

## Florida Standards Correlation

*Sunshine State Standards  
Science, Grades 9-12*

This correlation does not include the standards which are not part of a traditional physics curriculum (e.g. chemistry topics), unless they are covered in the textbook.

	<b>Physics for Scientists and Engineers</b>	<b>Principles of Physics</b>	<b>Conceptual Physics</b>
<b>The Nature of Matter</b>			
Standard 1: The student understands that all matter has observable, measurable properties. (SC.A.1.4)			
3. knows that a change from one phase of matter to another involves a gain or loss of energy.	19.21	19.18	18.14
Standard 2: The student understands the basic principles of atomic theory. (SC.A.2.4)			
3. knows that a number of elements have heavier, unstable nuclei that decay, spontaneously giving off smaller particles and waves that result in a small loss of mass and release a large amount of energy.	Chapter 44	Chapter 43	Chapter 38
4. knows that nuclear energy is released when small, light atoms are fused into heavier ones.	44.14	43.14	38.14
6. understands that matter may act as a wave, a particle, or something else entirely different with its own characteristic behavior.	Chapter 43	Chapter 42	Chapter 37
<b>Energy</b>			
Standard 1: The student recognizes that energy may be changed in form with varying efficiency. (SC.B.1.4)			
2. understands that there is conservation of mass and energy when matter is transformed.	41.23, Chapter 44	40.16, Chapter 43	35.12, Chapter 38
3. knows that temperature is a measure of the average translational kinetic energy of motion of the molecules in an object.	20.10	20.10	19.9
4. knows that as electrical charges oscillate, they create time-varying electric and magnetic fields that propagate away from the source as an electromagnetic wave.	Chapter 35	Chapter 34	Chapter 30
5. knows that each source of energy presents advantages and disadvantages to its use in society (e.g., political and economic implications may determine a society's selection of renewable or nonrenewable energy sources).	27.14, 44.13	27.9, 43.13	25.8, 38.13
6. knows that the first law of thermodynamics relates the transfer of energy to the work done and the heat transferred.	21.1	21.1	20.1

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	<b>Physics for Scientists and Engineers</b>	<b>Principles of Physics</b>	<b>Conceptual Physics</b>
7. knows that the total amount of usable energy always decreases, even though the total amount of energy is conserved in any transfer.	Chapter 22	Chapter 22	Chapter 21
Standard 2: The student understands the interaction of matter and energy. (SC.B.2.4)			
1. knows that the structure of the universe is the result of interactions involving fundamental particles (matter) and basic forces (energy) and that evidence suggests that the universe contains all of the matter and energy that ever existed.	44.22	43.22	38.19
<b>Force and Motion</b>			
Standard 1: The student understands that types of motion may be described, measured, and predicted. (SC.C.1.4)			
1. knows that all motion is relative to whatever frame of reference is chosen and that there is no absolute frame of reference from which to observe all motion.	4.22 - 4.25, Chapter 41	4.21 - 4.23, Chapter 40	4.14 - 4.15, Chapter 35
2. knows that any change in velocity is an acceleration.	2.10	2.10	2.8
Standard 2: The student understands that the types of force that act on an object and the effect of that force can be described, measured, and predicted. (SC.C.2.4)			
1. knows that acceleration due to gravitational force is proportional to mass and inversely proportional to the square of the distance between the objects.	13.1 - 13.2	13.1 - 13.2	12.1 - 12.2
2. knows that electrical forces exist between any two charged objects.	23.7	23.7	22.6
3. describes how magnetic force and electrical force are two aspects of a single force.	Chapters 31, 32, 34 & 35	Chapters 31, 32 & 34	28.20 - 28.22, Chapter 29
4. knows that the forces that hold the nucleus of an atom together are much stronger than electromagnetic force and that this is the reason for the great amount of energy released from the nuclear reactions in the sun and other stars.	44.5, 44.9, 44.14	43.5, 43.9, 43.14	38.5, 38.9, 38.14
5. knows that most observable forces can be traced to electric forces acting between atoms or molecules.			
6. explains that all forces come in pairs commonly called action and reaction.	5.10	5.10	5.10

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	Physics for Scientists and Engineers	Principles of Physics	Conceptual Physics
<b>Earth and Space</b>			
Standard 1: The student understands the interaction and organization in the Solar System and the universe and how this affects life on Earth. (SC.E.1.4)			
1. understands the relationships between events on Earth and the movements of the Earth, its moon, the other planets, and the sun.	Chapter 13, 35.11 - 35.12	Chapter 13, 34.8 - 34.9	Chapter 12, 30.6