

Physical Science

Course Syllabus



Supervising Teacher

Name: Michelle Rightler

Email: michellerightler@idahoidea.org

Phone: (208) 238-1388 x 106

Course Description:

This course meets the graduation requirement for a laboratory science course. Students will develop problem solving skills and strategies while performing laboratory investigations of fundamental chemical and physical principles. Students will explore the structure and properties of matter, the nature of energy and its role in chemical reactions and the physical and chemical laws that govern earth's interconnected systems and forces of nature.

Required Textbooks:

McGraw-Hill/Glencoe: Physical Science, SE and TE

McGraw-Hill/Glencoe: Physical Science Laboratory Activities Manual, SE

Course Evaluation:

A. Semester Examination: 12% of semester grade

A comprehensive semester examination will be given during exam week each semester. Semester examinations will be given by a supervising instructor at a previously agreed upon location, most often a resource center.

B. Home Participation and Portfolio: 60% of grade

Home participation is to be determined by the home teacher. The participation may include, but is not limited to, textbook activities, quizzes, unit tests, projects, oral reports, or research papers. Grades for home participation will be submitted to the contact teacher who will then forward a copy to the supervising instructor for semester grade tabulation. A portfolio of student work which may include copies of some of the laboratories will be presented to the contact teacher once per semester.

C. Laboratory Expectations: 28% of grade

Students are expected to complete four (4) labs per semester as indicated in the moodle course page. All laboratories must be completed only by the student and a full experiment write-up/report must be submitted to the supervising instructor on anchor due dates. All write-ups must contain at least one picture of the student performing the experiment, unless it is performed under supervision of an IDEA instructor at a local resource center. In the case of performing a supervised experiment, the supervising instructor's signature can substitute for the photographic documentation of student participation.

End of Course Assessment:

Since this course is required for high school graduation in the state of Idaho, an assessment piece is required.

A comprehensive examination will be given each semester in addition to required laboratories and the student portfolio.

Pacing Guide

The topics and standards for this course have been divided between the two semesters.

Semester 1(Fall)	Semester 2 (Spring)
Understanding Scientific Investigation	Understanding Energy
Understanding Matter	Understanding Heat
Understanding Properties of Atoms	Understanding Sound
Understanding the Periodic Table	Understanding Light
Understanding Changes in Matter	Understanding Electricity
Understanding Force and Motion	Understanding Magnetism

In order to fulfill this pacing requirement, the recommended texts have been broken down by chapter. Covering the chapters in the order listed will insure that all topics on the final exam will be covered during the appropriate semester.

McGraw-Hill/Glencoe: Physical Science

Semester 1(Fall)	Semester 2 (Spring)
Chapter 1	Chapters 4-5
Chapter 15	Chapter 6
Chapters 15-16	Chapters 10-11
Chapters 17-19	Chapters 12-14
Chapters 20-24	Chapter 7
Chapters 2-3	Chapters 8-9

Additional Information from the Instructor:

Upon successful completion of biology, the student will be able to:

- *define matter and energy*
- *demonstrate the measurement of mass and volume using a balance and a graduated cylinder*
- *list the parts of an atom*
- *define element and compound and explain that compounds are made up of elements*
- *explain that new substances can be made when two or more substances are combined*
- *compare the properties of new substances to original substances*
- *describe the states of matter*
- *state the law of conservation of mass*
- *classify substances according to their physical and chemical properties*
- *identify everyday examples of chemical changes*
- *explain the relationships between force and motion*
- *demonstrate how unbalanced forces cause changes in an object's velocity*
- *explain the scientific concepts of work and energy*
- *state the law of conservation of energy*
- *identify simple and complex machines*
- *explain Newton's three laws of motion*
- *list examples of potential and kinetic energy*
- *describe the movement of heat by convection, conduction and radiation*
- *explain how waves are generated and how they can travel through different mediums*
- *describe the characteristics and parts of waves*
- *describe wave interactions including interference, reflection, refraction, and diffraction*
- *explain the Doppler effect*
- *explain the concept of light years to describe distances in the universe*

- *identify opaque, transparent, and translucent substances*
- *define electric force*
- *describe the use of electromagnetic waves in different types of technology such as microwaves and radar*
- *compare series and parallel circuits*
- *define magnetic force*
- *explain how a compass works*
- *explain the relationship between an electric current and the strength of its magnetic field in an electromagnet*

I-DEA Student Honor Code:

With any form of valid proof of dishonesty with regard to student work or testing, the instructor may elect from a range of actions. Academic dishonesty could lead to a zero grade for the assignment or even failure for the entire course following consultation between the instructor, Secondary Supervisor, and Director.

All students must adhere to the **Honor Code**:

“On my honor, I will maintain the highest possible standards of honesty, integrity and personal responsibility. This means I will not lie, cheat or steal, and as a member of this academic community, I am committed to creating an environment of respect and mutual trust.”

IDAHO CONTENT STANDARDS: PHYSICAL SCIENCE

Standard 1: Nature of Science

Goals:	Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	Objective 7
Goal 1.1: Understand Systems, Order, and Organization	8-9.PS.1.1.1 Explain the scientific meaning of system, order, and organization. (648.01a)	8-9.PS.1.1.2 Apply the concepts of order and organization to a given system. (648.01a)					
Goal 1.2: Understand Concepts and Processes of Evidence, Models, and Explanations	8-9.PS.1.2.1 Use observations and data as evidence on which to base scientific explanations. (648.02a)	8-9.PS.1.2.2 Develop models to explain concepts or systems. (648.02b)	8-9.PS.1.2.3 Develop scientific explanations based on knowledge, logic, and analysis. (648.02c)				
Goal 1.3: Understand Constancy, Change, and Measurement	8-9.PS.1.3.1 Measure changes that can occur in and among systems. (648.03b)	8-9.PS.1.3.2 Analyze changes that can occur in and among systems. (648.03b)	8-9.PS.1.3.3 Measure and calculate using the metric system. (648.03c)				
Goal 1.6: Understand Scientific Inquiry and Develop Critical Thinking Skills	8-9.PS.1.6.1 Identify questions and concepts that guide scientific investigations. (649.01a)	8-9.PS.1.6.2 Utilize the components of scientific problem solving to design, conduct, and communicate results of investigations. (649.01b)	8-9.PS.1.6.3 Use appropriate technology and mathematics to make investigations. (649.01c)	8-9.PS.1.6.4 Formulate scientific explanations and models using logic and evidence. (649.01d)	8-9.PS.1.6.5 Analyze alternative explanations and models. (649.01e)	8-9.PS.1.6.6 Communicate and defend a scientific argument. (649.01f)	8-9.PS.1.6.7 Explain the differences among observations, hypotheses, and theories. (649.01g)
Goal 1.8: Understand Technical Communication	8-9.PS.1.8.1 Analyze technical writing, graphs, charts, and diagrams. (658.02a)						

Standard 2: Physical Science

Goals:	Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	Objective 7
Goal 2.2: Understand Concepts of Motion and Forces	8-9.PS.2.2.1 Explain motion using Newton's Laws of Motion. (650.04b)						
Goal 2.3: Understand the Total Energy in the Universe is Constant	8-9.PS.2.3.1 Explain that energy can be transformed but cannot be created nor destroyed. (650.05a)	8-9.PS.2.3.2 Classify energy as potential and/or kinetic and as energy contained in a field. (650.05b)					
Goal 2.4: Understand the Structure of Atoms	8-9.PS.2.4.1 Describe the properties, function, and location of protons, neutrons, and electrons. (650.01a)	8-9.PS.2.4.2 Explain the processes of fission and fusion. (650.01b)	8-9.PS.2.4.3 Describe the characteristics of isotopes. (650.01c)	8-9.PS.2.4.4 State the basic electrical properties of matter. (650.01d)	8-9.PS.2.4.5 Describe the relationships between magnetism and electricity.		
Goal 2.5: Understand Chemical Reactions	8-9.PS.2.5.1 Explain how chemical reactions may release or consume energy while the quantity of matter remains constant. (650.03a)						

Standard 5: Personal and Social Perspectives; Technology

Goals:	Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6	Objective 7
Goal 5.2: Understand the Relationship between Science and Technology	8-9.PS.5.2.1 Explain how science advances technology. (655.01a)	8-9.PS.5.2.2 Explain how technology advances science. (655.01a)	8-9.PS.5.2.3 Explain how science and technology are pursued for different purposes. (656.01b)				