Active Physics Correlation to the New York Standards

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.

	Communication			Home			Medicine			Predictions			Sports			Transportation		
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Scientific Inquiry																		
1. The central purpose of scientific inquiry is to develop explanations of natural phenomena in a continuing, creative process.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Students:	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
• elaborate on basic scientific and personal explanations of natural phenomena, and develop extended visual models and mathematical formulations to represent their thinking.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
• hone ideas through reasoning, library research, and discussion with others, including experts.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
• work toward reconciling competing explanations; clarifying points of agreement and disagreement.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
• coordinate explanations at different levels of scale, points of focus, and degrees of complexity and specificity and recognize the need for such alternative representations of the natural world.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
2. Beyond the use of reasoning and consensus, scientific inquiry involves the testing of proposed explanations involving the use of conventional techniques and procedures and usually requiring considerable ingenuity.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
Students:	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
• devise ways of making observations to test proposed explanations.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
• refine their research ideas through library investigations, including electronic information retrieval and reviews of the literature, and through peer feedback obtained from review and discussion.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX

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• develop and present proposals including formal hypotheses to test their explanations, i.e., they predict what should be observed under specified conditions if the explanation is true.	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**
• carry out their research plan for testing explanations, including selecting and developing techniques, acquiring and building apparatus, and recording observations as necessary.	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**
Engineering Design																		
1. Engineering design is an iterative process involving modeling and optimization finding the best solution within given constraints which is used to develop technological solutions to problems within given constraints.	**X**	**XX**	**XX**	**XX**	**X**	**XX**		**X**	**X**							**X**	**X**	
Students engage in the following steps in a design process:																		
• initiate and carry out a thorough investigation of an unfamiliar situation and identify needs and opportunities for technological invention or innovation.	**X**	**XX**	**XX**	**X**	**X**	**XX**		**X**	**X**							**XX**	**XX**	
• identify, locate, and use a wide range of information resources, and document through notes and sketches how findings relate to the problem.				**XX**	**X**			**X**									**XX**	
• generate creative solutions, break ideas into significant functional elements, and explore possible refinements; predict possible outcomes using mathematical and functional modeling techniques; choose the optimal solution to the problem, clearly documenting ideas against design criteria and constraints; and explain how human understanding, economics, ergonomics, and environmental considerations have influenced the solution.		**XX**		**XX**		**XX**											**xx**	

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• develop work schedules and working plans which include optimal use and cost of materials, processes, time, and expertise; construct a model of the solution, incorporating developmental modifications while working to a high degree of quality (craftsmanship).		**X**		**XX**		**XX**											**xx**	
• devise a test of the solution according to the design criteria and perform the test; record, portray, and logically evaluate performance test results through quantitative, graphic, and verbal means. Use a variety of creative verbal and graphic techniques effectively and persuasively to present conclusions, predict impacts and new problems, and suggest and pursue modifications.		**x**		**xx**		**xx**											**xx**	
Information Systems																		
1. Information technology is used to retrieve, process, and communicate information and as a tool to enhance learning.																		
Students:																		
• understand and use the more advanced features of word processing, spreadsheets, and database software.											**X**				**X**	**XX**	**XX**	**X**
• prepare multimedia presentations demonstrating a clear sense of audience and purpose.	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
• access, select, collate, and analyze information obtained from a wide range of sources such as research data bases, foundations, organizations, national libraries, and electronic communication networks, including the Internet.	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**
• students receive news reports from abroad and work in groups to produce newspapers reflecting the perspectives of different countries.																		
• utilize electronic networks to share information.																		

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• model solutions to a range of problems in mathematics, science, and technology using computer simulation software.																**X**	**X**	**XX**
2. Knowledge of the impacts and limitations of information systems is essential to its effective and ethical use.																		
Students:																		
• explain the impact of the use and abuse of electronically generated information on individuals and families.		**X**																
• evaluate software packages relative to their suitability to a particular application and their ease of use.																		
• discuss the ethical and social issues raised by the use and abuse of information systems.		**XX**																
3. Information technology can have positive and negative impacts on society, depending upon how it is used.																		
Students:																		
• work with a virtual community to conduct a project or solve a problem using the network.																		
• discuss how applications of information technology can address some major global problems and issues.		**XX**		**XX**														
• discuss the environmental, ethical, moral, and social issues raised by the use and abuse of information technology.		**XX**																
Physical Setting																		
3. Matter is made up of particles whose properties determine the observable characteristics of matter and its reactivity.																		
Students:																		
• explain the properties of materials in terms of the arrangement and properties of the atoms that compose them.																		

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• use atomic and molecular models to explain common chemical reactions.																		
• apply the principle of conservation of mass to chemical reactions.																		
• use kinetic molecular theory to explain rates of reactions and the relationships among temperature, pressure, and volume of a substance.																		
4. Energy exists in many forms, and when these forms change energy is conserved.																		
Students:																		
• observe and describe transmission of various forms of energy.	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**X**	**X**	**XX**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
• explain heat in terms of kinetic molecular theory.				**X**														
• explain variations in wavelength and frequency in terms of the source of the vibrations that produce them, e.g., molecules, electrons, and nuclear particles.	**XX**	**XX**					**X**	**X**	**X**			**X**						**X**
• explain the uses and hazards of radioactivity.										**X**								
5. Energy and matter interact through forces that result in changes in motion.																		
Students:																		
• explain and predict different patterns of motion of objects (e.g., linear and angular motion, velocity and acceleration, momentum and inertia).											**XX**		**XX**	**XX**	**X**	**XX**	**XX**	**X**
• explain chemical bonding in terms of the motion of electrons.																		
• compare energy relationships within an atom's nucleus to those outside the nucleus.																		