

PHYSICS II LEARNING OBJECTIVES

I. Students, through the inquiry process, demonstrate the ability to design, conduct, evaluate, and communicate results and reasonable conclusions of scientific investigations.

1. The learner will use or make systematic observations, accurate measurements, and control variables to formulate and conduct investigations, and to draw conclusions based on specific scientific data.
2. The learner will communicate scientific data and results, with an emphasis placed on data analysis, graphing, and metric measurement.
3. The learner will select and use appropriate tools including technology to make measurements, gather, process, and analyze data from scientific investigations.

II. Students, through the inquiry process, demonstrate knowledge of properties, forms, changes and interactions of physical and chemical systems.

4. The learner will analyze the dual nature of light, including the photoelectric and Compton effects.
5. The learner will explain quantum energy absorption and emission spectra.
6. The learner will apply the principles of nuclear physics to fission and fusion and the net energy of both.
7. The learner will discuss the creation of plasma and ionic propulsion.
8. The learner will explore the relationship between magnetism and electricity and relate these to the operation of motors, generators, transformers, and electromagnets.
9. The learner will solve problems with magnetic fields, magnetic forces, and induction.
10. The learner will investigate the laws of thermodynamics.
11. The learner will solve problems in heat energy, transfer, entropy, and enthalpy.
12. The learner will analyze the Standard Model of Particle Physics.
13. The learner will discuss the behavior and characteristics of matter as manifestations of its atomic structure.
14. The learner will explore how fundamental interactions are responsible for the appearance and behavior of all objects in the universe.
15. The learner will discuss the conversion of mass into energy as the fundamental energy source of the universe.

III. Students, through the inquiry process, demonstrate knowledge of characteristics, structures, and function of living things, the process of diversity of life, and how living organisms interact with each other and their environment. *None purposefully written for this standard for Physics II*

IV. Students, through the inquiry process, demonstrate knowledge of the composition, structures, processes and interaction of Earth's systems and other objects in space.

16. The learner will explore the current theories of physics, including unification theories, black holes, worm holes, and dimensions.

V. Students, through the inquiry process, understand how scientific knowledge and technological developments impact communities, cultures, and societies.

17. The learner will investigate a modern problem relating to an area of physics and how that problem is being addressed.

VI. Students understand historical developments in science and technology.

18. The learner will discuss historical developments leading to current theories in physics.
19. The learner will examine the role significant political and cultural events have affected the advancement of scientific thought and technology.