Integrated Science Correlation to the Draft Academic Content Standards for Ohio

Correlation key:

"X" = Coverage
Secondary concept of the activity or problem. Students gain a basic understanding or introduction of the concept.
"XX" = In-depth Coverage
Primary concept that is the focus of the activity or problem. Students gain thorough understanding of the concept. Coverage in student edition and/or Teacher Edition supports the development of the concept
"E" = Covers entire chapter

	ACTIVE PHYSICS																		EARTHCOMM															ACTIVE CHEMISTRY		
	Communication			Home			Medicine			Predictions			Sports			Transportation			Earth's Dynamic Geosphere			Understanding Your Environment			Earth's Fluid Spheres			Earth's Natural Resources			Earth System Evolution			Movie Special Effects	Periodic Table	Cool Chemistry
	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	G1	G2	G3	U1	U2	U3	F1	F2	F3	N1	N2	N3	E1	E2	E3	Chapter 1	Chapter 2	Chapter 3
Physical Sciences Students demonstrate an understanding of the composition of physical systems and the concepts and principles that describe and predict physical interations and events in the natural world. This includes demonstrating an understanding of the structure and properties of matter, the properties of materials and objects, chemical reactions and the conservation of matter. In addition, it includes understanding the nature, transfer and conservation of energy, as well as motion and the forces affecting motion, the nature of waves and interactions of matter and energy. Students also demonstate an understanding of the historical perspectives, scientific approaches and emerging scientific issues associated with the physical sciences.																																			
***Benchmarks*: By the end of the 9-10 program:**																																			
A. Describe that matter is made of minute particles called atoms and atoms are comprised of even smaller components. Explain the structure and properties of atoms.										X																								X	
B. Explain how atoms react with each other to form other substances and how molecules react with each other or other atoms to form even different substances.																																		XX	XX
C.Describe the identifiable physical properties of substances (e.g., color, hardness, conductivity, density, concentration, ductility). Explain how changes in these properties can occur without changing the chemical nature of the substance.																																		X	X	X
D.Explain the movement of objects by applying Newton's three laws of motion.											XX			XX	X		XX	X																		
E. Demonstrate that energy can be considered to be either kinetic (motion) or potential (stored).					XX	X						X	XX	XX	XX																			X	X	X
F.Explain how energy may change form or be redistributed but the total quantity of energy is conserved.		X		X	X	X						X	XX	XX	XX																			X		X
G. Demonstrate that waves (e.g., sound, seismic, water, light) have energy and waves can transfer energy when they interact with matter.	XX	X	X	XX	X	X	X					X						X																X	X	
H. Trace the historical development of scientific theories and ideas, and describe emerging issues in the study of physical sciences.		X					X	X	X		X	XX		XX			XX	X																X	XX	X
Science Grade- Level Indicators: **Grade 9** **Nature of Matter**																																				
1.Recognize that all atoms of the same element contain the same number of protons, and elements with the same number of protons may or may not have the same mass. Those with different masses (different numbers of neutrons) are called isotopes.																																		X	X	X
2. Illustrate that atoms with the same number of positively charged protons and negatively charged electrons are electrically neutral.																																		X	X	X
3. Describe radioactive substances as unstable nuclei that undergo random spontaneous nuclear decay emitting particles and/or high energy wavelike radiation.										X																									X	

Correlation key:	ACTIVE PHYSICS																		EARTHCOMM															ACTIVE CHEMISTRY		
"X" = Coverage Secondary concept of the activity or problem. Students gain a basic understanding or introduction of the concept. **"XX" = In-depth Coverage** Primary concept that is the focus of the activity or problem. Students gain thorough understanding of the concept. Coverage in student edition and/or Teacher Edition supports the development of the concept **"E" = Covers entire chapter**	Communication			Home			Medicine			Predictions			Sports			Transportation			Earth's Dynamic Geosphere			Understanding Your Environment			Earth's Fluid Spheres			Earth's Natural Resources			Earth System Evolution			Movie Special Effects	Periodic Table	Cool Chemistry
	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	G1	G2	G3	U1	U2	U3	F1	F2	F3	N1	N2	N3	E1	E2	E3	Chapter 1	Chapter 2	Chapter 3
4. Show that when elements are listed in order according to the number of protons (called the atomic number), the repeating patterns of physical and chemical properties identify families of elements. Recognize that the periodic table was formed as a result of the repeating pattern of electron configurations.																																		XX	XX	XX
5. Describe how ions are formed when an atom or a group of atoms acquire an unbalanced charge by gaining or losing one or more electrons.																																			XX	XX
6. Explain that the electric force between the nucleus and the electrons hold an atom together. Relate that on a larger scale, electric forces hold solid and liquid materials together (e.g., salt crystals, water).																																			X	
7. Show how atoms may be bonded together by losing, gaining or sharing electrons and that in a chemical reaction, the number, type of atoms and total mass must be the same before and after the reaction (e.g., writing correct chemical formulas and writing balanced chemical equations).																																			XX	XX
8. Demonstrate the pH scale (0-14) is used to measure acidity and classify solutions as acidic, basic, or neutral.																																				X
9. Investigate the properties of pure substances and mixtures (e.g., density, conductivity, hardness, properties of alloys, superconductors and semiconductors).																																		XX	X	XX
10. Compare the conductivity of different materials and explain the role of electrons in the ability to conduct electricity.																																		XX	XX	
Nature of Energy																																				
11. Explain how thermal energy exists in the random motion and vibrations of atoms and molecules (kinetic energy). Recognize that the higher the temperature, the greater the average atomic or molecular motion (potential energy), and during changes of state the temperature remains constant.																												X						X		XX
12. Explain how an object's kinetic energy depends on its mass and its speed ($KE = \frac{1}{2}mv^2$).													XX	XX	XX																					
13. Demonstrate that near Earth's surface an object's gravitational potential energy depends upon its weight (*mg* where *m* is the object's mass and *g* is the acceleration due to gravity) and height (*h*) above a reference surface ($PE = mgh$).													X	XX	XX			XX																		

Correlation key:	ACTIVE PHYSICS																		EARTHCOMM																	ACTIVE CHEMISTRY		
"X" = Coverage Secondary concept of the activity or problem. Students gain a basic understanding or introduction of the concept. **"XX" = In-depth Coverage** Primary concept that is the focus of the activity or problem. Students gain thorough understanding of the concept. Coverage in student edition and/or Teacher Edition supports the development of the concept **"E" = Covers entire chapter**	Communication			Home			Medicine			Predictions			Sports			Transportation			Earth's Dynamic Geosphere			Understanding Your Environment			Earth's Fluid Spheres			Earth's Natural Resources			Earth System Evolution			Movie Special Effects	Periodic Table	Cool Chemistry
	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	G1	G2	G3	U1	U2	U3	F1	F2	F3	N1	N2	N3	E1	E2	E3	Chapter 1	Chapter 2	Chapter 3
14. Summarize how nuclear reactions convert a small amount of matter into a large amount of energy. (Fission involves the splitting of a large nucleus into smaller nuclei; fusion is the joining of two small nuclei into a larger nucleus at extremely high energies.)										X																									X	
15. Trace the transformations of energy within a system (e.g., chemical to electrical to mechanical) and recognize that energy is conserved. Show that these transformations involve the release of some thermal energy.	X	XX		XX	XX	XX	X		X			XX	XX	XX	XX																				
																																		X	X	X
16. Illustrate that chemical reactions are either endothermic or exothermic (e.g., cold packs, hot packs and the burning of fossil fuels).																																			X	XX
17. Demonstrate that thermal energy can be transferred by conduction, convection or radiation (e.g., through materials by the collision of particles, moving air masses or across empty space by forms of electromagnetic radiation).	X	X		XX	X																							X						X		X
18. Demonstrate that electromagnetic radiation is a form of energy. Recognize that light acts as a wave. Show that visible light is a part of the electromagnetic spectrum (e.g., radio waves, microwaves, infrared, visible light, ultraviolet, X-rays, and gamma rays).			XX	X		X																									X	X		X		
19. Show how the properties of a wave depend on the properties of the medium through which it travels. Recognize that electromagnetic waves can be propagated without a medium.	XX	X	X	X	X	X	X	X	X			X						X																X	X	
20. Describe how waves can superimpose on one another when propagated in the same medium. Analyze conditions in which waves can bend around corners, reflect off surfaces, are absorbed by materials they enter, and change direction and speed when entering a different material.	XX	X	XX						XX			XX						X																	
Forces and Motion																																				
21. Demonstrate that motion is a measurable quantity that depends on the observer's frame of reference and describe the object's motion in terms of position, velocity, acceleration and time.											XX	XX	XX	XX		XX	X	X																		
22. Demonstrate that any object does not accelerate (remains at rest or maintains a constant speed and direction of motion) unless an unbalanced (net) force acts on it.											XX		X	XX	X	X	XX	X																		
23. Explain the change in motion (acceleration) of an object. Demonstrate that the acceleration is proportional to the net force acting on the object and inversely proportional to the mass of the object. (F_{net} = ma. Note that weight is the gravitational force on a mass.)											XX		X	XX	X	X	XX	X																		

Correlation key:	ACTIVE PHYSICS																		EARTHCOMM															ACTIVE CHEMISTRY		
"X" = Coverage Secondary concept of the activity or problem. Students gain a basic understanding or introduction of the concept. **"XX" = In-depth Coverage** Primary concept that is the focus of the activity or problem. Students gain thorough understanding of the concept. Coverage in student edition and/or Teacher Edition supports the development of the concept **"E" = Covers entire chapter**	**Communication**			**Home**			**Medicine**			**Predictions**			**Sports**			**Transportation**			**Earth's Dynamic Geosphere**			**Understanding Your Environment**			**Earth's Fluid Spheres**			**Earth's Natural Resources**			**Earth System Evolution**			**Movie Special Effects**	**Periodic Table**	**Cool Chemistry**
	Chapter 1	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**G1**	**G2**	**G3**	**U1**	**U2**	**U3**	**F1**	**F2**	**F3**	**N1**	**N2**	**N3**	**E1**	**E2**	**E3**	**Chapter 1**	**Chapter 2**	**Chapter 3**
24. Demonstrate that whenever one object exerts a force on another, an equal amount of force is exerted back on the first object.											XX		X	XX	X	X	X	X																	
25. Demonstrate the ways in which frictional forces constrain the motion of objects (e.g., a car traveling around a curve, a block on an inclined plane, a person running, an airplane in flight).											X		X	XX	XX	X	X	X																	
Historical Perspectives and Scientific Revolutions																																			
26. Use historical examples to explain how new ideas are limited by the context in which they are conceived; are often intially rejected by the scientific establishment; sometimes spring from unexpected findings; and usually grow slowly, through contributions from many different investigators (e.g., atomic theory, quantum theory, Newtonian mechanics).											X	XX		X			X																	X	
27. Describe advances and issues in physical science that have important, long-lasting effects on science and society (e.g., atomic theory, quantum theory, Newtonian mechanics, nuclear energy, nanotechnology, plastics and ceramics and communication technology).	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**		**E**		**E**	**E**	**E**																**X**	**X**	**X**
Science Grade- Level Indicators: **Grade 10** (No 10th Grade Physical Science indicators.) **Benchmarks: By the end of the 11-12 program:**																																			
A. Explain how variations in the arrangement and motion of atoms and molecules form the basis of a variety of biological, chemical and physical phenomena.																																			
B. Recognize that some atomic nuclei are unstable and will spontaneously break down.										XX																									
C. Describe how atoms and molecules can gain or lose energy only in discrete amounts.																																			
D. Apply principles of forces and motion to mathematically analyze, describe and predict the net effects on objects or systems.																																			
E. Trace the historical development of scientific theories and ideas within the study of physical sciences.		**X**							**X**		**X**	**X**					**XX**																		
Science Grade- Level Indicators: **Grade 11** **Nature of Matter**																																			
1. Explain that elements with the same number of protons may or may not have the same mass and those with different masses (different numbers of neutrons) are called isotopes. Some of these are radioactive.																																			
2. Explain that humans have used unique bonding of carbon atoms to make a variety of molecules (e.g., plastics).																																			
Forces and Motion																																			

Correlation key:	ACTIVE PHYSICS																		EARTHCOMM															ACTIVE CHEMISTRY		
"X" = Coverage Secondary concept of the activity or problem. Students gain a basic understanding or introduction of the concept. **"XX" = In-depth Coverage** Primary concept that is the focus of the activity or problem. Students gain thorough understanding of the concept. Coverage in student edition and/or Teacher Edition supports the development of the concept **"E" = Covers entire chapter**	**Communication**			**Home**			**Medicine**			**Predictions**			**Sports**			**Transportation**			**Earth's Dynamic Geosphere**			**Understanding Your Environment**			**Earth's Fluid Spheres**			**Earth's Natural Resources**			**Earth System Evolution**			**Movie Special Effects**	**Periodic Table**	**Cool Chemistry**
	Chapter 1	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**G1**	**G2**	**G3**	**U1**	**U2**	**U3**	**F1**	**F2**	**F3**	**N1**	**N2**	**N3**	**E1**	**E2**	**E3**	**Chapter 1**	**Chapter 2**	**Chapter 3**
3.Describe real world examples showing that all energy transformations tend toward disorganized states (e.g., fossil fuel combustion, food pyramids, electrical use).																																			
4. Explain how electric motors and generators work (e.g., relate that electricity and magnetism are two aspects of a single electromagnetic force). Investigate that electric charges in motion produce magnetic fields and a changing magnetic field creates an electric field.						**E**																													
Science Grade- Level Indicators: **Grade 12** **Nature of Matter**																																			
1. Explain how atoms join with one another in various combinations in distinct molecules or in repeating crystal patterns.																																			
2. Describe how a physical, chemical or ecological system in equilibrium may return to the same state of equilibrium if the disturbances it experiences are small. Large disturbances may cause it to escape that equilibrium and eventually settle into some other state of equilibrium.																																			
3. Explain how all matter tends toward more disorganized states and describe real world examples (e.g., erosion of rocks, expansion of the universe).																																			
4. Recognize that at low temperatures some materials become superconducting and offer little or no resistance to the flow of electrons.																																			
Forces & Motion																																			
5.Use and apply the laws of motion to analyze, describe and predict the effects of forces on the motions of objects mathematically.																																			
6. Recognize that the nuclear forces that hold the nucleus of an atom together, at nuclear distances, are stronger than the electric forces that would make it fly apart.																																			
7. Recognize that nuclear forces are much stronger than electromagnetic forces, and electromagnetic forces are vastly stronger than gravitational forces. The strength of the nuclear forces explains why greater amounts of energy are released from nuclear reactions (e.g., from atomic and hydrogen bombs and in the sun and other stars).																																			
8. Describe how the observed wavelength of a wave depends upon the relative motion of the source and the observer (Doppler effect). If either is moving towards the other, the observed wavelength is shorter; if either is moving away, the observed wavelength is longer (e.g., weather radar, bat echoes, police radar)			**XX**						**XX**																											

Correlation key:	ACTIVE PHYSICS																		EARTHCOMM																		ACTIVE CHEMISTRY		
"X" = Coverage Secondary concept of the activity or problem. Students gain a basic understanding or introduction of the concept. **"XX" = In-depth Coverage** Primary concept that is the focus of the activity or problem. Students gain thorough understanding of the concept. Coverage in student edition and/or Teacher Edition supports the development of the concept **"E" = Covers entire chapter**	**Communication**			**Home**			**Medicine**			**Predictions**			**Sports**			**Transportation**			**Earth's Dynamic Geosphere**			**Understanding Your Environment**			**Earth's Fluid Spheres**			**Earth's Natural Resources**			**Earth System Evolution**			**Movie Special Effects**	**Periodic Table**	**Cool Chemistry**
	Chapter 1	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**G1**	**G2**	**G3**	**U1**	**U2**	**U3**	**F1**	**F2**	**F3**	**N1**	**N2**	**N3**	**E1**	**E2**	**E3**	**Chapter 1**	**Chapter 2**	**Chapter 3**
9. Describe how gravitational forces act between all masses and always create a force of attraction. Recognize that the strength of the force is proportional to the masses and weakens rapidly with increasing distance between them.												XX																									
Nature of Energy																																					
10. Explain the characteristics of isotopes. The nucleus of radioactive isotopes is unstable and spontaneously decays emitting particles and/or wavelike radiation. It cannot be predicted exactly when, if ever, an unstable nucleus will decay, but a large group of identical nuclei decay at a predictable rate.																																					
11. Use the predictability of decay rates and the concept of half-life to explain how radioactive substances can be used in estimating the age of materials.										XX																											
12.Describe how different energy levels are associated with the electron configurations of atoms and electron configurations (and/or conformations) of molecules.																																					
13. Explain how atoms and molecules can gain or lose energy in particular discrete amounts (quanta or packets); therefore they can only absorb or emit light at the wavelengths corresponding to these amounts.																																					
Historical Perspectives and Scientific Revolutions																																					
14. Use historical examples to explain how new ideas are limited by the context in which they are conceived; are often initially rejected by the scientific establishment; sometimes spring from unexpected findings; and usually grow slowly, through contributions from many different investigators (e.g., nuclear energy, quantum theory, theory of relativity).												XX																									
15. Describe concepts/ideas in physical sciences that have important, long-lasting effects on science and society (e.g., quantum theory, theory of relativity, age of the universe).	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**																			
Science and Technology Students should recognize that science and technology are interconnected and that using technology involves assessment of the benefits, risks and costs. Students should **Benchmarks: By the end of the 9-10 program:**																																					
A. Explain the ways in which the processes of technological design respond to the needs of society.	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**X**	**E**	**X**	**X**	**X**	**X**	**E**	**X**																	**E**	**E**	**E**
B. Explain that science and technology are interdependent; each drives the other.	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**X**	**E**	**X**	**X**	**X**	**X**	**E**	**X**																	**E**	**E**	**E**
Science Grade- Level Indicators: Grade 9 **Understanding Technology**																																					
1.Describe means of comparing the benefits with the risks of technology and how science can inform public policy.		**E**					**E**	**E**	**E**						**E**		**E**	**E**																			
Abilities To Do Technological Design																																					

Correlation key:	ACTIVE PHYSICS																		EARTHCOMM															ACTIVE CHEMISTRY		
"X" = Coverage Secondary concept of the activity or problem. Students gain a basic understanding or introduction of the concept. **"XX" = In-depth Coverage** Primary concept that is the focus of the activity or problem. Students gain thorough understanding of the concept. Coverage in student edition and/or Teacher Edition supports the development of the concept **"E" = Covers entire chapter**	**Communication**			**Home**			**Medicine**			**Predictions**			**Sports**			**Transportation**			**Earth's Dynamic Geosphere**			**Understanding Your Environment**			**Earth's Fluid Spheres**			**Earth's Natural Resources**			**Earth System Evolution**			**Movie Special Effects**	**Periodic Table**	**Cool Chemistry**
	Chapter 1	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**G1**	**G2**	**G3**	**U1**	**U2**	**U3**	**F1**	**F2**	**F3**	**N1**	**N2**	**N3**	**E1**	**E2**	**E3**	**Chapter 1**	**Chapter 2**	**Chapter 3**
3.Explain why a design should be continually assessed and the ideas of the design should be tested, adapted and refined.	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**																**E**	**E**	**E**
Science Grade- Level Indicators: Grade 10 **Understanding Technology**																																			
1.Cite examples of ways that scientific inquiry is driven by the desire to understand the natural world and how technology is driven by the need to meet human needs and solve human problems.																																			
2.Describe examples of scientific advances and emerging technologies and how they may impact society.																																			
Abilities To Do Technological Design																																			
3.Explain that when evaluating a design for a device or process,thought should be given to how it will be manufactured,operated,maintained,replaced and disposed of in addition to who will sell,operate and take care of it.Explain how the costs associated with these considerations may introduce additional constraints on the design.																																			
Benchmarks: By the end of the 11-12 program:																																			
A. Predict how human choices today will determine the quality and quantity of life on Earth.				**E**	**E**			**E**	**E**			**E**					**E**																			
Science Grade- Level Indicators: Grade 11 **Understanding Technology**																																			
1.Identify that science and technology are essential social enterprises but alone they can only indicate what can happen,not what should happen.Realize the latter involves human decisions about the use of knowledge.																																			
2.Predict how decisions regarding the implementation of technologies involve the weighing of trade-offs between predicted positive and negative effects on the environment and/or humans.																																			
3.Explore and explain any given technology that may have a different value for different groups of people and at different points in time (e.g.,new varieties of farm plants and animals have been engineered by manipulating their genetic instructions to reproduce new characteristics).																																			
4.Explain why basic concepts and principles of science and technology should be a part of active debate about the economics,policies,politics and ethics of various science-related and technology-related challenges.																																			
5.Investigate that all fuels (e.g.,fossil,solar and nuclear) have advantages and disadvantages;therefore society must consider the trade-offs among them (e.g.,economic costs and environmental impact).																																			

Correlation key:	ACTIVE PHYSICS																		EARTHCOMM															ACTIVE CHEMISTRY		
"X" = Coverage Secondary concept of the activity or problem. Students gain a basic understanding or introduction of the concept. **"XX" = In-depth Coverage** Primary concept that is the focus of the activity or problem. Students gain thorough understanding of the concept. Coverage in student edition and/or Teacher Edition supports the development of the concept **"E" = Covers entire chapter**	**Communication**			**Home**			**Medicine**			**Predictions**			**Sports**			**Transportation**			**Earth's Dynamic Geosphere**			**Understanding Your Environment**			**Earth's Fluid Spheres**			**Earth's Natural Resources**			**Earth System Evolution**			**Movie Special Effects**	**Periodic Table**	**Cool Chemistry**
	Chapter 1	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**G1**	**G2**	**G3**	**U1**	**U2**	**U3**	**F1**	**F2**	**F3**	**N1**	**N2**	**N3**	**E1**	**E2**	**E3**	**Chapter 1**	**Chapter 2**	**Chapter 3**
6.Research sources of energy beyond traditional fuels and the advantages,disadvantages and trade-offs society must consider when using alternative sources (e.g., biomass, solar, hybrid engines, wind and fuel cells).																																			
Science Grade- Level Indicators: Grade 12 **Understanding Technology**																																			
1.Explain how science often advances with the introduction of new technologies and how solving technological problems often results in new scientific knowledge.																																			
2.Describe how new technologies often extend the current levels of scientific understanding and introduce new areas of research.																																			
3.Research how scientific inquiry is driven by the desire to understand the natural world and how technological design is driven by the need to meet human needs and solve human problems.																																			
4.Explain why basic concepts and principles of science and technology should be a part of active debate about the economics,policies,politics and ethics of various science-related and technology-related challenges.																																			
Scientific Inquiry Students will develop scientific habits of mind as they use the processes of scientific inquiry to ask valid questions and to gather and analyze information. They will **Benchmarks: By the end of the 9-10 program:**																																			
A. Participate in and apply the processes of scientific investigation to create models and to design, conduct, evaluate and communicate the results of these investigations.	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**																**E**	**E**	**E**
Science Grade- Level Indicators: Grade 9 **Doing Scientific Inquiry**																																			
1.Distinguish between observations and inferences given a scientific situation.	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**																**E**	**E**	**E**
2.Research and apply appropriate safety precautions when designing and conducting scientific investigations (e.g., OSHA,Material Safety Data Sheets [MSDS],eyewash, goggles and ventilation).	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**																**E**	**E**	**E**
3.Construct,interpret and apply physical and conceptual models that represent or explain systems,objects,events or concepts.	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**																**E**	**E**	**E**
4.Decide what degree of precision based on the data is adequate and round off the results of calculator operations to the proper number of significant figures to reasonably reflect those of the inputs.	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**																**E**	**E**	**E**
5.Develop oral and written presentations using clear language,accurate data,appropriate graphs,tables,maps and available technology.	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**																**E**	**E**	**E**

Correlation key:	ACTIVE PHYSICS																		EARTHCOMM															ACTIVE CHEMISTRY		
"X" = Coverage Secondary concept of the activity or problem. Students gain a basic understanding or introduction of the concept. **"XX" = In-depth Coverage** Primary concept that is the focus of the activity or problem. Students gain thorough understanding of the concept. Coverage in student edition and/or Teacher Edition supports the development of the concept **"E" = Covers entire chapter**	**Communication**			**Home**			**Medicine**			**Predictions**			**Sports**			**Transportation**			**Earth's Dynamic Geosphere**			**Understanding Your Environment**			**Earth's Fluid Spheres**			**Earth's Natural Resources**			**Earth System Evolution**			**Movie Special Effects**	**Periodic Table**	**Cool Chemistry**
	Chapter 1	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**G1**	**G2**	**G3**	**U1**	**U2**	**U3**	**F1**	**F2**	**F3**	**N1**	**N2**	**N3**	**E1**	**E2**	**E3**	**Chapter 1**	**Chapter 2**	**Chapter 3**
6.Draw logical conclusions based on scientific knowledge and evidence from investigations.	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**																**E**	**E**	**E**
Science Grade- Level Indicators: Grade 10 **Doing Scientific Inquiry**																																			
1.Research and apply appropriate safety precautions when designing and conducting scientific investigations (e.g. OSHA,MSDS,eyewash,goggles and ventilation).																																			
2.Present scientific findings using clear language,accurate data,appropriate graphs,tables,maps and available technology.																																			
3.Use mathematical models to predict and analyze natural phenomena.																																			
4.Draw conclusions from inquiries based on scientific knowledge and principles,the use of logic and evidence (data)from investigations.																																			
5.Explain how new scientific data can cause any existing scientific explanation to be supported,revised or rejected.																																			
Benchmarks: By the end of the 11-12 program:																																			
A. Make appropriate choices when designing and participating in scientific investigations by using cognitive and manipulative skills when collecting data and formulating conclusions from the data.	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**																		
Science Grade- Level Indicators: Grade 11 **Doing Scientific Inquiry**																																			
1.Formulate testable hypotheses.Develop and explain the appropriate procedures,controls and variables (dependent and independent)in scientific experimentation.																																			
2.Evaluate assumptions that have been used in reaching scientific conclusions.																																			
3.Design and carry out scientific inquiry (investigation), communicate and critique results through peer review.																																			
4.Explain why the methods of an investigation are based on the questions being asked.																																			
5.Summarize data and construct a reasonable argument based on those data and other known information.																																			
Science Grade- Level Indicators: Grade 12 **Doing Scientific Inquiry**																																			
1.Formulate testable hypotheses.Develop and explain the appropriate procedures,controls and variables (dependent and independent)in scientific experimentation.																																			

Correlation key:	ACTIVE PHYSICS																		EARTHCOMM															ACTIVE CHEMISTRY		
"X" = Coverage Secondary concept of the activity or problem. Students gain a basic understanding or introduction of the concept. **"XX" = In-depth Coverage** Primary concept that is the focus of the activity or problem. Students gain thorough understanding of the concept. Coverage in student edition and/or Teacher Edition supports the development of the concept **"E" = Covers entire chapter**	**Communication**			**Home**			**Medicine**			**Predictions**			**Sports**			**Transportation**			**Earth's Dynamic Geosphere**			**Understanding Your Environment**			**Earth's Fluid Spheres**			**Earth's Natural Resources**			**Earth System Evolution**			**Movie Special Effects**	**Periodic Table**	**Cool Chemistry**
	Chapter 1	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**G1**	**G2**	**G3**	**U1**	**U2**	**U3**	**F1**	**F2**	**F3**	**N1**	**N2**	**N3**	**E1**	**E2**	**E3**	**Chapter 1**	**Chapter 2**	**Chapter 3**
2.Derive simple mathematical relationships that have predictive power from experimental data (e.g.,derive an equation from a graph and vice versa,determine whether a linear or exponential relationship exists among the data in a table).																																			
3.Research and apply appropriate safety precautions when designing and/or conducting scientific investigations (e.g., OSHA,MSDS,eyewash,goggles and ventilation).																																			
4.Create and clarify the method,procedures,controls and variables in complex scientific investigations.																																	**E**	**E**	**E**
5.Use appropriate summary statistics to analyze and describe data.																																	**E**	**E**	**E**
Scientific Ways of Knowing Students realize that the current body of scientific knowledge must be based on evidence, be predictive, logical, subject to modification, and limited to the natural world. **Benchmarks: By the end of the 9-10 program:**																																			
A. Explain that scientific knowledge must be based on evidence, be predictive, logical, subject to modification and limited to the natural world.	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**																**E**	**E**	**E**
B. Explain how scientific inquiry is guided by knowledge, observations, ideas and questions.	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**																**E**	**E**	**E**
C. Describe the ethical practices and guidelines in which science operates.			**XX**	**XX**	**XX**		**XX**	**XX**	**XX**			**XX**				**XX**																				
D. Recognize that scientific literacy is part of being a knowledgable citizen.	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**																**E**	**E**	**E**
Science Grade- Level Indicators: Grade 9 **Nature of Science**																																			
1.Comprehend that many scientific investigations require the contributions of women and men from different disciplines in and out of science.These people study different topics,use different techniques and have different standards of evidence but share a common purpose -to better understand a portion of our universe.	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**																**E**	**E**	**E**
2.Illustrate that the methods and procedures used to obtain evidence must be clearly reported to enhance opportunities for further investigations.	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**																**E**	**E**	**E**
3.Demonstrate that reliable scientific evidence improves the ability of scientists to offer accurate predictions.	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**																**E**	**E**	**E**
Ethical Practices																																			
4.Explain how support of ethical practices in science (e.g., individual observations and confirmations,accurate reporting,peer review and publication)are required to reduce bias.										**X**		**X**																						**E**	**E**	**E**
Scientific Theories																																			

Correlation key:	ACTIVE PHYSICS																		EARTHCOMM																		ACTIVE CHEMISTRY		
"X" = Coverage Secondary concept of the activity or problem. Students gain a basic understanding or introduction of the concept. **"XX" = In-depth Coverage** Primary concept that is the focus of the activity or problem. Students gain thorough understanding of the concept. Coverage in student edition and/or Teacher Edition supports the development of the concept **"E" = Covers entire chapter**	Communication			Home			Medicine			Predictions			Sports			Transportation			Earth's Dynamic Geosphere			Understanding Your Environment			Earth's Fluid Spheres			Earth's Natural Resources			Earth System Evolution			Movie Special Effects	Periodic Table	Cool Chemistry
	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	G1	G2	G3	U1	U2	U3	F1	F2	F3	N1	N2	N3	E1	E2	E3	Chapter 1	Chapter 2	Chapter 3
5.Justify that scientific theories are explanations of large bodies of information and/or observations that withstand repeated testing.	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E																E	E	E
6.Explain that inquiry fuels observation and experimentation that produce data that are the foundation of scientific disciplines.Theories are explanations of these data.	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E																E	E	E
7.Recognize that scientific knowledge and explanations have changed over time,almost always building on earlier knowledge.	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E																E	E	E
Science and Society																																				
8.Illustrate that much can be learned about the internal workings of science and the nature of science from the study of scientists,their daily work and their efforts to advance scientific knowledge in their area of study.	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E																E	E	E
9.Investigate how the knowledge,skills and interests learned in science classes apply to the careers students plan to pursue.	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E																E	E	E
Science Grade- Level Indicators: Grade 10 **Nature of Science**																																				
1.Discuss science as a dynamic body of knowledge that can lead to the development of entirely new disciplines.																																				
2.Describe that scientists may disagree about explanations of phenomena,about interpretation of data or about the value of rival theories,but they do agree that questioning, response to criticism and open communication are integral to the process of science.																																				
3.Recognize that science is a systematic method of continuing investigation,based on observation,hypothesis testing,measurement,experimentation,and theory building,which leads to more adequate explanations of natural phenomena.																																				
Ethical Practices																																				
4.Recognize that ethical considerations limit what scientists can do.																																				
5.Recognize that research involving voluntary human subjects should be conducted only with the informed consent of the subjects and follow rigid guidelines and/or laws.																																				
6.Recognize that animal-based research must be conducted according to currently accepted professional standards and laws.																																				
Science and Society																																				

Correlation key:	ACTIVE PHYSICS																		EARTHCOMM															ACTIVE CHEMISTRY		
"X" = Coverage Secondary concept of the activity or problem. Students gain a basic understanding or introduction of the concept. **"XX" = In-depth Coverage** Primary concept that is the focus of the activity or problem. Students gain thorough understanding of the concept. Coverage in student edition and/or Teacher Edition supports the development of the concept **"E" = Covers entire chapter**	**Communication**			**Home**			**Medicine**			**Predictions**			**Sports**			**Transportation**			**Earth's Dynamic Geosphere**			**Understanding Your Environment**			**Earth's Fluid Spheres**			**Earth's Natural Resources**			**Earth System Evolution**			**Movie Special Effects**	**Periodic Table**	**Cool Chemistry**
	Chapter 1	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**G1**	**G2**	**G3**	**U1**	**U2**	**U3**	**F1**	**F2**	**F3**	**N1**	**N2**	**N3**	**E1**	**E2**	**E3**	**Chapter 1**	**Chapter 2**	**Chapter 3**
7.Investigate how the knowledge,skills and interests learned in science classes apply to the careers students plan to pursue.																																			
Benchmarks: By the end of the 11-12 program:																																			
A. Explain how scientific evidence is used to develop and revise scientific predictions, ideas or theories.	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**																	
B. Explain how ethical considerations shape scientific endeavors.			**XX**	**XX**	**XX**		**XX**	**XX**	**XX**			**XX**				**XX**																			
C. Explain how societal issues and considerations affect the progress of science and technology.		**E**	**E**	**E**	**E**		**E**	**E**	**E**			**E**				**E**	**E**																		
Science Grade- Level Indicators: Grade 11 **Nature of Science**																																			
1.Analyze a set of data to derive a hypothesis and apply that hypothesis to a similar phenomenon (e.g.,biome data).																																			
2.Apply scientific inquiry to evaluate results of scientific investigations,observations,theoretical models and the explanations proposed by other scientists.																																			
3.Demonstrate that scientific explanations adhere to established criteria,for example a proposed explanation must be logically consistent,it must abide by the rules of evidence and it must be open to questions and modifications.																																			
4.Explain why scientists can assume that the universe is a vast single system in which the basic rules are the same everywhere.																																			
Ethical Practices																																			
5.Recognize that bias affects outcomes.People tend to ignore evidence that challenges their beliefs but accept evidence that supports their beliefs.Scientist attempt to avoid bias in their work.																																			
6.Describe the strongly held traditions of science that serve to keep scientists within the bounds of ethical professional behavior.																																			
Scientific Theories																																			
7.Explain how theories are judged by how well they fit with other theories,the range of included observations, how well they explain observations and how effective they are in predicting new findings.																																			
Science and Society																																			
8.Explain that the decision to develop a new technology is influenced by societal opinions and demands and by cost benefit considerations.																																			
9.Explain how natural and human-induced hazards present the need for humans to assess potential danger and risk. Many changes in the environment designed by humans bring benefits to society as well as cause risks.																																			

Correlation key:	ACTIVE PHYSICS																		EARTHCOMM															ACTIVE CHEMISTRY		
"X" = Coverage Secondary concept of the activity or problem. Students gain a basic understanding or introduction of the concept. **"XX" = In-depth Coverage** Primary concept that is the focus of the activity or problem. Students gain thorough understanding of the concept. Coverage in student edition and/or Teacher Edition supports the development of the concept **"E" = Covers entire chapter**	Communication			Home			Medicine			Predictions			Sports			Transportation			Earth's Dynamic Geosphere			Understanding Your Environment			Earth's Fluid Spheres			Earth's Natural Resources			Earth System Evolution			Movie Special Effects	Periodic Table	Cool Chemistry
	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	G1	G2	G3	U1	U2	U3	F1	F2	F3	N1	N2	N3	E1	E2	E3	Chapter 1	Chapter 2	Chapter 3
10.Describe costs and trade-offs of various hazards -ranging from those with minor risk to a few people,to major catastrophes with major risk to many people.The scale of events and the accuracy with which scientists and engineers can (and cannot)predict events are important considerations.																																			
11.Research the role of science and technology in careers that students plan to pursue.																																			
Science Grade- Level Indicators: Grade 12																																			
Nature of Science																																			
1.Give examples that show how science is a social endeavor in which scientists share their knowledge with the expectation that it will be challenged continuously by the scientific community and others.																																			
2.Evaluate scientific investigations by reviewing current scientific knowledge and the experimental procedures used,examining the evidence,identifying faulty reasoning,pointing out statements that go beyond the evidence and suggesting alternative explanations for the same observations.																																			
3.Select a scientific model,concept or theory and explain how it has been revised over time based on new knowledge, perceptions or technology.																																			
4.Analyze a set of data to derive a principle and then apply that principle to a similar phenomenon (e.g., predator-prey relationships and properties of semiconductors).																																			
5.Describe how individuals and teams contribute to science and engineering at different levels of complexity (e.g.,an individual may conduct basic field studies,hundreds of people may work together on major scientific questions or technical problem).																																			
Ethical Practices																																			
6.Explain that scientists may develop and apply ethical tests to evaluate the consequences of their research when appropriate.																																			
Science and Society																																			
7.Describe the current and historical contributions of diverse peoples and cultures to science and technology and the scarcity and inaccessibility of information on some of these contributions.																																			
8.Recognize that individuals and society must decide on proposals involving new research and the introduction of new technologies into society.Decisions involve assessment of alternatives,risks,costs and benefits and consideration of who benefits and who suffers,who pays and gains,and what the risks are and who bears them.																																			

Correlation key:	ACTIVE PHYSICS																		EARTHCOMM															ACTIVE CHEMISTRY		
"X" = Coverage Secondary concept of the activity or problem. Students gain a basic understanding or introduction of the concept. **"XX" = In-depth Coverage** Primary concept that is the focus of the activity or problem. Students gain thorough understanding of the concept. Coverage in student edition and/or Teacher Edition supports the development of the concept **"E" = Covers entire chapter**	Communication			Home			Medicine			Predictions			Sports			Transportation			Earth's Dynamic Geosphere			Understanding Your Environment			Earth's Fluid Spheres			Earth's Natural Resources			Earth System Evolution			Movie Special Effects	Periodic Table	Cool Chemistry
	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	G1	G2	G3	U1	U2	U3	F1	F2	F3	N1	N2	N3	E1	E2	E3	Chapter 1	Chapter 2	Chapter 3
9.Recognize the appropriateness and value of basic questions "What can happen?""What are the odds?"and "How do scientists and engineers know what will happen?"																																			
10.Recognize that social issues and challenges can affect progress in science and technology.(e.g.,Funding priorities for specific health problems serve as examples of ways that social issues influence science and technology.)																																			
11.Research how advances in scientific knowledge have impacted society on a local,national or global level.																																			
EARTH SCIENCE																																			
Benchmarks: By the end of the 9-10 program:																																			
A.Explain how evidence from stars and other celestial objects provide information about the processes that cause changes in the composition and scale of the physical universe.																															XX	X				
B.Explain that many processes occur in patterns within the Earth's systems.																			E	E	E	E	E	E	E	E	E	E	E	E	E	E	E			
C.Explain the 4.5 billion-year-history of Earth and the 4 billion-year-history of life on Earth based on observable scientific evidence in the geologic record.																						X									X					
D.Describe the finite nature of Earth's resources and those human activities that can conserve or deplete Earth's resources.																												XX	XX	X						
E.Explain the processes that move and shape Earth's surface.																			XX	XX	XX	XX	XX	XX	X		XX		X	XX	X	X	X			
F.Summarize the historical development of scientific theories and ideas,and describe emerging issues in the study of Earth and space sciences.																			X	XX		XX			X	X	X		X	X	XX	XX	XX			
EARTH AND SPACE SCIENCES																																			
Science Grade- Level Indicators: Grade 9																																			
The Universe																																			
1. Describe that stars produce energy from nuclear reactions and that processes in stars have led to the formation of all elements beyond hydrogen and helium.																															X					
2. Describe the current scientific evidence that supports the theory of the explosive expansion of the universe, the Big Bang, over 10 billion years ago.																															XX					
3. Explain that gravitational forces govern the characteristics and movement patterns of the planets, comets and asteroids in the Solar System.																															X					
Earth Systems																																			
4. Explain the relationships of the oceans to the lithosphere and atmosphere (e.g., transfer of energy, ocean currents, landforms).																			X	XX		X			XX	X	X			XX		XX				
Processes That Shape Earth																																			

Correlation key:	ACTIVE PHYSICS																		EARTHCOMM															ACTIVE CHEMISTRY		
"X" = Coverage Secondary concept of the activity or problem. Students gain a basic understanding or introduction of the concept. **"XX" = In-depth Coverage** Primary concept that is the focus of the activity or problem. Students gain thorough understanding of the concept. Coverage in student edition and/or Teacher Edition supports the development of the concept **"E" = Covers entire chapter**	Communication			Home			Medicine			Predictions			Sports			Transportation			Earth's Dynamic Geosphere			Understanding Your Environment			Earth's Fluid Spheres			Earth's Natural Resources			Earth System Evolution			Movie Special Effects	Periodic Table	Cool Chemistry
	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	Chapter 1	Chapter 2	Chapter 3	G1	G2	G3	U1	U2	U3	F1	F2	F3	N1	N2	N3	E1	E2	E3	Chapter 1	Chapter 2	Chapter 3
5. Explain how the slow movement of material within Earth results from:																																			
a. thermal energy transfer (conduction and convection) from the deep interior																			X	XX					X	X		XX							
b. the action of gravitational forces on regions of different density																			X	XX					XX	XX									
6. Explain the results of plate tectonic activity (e.g., magma generation, igneous intrusion, metamorphism, volcanic action, earthquakes, faulting and folding).																			XX	XX	XX	XX							XX			XX			
7. Explain sea-floor spreading and continental drift using scientific evidence (e.g., fossil distributions, magnetic reversals and radiometric dating).																			X	XX															
Historical Perspectives and Scientific Revolutions																																			
8. Use historical examples to explain how new ideas are limited by the context in which they are conceived; are often initially rejected by the scientific establishment; sometimes spring from unexpected findings; and usually grow slowly through contributions from many different investigators (e.g., heliocentric theory and plate tectonics theory).																			X	XX	X	X	X	X	X	X	X	X	X	X	X	X	X			
Science Grade- Level Indicators: Grade 10 ***Earth Systems***																																			
1. Summarize the relationship between the climatic zone and the resultant biome. (This includes explaining the nature of the rainfall and temperature of the mid-latitude climatic zone that supports the deciduous forest.)																										X						XX			
2. Explain climate and weather patterns associated with certain geographic locations and features (e.g., tornado alley, tropical hurricanes and lake effect snow).																									XX	XX						XX			
3. Explain how geologic time can be estimated by multiple methods (e.g., rock sequences, fossil correlation, radiometric dating).																			XX	XX		XX					X	X	X			XX	XX		
4. Describe how organisms on Earth contributed to the dramatic change in oxygen content of Earth's early atmosphere.																												X					X		
5. Explain how the acquisition and use of resources, urban growth and waste disposal can accelerate natural change and impact the quality of life.																							XX	XX				XX	XX	XX					
6. Describe ways that human activity can alter biogeochemical cycles (e.g., carbon and nitrogen cycles) as well as food webs and energy pyramids (e.g., pest control, legume rotation crops vs. chemical fertilizers).																							XX	XX	XX			XX	X	XX			XX	X		
Historical Perspectives and Scientific Revolutions																																			

Correlation key:	ACTIVE PHYSICS																		EARTHCOMM															ACTIVE CHEMISTRY		
"X" = Coverage Secondary concept of the activity or problem. Students gain a basic understanding or introduction of the concept. **"XX" = In-depth Coverage** Primary concept that is the focus of the activity or problem. Students gain thorough understanding of the concept. Coverage in student edition and/or Teacher Edition supports the development of the concept **"E" = Covers entire chapter**	**Communication**			**Home**			**Medicine**			**Predictions**			**Sports**			**Transportation**			**Earth's Dynamic Geosphere**			**Understanding Your Environment**			**Earth's Fluid Spheres**			**Earth's Natural Resources**			**Earth System Evolution**			**Movie Special Effects**	**Periodic Table**	**Cool Chemistry**
	Chapter 1	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**G1**	**G2**	**G3**	**U1**	**U2**	**U3**	**F1**	**F2**	**F3**	**N1**	**N2**	**N3**	**E1**	**E2**	**E3**	**Chapter 1**	**Chapter 2**	**Chapter 3**
7. Describe advances and issue in Earth and space science that have important long-lasting effects on science and society (e.g., geologic time scales, global warming, depletion of resources, exponential population growth).																			XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX			
SCIENCE AND TECHNOLOGY **Science Grade- Level Indicators: Grade 9** ***Understanding Technology***																																			
1. Describe means of comparing the benefits with the risks of technology and how science can inform public policy.																			X	X	X	X	X	X	X	X	X	X	X	X	X	X			
Abilities To Do Technological Design																																			
2. Identify a problem or need, propose designs and choose among alternative solutions for the problem.																			XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX			
3. Explain why a design should be continually assessed and the ideas of the design should be tested, adapted, and refined.																			XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX			
SCIENCE AND TECHNOLOGY **Science Grade- Level Indicators: Grade 10** ***Understanding Technology***																																			
1. Cite examples of ways that scientific inquiry is driven by the desire to understand the natural world and how technology is driven by the need to meet human needs and solve human problems.																			XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX			
2. Describe examples of scientific advances and emerging technologies and how they may impact society.																			XX	XX	XX		X	XX	XX	XX	X	XX	XX	XX	XX	X			
Abilities To Do Technological Design																																			
3. Explain that when evaluating a design for a device or process, thought should be given to how it will be manufactured, opertated, maintained, replaced, and disposed of in addition to who will sell, operate and take care of it. Explain how the costs associated with these condiderations may introduce additional constraints on the design.																			X					X				X	XX					
Benchmarks: By the end of the 11-12 program:																																			
A.Explain how technology can be used to gather evidence and increase our understanding of the universe.																																			
B.Describe how Earth is made up of a series of interconnected systems and how a change in one system affects other systems.																																			
C.Explain that humans are an integral part of the Earth's system and the choices humans make today impact natural systems in the future.																																			

Correlation key:	ACTIVE PHYSICS																		EARTHCOMM															ACTIVE CHEMISTRY		
"X" = Coverage Secondary concept of the activity or problem. Students gain a basic understanding or introduction of the concept. **"XX" = In-depth Coverage** Primary concept that is the focus of the activity or problem. Students gain thorough understanding of the concept. Coverage in student edition and/or Teacher Edition supports the development of the concept **"E" = Covers entire chapter**	**Communication**			**Home**			**Medicine**			**Predictions**			**Sports**			**Transportation**			**Earth's Dynamic Geosphere**			**Understanding Your Environment**			**Earth's Fluid Spheres**			**Earth's Natural Resources**			**Earth System Evolution**			**Movie Special Effects**	**Periodic Table**	**Cool Chemistry**
	Chapter 1	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**G1**	**G2**	**G3**	**U1**	**U2**	**U3**	**F1**	**F2**	**F3**	**N1**	**N2**	**N3**	**E1**	**E2**	**E3**	**Chapter 1**	**Chapter 2**	**Chapter 3**
D.Summarize the historical development of scientific theories and ideas and describe emerging issues in the study of Earth and space sciences.																																			
Science Grade- Level Indicators: Grade 11 **Understanding Technology**																																			
1.Identify that science and technology are essential social enterprises but alone they can only indicate what can happen,not what should happen.Realize the latter involves human decisions about the use of knowledge.																																			
2.Predict how decisions regarding the implementation of technologies involve the weighing of trade-offs between predicted positive and negative effects on the environment and/or humans.																																			
3.Explore and explain any given technology that may have a different value for different groups of people and at different points in time (e.g.,new varieties of farm plants and animals have been engineered by manipulating their genetic instructions to reproduce new characteristics).																																			
4.Explain why basic concepts and principles of science and technology should be a part of active debate about the economics,policies,politics and ethics of various science-related and technology-related challenges.																																			
5.Investigate that all fuels (e.g.,fossil,solar and nuclear) have advantages and disadvantages;therefore society must consider the trade-offs among them (e.g.,economic costs and environmental impact).																																			
6.Research sources of energy beyond traditional fuels and the advantages,disadvantages and trade-offs society must consider when using alternative sources (e.g.,biomass, solar,hybrid engines,wind and fuel cells).																																			
Science Grade- Level Indicators: Grade 12 **Understanding Technology**																																			
1.Explain how science often advances with the introduction of new technologies and how solving technological problems often results in new scientific knowledge.																																			
2.Describe how new technologies often extend the current levels of scientific understanding and introduce new areas of research.																																			
3.Research how scientific inquiry is driven by the desire to understand the natural world and how technological design is driven by the need to meet human needs and solve human problems.																																			

Correlation key:	ACTIVE PHYSICS																		EARTHCOMM															ACTIVE CHEMISTRY		
"X" = Coverage Secondary concept of the activity or problem. Students gain a basic understanding or introduction of the concept. **"XX" = In-depth Coverage** Primary concept that is the focus of the activity or problem. Students gain thorough understanding of the concept. Coverage in student edition and/or Teacher Edition supports the development of the concept **"E" = Covers entire chapter**	**Communication**			**Home**			**Medicine**			**Predictions**			**Sports**			**Transportation**			**Earth's Dynamic Geosphere**			**Understanding Your Environment**			**Earth's Fluid Spheres**			**Earth's Natural Resources**			**Earth System Evolution**			**Movie Special Effects**	**Periodic Table**	**Cool Chemistry**
	Chapter 1	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**G1**	**G2**	**G3**	**U1**	**U2**	**U3**	**F1**	**F2**	**F3**	**N1**	**N2**	**N3**	**E1**	**E2**	**E3**	**Chapter 1**	**Chapter 2**	**Chapter 3**
4.Explain why basic concepts and principles of science and technology should be a part of active debate about the economics,policies,politics and ethics of various science-related and technology-related challenges.																																			
SCIENTIFIC INQUIRY **Benchmarks: By the end of the 9-10 program:**																																			
A.Participate in and apply the processes of scientific investigation to create models and to design, conduct,evaluate and communicate the results of these investigations.																			E	E	E	E	E	E	E	E	E	E	E	E	E	E			
Science Grade- Level Indicators: Grade 9 ***Doing Scientific Inquiry***																																			
1. Distinguish between observations and inferences given a scientific situation.																			XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX			
2. Research and apply appropiate safety precautions when designing and conducting scientific investigations (e.g., OSHA, Material Safety Data Sheets [MSDS], eyewash, goggles, ventilation).																			XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX			
3. Construct, interpret and apply physical and conceptual models that represent or explain systems, objects, events or concepts.																			XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX			
4. Decide what degree of precision based on the data is adequate and round off the results of calculator operations to the proper number of significant figures to reasonably reflect those of the inputs.																			X	X	X	X	X	X	X	X	X	X	X	X	X	X			
5. Develop oral and written presentations using clear language, accurate data, appropiate graphs, tables, maps, and available technology.																			XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX			
6. Draw logical conclusions based on scientific knowledge and evidence from investigations.																			XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX			
SCIENTIFIC WAYS OF KNOWING **Science Grade- Level Indicators: Grade 9** ***Nature of Science***																																			
1. Comprehend that many scientific investigations require the contributions of women and men from different disciplines in and out of science. These people study different topics, use different techniques and have different standards of evidence but share a common purpose - to better understand a portion of our universe.																			X	X	X	X	X	X	X	X	X	X	X	X	X	X			
2. Illustrate that the methods and procedures used to obtain evidence must be clearly reported to enhance opportunities for further investigations.																			XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX			
3. Demonstrate that reliable scientific eveidence improves the ability of scientists to offer accurate predictions.																			XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX			
Ethical Practices																																			

Correlation key:	ACTIVE PHYSICS																		EARTHCOMM															ACTIVE CHEMISTRY		
"X" = Coverage Secondary concept of the activity or problem. Students gain a basic understanding or introduction of the concept. **"XX" = In-depth Coverage** Primary concept that is the focus of the activity or problem. Students gain thorough understanding of the concept. Coverage in student edition and/or Teacher Edition supports the development of the concept **"E" = Covers entire chapter**	**Communication**			**Home**			**Medicine**			**Predictions**			**Sports**			**Transportation**			**Earth's Dynamic Geosphere**			**Understanding Your Environment**			**Earth's Fluid Spheres**			**Earth's Natural Resources**			**Earth System Evolution**			**Movie Special Effects**	**Periodic Table**	**Cool Chemistry**
	Chapter 1	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**G1**	**G2**	**G3**	**U1**	**U2**	**U3**	**F1**	**F2**	**F3**	**N1**	**N2**	**N3**	**E1**	**E2**	**E3**	**Chapter 1**	**Chapter 2**	**Chapter 3**
4. Explain how support of ethical practices in science (e.g., individual observations and confirmations, accurate reporting, peer review and publication) are required to reduce bias.																			X	X	X	X	X	X	X	X	X	X	X	X	X			
Scientific Theories																																			
5. Justify that scientific theories are explanations of large bodies of information and/or observations that withstand repeated testing.																			X	XX	X	X	X	X	X	X	X	X	X	X	X	X			
6. Explain that inquiry fuels observation and experimentation that produce data that are the foundation of scientific disciplines. Theories are explanations of these data.																			XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX			
7. Recognize that scientific knowledge and explanations have changed over time, almost always building on earlier knowledge.																			X	XX	X	X	X	X	XX	X	XX	X	X	X	XX	XX	XX			
Science and Society																																			
8. Illustrate that much can be learned about the internal workings of science and the nature of science from the study of scientists, their daily work and their efforts to advance scientific knowledge in their area of study.																			X	X	X	X	X	X	X	X	X	X	X	X	X	X			
9. Investigate how the knowledge, skills, and interests learned in science classes apply to the careers students plan to pursue.																			XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX			
SCIENTIFIC INQUIRY **Science Grade- Level Indicators: Grade 10** ***Doing Scientific Inquiry***																																			
1. Research and apply appropriate safety precautions when designing and conducting scientific investigations (e.g., OSHA, MSDS, eyewash, goggles, ventilations).																			XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX			
2. Present scientific findings using clear language, accurate data, appropriate graphs, tables, maps, and available technology.																			XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX			
3. Use mathematical models to predict and analyze natural phenomena.																			XX	X	X	X	X	X	X	XX	XX	X	X	X	X	X			
4. Draw conclusions from inquiries based on scientific knowledge and principles, the use of logic and evidence (data) from investigations.																			XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX			
5. Explain how new scientific data can cause any existing scientific explanation to be supported, revised, or rejected.																			XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX			
Benchmarks: By the end of the 11-12 program:																																			
A.Make appropriate choices when designing and participating in scientific investigations by using cognitive and manipulative skills when collecting data and formulating conclusions from the data.																																			

Correlation key:	ACTIVE PHYSICS																		EARTHCOMM															ACTIVE CHEMISTRY		
"X" = Coverage Secondary concept of the activity or problem. Students gain a basic understanding or introduction of the concept. **"XX" = In-depth Coverage** Primary concept that is the focus of the activity or problem. Students gain thorough understanding of the concept. Coverage in student edition and/or Teacher Edition supports the development of the concept **"E" = Covers entire chapter**	**Communication**			**Home**			**Medicine**			**Predictions**			**Sports**			**Transportation**			**Earth's Dynamic Geosphere**			**Understanding Your Environment**			**Earth's Fluid Spheres**			**Earth's Natural Resources**			**Earth System Evolution**			**Movie Special Effects**	**Periodic Table**	**Cool Chemistry**
	Chapter 1	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**Chapter 1**	**Chapter 2**	**Chapter 3**	**G1**	**G2**	**G3**	**U1**	**U2**	**U3**	**F1**	**F2**	**F3**	**N1**	**N2**	**N3**	**E1**	**E2**	**E3**	**Chapter 1**	**Chapter 2**	**Chapter 3**
Science Grade- Level Indicators: Grade 11 **Doing Scientific Inquiry**																																			
1.Formulate testable hypotheses.Develop and explain the appropriate procedures,controls and variables (dependent and independent)in scientific experimentation.																																			
2.Evaluate assumptions that have been used in reaching scientific conclusions.																																			
3. Design and carry out scientific inquiry (investigation), communicate and critique results through peer review.																																			
4.Explain why the methods of an investigation are based on the questions being asked.																																			
5.Summarize data and construct a reasonable argument based on those data and other known information.																																			
Science Grade- Level Indicators: Grade 12 **Doing Scientific Inquiry**																																			
1.Formulate testable hypotheses.Develop and explain the appropriate procedures,controls and variables (dependent and independent)in scientific experimentation.																																			
2.Derive simple mathematical relationships that have predictive power from experimental data (e.g.,derive an equation from a graph and vice versa,determine whether a linear or exponential relationship exists among the data in a table).																																			
3.Research and apply appropriate safety precautions when designing and/or conducting scientific investigations (e.g., OSHA,MSDS,eyewash,goggles and ventilation).																																			
4.Create and clarify the method,procedures,controls and variables in complex scientific investigations.																																			
5.Use appropriate summary statistics to analyze and describe data.																																			