Introductory Physical Science and *Force, Motion, and Energy*
Correlation with the Alaska Grade K-12 Science Content Standards

Alaska K-12 Science 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
A student should understand scientific facts, concepts, principles, and theories. A student who meets the content standard should: **1. understand models describing the nature of molecules, atoms, and sub-atomic particles and the relation of the models to the structure and behavior of matter (Structure of Matter);**																			
2. understand the physical, chemical, and nuclear changes and interactions that result in observable changes in the properties of matter (Changes and Interactions of Matter);								X	X		X	X							
3. understand models describing the composition, age, and size of our universe, galaxy, and solar system and understand that the universe is constantly moving and changing (Universe);		X	X	X	X	X	X	X	X	X	X								
4. understand observable natural events such as tides, weather, seasons, and moon phases in terms of the structure and motion of the earth (Earth);																			
5. understand the strength and effects of forces of nature, including gravity and electromagnetic radiation (Forces of Nature);													X	X	X				X
6. understand that forces of nature cause different types of motion and describe the relationship between these forces and motion (Motion);													X		X	X			

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7. understand how the earth changes because of plate tectonics, earthquakes, volcanoes, erosion and deposition, and living things (Processes that Shape the Earth);																			
8. understand the scientific principles and models that * describe the nature of physical, chemical, and nuclear reactions; * state that whenever energy is reduced in one place, it is increased somewhere else by the same amount; and * state that whenever there is a transformation of energy, some energy is spent in ways that make it unavailable for use (Energy Transformations);	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
9. understand the transfers and transformations of matter and energy that link living things and their physical environment, from molecules to ecosystems (Flow of Matter and Energy);																			
10. understand that living things are made up mostly of cells and that all life processes occur in cells (Cells);																			
11. understand that similar features are passed on by genes through reproduction (Heredity);																			
12. distinguish the patterns of similarity and differences in the living world in order to understand the diversity of life and understand the theories that describe the importance of diversity for species and ecosystems (Diversity);																			

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13. understand the theory of natural selection as an explanation for evidence of changes in life forms over time (Evolution and Natural Selection);																			
14. understand *** the interdependence between living things and their environments;** *** that the living environment consists of individuals, populations, and communities; and** *** that a small change in a portion of an environment may affect the entire environment (Interdependence);**																			
15. use science to understand and describe the local environment (Local Knowledge); and																			
16. understand basic concepts about the theory of relativity, which changed the view of the universe by uniting matter and energy and by linking time with space (Relativity).																			
<u>A student should possess and understand the skills of scientific inquiry.</u> A student who meets the content standard should: **1. use the processes of science; these processes include observing, classifying, measuring, interpreting data, inferring, communicating, controlling variables, developing models and theories, hypo-thesizing, predicting, and experimenting;**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	X	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**

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2. design and conduct scientific investigations using appropriate instruments;	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3. understand that scientific inquiry often involves different ways of thinking, curiosity, and the exploration of multiple paths;	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4. understand that personal integrity, skepticism, openness to new ideas, creativity, collaborative effort, and logical reasoning are all aspects of scientific inquiry;	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5. employ ethical standards, including unbiased data collection and factual reporting of results; and	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6. employ strict adherence to safety procedures in conducting scientific investigations.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<u>A student should understand the nature and history of science.</u> A student who meets the content standard should: **1. know how the words "fact," "observation," "concept," "principle," "law," and "theory" are generally used in the scientific community;**	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2. understand that scientific knowledge is validated by repeated specific experiments that conclude in similar results;	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3. understand that society, culture, history, and environment affect the development of scientific knowledge;																			

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4. understand that some personal and societal beliefs accept non- scientific methods for validating knowledge;																			
5. understand that sharing scientific discoveries is important to influencing individuals and society and in advancing scientific knowledge;																			
6. understand that scientific discovery is often a combination of an accidental happening and observation by a knowledgeable person with an open mind;																			
7. understand that major scientific breakthroughs may link large amounts of knowledge, build upon the contributions of many scientists, and cross different lines of study; and																			
8. understand that acceptance of a new idea depends upon sup- porting evidence and that new ideas that conflict with beliefs or common sense are often resisted.	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	X	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**