

Illinois Physics Standards Correlation

Illinois Learning Standards for Science
 Goal 12 - Concepts and Principles

	Physics for Scientists and Engineers	Principles of Physics	Conceptual Physics
C. Know and apply concepts that describe properties of matter and energy and the interactions between them.			
Early High School			
12.C.4a Use kinetic theory, wave theory, quantum theory and the laws of thermo-dynamics to explain energy transformations.	16.1, 16.19 - 16.21, Chapters 19, 20, 21, 22, 42	16.1, Chapters 19, 20, 21, 22, 41	15.1, Chapters 18, 19, 20, 21, 36
12.C.4b Analyze and explain the atomic and nuclear structure of matter.	42.9 - 42.16, 44.1 - 44.12	41.9 - 41.15, 43.1 - 43.12	36.8 - 36.13, 38.1 - 38.12
Late High School			
12.C.5a Analyze reactions (e.g., nuclear reactions, burning of fuel, decomposition of waste) in natural and man-made energy systems.	44.13 - 44.21	43.13 - 43.21	38.13 - 38.18
12.C.5b Analyze the properties of materials (e.g., mass, boiling point, melting point, hardness) in relation to their physical and/or chemical structures.	5.18, 12.11, 14.2, 14.25, 14.26, 21.15, 27.12, 34.1 - 34.5, 36.5, 37.2	5.18, 12.10, 14.2, 14.24, 14.25, 21.14, 30.6, 35.5, 36.2	5.16, 11.5, 13.2, 13.17, 28.6, 31.5, 32.2
D. Know and apply concepts that describe force and motion and the principles that explain them.			
Early High School			
12.D.4a Explain and predict motions in inertial and accelerated frames of reference.	Chapters 2 & 4, 5.2, 9.10	Chapters 2 & 4, 5.2, 9.9	Chapters 2 & 4, 5.2
12.D.4b Describe the effects of electromagnetic and nuclear forces including atomic and molecular bonding, capacitance and nuclear reactions.	Chapters 23 through 35, 44	Chapters 23 through 34, 43	Chapters 22 through 30, 38
Late High School			
12.D.5a Analyze factors that influence the relative motion of an object (e.g., friction, wind shear, cross currents, potential differences).	2.30, 2.31, 4.21 (spreadsheet), 5.18 - 5.20, 5.30, more	2.27, 4.20 (spreadsheet), 5.18 - 5.20, 5.30, more	5.16 - 5.18, 5.24, more
12.D.5b Analyze the effects of gravitational, electromagnetic and nuclear forces on a physical system.	Chapters 5, 6, 13, 32, 44, more	Chapters 5, 6, 13, 32, 43, more	Chapters 5, 12, 29, 38, more