Mc Graw Hill Education

Alignment Guide

LIFE iSCIENCE

GLENCOE

Glencoe Science—Your Partner in Understanding and Implementing NGSS*

Ease the Transition to Next Generation Science Standards

Meeting NGSS

Glencoe Science helps ease the transition to Next Generation Science Standards (NGSS). Our middle school science programs ensure you are fully aligned to:

- Performance Expectations
- Science and Engineering Practices
- Disciplinary Core Ideas
- Crosscutting Concepts

We are committed to ensuring that you have the tools and resources necessary to meet the expectations for the next generation of science standards.

What is NGSS?

The purpose of the NGSS Framework is to act as the foundation for science education standards while describing a vision of what it means to be proficient in science. It emphasizes the importance of the practices of science where the content becomes a vehicle for teaching the processes of science.

Why NGSS?

The NGSS were developed in an effort to create unified standards in science education that consider content, practices, pedagogy, curriculum, and professional development. The standards provide all students with an internationally benchmarked education in science.

Correlation of NGSS Performance Expectations to Life Science

The Correlation Table lists a Performance Expectation that integrates a combination of Science and Engineering Practices, Discliplinary Core Ideas, and Crosscutting Concepts.

Performance Expectations

are tasks to evaluate student's knowledge. Each Performance Expectation is correlated to an Applying Practices activity written specifically for the purpose. These activities can be found in the resources for the section listed.

Science and Engineering Practices

are skills that scientists and engineers use in their work. Each Practice is correlated to a part of the Science and Engineering Practices Handbook, which can be found in the program resources.

Disciplinary Core Ideas

are the content knowledge students will need to learn. These are correlated to the main student text.

Crosscutting Concepts

are themes that appear throughout all branches of science and engineering. These are not directly correlated but are found implicitly in the other correlations listed on the page.

Find it here!

Code	Title/Text	Location
MS-LS1	**From Molecules to Organisms: Structures and Processes**	
MS-LS1-1	**Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.** Clarification Statement: Emphasis is on developing evidence that living things are made of cells, distinguishing between living and non-living things, and understanding that living things may be made of one cell or many and varied cells.	Refer to the Project-Based Activity titled "It's Alive! Or is it?"
The performance expectation above was developed using the following elements from the NRC document *A Framework for K-12 Science Education:*		
Science and Engineering Practices		
	Planning and Carrying Out Investigations Planning and carrying out investigations in 6-8 builds on K-5 experiences and progresses to include investigations that use multiple variables and provide evidence to support explanations or solutions.	
	• Conduct an investigation to produce data to serve as the basis for evidence that meet the goals of an investigation.	**Student Edition:** Launch Lab 9, 43, 707 MiniLab 54, 103 Skill Practice 59 Lab 106-107
Disciplinary Core Ideas		
LS1.A	**Structure and Function**	
	• All living things are made up of cells, which is the smallest unit that can be said to be alive. An organism may consist of one single cell (unicellular) or many different numbers and types of cells (multicellular).	**Student Edition:** 10, 44, 98-100 **Teacher Edition:** GQ 10, 43, 99; SCB 40E; VL 99
Crosscutting Concepts		
	Scale, Proportion, and Quantity	
	• Phenomena that can be observed at one scale may not be observable at another scale.	**Student Edition:** Launch Lab 43 MiniLab 54 Skill Practice 59
	Connections to Engineering, Technology and Applications of Science **Interdependence of Science, Engineering, and Technology**	
	• Engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered systems.	**Student Edition:** Launch Lab 43 Skill Practice 59

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LOCATION ABBREVIATION KEY

AC	Activity	**FF**	Fun Fact	**RS**	Reading Strategy	**TA**	Technology Activity
CD	Cultural Diversity	**GQ**	Guiding Questions	**RWS**	Real-World Science	**TD**	Teacher Demo
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DI	Differentiated Instruction	**MS**	Math Skills				

Life iScience continued

Code	Title/Text	Location
MS-LS1	**From Molecules to Organisms: Structures and Processes** *continued*	
MS-LS1-2	**Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.** **Clarification Statement:** Emphasis is on the cell functioning as a whole system and the primary role of identified parts of the cell, specifically the nucleus, chloroplasts, mitochondria, cell membrane, and cell wall. **Assessment Boundary:** Assessment of organelle structure/function relationships is limited to the cell wall and cell membrane. Assessment of the function of the other organelles is limited to their relationship to the whole cell. Assessment does not include the biochemical function of cells or cell parts.	Refer to the Project-Based Activity titled "Engineering a Cell"
The performance expectation above was developed using the following elements from the NRC document *A Framework for K-12 Science Education:*		
Science and Engineering Practices		
	Developing and Using Models Modeling in 6-8 builds on K-5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems.	
	• Develop and use a model to describe phenomena.	**Student Edition:** Launch Lab 61 MiniLab 54, 63 **Teacher Edition:** TD 55, 61
Disciplinary Core Ideas		
LS1.A	**Structure and Function**	
	• Within cells, special structures are responsible for particular functions, and the cell membrane forms the boundary that controls what enters and leaves the cell.	**Student Edition:** 51-57, 61-64 **Teacher Edition:** DI 53, 57; GQ 52, 55, 56, 57; VL 52, 53, 56, 57
Crosscutting Concepts		
	Structure and Function	
	• Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the relationships among its parts, therefore complex natural structures/systems can be analyzed to determine how they function.	**Student Edition:** Launch Lab 61 MiniLab 54, 63 **Teacher Edition:** TD 55

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Life iScience continued

Code	Title/Text	Location
MS-LS1	**From Molecules to Organisms: Structures and Processes** *continued*	
MS-LS1-3	**Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.** **Clarification Statement:** Emphasis is on the conceptual understanding that cells form tissues and tissues form organs specialized for particular body functions. Examples could include the interaction of subsystems within a system and the normal functioning of those systems. **Assessment Boundary:** Assessment does not include the mechanism of one body system independent of others. Assessment is limited to the circulatory, excretory, digestive, respiratory, muscular, and nervous systems.	Refer to the Project-Based Activity titled "The knee bone's connected to the..."
The performance expectation above was developed using the following elements from the NRC document *A Framework for K-12 Science Education:*		
Science and Engineering Practices		
	Engaging in Argument from Evidence Engaging in argument from evidence in 6-8 builds on K-5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world(s).	
	• Use an oral and written argument supported by evidence to support or refute an explanation or a model for a phenomenon.	**Student Edition:** MiniLab 103, 483 Lab 106-107
Disciplinary Core Ideas		
LS1.A	**Structure and Function**	
	• In multicellular organisms, the body is a system of multiple interacting subsystems. These subsystems are groups of cells that work together to form tissues and organs that are specialized for particular body functions.	**Student Edition:** 97, 99-104, 482-483, 497-501, 531-537, 541-546, 559-563, 567-573, 637-643 **Teacher Edition:** GQ 101, 102, 103, 104, 482, 497, 501, 531, 537, 542, 543, 546, 640; VL 482
Crosscutting Concepts		
	Systems and System Models	
	• Systems may interact with other systems; they may have sub-systems and be a part of larger complex systems.	**Student Edition:** 103-104, 482-483 MiniLab 103, 483 Lab 106-107 **Teacher Edition:** AC 97; DI 103
	Connections to Nature of Science **Science is a Human Endeavor**	
	• Scientists and engineers are guided by habits of mind such as intellectual honesty, tolerance of ambiguity, skepticism, and openness to new ideas.	Refer to the Project-Based Activity titled "The knee bone's connected to the..."

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Life iScience continued

Code	Title/Text	Location
MS-LS1	**From Molecules to Organisms: Structures and Processes** *continued*	
MS-LS1-4	**Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.** Clarification Statement: Examples of behaviors that affect the probability of animal reproduction could include nest building to protect young from cold, herding of animals to protect young from predators, and vocalization of animals and colorful plumage to attract mates for breeding. Examples of animal behaviors that affect the probability of plant reproduction could include transferring pollen or seeds, and creating conditions for seed germination and growth. Examples of plant structures could include bright flowers attracting butterflies that transfer pollen, flower nectar and odors that attract insects that transfer pollen, and hard shells on nuts that squirrels bury.	Refer to the Project-Based Activity titled "The Burrs and the Bees"
The performance expectation above was developed using the following elements from the NRC document *A Framework for K-12 Science Education:*		
Science and Engineering Practices		
	Engaging in Argument from Evidence Engaging in argument from evidence in 6-8 builds on K-5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world(s).	
	• Use an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem.	**Student Edition:** Launch Lab 351 MiniLab 133, 452
Disciplinary Core Ideas		
LS1.B	**Growth and Development of Organisms**	
	• Animals engage in characteristic behaviors that increase the odds of reproduction.	**Student Edition:** 127, 451, 460-461, 463 **Teacher Edition:** GQ 461
	• Plants reproduce in a variety of ways, sometimes depending on animal behavior and specialized features for reproduction.	**Student Edition:** 351-358 **Teacher Edition:** GQ 350, 351, 358
Crosscutting Concepts		
	Cause and Effect	
	• Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability.	**Teacher Edition:** TD 449

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Life iScience continued

Code	Title/Text	Location
MS-LS1	**From Molecules to Organisms: Structures and Processes** *continued*	
MS-LS1-5	**Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.** **Clarification Statement:** Examples of local environmental conditions could include availability of food, light, space, and water. Examples of genetic factors could include large breed cattle and species of grass affecting growth of organisms. Examples of evidence could include drought decreasing plant growth, fertilizer increasing plant growth, different varieties of plant seeds growing at different rates in different conditions, and fish growing larger in large ponds than they do in small ponds. **Assessment Boundary:** Assessment does not include genetic mechanisms, gene regulation, or biochemical processes.	Refer to the Project-Based Activity titled "Ready, Set, Grow!"
The performance expectation above was developed using the following elements from the NRC document *A Framework for K-12 Science Education:*		
Science and Engineering Practices		
	Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in 6-8 builds on K-5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific knowledge, principles, and theories.	
	• Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.	**Student Edition:** MiniLab 743 Skill Practice 349 Lab 730-731, 802-803 **Teacher Edition:** DI 743; TD 297
Disciplinary Core Ideas		
LS1.B	**Growth and Development of Organisms**	
	• Genetic factors as well as local conditions affect the growth of the adult plant.	**Student Edition:** 707-709, 743 **Teacher Edition:** GQ 708
Crosscutting Concepts		
	Cause and Effect	
	• Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability.	**Student Edition:** Lab 802-803 **Teacher Edition:** DI 743

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Life iScience continued

Code	Title/Text	Location
MS-LS1	**From Molecules to Organisms: Structures and Processes** *continued*	
MS-LS1-6	**Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.** **Clarification Statement:** Emphasis is on tracing movement of matter and flow of energy. **Assessment Boundary:** Assessment does not include the biochemical mechanisms of photosynthesis.	Refer to the Project-Based Activity titled "Sun Block"
The performance expectation above was developed using the following elements from the NRC document *A Framework for K-12 Science Education:*		
Science and Engineering Practices		
	Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in 6-8 builds on K-5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific knowledge, principles, and theories.	
	• Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.	**Student Edition:** MiniLab 725
	Connections to Nature of Science **Scientific Knowledge is Based on Empirical Evidence**	
	• Science knowledge is based upon logical connections between evidence and explanations.	**Student Edition:** MiniLab 725
Disciplinary Core Ideas		
LS1.C	**Organization for Matter and Energy Flow in Organisms**	
	• Plants, algae (including phytoplankton), and many microorganisms use the energy from light to make sugars (food) from carbon dioxide from the atmosphere and water through the process of photosynthesis, which also releases oxygen. These sugars can be used immediately or stored for growth or later use.	**Student Edition:** 71-72, 266, 268, 334-335, 724, 760 **Teacher Edition:** GQ 14, 72, 266, 268, 334, 335; IM 704H; SCB 704F; VL 334, 335, 724
PS3.D	**Energy in Chemical Processes and Everyday Life**	
	• The chemical reaction by which plants produce complex food molecules (sugars) requires an energy input (i.e., from sunlight) to occur. In this reaction, carbon dioxide and water combine to form carbon-based organic molecules and release oxygen. *(secondary)*	**Student Edition:** 71-72, 334-335, 724, 760 **Teacher Edition:** GQ 72, 334; VL 724
Crosscutting Concepts		
	Energy and Matter	
	• Within a natural system, the transfer of energy drives the motion and/or cycling of matter.	**Student Edition:** 71-72, 333-335 MiniLab 725

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Life iScience continued

Code	Title/Text	Location
MS-LS1	**From Molecules to Organisms: Structures and Processes** *continued*	
MS-LS1-7	**Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.** **Clarification Statement:** Emphasis is on describing that molecules are broken apart and put back together and that in this process, energy is released. **Assessment Boundary:** Assessment does not include details of the chemical reactions for photosynthesis or respiration.	Refer to the Project-Based Activity titled "You Are What You Eat"
The performance expectation above was developed using the following elements from the NRC document *A Framework for K-12 Science Education:*		
Science and Engineering Practices		
	Developing and Using Models Modeling in 6-8 builds on K-5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems.	
	• Develop a model to describe unobservable mechanisms.	**Student Edition:** MiniLab 336, 532 **Teacher Edition:** TD 337
Disciplinary Core Ideas		
LS1.C	**Organization for Matter and Energy Flow in Organisms**	
	• Within individual organisms, food moves through a series of chemical reactions in which it is broken down and rearranged to form new molecules, to support growth, or to release energy.	**Student Edition:** 69-70, 336-337, 531-533, 535, 536, 725, 760-761 **Teacher Edition:** GQ 69, 70, 71, 72, 336, 532, 533, 725, 760; IM 40H, 330H; SCB 40F, 330E
PS3.D	**Energy in Chemical Processes and Everyday Life**	
	• Cellular respiration in plants and animals involve chemical reactions with oxygen that release stored energy. In these processes, complex molecules containing carbon react with oxygen to produce carbon dioxide and other materials. *(secondary)*	**Student Edition:** 69-70, 336-337, 725, 760-761 **Teacher Edition:** GQ 69, 71, 337, 725, 760; IM 40H, 330H; SCB 40F
Crosscutting Concepts		
	Energy and Matter	
	• Matter is conserved because atoms are conserved in physical and chemical processes.	Refer to the Project-Based Activity titled "You Are What You Eat"

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Life iScience continued

Code	Title/Text	Location
MS-LS1	**From Molecules to Organisms: Structures and Processes** *continued*	
MS-LS1-8	**Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.** Assessment Boundary: Assessment does not include mechanisms for the transmission of this information.	Refer to the Project-Based Activity titled "It Makes Sense!"
The performance expectation above was developed using the following elements from the NRC document *A Framework for K-12 Science Education:*		
Science and Engineering Practices		
	Obtaining, Evaluating, and Communicating Information Obtaining, evaluating, and communicating information in 6-8 builds on K-5 experiences and progresses to evaluating the merit and validity of ideas and methods.	
	• Gather, read, and synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are supported or not supported by evidence.	Refer to the Project-Based Activity titled "It Makes Sense!"
Disciplinary Core Ideas		
LS1.D	**Information Processing**	
	• Each sense receptor responds to different inputs (electromagnetic, mechanical, chemical), transmitting them as signals that travel along nerve cells to the brain. The signals are then processed in the brain, resulting in immediate behaviors or memories.	**Student Edition:** 447-449, 452-453, 637-641, 647-653 **Teacher Edition:** GQ 447, 449, 637, 640, 650; VL 453, 638, 639, 652
Crosscutting Concepts		
	Cause and Effect	
	• Cause and effect relationships may be used to predict phenomena in natural systems.	**Student Edition:** Launch Lab 447 Lab 472-473

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Life iScience continued

Code	Title/Text	Location
MS-LS2	**Ecosystems: Interactions, Energy, and Dynamics**	
MS-LS2-1	**Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.** Clarification Statement: Emphasis is on cause and effect relationships between resources and growth of individual organisms and the numbers of organisms in ecosystems during periods of abundant and scarce resources.	Refer to the Project-Based Activity titled "The Fox and the Hare"
The performance expectation above was developed using the following elements from the NRC document *A Framework for K-12 Science Education:*		
Science and Engineering Practices		
	Analyzing and Interpreting Data Analyzing data in 6-8 builds on K-5 experiences and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis.	
	• Analyze and interpret data to provide evidence for phenomena.	**Student Edition:** Launch Lab 749 MiniLab 371, 743 *Nature of Science* 370-371 **Teacher Edition:** DI 743
Disciplinary Core Ideas		
LS2.A	**Interdependent Relationships in Ecosystems**	
	• Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors.	**Student Edition:** 370-371, 706-709, 724-726 **Teacher Edition:** GQ 704, 707, 708, 709, 726; SCB 704E
	• In any ecosystem, organisms and populations with similar requirements for food, water, oxygen, or other resources may compete with each other for limited resources, access to which consequently constrains their growth and reproduction.	**Student Edition:** 370-371, 743, 745 **Teacher Edition:** GQ 743; SCB 738E
	• Growth of organisms and population increases are limited by access to resources.	**Student Edition:** 370-371, 743-745, 750, 753-755 **Teacher Edition:** GQ 743, 745, 755
Crosscutting Concepts		
	Cause and Effect	
	• Cause and effect relationships may be used to predict phenomena in natural or designed systems.	**Student Edition:** *Nature of Science* 370-371 Launch Lab 749 MiniLab 371, 743 **Teacher Edition:** DI 743

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Life iScience continued

Code	Title/Text	Location
MS-LS2	**Ecosystems: Interactions, Energy, and Dynamics** *continued*	
MS-LS2-2	**Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.** Clarification Statement: Emphasis is on predicting consistent patterns of interactions in different ecosystems in terms of the relationships among and between organisms and abiotic components of ecosystems. Examples of types of interactions could include competitive, predatory, and mutually beneficial.	Refer to the Project-Based Activity titled "The Hungry Games: Eat or Be Eaten"
The performance expectation above was developed using the following elements from the NRC document *A Framework for K-12 Science Education:*		
Science and Engineering Practices		
	Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in 6-8 builds on K-5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories.	
	• Construct an explanation that includes qualitative or quantitative relationships between variables that predict phenomena.	**Student Edition:** Lab 286-287, 766-767 **Teacher Edition:** DI 763
Disciplinary Core Ideas		
LS2.A	**Interdependent Relationships in Ecosystems**	
	• Similarly, predatory interactions may reduce the number of organisms or eliminate whole populations of organisms. Mutually beneficial interactions, in contrast, may become so interdependent that each organism requires the other for survival. Although the species involved in these competitive, predatory, and mutually beneficial interactions vary across ecosystems, the patterns of interactions of organisms with their environments, both living and nonliving, are shared.	**Student Edition:** 282, 284, 762-764 **Teacher Edition:** GQ 284, 762, 763, 764
Crosscutting Concepts		
	Patterns	
	• Patterns can be used to identify cause and effect relationships.	Refer to the Project-Based Activity titled "The Hungry Games: Eat or Be Eaten"

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Life iScience continued

Code	Title/Text	Location
MS-LS2	**Ecosystems: Interactions, Energy, and Dynamics** *continued*	
MS-LS2-3	**Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.** **Clarification Statement:** Emphasis is on describing the conservation of matter and flow of energy into and out of various ecosystems, and on defining the boundaries of the system. **Assessment Boundary:** Assessment does not include the use of chemical reactions to describe the processes.	Refer to the Project-Based Activity titled "Web of Life"
The performance expectation above was developed using the following elements from the NRC document *A Framework for K-12 Science Education:*		
Science and Engineering Practices		
	Developing and Using Models Modeling in 6-8 builds on K-5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems.	
	• Develop a model to describe phenomena.	**Student Edition:** MiniLab 760 **Teacher Edition:** DI 715, 717, 719; TD 713
Disciplinary Core Ideas		
LS2.B	**Cycle of Matter and Energy Transfer in Ecosystems**	
	• Food webs are models that demonstrate how matter and energy is transferred between producers, consumers, and decomposers as the three groups interact within an ecosystem. Transfers of matter into and out of the physical environment occur at every level. Decomposers recycle nutrients from dead plant or animal matter back to the soil in terrestrial environments or to the water in aquatic environments. The atoms that make up the organisms in an ecosystem are cycled repeatedly between the living and nonliving parts of the ecosystem.	**Student Edition:** 240, 281, 715-716, 718-719, 723-728, 760-761 **Teacher Edition:** CD 725; GQ 281, 716, 725, 761
Crosscutting Concepts		
	Energy and Matter	
	• The transfer of energy can be tracked as energy flows through a natural system.	**Student Edition:** 723-728 MiniLab 760
	Connections to Nature of Science **Scientific Knowledge Assumes an Order and Consistency in Natural Systems**	
	• Science assumes that objects and events in natural systems occur in consistent patterns that are understandable through measurement and observation.	Refer to the Project-Based Activity titled "Web of Life"

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Life iScience continued

Code	Title/Text	Location
MS-LS2	**Ecosystems: Interactions, Energy, and Dynamics** *continued*	
MS-LS2-4	**Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.** Clarification Statement: Emphasis is on recognizing patterns in data and making warranted inferences about changes in populations, and on evaluating empirical evidence supporting arguments about changes to ecosystems.	Refer to the Project-Based Activity titled "Snake Invaders"
The performance expectation above was developed using the following elements from the NRC document *A Framework for K-12 Science Education:*		
Science and Engineering Practices		
	Engaging in Argument from Evidence Engaging in argument from evidence in 6-8 builds on K-5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world(s).	
	• Construct an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem.	**Teacher Edition:** DI 743
	Connections to Nature of Science **Scientific Knowledge is Based on Empirical Evidence**	
	• Science disciplines share common rules of obtaining and evaluating empirical evidence.	Refer to the Project-Based Activity titled "Snake Invaders"
Disciplinary Core Ideas		
LS2.C	**Ecosystem Dynamics, Functioning, and Resilience**	
	• Ecosystems are dynamic in nature; their characteristics can vary over time. Disruptions to any physical or biological component of an ecosystem can lead to shifts in all its populations.	**Student Edition:** 797-800 **Teacher Edition:** GQ 797, 798, 799, 800; SCB 774F
Crosscutting Concepts		
	Stability and Change	
	• Small changes in one part of a system might cause large changes in another part.	**Student Edition:** Launch Lab 749 **Teacher Edition:** DI 743

LOCATION ABBREVIATION KEY

AC	Activity	**FF**	Fun Fact	**RS**	Reading Strategy	**TA**	Technology Activity
CD	Cultural Diversity	**GQ**	Guiding Questions	**RWS**	Real-World Science	**TD**	Teacher Demo
CIS	Careers in Science	**IWB**	Interactive Whiteboard Strategy	**SCB**	Science Content Background	**VL**	Visual Literacy
DI	Differentiated Instruction	**MS**	Math Skills				

Life iScience continued

Code	Title/Text	Location
MS-LS2	**Ecosystems: Interactions, Energy, and Dynamics** *continued*	
MS-LS2-5	**Evaluate competing design solutions for maintaining biodiversity and ecosystem services.*** **Clarification Statement:** Examples of ecosystem services could include water purification, nutrient recycling, and prevention of soil erosion. Examples of design solution constraints could include scientific, economic, and social considerations.	Refer to the Project-Based Activity titled "Good "greef"! The corals are dying!"
The performance expectation above was developed using the following elements from the NRC document *A Framework for K-12 Science Education:*		
Science and Engineering Practices		
	Engaging in Argument from Evidence Engaging in argument from evidence in 6-8 builds on K-5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world(s).	
	• Evaluate competing design solutions based on jointly developed and agreed-upon design criteria.	Refer to the Project-Based Activity titled "Good "greef"! The corals are dying!"
Disciplinary Core Ideas		
LS2.C	**Ecosystem Dynamics, Functioning, and Resilience**	
	• Biodiversity describes the variety of species found in Earth's terrestrial and oceanic ecosystems. The completeness or integrity of an ecosystem's biodiversity is often used as a measure of its health.	**Student Edition:** 214, 778-783, 788-793 **Teacher Edition:** GQ 778, 779, 780, 781, 783; IM 774H; VL 790, 791, 792
LS4.D	**Biodiversity and Humans**	
	• Changes in biodiversity can influence humans' resources, such as food, energy, and medicines, as well as ecosystem services that humans rely on—for example, water purification and recycling. *(secondary)*	**Student Edition:** 240, 241, 269, 272, 273, 275, 281-283, 339 **Teacher Edition:** GQ 240, 272, 273, 283
ETS1.B	**Developing Possible Solutions**	
	• There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem. *(secondary)*	**Student Edition:** NOS 20-NOS 27, 4-5 **Teacher Edition:** GQ NOS 27, 4; VL NOS 23

Note: Correlation continues on the next page

Life iScience continued

Code	Title/Text	Location
Crosscutting Concepts		
	Stability and Change	
	• Small changes in one part of a system might cause large changes in another part.	**Teacher Edition:** IM 810H
	Connections to Engineering, Technology, and Applications of Science	
	Influence of Science, Engineering, and Technology on Society and the Natural World	
	• The use of technologies and any limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions. Thus technology use varies from region to region and over time.	**Teacher Edition:** SCB 810F
	Connections to Nature of Science	
	Science Addresses Questions About the Natural and Material World	
	• Scientific knowledge can describe the consequences of actions but does not necessarily prescribe the decisions that society takes.	**Student Edition:** 831-836 *Science and Society* 795 *Green Science* 339, 821

LOCATION ABBREVIATION KEY

AC	Activity	**FF**	Fun Fact	**RS**	Reading Strategy	**TA**	Technology Activity
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CIS	Careers in Science	**IWB**	Interactive Whiteboard Strategy	**SCB**	Science Content Background	**VL**	Visual Literacy
DI	Differentiated Instruction	**MS**	Math Skills				

Life iScience continued

Code	Title/Text	Location
MS-LS3	**Heredity: Inheritance and Variation of Traits**	
MS-LS3-1	**Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism** **Clarification Statement:** Emphasis is on conceptual understanding that changes in genetic material may result in making different proteins. **Assessment Boundary:** Assessment does not include specific changes at the molecular level, mechanisms for protein synthesis, or specific types of mutations.	Refer to the Project-Based Activity titled "Model Mighty Mutations"
The performance expectation above was developed using the following elements from the NRC document *A Framework for K-12 Science Education:*		
Science and Engineering Practices		
	Developing and Using Models Modeling in 6-8 builds on K-5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems.	
	• Develop and use a model to describe phenomena.	**Student Edition:** Launch Lab 170 **Teacher Edition:** DI 171
Disciplinary Core Ideas		
LS3.A	**Inheritance of Traits**	
	• Genes are located in the chromosomes of cells, with each chromosome pair containing two variants of each of many distinct genes. Each distinct gene chiefly controls the production of specific proteins, which in turn affects the traits of the individual. Changes (mutations) to genes can result in changes to proteins, which can affect the structures and functions of the organism and thereby change traits.	**Student Edition:** 136, 159-160, 170, 173-176, 201 **Teacher Edition:** GQ 160, 170, 176; VL 160, 174
LS3.B	**Variation of Traits**	
	• In addition to variations that arise from sexual reproduction, genetic information can be altered because of mutations. Though rare, mutations may result in changes to the structure and function of proteins. Some changes are beneficial, others harmful, and some neutral to the organism.	**Student Edition:** 136, 175-176, 201 **Teacher Edition:** GQ 175, 176
Crosscutting Concepts		
	Structure and Function	
	• Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the shapes, composition, and relationships among its parts, therefore complex natural structures/systems can be analyzed to determine how they function.	**Student Edition:** 175 **Teacher Edition:** DI 171

LOCATION ABBREVIATION KEY

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CD	Cultural Diversity	**GQ**	Guiding Questions	**RWS**	Real-World Science	**TD**	Teacher Demo
CIS	Careers in Science	**IWB**	Interactive Whiteboard Strategy	**SCB**	Science Content Background	**VL**	Visual Literacy
DI	Differentiated Instruction	**MS**	Math Skills				

Life iScience continued

Code	Title/Text	Location
MS-LS3	**Heredity: Inheritance and Variation of Traits** *continued*	
MS-LS3-2	**Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.** Clarification Statement: Emphasis is on using models such as Punnett squares, diagrams, and simulations to describe the cause and effect relationship of gene transmission from parent(s) to offspring and resulting genetic variation.	Refer to the Project-Based Activity titled "It's in the Cards"
The performance expectation above was developed using the following elements from the NRC document *A Framework for K-12 Science Education:*		
Science and Engineering Practices		
	Developing and Using Models Modeling in 6-8 builds on K-5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems.	
	• Develop and use a model to describe phenomena.	**Student Edition:** Launch Lab 117 MiniLab 161 Skill Practice 168 Lab 178-179 **Teacher Edition:** TD 129
Disciplinary Core Ideas		
LS1.B	**Growth and Development of Organisms**	
	• Organisms reproduce, either sexually or asexually, and transfer their genetic information to their offspring. (secondary)	**Student Edition:** 11, 93, 117-124, 129-133, 351-352, 465-467 **Teacher Edition:** GQ 11, 114, 117, 128, 129, 465; SCB 114E, 114F
LS3.A	**Inheritance of Traits**	
	• Variations of inherited traits between parent and offspring arise from genetic differences that result from the subset of chromosomes (and therefore genes) inherited.	**Student Edition:** 124, 159-165, 201 **Teacher Edition:** GQ 117, 124, 146, 159, 160, 161, 198
LS3.B	**Variation of Traits**	
	• In sexually reproducing organisms, each parent contributes half of the genes acquired (at random) by the offspring. Individuals have two of each chromosome and hence two alleles of each gene, one acquired from each parent. These versions may be identical or may differ from each other.	**Student Edition:** 117-119, 159-160 **Teacher Edition:** GQ 114, 118, 122, 124, 159; VL 160; SCB 114E

Note: Correlation continues on the next page

Life iScience continued

Code	Title/Text	Location
Crosscutting Concepts		
	Cause and Effect	
	• Cause and effect relationships may be used to predict phenomena in natural systems.	**Student Edition:** 117-119, 129-133, 159-165 Launch Lab 117 MiniLab 161 Skill Practice 168 Lab 178-179 **Teacher Edition:** DI 163; IWB 146D

LOCATION ABBREVIATION KEY

AC	Activity	**FF**	Fun Fact	**RS**	Reading Strategy	**TA**	Technology Activity
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CIS	Careers in Science	**IWB**	Interactive Whiteboard Strategy	**SCB**	Science Content Background	**VL**	Visual Literacy
DI	Differentiated Instruction	**MS**	Math Skills				

Life iScience continued

Code	Title/Text	Location
MS-LS4	**Biological Evolution: Unity and Diversity**	
MS-LS4-1	**Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.** **Clarification Statement:** Emphasis is on finding patterns of changes in the level of complexity of anatomical structures in organisms and the chronological order of fossil appearance in the rock layers. **Assessment Boundary:** Assessment does not include the names of individual species or geological eras in the fossil record.	Refer to the Project-Based Activity titled "Set in Stone"
The performance expectation above was developed using the following elements from the NRC document *A Framework for K-12 Science Education:*		
Science and Engineering Practices		
	Analyzing and Interpreting Data Analyzing data in 6-8 builds on K-5 experiences and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis.	
	• Analyze and interpret data to determine similarities and differences in findings.	**Student Edition:** MiniLab 195
	Connections to Nature of Science **Scientific Knowledge is Based on Empirical Evidence**	
	• Science knowledge is based upon logical and conceptual connections between evidence and explanations.	**Student Edition:** 189-195, 209-211 MiniLab 195
Disciplinary Core Ideas		
LS4.A	**Evidence of Common Ancestry and Diversity**	
	• The collection of fossils and their placement in chronological order (e.g., through the location of the sedimentary layers in which they are found or through radioactive dating) is known as the fossil record. It documents the existence, diversity, extinction, and change of many life forms throughout the history of life on Earth.	**Student Edition:** 189-195 **Teacher Edition:** GQ 188, 189, 192; SCB 186E; VL 193
Crosscutting Concepts		
	Patterns	
	• Graphs, charts, and images can be used to identify patterns in data.	**Student Edition:** MiniLab 195
	Connections to Nature of Science **Scientific Knowledge Assumes an Order and Consistency in Natural Systems**	
	• Science assumes that objects and events in natural systems occur in consistent patterns that are understandable through measurement and observation.	**Student Edition:** 189-195, 209-211 MiniLab 195

LOCATION ABBREVIATION KEY

AC	Activity	**FF**	Fun Fact	**RS**	Reading Strategy	**TA**	Technology Activity
CD	Cultural Diversity	**GQ**	Guiding Questions	**RWS**	Real-World Science	**TD**	Teacher Demo
CIS	Careers in Science	**IWB**	Interactive Whiteboard Strategy	**SCB**	Science Content Background	**VL**	Visual Literacy
DI	Differentiated Instruction	**MS**	Math Skills				

Life iScience continued

Code	Title/Text	Location
MS-LS4	**Biological Evolution: Unity and Diversity** *continued*	
MS-LS4-2	**Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships.** **Clarification Statement:** Emphasis is on explanations of the evolutionary relationships among organisms in terms of similarity or differences of the gross appearance of anatomical structures.	Refer to the Project-Based Activity titled "It's All Relative"
The performance expectation above was developed using the following elements from the NRC document *A Framework for K-12 Science Education:*		
Science and Engineering Practices		
	Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in 6-8 builds on K-5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories.	
	• Apply scientific ideas to construct an explanation for real-world phenomena, examples, or events.	**Student Edition:** MiniLab 195 **Teacher Edition:** DI 195
Disciplinary Core Ideas		
LS4.A	**Evidence of Common Ancestry and Diversity**	
	• Anatomical similarities and differences between various organisms living today and between them and organisms in the fossil record, enable the reconstruction of evolutionary history and the inference of lines of evolutionary descent.	**Student Edition:** 195, 209, 209-211 **Teacher Edition:** GQ 209, 210; SCB 186F; VL 211
Crosscutting Concepts		
	Patterns	
	• Patterns can be used to identify cause and effect relationships.	**Student Edition:** MiniLab 195
	Connections to Nature of Science **Scientific Knowledge Assumes an Order and Consistency in Natural Systems**	
	• Science assumes that objects and events in natural systems occur in consistent patterns that are understandable through measurement and observation.	**Student Edition:** MiniLab 195 **Teacher Edition:** TD 195

LOCATION ABBREVIATION KEY

AC	Activity	**FF**	Fun Fact	**RS**	Reading Strategy	**TA**	Technology Activity
CD	Cultural Diversity	**GQ**	Guiding Questions	**RWS**	Real-World Science	**TD**	Teacher Demo
CIS	Careers in Science	**IWB**	Interactive Whiteboard Strategy	**SCB**	Science Content Background	**VL**	Visual Literacy
DI	Differentiated Instruction	**MS**	Math Skills				

Life iScience continued

Code	Title/Text	Location
MS-LS4	**Biological Evolution: Unity and Diversity** *continued*	
MS-LS4-3	**Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy.** **Clarification Statement:** Emphasis is on inferring general patterns of relatedness among embryos of different organisms by comparing the macroscopic appearance of diagrams or pictures. **Assessment Boundary:** Assessment of comparisons is limited to gross appearance of anatomical structures in embryological development.	Refer to the Project-Based Activity titled "If you've seen one..."
The performance expectation above was developed using the following elements from the NRC document *A Framework for K-12 Science Education:*		
Science and Engineering Practices		
	Analyzing and Interpreting Data Analyzing data in 6-8 builds on K-5 experiences and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis.	
	• Analyze displays of data to identify linear and nonlinear relationships.	**Teacher Edition:** DI 213
Disciplinary Core Ideas		
LS4.A	**Evidence of Common Ancestry and Diversity**	
	• Comparison of the embryological development of different species also reveals similarities that show relationships not evident in the fully-formed anatomy.	**Student Edition:** 212 **Teacher Edition:** GQ 212; SCB 186F; VL 212
Crosscutting Concepts		
	Patterns	
	• Graphs, charts, and images can be used to identify patterns in data.	**Student Edition:** 212 **Teacher Edition:** DI 213

LOCATION ABBREVIATION KEY

AC	Activity	**FF**	Fun Fact	**RS**	Reading Strategy	**TA**	Technology Activity
CD	Cultural Diversity	**GQ**	Guiding Questions	**RWS**	Real-World Science	**TD**	Teacher Demo
CIS	Careers in Science	**IWB**	Interactive Whiteboard Strategy	**SCB**	Science Content Background	**VL**	Visual Literacy
DI	Differentiated Instruction	**MS**	Math Skills				

Life iScience continued

Code	Title/Text	Location
MS-LS4	**Biological Evolution: Unity and Diversity** *continued*	
MS-LS4-4	**Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.** Clarification Statement: Emphasis is on using simple probability statements and proportional reasoning to construct explanations.	Refer to the Project-Based Activity titled "Spot On"
The performance expectation above was developed using the following elements from the NRC document *A Framework for K-12 Science Education:*		
Science and Engineering Practices		
	Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in 6-8 builds on K-5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories.	
	• Construct an explanation that includes qualitative or quantitative relationships between variables that describe phenomena.	**Student Edition:** MiniLab 205 Lab 216-217 **Teacher Edition:** DI 205
Disciplinary Core Ideas		
LS4.B	**Natural Selection**	
	• Natural selection leads to the predominance of certain traits in a population, and the suppression of others.	**Student Edition:** 195, 201-202 **Teacher Edition:** GQ 202, 203; IM 186H; SCB 186F; VL 202
Crosscutting Concepts		
	Cause and Effect	
	• Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability.	**Student Edition:** MiniLab 205 Lab 216-217 **Teacher Edition:** DI 203

LOCATION ABBREVIATION KEY

AC	Activity	**FF**	Fun Fact	**RS**	Reading Strategy	**TA**	Technology Activity
CD	Cultural Diversity	**GQ**	Guiding Questions	**RWS**	Real-World Science	**TD**	Teacher Demo
CIS	Careers in Science	**IWB**	Interactive Whiteboard Strategy	**SCB**	Science Content Background	**VL**	Visual Literacy
DI	Differentiated Instruction	**MS**	Math Skills				

Life iScience continued

Code	Title/Text	Location
MS-LS4	**Biological Evolution: Unity and Diversity** *continued*	
MS-LS4-5	**Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.** **Clarification Statement:** Emphasis is on synthesizing information from reliable sources about the influence of humans on genetic outcomes in artificial selection (such as genetic modification, animal husbandry, gene therapy); and, on the impacts these technologies have on society as well as the technologies leading to these scientific discoveries.	Refer to the Project-Based Activity titled "Foods of the Future"
The performance expectation above was developed using the following elements from the NRC document *A Framework for K-12 Science Education:*		
Science and Engineering Practices		
	Obtaining, Evaluating, and Communicating Information Obtaining, evaluating, and communicating information in 6-8 builds on K-5 experiences and progresses to evaluating the merit and validity of ideas and methods.	
	• Gather, read, and synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are supported or not supported by evidence.	**Teacher Edition:** DI 125
Disciplinary Core Ideas		
LS4.B	**Natural Selection**	
	• *In artificial* selection, humans have the capacity to influence certain characteristics of organisms by selective breeding. One can choose desired parental traits determined by genes, which are then passed on to offspring.	**Student Edition:** 125, 205 **Teacher Edition:** GQ 205; SCB 186F; VL 702
Crosscutting Concepts		
	Cause and Effect	
	• Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability.	Refer to the Project-Based Activity titled "Foods of the Future"
	Connections to Engineering, Technology, and Applications of Science **Interdependence of Science, Engineering, and Technology**	
	• Engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered systems.	**Student Edition:** *Nature of Science* 702 **Teacher Edition:** DI 125
	Connections to Nature of Science **Science Addresses Questions About the Natural and Material World**	
	• Scientific knowledge can describe the consequences of actions but does not necessarily prescribe the decisions that society takes.	Refer to the Project-Based Activity titled "Foods of the Future"

LOCATION ABBREVIATION KEY

AC	Activity	**FF**	Fun Fact	**RS**	Reading Strategy	**TA**	Technology Activity
CD	Cultural Diversity	**GQ**	Guiding Questions	**RWS**	Real-World Science	**TD**	Teacher Demo
CIS	Careers in Science	**IWB**	Interactive Whiteboard Strategy	**SCB**	Science Content Background	**VL**	Visual Literacy
DI	Differentiated Instruction	**MS**	Math Skills				

Life iScience continued

Code	Title/Text	Location
MS-LS4	**Biological Evolution: Unity and Diversity** *continued*	
MS-LS4-6	**Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.** **Clarification Statement:** Emphasis is on using mathematical models, probability statements, and proportional reasoning to support explanations of trends in changes to populations over time. **Assessment Boundary:** Assessment does not include Hardy Weinberg calculations.	Refer to the Project-Based Activity titled "Population Probabilities"
The performance expectation above was developed using the following elements from the NRC document *A Framework for K-12 Science Education:*		
Science and Engineering Practices		
	Using Mathematics and Computational Thinking Mathematical and computational thinking in 6-8 builds on K-5 experiences and progresses to identifying patterns in large data sets and using mathematical concepts to support explanations and arguments.	
	• Use mathematical representations to support scientific conclusions and design solutions.	Refer to the Project-Based Activity titled "Population Probabilities"
Disciplinary Core Ideas		
LS4.C	**Adaptation**	
	• Adaptation by natural selection acting over generations is one important process by which species change over time in response to changes in environmental conditions. Traits that support successful survival and reproduction in the new environment become more common; those that do not become less common. Thus, the distribution of traits in a population changes.	**Student Edition:** 201-204 **Teacher Edition:** GQ 203, 204; IM 186H; SCB 186F
Crosscutting Concepts		
	Cause and Effect	
	• Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability.	**Student Edition:** MiniLab 205

LOCATION ABBREVIATION KEY

AC	Activity	**FF**	Fun Fact	**RS**	Reading Strategy	**TA**	Technology Activity
CD	Cultural Diversity	**GQ**	Guiding Questions	**RWS**	Real-World Science	**TD**	Teacher Demo
CIS	Careers in Science	**IWB**	Interactive Whiteboard Strategy	**SCB**	Science Content Background	**VL**	Visual Literacy
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