Glencoe

Science State Goals: 11-13
Middle/Junior High School

Illinois

Science

LEVEL GREEN

STANDARDS	PAGE REFERENCES
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.	
11.A.3a Formulate hypotheses that can be tested by collecting data.	**Student Edition:** 14 *Lab* 108-109, 354-355, 550-551, 610-611 **Teacher Wraparound Edition:** AC 15; DIF 15 **Teacher Resources:** *Weather* 9-11 *Support, Movement, and Responses* 13-15

Codes used for Teacher Wraparound Edition pages are the initial caps of headings on that page.

STANDARDS	PAGE REFERENCES
11.A.3b Conduct scientific experiments that control all but one variable.	**Student Edition:** 16-17 *Lab* 108-109, 167, 424-425, 550-551 **Teacher Wraparound Edition:** AIL 424; AS 551 **Teacher Resources:** *Weather* 9-11 *Adaptations Over Time* 11-14 *Support, Movement, and Responses* 13-15
11.A.3c Collect and record data accurately using consistent measuring and recording techniques and media.	**Student Edition:** *Lab* 48-49, 108-109, 167, 168-169, 354-355, 488-489, 550-551, 582-583 *MiniLab* 507, 596 **Teacher Wraparound Edition:** AS 583; IL 128; LD 596 **Teacher Resources:** *The Nature of Science* 9-10 *Atmosphere* 9-10, 11-12 *Properties and Changes of Matter* 13-16 *Substances, Mixtures, and Solubility* 13-15
11.A.3d Explain the existence of unexpected results in a data set.	This standard can be addressed in discussion using the following pages: **Student Edition:** *Lab* 108-109, 168-169, 354-355, 488-489, 550-551, 642-643 **Teacher Wraparound Edition:** AS 583; IL 128; LD 596 **Teacher Resources:** *The Nature of Science* 9-10 *Atmosphere* 9-10, 11-12 *Properties and Changes of Matter* 13-16 *Substances, Mixtures, and Solubility* 13-15

STANDARDS	PAGE REFERENCES
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.	**Student Edition:** *Lab* 138-139, 168-169, 313, 354-355, 488-489 *Technology Skill Handbook* 774 **Teacher Wraparound Edition:** CYD 169, 489, 633 **Teacher Resources:** *Atmosphere* 11-12 *Cell Processes* 11-14 *Support, Movement, and Responses* 9-12 *Substances, Mixtures, and Solubility* 13-15
11.A.3f Interpret and represent results of analysis to produce findings.	**Student Edition:** *Lab* 108-109, 167, 168-169, 354-355, 424-425, 488-489, 550-551, 582-583 **Teacher Wraparound Edition:** CYD 109, 167 **Teacher Resources:** *Weather* 9-11 *Adaptations Over Time* 11-14 *Support, Movement, and Responses* 13-15
11.A.3g Report and display the process and results of a scientific investigation.	**Student Edition:** *Lab* 108-109, 167, 168-169, 354-355, 424-425, 488-489, 550-551, 582-583 *Technology Skill Handbook* 775 **Teacher Wraparound Edition:** CYD 109, 167 **Teacher Resources:** *Weather* 9-11 *Adaptations Over Time* 11-14 *Support, Movement, and Responses* 13-15

STANDARDS	PAGE REFERENCES
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.	This standard can be addressed in discussion using the following pages: **Student Edition:** *Lab* 138-139, 202-203, 582-583, 674-675 *Oops! Accidents in Science* 460 **Teacher Wraparound Edition:** AS 583; IN 460 **Teacher Resources:** *Climate* 13-16 *Earth in Space* 13-15 *Energy and Energy Resources* 11-14 *States of Matter* 28
11.B.3b Sketch, propose and compare design solutions to the problem considering available materials, tools, cost effectiveness and safety.	This standard can be addressed in discussion using the following pages: **Student Edition:** *Lab* 138-139, 202-203, 582-583, 674-675 *Oops! Accidents in Science* 460 **Teacher Wraparound Edition:** AS 583; IN 460 **Teacher Resources:** *Climate* 13-16 *Earth in Space* 13-15 *Energy and Energy Resources* 11-14 *States of Matter* 28, 29
11.B.3c Select the most appropriate design and build a prototype or simulation.	This standard can be addressed in discussion using the following pages: **Student Edition:** *Lab* 138-139, 202-203, 582-583, 674-675 *Oops! Accidents in Science* 460 **Teacher Wraparound Edition:** AS 583; IN 460 **Teacher Resources:** *Climate* 13-16 *Earth in Space* 13-15 *Energy and Energy Resources* 11-14 *States of Matter* 28, 29

STANDARDS	PAGE REFERENCES
11.B.3d Test the prototype using available materials, instruments and technology and record the data.	This standard can be addressed in discussion using the following pages: **Student Edition:** *Lab* 138-139, 202-203, 582-583, 674-675 *Oops! Accidents in Science* 460 **Teacher Wraparound Edition:** AS 583; IN 460 **Teacher Resources:** *Climate* 13-16 *Earth in Space* 13-15 *Energy and Energy Resources* 11-14 *States of Matter* 28, 29
11.B.3e Evaluate the test results based on established criteria, note sources of error and recommend improvements.	This standard can be addressed in discussion using the following pages: **Student Edition:** *Lab* 138-139, 202-203, 582-583, 674-675 *Oops! Accidents in Science* 460 **Teacher Wraparound Edition:** AS 583; IN 460 **Teacher Resources:** *Climate* 13-16 *Earth in Space* 13-15 *Energy and Energy Resources* 11-14 *States of Matter* 28, 29
11.B.3f Using available technology, report the relative success of the design based on the test results and criteria.	This standard can be addressed in discussion using the following pages: **Student Edition:** *Lab* 138-139, 202-203, 582-583, 674-675 *Oops! Accidents in Science* 460 **Teacher Wraparound Edition:** AS 583; IN 460 **Teacher Resources:** *Climate* 13-16 *Earth in Space* 13-15 *Energy and Energy Resources* 11-14 *States of Matter* 28, 29

STANDARDS	PAGE REFERENCES
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.	
12.A.3a Explain how cells function as "building blocks" of organisms and describe the requirements for cells to live.	**Student Edition:** 214, 216-217, 221, 224-230, 261 *Lab* 231 **Teacher Wraparound Edition:** TTPK 221; UAA 227 **Teacher Resources:** *Life's Structure and Classification* 35, 50, 53-54
12.A.3b Compare characteristics of organisms produced from a single parent with those of organisms produced by two parents.	**Student Edition:** 216, 281-282, 284-287 *Self-Check* 282 (#2), 289 (#4) **Teacher Wraparound Edition:** LD 280; SJ 281 **Teacher Resources:** *Cell Reproduction* 26, 28
12.A.3c 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).	**Student Edition:** 152-155, 226-227, 338-339, 348 *Lab* 231 *MiniLab* 351 *Self-Check* 230 (#3) **Teacher Wraparound Edition:** MAM 154; VL 227, 348 **Teacher Resources:** *Climate* 49 *Life's Structure and Classification* 29, 53

STANDARDS	PAGE REFERENCES
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.	**Student Edition:** 532-537, 540-541, 547 *Lab* 550-551 *Self-Check* 537 (#1) **Teacher Wraparound Edition:** DIF 533, 541, 547; SJ 534; TFYI 533 **Teacher Resources:** *Interactions of Living Things* 9-12, 13-15, 27, 28, 49
12.B.3b Compare and assess features of organisms for their adaptive, competitive and survival potential (e.g., appendages, reproductive rates, camouflage, defensive structures).	**Student Edition:** 152-155, 338-339 *Lab* 342 *MiniLab* 351 *Self-Check* 155 (#3) **Teacher Wraparound Edition:** DIF 153; FF 153; MAM 154; UAA 153 **Teacher Resources:** *Adaptations Over Time* 11-14, 25, 29, 42 *Climate* 49
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.	**Student Edition:** 601, 609, 657-659, 661-664, 722 *Lab* 665 *MiniLab* 662 *National Geographic* 660 *Science Online* 661, 663 *Self-Check* 609 (#3) **Teacher Wraparound Edition:** AC 660 **Teacher Resources:** *States of Matter* 9-10, 18

STANDARDS	PAGE REFERENCES
12.C.3b Model and describe the chemical and physical characteristics of matter (e.g., atoms, molecules, elements, compounds, mixtures).	**Student Edition:** 246-251, 620-625 *Self-Check* 253 (#1, 5) **Teacher Wraparound Edition:** DIF 247; MAM 621; QD 249 **Teacher Resources:** *Cell Processes* 17, 25 *Solutions, Mixtures, and Solubility* 49
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).	**Student Edition:** 684-689, 690-693, 694-698, 700, 702-705 *Lab* 701, 706-707 *MiniLab* 704 *National Geographic* 699 **Teacher Wraparound Edition:** IM 703; LD 687; VL 691 **Teacher Resources:** *Newton's Laws of Motion* 9-12, 13-15, 27-31, 51
12.D.3b Explain the factors that affect the gravitational forces on objects (e.g., changes in mass, distance).	**Student Edition:** 696, 704-705 *Science Online* 697 **Teacher Wraparound Edition:** TFYI 696 **Teacher Resources:** *Newton's Laws of Motion* 9-12
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).	**Student Edition:** 99-102, 103-104, 106-107, 126-130, 148-151, 152-153 *MiniLab* 149 *National Geographic* 131 **Teacher Wraparound Edition:** CC 149; TFYI 106 **Teacher Resources:** *Atmosphere* 43 *Climate* 9-11, 32

STANDARDS	PAGE REFERENCES
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).	**Student Edition:** 96-97, 156-157, 160-166, 570-571, 575 *Lab* 167, 577 *MiniLab* 157 *National Geographic* 158-159 *Science Online* 163 **Teacher Wraparound Edition:** CB 159; IM 160; TFYI 575 **Teacher Resources:** *Climate* 29 *Conserving Resources* 45
12.E.3c Evaluate the biodegradability of renewable and nonrenewable natural resources.	This standard can be addressed in discussion using the following pages: **Student Edition:** 560-566, 575-576, 578-581 **Teacher Wraparound Edition:** QD 575 **Teacher Resources:** *Conserving Resources* 9-12, 13-16
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).	**Student Edition:** 179-180, 181, 185-188 *Applying Science* 197 *Self-Check* 183 (#1) **Teacher Wraparound Edition:** IL 198 **Teacher Resources:** *Earth in Space* 49-50, 51
12.F.3b Describe the organization and physical characteristics of the solar system (e.g., sun, planets, satellites, asteroids, comets).	**Student Edition:** 183, 194-201 *Science Online* 198 *Time: Science and Society* 204 **Teacher Wraparound Edition:** CFU 201; DIF 195, 200; MAM 195 **Teacher Resources:** *Earth in Space* 21, 22, 29

STANDARDS	PAGE REFERENCES
12.F.3c Compare and contrast the sun as a star with other objects in the Milky Way Galaxy (e.g., nebulae, dust clouds, stars, black holes).	This standard can be addressed in discussion using the following pages: **Student Edition:** 194-201 *Integrate Astronomy* 605
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.	
13.A.3a Identify and reduce potential hazards in science activities (e.g., ventilation, handling chemicals).	**Student Edition:** *Lab* 108-109, 390-391, 411, 599, 642-643 *Science Skill Handbook* 757-759 **Teacher Wraparound Edition:** 19T-21T **Teacher Resources:** *The Nature of Science* 9-10 *Minerals* 11-12 *Digestion, Respiration, and Excretion* 9-11 *Support, Movement, and Responses* 13-15 *States of Matter* 11-13 *Properties and Changes of Matter* 13-16
13.A.3b Analyze historical and contemporary cases in which the work of science has been affected by both valid and biased scientific practices.	**Student Edition:** 221, 307-308, 335 *National Geographic* 15, 309 *Time: Science and History* 392 *Time: Science and Society* 140 **Teacher Wraparound Edition:** CC 293; VH 15 **Teacher Resources:** *Earth in Space* 30 *Life's Structure and Classification* 33 *Circulation and Immunity* 33

STANDARDS	PAGE REFERENCES
13.A.3c Explain what is similar and different about observational and experimental investigations.	This standard can be addressed in discussion using the following pages: **Student Edition:** 6-11, 12-14, 16-18 *Lab* 20-21, 108-109, 354-355, 538, 550-551, 577 *Launch Lab* 5 *National Geographic* 15 *Science Online* 16 **Teacher Wraparound Edition:** IL 16 **Teacher Resources:** *The Nature of Science* 9-10
B. Know and apply 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.	**Student Edition:** 9, 321-323, 562-566, 730-737 *Integrate Environment* 322 *National Geographic* 222-223, 567 *Oops! Accidents in Science* 460 *Self-Check* 11 (#6) **Teacher Wraparound Edition:** CD 322; QD 9; TFYI 322 **Teacher Resources:** *Heredity* 28, 42 *Energy and Energy Resources* 29, 30
13.B.3b Identify important contributions to science and technology that have been made by individuals and groups from various cultures.	**Student Edition:** 61, 218-219, 221, 291, 307, 335-337, 381 *National Geographic* 15, 383 *Time: Science and History* 50, 238, 392 *Time: Science and Society* 426 **Teacher Wraparound Edition:** CB 223; CC 671; CDIV 188; TFYI 668 **Teacher Resources:** *Climate* 32 *Earth in Space* 32 *Life's Structure and Classification* 33 *States of Matter* 30

STANDARDS	PAGE REFERENCES
13.B.3c Describe how occupations use scientific and technological knowledge and skills.	**Student Edition:** 6-11 *Integrate Career* 74, 161, 196, 263, 277, 317, 480, 534, 631 *National Geographic* 222-223 *Self-Check* 11 (#2) *Time: Science and Society* 708 **Teacher Wraparound Edition:** IC 74, 161, 196, 263, 277, 317, 480, 534, 631 **Teacher Resources:** *The Nature of Science* 25
13.B.3d Analyze the interaction of resource acquisition, technological development and ecosystem impact (e.g., diamond, coal or gold mining; deforestation).	**Student Edition:** 165, 562, 730 *MiniLab* 562 *Science Online* 165 **Teacher Wraparound Edition:** AS 562
13.B.3e Identify advantages and disadvantages of natural resource conservation and management programs.	**Student Edition:** 562-566, 578-581, 737 *Science Online* 580 **Teacher Wraparound Edition:** CFU 737; DIF 579; ISS 563 **Teacher Resources:** *Conserving Resources* 13-16, 29, 46
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).	This standard can be addressed in discussion using the following pages: **Student Edition:** 165, 321-323, 560-566, 578-581, 730-737 *Lab* 738-739 *MiniLab* 562 *Science Online* 165 **Teacher Wraparound Edition:** AS 562; DI 563; DIF 580; SJ 564; TFYI 571 **Teacher Resources:** *Conserving Resources* 9-12, 13-16, 29, 46