

Active Physics Correlation to the Illinois Standards (Early High School)

<p>"X" = Coverage Secondary concept of the activity or problem. Students gain a basic understanding or introduction of the concept.</p> <p>"XX" = In-depth Coverage Primary concept that is the focus of the activity or problem. Students gain thorough understanding of the concept.</p>	Communication			Home			Medicine			Predictions			Sports			Transportation		
	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

STATE GOAL 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.4a Formulate hypotheses referencing prior research and knowledge.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
11.A.4b Conduct controlled experiments or simulations to test hypotheses.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
11.A.4c Collect, organize and analyze data accurately and precisely.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
11.A.4d Apply statistical methods to the data to reach and support conclusions.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
11.A.4e Formulate alternative hypotheses to explain unexpected results.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
11.A.4f Using available technology, report, display and defend to an audience conclusions drawn from investigations.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX

B. Know and apply the concepts, principles and processes of technological design.

11.B.4a Identify a technological design problem inherent in a commonly used product.		X		X													X	
11.B.4b Propose and compare different solution designs to the design problem based upon given constraints including available tools, materials and time.		X		X													XX	
11.B.4c Develop working visualizations of the proposed solution designs (e.g., blueprints, schematics, flowcharts, cad-cam, animations).				XX													XX	

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11.B.4d Determine the criteria upon which the designs will be judged, identify advantages and disadvantages of the designs and select the most promising design.				XX													XX	
11.B.4e Develop and test a prototype or simulation of the solution design using available materials, instruments and technology.				XX													XX	
11.B.4f Evaluate the test results based on established criteria, note sources of error and recommend improvements.				X													X	
11.B.4g Using available technology, report to an audience the relative success of the design based on the test results and criteria.				XX													XX	

STATE GOAL 12: Understand the fundamental concepts, principles and interconnections of the life, physical and earth/space sciences.

A. Know and apply concepts that explain how living things function, adapt and change.

12.A.4a Explain how genetic combinations produce visible effects and variations among physical features and cellular functions of organisms.																		
12.A.4b Describe the structures and organization of cells and tissues that underlie basic life functions including nutrition, respiration, cellular transport, biosynthesis and reproduction.																		
12.A.4c Describe processes by which organisms change over time using evidence from comparative anatomy and physiology, embryology, the fossil record, genetics and biochemistry.																		

B. Know and apply concepts that describe how living things interact with each other and with their environment.

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12.B.4a Compare physical, ecological and behavioral factors that influence interactions and interdependence of organisms.																		
12.B.4b Simulate and analyze factors that influence the size and stability of populations within ecosystems (e.g., birth rate, death rate, predation, migration patterns).																		
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					
12.C.3b Model and describe the chemical and physical characteristics of matter (e.g., atoms, molecules, elements, compounds, mixtures).										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).																		
12.D.3b Explain the factors that affect the gravitational forces on objects (e.g., changes in mass, distance).											X	XX	XX	XX	XX	XX	XX	XX
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., jet stream, hurricanes, plate tectonics).													X	XX	XX	XX	XX	XX
12.E.3b Describe interactions between solid earth, oceans, atmosphere and organisms that have resulted in ongoing changes of Earth (e.g., erosion, El Nino).																		

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12.E.3c Evaluate the biodegradability of renewable and nonrenewable natural resources.																		
F. Know and apply concepts that explain the composition and structure of the universe and Earth's place in it.																		
12.F.3a 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).																		
12.F.3b Describe the organization and physical characteristics of the solar system (e.g., sun, planets, satellites, asteroids, comets).																		
STATE GOAL 13: Understand the relationships among science, technology and society in historical and contemporary contexts.																		
A. Know and apply the accepted practices of science.																		
13.A.4a Estimate and suggest ways to reduce the degree of risk involved in science activities.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
13.A.4b Assess the validity of scientific data by analyzing the results, sample set, sample size, similar previous experimentation, possible misrepresentation of data presented and potential sources of error.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
13.A.4c Describe how scientific knowledge, explanations and technological designs may change with new information over time (e.g., the understanding of DNA, the design of computers).			X	X			X	X	X	X					X	X	X	
13.A.4d Explain how peer review helps to assure the accurate use of data and improves the scientific process.	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
B. Know and apply concepts that describe the interaction between science, technology and society.																		

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13.B.4a Compare and contrast scientific inquiry and technological design as pure and applied sciences.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
13.B.4b Analyze a particular occupation to identify decisions that may be influenced by a knowledge of science.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
13.B.4c Analyze ways that resource management and technology can be used to accommodate population trends.				XX														
13.B.4d Analyze local examples of resource use, technology use or conservation programs; document findings; and make recommendations for improvements.																		
13.B.4e Evaluate claims derived from purported scientific studies used in advertising and marketing strategies.										XX								