

Glencoe Biology correlated to Illinois state standards

STATE GOAL 11: Understand the processes of scientific inquiry and technological design to investigate questions, conduct experiments and solve problems.		
Why This Goal Is Important: The inquiry process prepares learners to engage in science and apply methods of technological design. This understanding will enable students to pose questions, use models to enhance understanding, make predictions, gather and work with data, use appropriate measurement methods, analyze results, draw conclusions based on evidence, communicate their methods and results, and think about the implications of scientific research and technological problem solving.		
A. Know and apply the concepts, principles and processes of scientific inquiry.		
Early High School		
11.A.4a	Formulate hypotheses referencing prior research and knowledge.	SE: Utilized Throughout the Text, for example: 16-21, 173, 519, 590 TWE: 183, 403, 728
11.A.4b	Conduct controlled experiments or simulations to test hypotheses.	SE: Utilized Throughout the Text, for example: 16-21, 51, 173, 235 TWE: 18, 402, 653, 728
11.A.4c	Collect, organize and analyze data accurately and precisely.	SE: Utilized Throughout the Text, for example: 16-21, 83, 259, 396 TWE: 20, 129
11.A.4d	Apply statistical methods to the data to reach and support conclusions.	SE: Utilized Throughout the Text, for example: 217, 420, 590, 646
11.A.4e	Formulate alternative hypotheses to explain unexpected results.	SE: 567, 593 TWE: 403
11.A.4f	Using available technology, report, display and defend to an audience conclusions drawn from investigations.	SE: 653, 983, 1011 TWE: 923
B. Know and apply the concepts, principles and processes of technological design.		
Early High School		
11.B.4a	Identify a technological design problem inherent in a commonly used product.	SE: 378 TWE: 184
11.B.4b	Propose and compare different solution designs to the design problem based upon given constraints including available tools, materials and time.	SE: 51, 235, 783
11.B.4c	Develop working visualizations of the proposed solution designs (e.g., blueprints, schematics, flowcharts, cad-cam,	SE: 1011

	animations).	
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.	SE: 1011
11.B.4e	Develop and test a prototype or simulation of the solution design using available materials, instruments and technology.	SE: 381
11.B.4f	Evaluate the test results based on established criteria, note sources of error and recommend improvements.	SE: Utilized Throughout the Text, for example: 235, 259, 533, 975
11.B.4g	Using available technology, report to an audience the relative success of the design based on the test results and criteria.	SE: 1011
STATE GOAL 12: Understand the fundamental concepts, principles and interconnections of the life, physical and earth/space sciences.		
Why This Goal Is Important: This goal is comprised of key concepts and principles in the life, physical and earth/space sciences that have considerable explanatory and predictive power for scientists and non-scientists alike. These ideas have been thoroughly studied and have stood the test of time. Knowing and being able to apply these concepts, principles and processes help students understand what they observe in nature and through scientific experimentation. A working knowledge of these concepts and principles allows students to relate new subject matter to material previously learned and to create deeper and more meaningful levels of understanding.		
A. Know and apply concepts that explain how living things function, adapt and change.		
EARLY HIGH SCHOOL		
12.A.4a	Explain how genetic combinations produce visible effects and variations among physical features and cellular functions of organisms.	SE: 270-276, 277-282, 283-285, 296-301, 302-310, 311, 313-315, 326-332, 333-335, 336-338, 340-341, 342-349, 360-362, 363-371, 372-376, 378-379 TWE: 275, 280, 283, 296, 298, 299, 302, 303, 304, 305, 308, 309, 338, 346, 347
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.	SE: 182-186, 187-190, 191, 193-200, 201-207, 218-221, 222-224, 225-227, 228-233, 244-247, 248, 250-252, 253-257 TWE: 185, 187, 188, 193, 225, 230, 244,

		248, 249, 250
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.	SE: 277-282, 283-285, 392-396, 398-400, 401-407, 418-420, 422, 423-430, 431-441, 452-453, 455-460, 461-466, 467-473, 490-496, 498 TWE: 392, 402, 404, 405, 423, 424, 426, 427, 428, 439, 470, 471, 491, 492, 493
B. Know and apply concepts that describe how living things interact with each other and with their environment.		
EARLY HIGH SCHOOL		
12.B.4a	Compare physical, ecological and behavioral factors that influence interactions and interdependence of organisms.	SE: 32-40, 41-44, 45-49, 65-66, 68-73, 74-81, 116-121, 129-131, 133-135 TWE: 38, 41, 44, 65, 68, 78
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).	SE: 60-64, 92, 94-99, 100-105, 116-121, 122-128 TWE: 61, 92, 100, 102, 105, 123, 126
C. Know and apply concepts that describe properties of matter and energy and the interactions between them.		
EARLY HIGH SCHOOL		
12.C.4a	Use kinetic theory, wave theory, quantum theory and the laws of thermodynamics to explain energy transformations.	SE: 218-221 TWE: 219
12.C.4b	Analyze and explain the atomic and nuclear structure of matter.	SE: 148-155 TWE: 148, 149, 151, 153
D. Know and apply concepts that describe force and motion and the principles that explain them.		
EARLY HIGH SCHOOL		
12.D.4b	Describe the effects of electromagnetic and nuclear forces including atomic and molecular bonding, capacitance and nuclear reactions.	SE: 152-155 TWE: 152, 153
STATE GOAL 13: Understand the relationships among science, technology and society in historical and contemporary contexts.		

Why This Goal Is Important: Understanding the nature and practices of science such as ensuring the validity and replicability of results, building upon the work of others and recognizing risks involved in experimentation gives learners a useful sense of the scientific enterprise. In addition, the relationships among science, technology and society give humans the ability to change and improve their surroundings. Learners who understand this relationship will be able to appreciate the efforts and effects of scientific discovery and applications of technology on their own lives and on the society in which we live.

A. Know and apply the accepted practices of science.

EARLY HIGH SCHOOL

13.A.4a	Estimate and suggest ways to reduce the degree of risk involved in science activities.	SE: 21 TWE: 21, 23, 51, 107, 137, 154, 159, 173, 235, 259, 381, 409, 443, 567, 583, 593, 623, 653, 672, 681, 717, 725, 748, 761, 783, 871, 899, 935, 991, 1019, 1039, 1075, 1093
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.	SE: Utilized Throughout the Text, for example: 11-15, 533, 623, 681 TWE: 18
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).	SE: 4-10, 11-15, 363-371 TWE: 326, 330, 370, 374, 375
13.A.4d	Explain how peer review helps to assure the accurate use of data and improves the scientific process.	SE: Utilized Throughout the Text, for example: 11-15, 209, 623, 783 TWE: 407

B. Know and apply concepts that describe the interaction between science, technology and society.

EARLY HIGH SCHOOL

13.B.4a	Compare and contrast scientific inquiry and technological design as pure and applied sciences.	SE: 5-6
13.B.4b	Analyze a particular occupation to identify decisions that may be influenced by a knowledge of science.	SE: Utilized Throughout the Text, for example: 372-376, 378-379, 622, 782, 1038 TWE: 106, 375, 622, 782
13.B.4c	Analyze ways that resource management and technology can be used to accommodate population trends.	SE: 92, 94-99, 100-105, 106, 107

		TWE: 95
13.B.4d	Analyze local examples of resource use, technology use or conservation programs; document findings; and make recommendations for improvements.	SE: 129-131, 133-135, 136, 137 TWE: 50, 129, 131, 133
13.B.4e	Evaluate claims derived from purported scientific studies used in advertising and marketing strategies.	SE: 14, 1111 TWE: 1028, 1030