Kendall/Hunt Chemistry: Chemistry You Need to Know

Correlations to Florida State Science Standards

(with page numbers of correlating information)

The Nature of Matter

Standards 1: The student understands that all matter has observable, measurable properties (SC.A.1.4)	
1. Knows that the electron configuration in atoms determines how a substance reacts and how much energy is involved in its reactions.	30-31, 35-36, 104-108, 115-116, 127-149, 212-220, 278-294, 312-314
2. Knows that the vast diversity of the properties of materials is primarily due to variations in the forces that hold molecules together.	127-130, 147-151, 187-192, 254-267, 298-319,
3. Knows that a change from one phase of matter to another involves a gain or loss of energy.	65, 129, 147, 207-211, 298-314
4. Experiments and determines that the rates of reaction among atoms and molecules depend on the concentration, pressure, and temperature of the reactants and the presence of catalysts.	54-59, 241-244, 316-319
5. Knows that connections (bonds) form between substance when outer-shell electrons are either transferred or shared between their atoms, changing the properties of substances.	30-31, 35-39, 127-149, 254-260, 278-294, 297-316
Standard 2: The student understands the basic principles of atomic theory. (SC.A.2.4)	
1. Knows that the number and configuration of electrons will equal the number of protons in an electrically neutral atom and when an atom gains or loses electrons, the charge is unbalanced.	30-34, 36-38, 40-43, 45, 99-101, 104-108, 116, 127-128, 132-134, 138-139, 160-164, 171-175, 254-260, 278-293
2. Knows the difference between an element, a molecule and a compound.	27-39
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.	323-330
4. Knows that nuclear energy is released when small, light atoms are fused into heavier ones.	323-330
5. Knows that elements are arranged into groups and families based on similarities in electron structure and that their physical and chemical properties can be predicted.	109-116, 131
6. Understands that matter may act as a wave, a particle, or something else entirely different with its own characteristic behavior.	

Energy

Standard 1: The student recognizes that energy may be changed in form with varying efficiency (SC.B.1.4)	
1. Understands how knowledge of energy is fundamental to all the scientific disciplines (eg. The energy required for biological processes in living organisms and the energy required for the building, erosion, and rebuilding of the Earth).	56-57, 246-247

2. Understands that there is conservation of mass and energy when matter is transformed.	50-53, 118-122, 175-187, 198-220
3. Knows that temperature is a measure of the average translational kinetic energy of the molecules in an object	10, 56-57, 64-65, 74-77, 81-88, 189-192, 199-222, 233,
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.	
5. Knows that each source of energy presents advantages and disadvantages to its use in society (eg. Political and economic implications may determine a society's selection of renewable or nonrenewable energy sources.)	245-249, 327-330
6. Knows that the total amount of usable energy always decreases, even through the total amount of energy is conserved in any transfer.	
Standard 2: The student understands the interaction of matter and energy	
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.	1-16 and throughout text

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The Nature of Science

Standard 1: The student uses the scientific processes and habits of mind to solve problems.	
1. Knows that investigations are conducted to explore new phenomena, to check on previous results, to test how well a theory predicts, and to compare different theories.	1-16, all labs in the text
2. Knows that from time to time, major shifts occur in the scientific view of how the world works, but that more often the changes that take place in the body of scientific knowledge are small modifications of prior knowledge.	1-16, 96-98
3. Understands that no matter how well one theory fits observations, a new theory might fit them as well or better, or might fit a wider range of observations, because in science, the testing, revising and occasional discarding or theories, new and old, never ends and leads to an increasingly better understanding of how things work in the world, but not to absolute truth.	1-16, labs throughout the text as they discuss individual group results & class results
4. Knows that scientists in any one research group tend to see things alike and that therefore scientific teams are expected to seek out the possible sources of bias in the design of their investigations and in their data analysis.	1-16, labs throughout the text as they discuss individual group results & class results
5. Understands that new ideas in science are limited by the context in which they are conceived, are often rejected by the scientific establishment, sometimes spring from unexpected findings and usually grow slowly from many contributors.	1-16, labs throughout
6. Understands that, in the short run, new ideas that do not mesh well with mainstream ideas in science often encounter vigorous criticism and that, in the long run, theories are judged by how they fit with other theories, the range of observations they explain, how well they explain observations, and how effective they are in predicting new findings.	1-16, labs throughout
7. Understands the importance of a sense of responsibility, a commitment to peer review, truthful reporting of the methods and outcomes of investigations, and making the public aware of the findings.	1-16, labs throughout

Standard 2: The student understands that most natural events occur in comprehensible, consistent patterns. (SC.H.2.4)	
1. Knows that scientists assume that the universe is a vast system in which basic rules exist that may range from very simple to extremely complex, but that scientists operate on the belief that the rules can be discovered by careful, systemic study.	1-16, labs throughout
2. Knows that scientists control conditions in order to obtain evidence, but when that is not possible for practical or ethical reasons, they try to observe a wide range of natural occurrences to discern patterns.	1-16, labs throughout
Standard 3: The student understands that science, technology, and society are interwoven and interdependent. (SC.H.3.4)	
1. Knows that performance testing is often conducted using small-scale models, computer simulations, or analogous systems to reduce the chance of system failure.	Labs involving probeware, spot-plate experiments, etc.
2. Knows that technological problems often create a demand for new scientific knowledge and that new technologies make it possible for scientists to extend their research in a way that advances science.	Themes throughout deal with technology and science interface (for example, how to make a better airbag, etc.)
3. Knows that scientists can bring information, insights, and analytical skills to matters of public concern and help people understand the possible causes and effects of events.	Themes throughout deal with technology and science interface (for example, how to make a better airbag, etc.)
4. Knows that funds for science research come from federal government agencies, industry, and private foundations and that this funding often influences the areas of discovery.	
5. Knows that the value of a technology may differ for different people and at different times.	Themes throughout deal with technology and science interface (for example, how to make a better airbag, etc.)