Introductory Physical Science and *Force, Motion, and Energy* – Correlation with the Connecticut Science Content Standards

Content Standard	Standard Description	Performance Standard	IPS Ch. 1	IPS Ch. 2	IPS Ch. 3	IPS Ch. 4	IPS Ch. 5	IPS Ch. 6	IPS Ch. 7	IPS Ch. 8	IPS Ch. 9	IPS Ch. 10	IPS Ch. 11	IPS Ch. 12	FM&E Ch. 1	FM&E Ch. 2	FM&E Ch. 3	FM&E Ch. 4	FM&E Ch. 5	FM&E Ch. 6	FM&E Ch. 7
CONTENT STANDARD 1: **The Nature of Science**	*Students will experience an inquiry-based learning environment in which they are free to ask questions, seek information and validate explanations in thoughtful and creative ways. Students also will understand that the processes, ways of knowing and conceptual foundations of science are interdependent and inextricably bound.*	Educational experiences in **Grades 5 - 8** will assure that students: • conduct scientific investigations which generally involve the collection of relevant evidence, the use of logical reasoning and creativity in devising hypotheses and explanations to make sense of the evidence;	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		• identify and control variables in experiments;	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		• evaluate the strengths and weaknesses of claims, arguments or data;	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		• recognize that a variety of experimental designs and strategies can be developed to answer the same question;	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		• use appropriate technology as a tool in problem solving;	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		• accept the open-ended-ness of scientific inquiry and that scientific findings are not always definite or complete; and	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		• use scientific knowledge and ways of thinking in personal decision-making.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CONTENT STANDARD 2: **History of Science**	*Students will learn the evolution of scientific thought, how science has influenced culture and society, and how groups from many countries have contributed to the history of science.*	Educational experiences in **Grades 5 - 8** will assure that students: • recognize important contributions to the advancement of science, mathematics and technology that have been made by men and women in different cultures at different times;																			

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CONTENT STANDARD 2: **History of Science**	*Students will learn the evolution of scientific thought, how science has influenced culture and society, and how groups from many countries have contributed to the history of science.*	• understand that scientific discoveries are influenced by technological demands, competition, controversy, world events, personalities and societal issues;							**X**												
		• recognize that, throughout history, scientists and engineers have been considered valued contributors to society; and							**X**												
		• recognize that, throughout history, it has been difficult for scientific innovators to break through the preconceptions of their time to reach conclusions, which today seem obvious.																			
CONTENT STANDARD 11: **Structure Of Matter**	*Students will know the characteristic properties of matter and the relationship of these properties to structure and composition.*	Educational experiences in **Grades 5 - 8** will assure that students: • use physical and chemical properties to classify and describe matter in terms of elements, compounds, mixtures, atoms and molecules;			**X**	**X**	**X**	**X**			**X**										
		• demonstrate that the kinetic molecular model of matter is useful in describing the structure and properties of solids, liquids and gases;								**X**	**X**										
		• show that, while the quantity of matter is conserved, changes in matter can result in the formation of new materials;		**X**																	
		• recognize that all matter is made up atoms which are too small to be seen directly through the micro- scope, but that indirect evidence can be used to construct a useful model of the atom;	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**											
		• recognize that atoms and molecules are perpetually in motion and that as the temperature of a sub- stance increases, the average energy of motion also increases;								**X**	**X**										
		• show how features such as the temperature and acidity of a solution can influence reaction rates;			**X**																

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CONTENT STANDARD 11: **Structure Of Matter**	*Students will know the characteristic properties of matter and the relationship of these properties to structure and composition.*	• give examples which show that changes in pressure, temperature or volume of a gas sample result in predictable changes in either or both of the other properties; and			**X**																
		• demonstrate that some properties (such as mass and volume) depend on the amount of material and some properties (such as density, melting point and boiling point) are independent of the amount of material.	**X**	**X**	**X**																
CONTENT STANDARD 12: **Energy**	*Students will know that energy is conserved, transferred, transformed, and appears in different forms*	Educational experiences in **Grades 5 - 8** will assure that students: • recognize that energy can neither be created nor destroyed;																			**X**
		• identify energy transformations that occur in various systems (e.g., biological, mechanical, geological) and recognize that heat is a by product of energy transformations;																			**X**
		• demonstrate that heat can be transferred by convection, conduction and radiation;																		**X**	
		• recognize that energy exists in many forms (e.g., light, heat, chemical, electrical and mechanical) and that energy can be transformed from one form to another;																		**X**	**X**
		• understand that all physical changes, including changes of state, require energy;		**X**	**X**															**X**	**X**
		• recognize that the sun produces energy in a range of wavelengths within the electromagnetic spectrum;																			
		• compare and contrast different forms of energy in terms of their wave-lengths on the electromagnetic spectrum.																	**X**		

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CONTENT STANDARD 13: **Interaction Of Matter And Energy**	*Students will know that interactions between matter and energy can produce changes in a system, although the total quantities of matter and energy are unchanged.*	Educational experiences in **Grades 5 - 8** will assure that students: • identify evidence that waves (e.g., light, sound, radiant) can transfer energy between two points;																	X		
		• demonstrate that objects have inertia and momentum;															X	X			
		• recognize that the motion of one object can be de-scribed by measuring its position, direction and speed relative to another object;																X			
		• illustrate that changes in the speed and direction of an object are due to forces which have magnitude and direction;															X	X			
		• recognize that electric currents and magnets can exert a force on each other; and																			
		• understand that a complete circuit is necessary in order for electric current to flow.										X									
CONTENT STANDARD 14: **Science And Technology**	*Students will understand the relationships among mathematics, science and technology and the way they affect and are affected by society.*	Educational experiences in **Grades 5 - 8** will assure that students: • investigate and describe human uses of renewable and nonrenewable re-sources (e.g., forests, fossil fuels);																			
		• explain interrelationships between science and technology (e.g., building a bridge, designing a better running shoe);																	X		
		• describe how the use of technology can contribute to the solution of an individual or community problem (e.g., using oxygenated fuels to help reduce air pollution);							X										X		
		• recognize that science and technology cannot solve every problem faced by society;																			

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CONTENT STANDARD 14: **Science And Technology**	*Students will understand the relationships among mathematics, science and technology and the way they affect and are affected by society* .	• describe how people use science and technology in their professions;																			
		• identify and analyze ways in which advances in science and technology have affected each other and society;							**X**												
		• recognize that issues related to science, technology and society often are complex and involve risk/ benefit tradeoffs;							**X**												
		• understand that scientific advances may be misused and developed into technologies that have negative consequences;							**X**												
		• identify technological advances that are reported in the media; and							**X**										**X**		
		• understand that engineers, architects and others who engage in design and technology use scientific knowledge to solve practical problems.							**X**										**X**		