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	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		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

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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		
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		
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		
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		
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		
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																																						

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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	XX					
SCIENCE AND TECHNOLOGY																																						
Science Grade- Level Indicators: Grade 9																																						
<i>Understanding Technology</i>																																						
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	X				
<i>Abilities To Do Technological Design</i>																																						
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	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	XX	XX			
SCIENCE AND TECHNOLOGY																																						
Science Grade- Level Indicators: Grade 10																																						
<i>Understanding Technology</i>																																						
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	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	XX	XX	X			
<i>Abilities To Do Technological Design</i>																																						
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.																				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.																																						

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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	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	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	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	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	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	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	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	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	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	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.																																				

