

**Introductory Physical Science (7<sup>th</sup> and 8<sup>th</sup> editions) & Force, Motion, and Energy – Correlation with Illinois Learning Standards**

Illinois State Learning Goal	Learning Standards	Middle/Junior High School	IPS7 IPS8 Ch. 1	IPS7 IPS8 Ch. 2	IPS7 IPS8 Ch. 3	IPS7 IPS8 Ch. 4	IPS7 IPS8 Ch. 5	IPS7 IPS8 Ch. 6	IPS7 IPS8 Ch. 7	IPS7 IPS8 Ch. 8	IPS7 IPS8 Ch. 9	IPS7 IPS8 Ch. 10	IPS7 Ch. 11	IPS7 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		
11. Understand the processes of scientific inquiry and technological design to investigate questions, conduct experiments, and solve problems.	A. Know and apply the concepts, principles and processes of scientific inquiry.	11.A.3a Formulate hypotheses that can be tested by collecting data.	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X	X	X	X	X	X	X	X	X		
		11.A.3b Conduct scientific experiments that control all but one variable.	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X	X	X	X	X	X	X	X	X	X	
		11.A.3c Collect and record data accurately using consistent measuring and recording techniques and media.	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X	X	X	X	X	X	X	X	X	X	X
		11.A.3d Explain the existence of unexpected results in a data set.	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X	X	X	X	X	X	X	X	X	X
		11.A.3e Use data manipulation tools and quantitative (e.g. mean, mode, simple equations) and representational methods (e.g., simulations, image processing) to analyze measurements.	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X	X	X	X	X	X	X	X	X	X
		11.A.3f Interpret and represent results of analysis to produce findings.	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X	X	X	X	X	X	X	X	X	X
		11.A.3g Report and display the process and results of a scientific investigation.	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X	X	X	X	X	X	X	X	X	X
		B. Know and apply the concepts, principles and processes of technological design.	11.B.3a Identify an actual design problem and establish criteria for determining the success of a solution.																				

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		<b>11.B.3b</b> Sketch, propose and compare design solutions to the problem considering available materials, tools, cost effectiveness and safety.																				
		<b>11.B.3c</b> Select the most appropriate design and build a prototype or simulation.																				
		<b>11.B.3d</b> Test the prototype using available materials, instruments and technology and record the data.																				
		<b>11.B.3e</b> Evaluate the test results based on established criteria, note sources of error and recommend improvements.																				
		<b>11.B.3f</b> Using available technology, report the relative success of the design based on the test results and criteria.																				
<b>12.</b> Understand the fundamental concepts, principles and interconnections of the life, physical, and earth/space sciences.	<b>A.</b> Know and apply concepts that explain how living things function, adapt, and change.	<b>12.A.3a</b> Explain how cells function as "building blocks" of organisms and describe the requirements for cells to live.																				
		<b>12.A.3b</b> Compare characteristics of organisms produced from a single parent with those of organisms produced by two parents.																				
		<b>12.A.3c</b> Compare and contrast how different forms and structures reflect different functions (e.g., similarities and differences among animals that fly, walk or swim; structures of plant cells and animal cells.																				

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	B. Know and apply concepts that describe how living things interact with each other and with their environment.	12.B.3a Identify and classify biotic and abiotic factors in an environment that affect population density, habitat and placement of organisms in an energy pyramid.																				
		12.B.3b Compare and assess features of organisms for their adaptive, competitive and survival potential (e.g., appendages, reproductive rates, camouflage, defensive structures).																				
	C. Know and apply concepts that describe properties of matter and energy and the interactions between them.	12.C.3a Explain interactions of energy with matter including changes of state and conservation of mass and energy.		X X	X X	X X	X X	X X													X	X
		12.C.3b Model and describe the chemical and physical characteristics of matter (e.g., atom, molecules, elements, compounds, mixtures).					X X	X X	X X	X X	X X	X X										
	D. Know and apply concepts that describe force and motion and the principles that explain them.	12.D.3a Explain and demonstrate how forces affect motion (e.g., action/reaction, equilibrium conditions, free-falling objects).													X	X	X					X
		12.D.3b Explain the factors that affect the gravitational forces on objects (e.g., changes in mass, distance).																				
	E. Know and apply concepts that describe the features and processes of the Earth and its resources.	12.E.3a Analyze and explain large-scale dynamic forces, events and processes that affect the Earth's land, water and atmospheric systems (e.g., jetstream, hurricanes, plate tectonics).																				

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			IPS8 Ch. 1	IPS8 Ch. 2	IPS8 Ch. 3	IPS8 Ch. 4	IPS8 Ch. 5	IPS8 Ch. 6	IPS8 Ch. 7	IPS8 Ch. 8	IPS8 Ch. 9	IPS8 Ch. 10	Ch. 11	Ch. 12	Ch. 1	Ch. 2	Ch. 3	Ch. 4	Ch. 5	Ch. 6	Ch. 7
		<b>12.E.3b</b> Describe interactions between solid earth, oceans, atmosphere and organisms that have resulted in ongoing changes of Earth (i.e., erosion, El Nino)																			
		<b>12.E.3c</b> Evaluate the biodegradability of renewable and nonrenewable natural resources.																			
	<b>F.</b> Know and apply concepts that explain the composition and structure of the universe and Earth's place in it.	<b>12.F.3a</b> Simulate, analyze and explain the effects of gravitational force in the solar system (e.g., orbital shape and speed, tides, spherical shape of the planets and moons).																			
		<b>12.F.3b</b> Describe the organization and physical characteristics of the solar system (e.g., sun, planets, satellites, asteroids, comets).																			
<b>13.</b> Understand the relationship among science, technology and society in historical and contemporary contexts.	<b>A.</b> Know and apply the accepted practices of science.	<b>13.A.3a</b> Identify and reduce potential hazards in science activities (e.g., ventilation, handling chemicals).	X X	X X	X X	X X	X X	X X	X X	X X	X X	X X	X	X	X	X	X			X	X
		<b>13.A.3b</b> Analyze historical and contemporary cases in which the work of science has been affected by both valid and biased scientific practices.							X X		X X				X		X				
		<b>13.A.3c</b> Explain what is similar and different about observational and experimental investigations.										X									

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	B. Know and apply the concepts that describe the interaction between science, technology and society.	13.B.3a Identify and explain ways that scientific knowledge and economics drive technological development.																			
		13.B.3b Identify important contributions to science and technology that have been made by individuals and groups from various cultures.																			
		13.B.3c Describe how occupations use scientific and technological knowledge and skills.																			
		13.B.3d Analyze the interaction of resource acquisition, technological development and ecosystem impact (e.g., diamond, coal, or gold mining; deforestation).																			
		13.B.3e Identify advantages and disadvantages of natural resource conservation and management programs.																			
		13.B.3f Apply classroom-developed criteria to determine the effects of policies on local science and technology issues (e.g., energy consumption, landfills, water quality).																			