12-14 days	
8. Earth, the home planet a. the atmosphere & Hydrosphere & biosphere b. meteorology c. plate tectonics d. geology & soil	12-14 days	ES #2-3a-d; ES 32-4 a-d ES #2-2 a-f ES #2-1a, 1b, 1c,1d,1e. ES #1-2 a-f; ES #3-1a,1b ES #3-2a-d
9. Electricity & magnetism a. interrelationship of electricity and magnetism b. circuits and ohm's law c. magnetic lines of force (forces of attraction) d. Earth's magnetic field	12-14 days	PS #2-1d
10. Energy and Waves a. types of energy transfer & Heat b. Potential Energy & Kinetic Energy c. electro-magnetic energy and	12-14 days	PS #2-1a, PS #2-1b PS #2-1d

waves, light		
d. mechanical waves, sound		
e. Non-renewable energy resources		PS #3-3a; PS #4-1a, 1b,
f. future sources and new types of energy		ES #4-2a,2b,2c.
11. Simple machines, types	6-7 days	
a. work		PS #3-2a
b. power		PS #3-2b
c. mechanical advantage		PS #3-2c
12. Chemistry	36-42 days	
a. source of matter states of matter, & makeup of matter & conservation of matter & energy		PS #1-1a.; PS #1-1e
b. historical models		
c. Composition of the atom: protons, neutrons, electrons & the Quantum states		
d. periodic table: atomic number and atomic weight, and the mole		
f. electron configuration and prediction based on the periodic table		PS #1-1c
g. elements & compounds		
h. type of bonds		
I. types of reactions & reaction rates		PS #1-1b, PS #1-1d, PS #2-2a
j. inorganic and organic basics		PS #2-2a,2b,2c.
k. nuclear		
1. fission & fusion		
2. radioactive particles & half-life		
l. solution chemistry		
1. solubility		
2. conductivity and non-conductivity in solution		
13. Ecology (presented within the framework of the entire course)		ES #4-1a, 1b, 1c. ES #4-2a, 2b, 2c,2d,2e

<u>METHODS</u>: A variety of instructional strategies will be utilized to accommodate all learning styles and to reinforce science skills while learning physical science content.

- textbook reading assignments
- written reports
- short term and long term science projects
- oral presentations

- cooperative projects
- hands-on laboratory exercises

- use of the internet as a information source
- homework assignments, long & short term
- creation of models, charts, and graphs depicting scientific concept
- note taking based on lectures and videos

MATERIALS USED IN TEACHING THE COURSE: In addition to the basic text, a variety of instructional tools will be used to meet the needs of all students.

Basic Text: Exploring Earth Science; Coble, 1997, Prentice Hall
Exploring Physical Science; Hurd, 1997, Prentice Hall

Bilingual: La materia y la energia; Heimler, 1992, Glencoe
La ciencia de la tierra y del espacio; Sutherland, 1985, Glencoe
SDAIE: Concepts & Challenges in Physical Science, 2nd Edition; Bernstein, 1986, Globe
Concepts & Challenges in Physical Science, 3rd Edition; Berstein, 1986, Globe

Supplementary Materials:

A variety of apparatus (laboratory equipment), computer based simulations (MAC & DOS), videos, laser discs, CD-ROM, and computer with internet access.

EVALUATION: Student achievement in this course will be measured using multiple assessment tools including but not limited to: (a grading scale and/or rubric should be included)

Student maintained notebook/portfolio sectioned to containing: class notes, homework assignments, laboratory exercises, mind maps, and quizzes and tests. Student present group and individual oral presentations with visuals.

Revised 4/98
Board Approval: