



**LAB-AIDS Correlations for
Oklahoma Academic Standards for Science
MIDDLE LEVEL, GRADES 6-8**

*Mark Koker, Ph D, Director of Curriculum & Professional Development, LAB-AIDS
Oralia Gil, Curriculum Specialist, LAB-AIDS*

This document is intended to show how our SEPUP curriculum products align with the new directions in the *Next Generation Science Standards*¹ and the Oklahoma Academic Standards for Science documents.

ABOUT OUR PROGRAMS

LAB-AIDS Core Science Programs are developed to support current knowledge on the teaching and learning of science. All materials support an inquiry-driven pedagogy, with support for literacy skill development and with assessment programs that clearly show what students know and are able to do from using the programs. All programs have extensive support for technology in the school science classrooms, and feature comprehensive teacher support. For more information please visit www.lab-aids.com and navigate to the program of interest.

SEPUP

Materials from the Science Education for Public Understanding Program (SEPUP) are developed at the Lawrence Hall of Science, at the University of California, Berkeley, and distributed nationally by LAB-AIDS, Inc. Development of SEPUP materials is supported by grants from the National Science Foundation. SEPUP programs are available as full year courses, or separately, as units, each taking 3-9 weeks to complete, as listed below.

Middle Level, Grades 6-8

Issues and Earth Science, Second Edition (IAES)

Unit Title	Activity Number
Studying Soil Scientifically	1-11
Rocks and Minerals	12-23
Erosion and Deposition	24-35
Plate Tectonics	36-49
Weather and Atmosphere	50-70
The Earth in Space	71-84
Exploring Space	85-98

¹ <http://www.nextgenscience.org/next-generation-science-standards>

Issues and Life Science, Second Edition (IALS)

Unit Title	Activity Number
Experimental Design: Studying People Scientifically	1-10
Body Works	11-29
Cell Biology and Disease	30-53
Genetics	54-71
Ecology	72-88
Evolution	89-101
Bioengineering	102-109

Issues and Physical Science, Second Edition (IAPS)

Unit Title	Activity Number
Studying Materials Scientifically	1-11
The Chemistry of Materials	12-29
Water	30-52
Energy	53-72
Force and Motion	73-88
Waves	89-99

Each of the full year programs begins with a “starter” unit sequence on the scientific method in the context of each particular discipline. For example, the Issues and Life Science (IALS) course contains a ten-activity unit called “Experimental Design: Studying People Scientifically,” which uses the science behind clinical trials on human subjects, to frame the study of the life sciences. These are listed first in each course.

ABOUT THE NEXT GENERATION SCIENCE STANDARDS

The National Academy of Sciences, Achieve, the American Association for the Advancement of Science, and the National Science Teachers Association have collaborated over several years to develop the *Next Generation Science Standards* (NGSS). The first step of the process was led by The National Academies of Science, a non-governmental organization commissioned in 1863 to advise the nation on scientific and engineering issues. On July 19, 2011, the National Research Council (NRC), the functional staffing arm of the National Academy of Sciences, released the *Framework for K-12 Science Education*.

The *Framework* was a critical first step because it is grounded in the most current research on science and science learning and it identifies the science all K–12 students should know. The second step in the process was the development of standards grounded in the NRC Framework. A group of 26 lead states and writers, in a process managed by Achieve, has been working since the release of the Framework to develop K-12 *Next Generation Science Standards*. The *Standards* have undergone numerous lead states and all state reviews as well as two public comment periods, the most recent of these in January, 2013. The final release of the Standards coincided with the National Conference of the National Science Teachers Association in San Antonio, TX, the week of April 8.

The *Next Generation Science Standards* (NGSS) provide an important opportunity to improve not only science education but also student achievement. Based on the *Framework for K–12 Science Education*, the NGSS are intended to reflect a new vision for American science education. **The Next Generation Science Standards** are student performance expectations – NOT curriculum. Even though within each

performance expectation Science and Engineering Practices (SEP) are partnered with a particular Disciplinary Core Idea (DCI) and Crosscutting Concept (CC) in the NGSS, these intersections do not predetermine how the three are linked in curriculum, units, or lessons. Performance expectations simply clarify the expectations of what students will know and be able to do by the end of the grade or grade band.

As the reader knows, the *Standards* represent content from several domains: (1) science and engineering practices; (2) cross-cutting concepts; (3) the disciplines of life, earth, and physical science, as set forth in the *Next Generation Science Framework* (NRC, 2012). The Standards themselves are written as performance indicators, and content from the Common Core (<http://www.corestandards.org/>) is included. The following middle level standard from the life sciences is used to show the basic structure. Standards, as performance indicators, are in the white box on top, and the relevant Practices, Disciplinary Core Ideas, and Crosscutting Concepts are listed below in the blue, orange, and green boxes, respectively. Clarification Statements, in red, list assessment boundaries or further describe the standard; statements marked with an asterisk (*) denote integration of engineering content.

MS.Growth, Development, and Reproduction of Organisms

MS.Growth, Development, and Reproduction of Organisms		
<p>Students who demonstrate understanding can:</p> <p>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.]</p> <p>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.]</p> <p>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.]</p> <p>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.]</p> <p>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.]</p>		
The performance expectations above were developed using the following elements from the NRC document <i>A Framework for K-12 Science Education</i> :		
Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>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.</p> <ul style="list-style-type: none"> Develop and use a model to describe phenomena. (MS-LS3-1),(MS-LS3-2) <p>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.</p> <ul style="list-style-type: none"> 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. (MS-LS1-5) <p>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).</p> <ul style="list-style-type: none"> 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. (MS-LS1-4) <p>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.</p> <ul style="list-style-type: none"> 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. (MS-LS4-5) 	<p>LS1.B: Growth and Development of Organisms</p> <ul style="list-style-type: none"> Organisms reproduce, either sexually or asexually, and transfer their genetic information to their offspring. (<i>secondary to MS-LS3-2</i>) Animals engage in characteristic behaviors that increase the odds of reproduction. (MS-LS1-4) Plants reproduce in a variety of ways, sometimes depending on animal behavior and specialized features for reproduction. (MS-LS1-4) Genetic factors as well as local conditions affect the growth of the adult plant. (MS-LS1-5) <p>LS3.A: Inheritance of Traits</p> <ul style="list-style-type: none"> 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. (MS-LS3-1) Variations of inherited traits between parent and offspring arise from genetic differences that result from the subset of chromosomes (and therefore genes) inherited. (MS-LS3-2) <p>LS3.B: Variation of Traits</p> <ul style="list-style-type: none"> 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. (MS-LS3-2) 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. (MS-LS3-1) <p>LS4.B: Natural Selection</p> <ul style="list-style-type: none"> In <i>artificial</i> 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. (MS-LS4-5) 	<p>Cause and Effect</p> <ul style="list-style-type: none"> Cause and effect relationships may be used to predict phenomena in natural systems. (MS-LS3-2) Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability. (MS-LS1-4),(MS-LS1-5),(MS-LS4-5) <p>Structure and Function</p> <ul style="list-style-type: none"> 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 and designed structures/systems can be analyzed to determine how they function. (MS-LS3-1) <p style="text-align: center;">----- <i>Connections to Engineering, Technology, and Applications of Science</i> -----</p> <p>Interdependence of Science, Engineering, and Technology</p> <ul style="list-style-type: none"> 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. (MS-LS4-5) <p style="text-align: center;">----- <i>Connections to Nature of Science</i> -----</p> <p>Science Addresses Questions About the Natural and Material World</p> <ul style="list-style-type: none"> Science knowledge can describe consequences of actions but does not make the decisions that society takes. (MS-LS4-5)
<p><i>Connections to other DCIs in this grade-band:</i> MS.LS1.A (MS-LS3-1); MS.LS2.A (MS-LS1-4),(MS-LS1-5); MS.LS4.A (MS-LS3-1)</p> <p><i>Articulation to DCIs across grade-bands:</i> 3.LS1.B (MS-LS1-4),(MS-LS1-5); 3.LS3.A (MS-LS1-5),(MS-LS3-1),(MS-LS3-2); 3.LS3.B (MS-LS3-1),(MS-LS3-2); HS.LS1.A (MS-LS3-1); HS.LS1.B (MS-LS3-1),(MS-LS3-2); HS.LS2.A (MS-LS1-4),(MS-LS1-5); HS.LS2.D (MS-LS1-4); HS.LS3.A (MS-LS3-1),(MS-LS3-2); HS.LS3.B (MS-LS3-1),(MS-LS3-2),(MS-LS4-5); HS.LS4.C (MS-LS4-5)</p>		
<p><i>Common Core State Standards Connections:</i></p>		

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.

The section entitled "Disciplinary Core Ideas" is reproduced verbatim from *A Framework for K-12 Science Education: Practices, Cross-Cutting Concepts, and Core Ideas*. Integrated and reprinted with permission from the National Academy of Sciences.

May 2013

©2013 Achieve, Inc. All rights reserved.

Various other appendices describe other important elements of the Standards, such as DCI progressions, STS, nature of science, and more.

ABOUT THE LAB-AIDS CITATIONS

The following tables are presented in a Disciplinary Core Idea arrangement – Earth Space Science (ESS), Life Science (LS), Physical Science (PS) and Engineering, Technology and Applications of Science (ETS). *In some cases, lesson ranges are specified instead of individual lessons, particularly where meeting the Standard (e.g., cross-cutting concepts) is best achieved in a series of lessons. In some cases you will notice clarification statements of our own, to clarify treatment of a particular Standard or to show where a gap exists and material is under development to meet a Standard.*

Citations included in the correlation document are as follows:

Abbreviation of course title, Unit title, (activity number)

IAES Weather and Atmosphere (61-62)

The above means Issues and Earth Science, Weather and Atmosphere Unit, Activity 61 and 62.

IAPS Plate Tectonics (39)

The above means Issues and Physical Science, Plate Tectonics Unit, Activity 39

RECOMMENDED SCOPE AND SEQUENCE

Grade 6

<i>SEPUP Course</i>	<i>Main Unit Issue</i>
Erosion and Deposition	Where should Boomtown construct the new buildings?
Weather and Atmosphere	Is the growth of Sunbeam City affecting its weather, atmosphere, and water availability?
Body Works	How can you convince people to make choices that reduce their level of heart disease risk?
Cell Biology and Disease	How is an emerging disease spread? What can you do to stop it?
Ecology	What are the trade-offs of introducing a species into a new environment?
Water	What does your community do to make its water safe to drink? Whose responsibility is it?
Energy	Can you help a family decide what energy improvements they should invest in?

Grade 7

<i>SEPUP Course</i>	<i>Main Unit Issue</i>
Weather and Atmosphere	Is the growth of Sunbeam City affecting its weather, atmosphere, and water availability?
The Earth in Space	Why are there many different calendars?
Exploring Space	What kinds of future space missions should we conduct?
Genetics	What are the ethical issues involved in using genetic information?
Ecology	What are the trade-offs of introducing a species into a new environment?
Evolution	What are the trade-offs in deciding whether to save an endangered species or to re-create an extinct one?
The Chemistry of Materials	When you buy a new product, do you think about what materials it is made of? What will happen to it when you no longer have a use for it?
Water	What does your community do to make its water safe to drink? Whose responsibility is it?

Grade 8

<i>SEPUP Course</i>	<i>Main Unit Issue</i>
Rocks and Minerals	How do diamonds made in a lab compare to diamonds mined from the earth?
Erosion and Deposition	Where should Boomtown construct the new buildings?
Plate Tectonics	Which site would you recommend for storing nuclear waste?
Weather and Atmosphere	Is the growth of Sunbeam City affecting its weather, atmosphere, and water availability?
Evolution	What are the trade-offs in deciding whether to save an endangered species or to re-create an extinct one?
The Chemistry of Materials	When you buy a new product, do you think about what materials it is made of? What will happen to it when you no longer have a use for it?
Force and Motion	Should noncommercial vehicles be more alike?
Waves	Are there situations in which some waves are harmful to your health?

Grade 6

Disciplinary Core Idea	SEPUP Unit Title
MS-PS1 Matter and Its Interactions	
<p>MS-PS1-4. Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.</p> <p>[Clarification Statement: Emphasis is on qualitative molecular-level models of solids, liquids, and gases to show that adding or removing thermal energy increases or decreases kinetic energy of the particles until a change of state occurs. Examples of models could include drawings and diagrams. Examples of particles could include molecules or inert atoms. Examples of pure substances could include water, carbon dioxide, and helium.]</p>	<p>IAPS Energy (59) IAPS Water (35) IAES Weather and Atmosphere (60)</p> <p>[LAB-AIDS Clarification Statement: Predictive aspect of standard not yet addressed.]</p>
MS-PS2 Motion and Stability: Forces and Interactions	
<p>MS-PS2-3. Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.</p> <p>[Clarification Statement: Examples of devices that use electric and magnetic forces could include electromagnets, electric motors, or generators. Examples of data could include the effect of the number of turns of wire on the strength of an electromagnet, or the effect of increasing the number or strength of magnets on the speed of an electric motor.] [Assessment Boundary: Assessment about questions that require quantitative answers is limited to proportional reasoning and algebraic thinking.]</p>	<p>IAPS Energy (56A, 65A)</p>
<p>MS-PS2-5. Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.</p> <p>[Clarification Statement: Examples of this phenomenon could include the interactions of magnets, electrically-charged strips of tape, and electrically-charged pith balls. Examples of investigations could include first-hand experiences or simulations.] [Assessment Boundary: Assessment is limited to electric and magnetic fields, and limited to qualitative evidence for the existence of fields.]</p>	<p>IAPS Energy (56A, 65A)</p>
MS-PS3 Energy	
<p>MS-PS3-1. Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.</p>	<p>IAPS Energy (54-55)</p>

Disciplinary Core Idea	SEPUP Unit Title
<p>[Clarification Statement: Emphasis is on descriptive relationships between kinetic energy and mass separately from kinetic energy and speed. Examples could include riding a bicycle at different speeds, rolling different sizes of rocks downhill, and getting hit by a wiffle ball versus a tennis ball.]</p>	<p>[LAB-AIDS Clarification Statement: Students construct data tables, are given the option to create graphs, and interpret diagrams to determine the relationship between mass and speed, and between kinetic and potential energy on a roller coaster.]</p>
<p>MS-PS3-2. Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.</p> <p>[Clarification Statement: Emphasis is on relative amounts of potential energy, not on calculations of potential energy. Examples of objects within systems interacting at varying distances could include: the Earth and either a roller coaster cart at varying positions on a hill or objects at varying heights on shelves, changing the direction/orientation of a magnet, and a balloon with static electrical charge being brought closer to a classmate’s hair. Examples of models could include representations, diagrams, pictures, and written descriptions of systems.] [Assessment Boundary: Assessment is limited to two objects and electric, magnetic, and gravitational interactions.]</p>	<p>IAPS Energy (54-55, 65A)</p> <p>[LAB-AIDS Clarification Statement: Examples include a “piledriver” type activity (effect of mass and height to drive a nail) and a wet cell battery where electrode distance can be varied in an incremental fashion.]</p>
<p>MS-PS3-3. Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.*</p> <p>[Clarification Statement: Examples of devices could include an insulated box, a solar cooker, and a Styrofoam cup.] [Assessment Boundary: Assessment does not include calculating the total amount of thermal energy transferred.]</p>	<p>IAPS Energy (56, 59-61, 69-70)</p>
<p>MS-PS3-4. Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.</p> <p>[Clarification Statement: Examples of experiments could include comparing final water temperatures after different masses of ice melted in the same volume of water with the same initial temperature, the temperature change of samples of different materials with the same mass as they cool or heat in the environment, or the same material with different masses when a specific amount of energy is added.] [Assessment Boundary: Assessment does not include calculating the total amount of thermal energy transferred.]</p>	<p>IAPS Energy (59-63, 67-69)</p>

Disciplinary Core Idea	SEPUP Unit Title
MS-LS1 From Molecules to Organisms: Structures and Processes	
<p>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.</p> <p>[Clarification Statement: Emphasis is on developing evidence that living things are made of cells, distinguishing between living and non-living cells, and understanding that living things may be made of one cell or many and varied cells.]</p>	<p>IALS Cell Biology and Disease (35-39, 43, 45)</p> <p>IALS Ecology (81-82)</p>
<p>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.</p> <p>[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.]</p>	<p>IALS Cell Biology and Disease (38-42)</p> <p>IALS Genetics (63) [nucleus, chromosomes]</p> <p>IALS Ecology (82) [chloroplasts]</p>
<p>MS-LS1-3. Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.</p> <p>[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.]</p>	<p>IALS Body Works (11-29)</p>
<p>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.</p> <p>[Clarification Statement: Emphasis is on tracing movement of matter and flow of energy.] [Assessment Boundary: Assessment does not include the biochemical mechanisms of photosynthesis.]</p>	<p>IALS Ecology (78-82)</p>
MS-LS2 Ecosystems: Interactions, Energy, and Dynamics	
<p>MS-LS2-1. Analyze and interpret data to provide evidence for</p>	<p>IALS Ecology (72, 73, 84, 85, 88)</p>

Disciplinary Core Idea	SEPUP Unit Title
<p>the effects of resource availability on organisms and populations of organisms in an ecosystem.</p> <p>[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.]</p>	<p>[LAB-AIDS Clarification Statement: Data driven perspective is included, but not for a cause/effect relationship.]</p>
<p>MS-LS2-2. Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.</p> <p>[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.]</p>	<p>IALS Ecology (83)</p> <p>[LAB-AIDS Clarification Statement: Contains predator/prey only, this standard on symbiosis is under further development.]</p>
<p>MS-LS2-3. Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.</p> <p>[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.]</p>	<p>IALS Ecology (79-81)</p> <p>[LAB-AIDS Clarification Statement: While basic content of the standard is developed, students are not asked to develop a model.]</p>
<p>MS-LS2-4. Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.</p> <p>[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.]</p>	<p>[LAB-AIDS Clarification Statement: Under review for further development.]</p>
<p>MS-LS2-5. Evaluate competing design solutions for maintaining biodiversity and ecosystem services.*</p> <p>[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.]</p>	<p>IALS Ecology (72)</p> <p>[LAB-AIDS Clarification Statement: Emphasis on decrease in biodiversity.]</p> <p>IAPS Water (42-44, 51-52)</p> <p>[LAB-AIDS Clarification Statement: Emphasis on water treatment techniques and evaluation.]</p> <p>IAES Erosion and Deposition (8, 28, 31-33, 34-35)</p> <p>[LAB-AIDS Clarification Statement: Emphasis on mitigating soil erosion;</p>

Disciplinary Core Idea	SEPUP Unit Title
	students are not asked to evaluate competing designs in all cases.]

Disciplinary Core Idea	SEPUP Unit Title
MS-ESS2 Earth's Systems	
<p>MS-ESS2-4. Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.</p> <p>[Clarification Statement: Emphasis is on the ways water changes its state as it moves through the multiple pathways of the hydrologic cycle. Examples of models can be conceptual or physical.] [Assessment Boundary: A quantitative understanding of the latent heats of vaporization and fusion is not assessed.]</p>	IAES Weather and Atmosphere (54-62)
MS-ESS3 Earth and Human Activity	
<p>MS-ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.</p> <p>[Clarification Statement: Examples of the design process include examining human environmental impacts, assessing the kinds of solutions that are feasible, and designing and evaluating solutions that could reduce that impact. Examples of human impacts can include water usage (such as the withdrawal of water from streams and aquifers or the construction of dams and levees), land usage (such as urban development, agriculture, or the removal of wetlands), and pollution (such as of the air, water, or land).]</p>	<p>IAES Water (51-52)</p> <p>[LAB-AIDS Clarification Statement: Focus on testing and treating wastewater.]</p> <p>IAES Erosion and Deposition (34-35) [LAB-AIDS Clarification Statement: Issue emphasis on new building construction.]</p>

Grade 7

Disciplinary Core Idea	SEPUP Unit Title
MS-PS1 Matter and Its Interactions	
<p>MS-PS1-1. Develop models to describe the atomic composition of simple molecules and extended structures.</p> <p>[Clarification Statement: Emphasis is on developing models of molecules that vary in complexity. Examples of simple molecules could include ammonia and methanol. Examples of extended structures could include sodium chloride or diamonds. Examples of molecular-level models could include drawings, 3D ball and stick structures, or computer representations showing different molecules with different types of atoms.] [Assessment Boundary: Assessment does not include valence electrons and bonding energy, discussing the ionic nature of subunits of complex structures, or a complete depiction of all individual atoms in a complex molecule or extended structure.]</p>	<p>IAPS Chemistry of Materials (17-20) IAPS Water (36)</p>
<p>MS-PS1-2. Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.</p> <p>[Clarification Statement: Examples of reactions could include burning sugar or steel wool, fat reacting with sodium hydroxide, and mixing zinc with HCl.] [Assessment Boundary: Assessment is limited to analysis of the following properties: density, melting point, boiling point, solubility, flammability, and odor.]</p>	<p>IAPS Chemistry of Materials (25-28) IAPS Water (45-51)</p>
MS-PS2 Motion and Stability: Forces and Interactions	
<p>MS-PS2-4. Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.</p> <p>[Clarification Statement: Examples of evidence for arguments could include data generated from simulations or digital tools; and charts displaying mass, strength of interaction, distance from the Sun, and orbital periods of objects within the solar system.] [Assessment Boundary: Assessment does not include Newton’s Law of Gravitation or Kepler’s Laws.]</p>	<p>IAES Exploring Space (95-96)</p>
MS-PS3 Energy	
<p>MS-PS3-5 (MS-PS3-6). Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.</p> <p>[Clarification Statement: Examples of empirical evidence used</p>	<p>IAPS Energy (54-56A)</p> <p>[LAB-AIDS Clarification Statement:</p>

Disciplinary Core Idea	SEPUP Unit Title
<p>in arguments could include an inventory or other representation of the energy before and after the transfer in the form of temperature changes or motion of object.] [Assessment Boundary: Assessment does not include calculations of energy.]</p>	<p>Formal arguments (claim + evidence) are an extension to these activities.]</p>

Disciplinary Core Idea	SEPUP Unit Title
MS-LS1 From Molecules to Organisms: Structures and Processes	
<p>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.</p> <p>[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.]</p>	<p>IALS Ecology (83-84, 87) IALS Evolution (95-96)</p> <p>[LAB-AIDS Clarification Statement: Plant structures are briefly covered in the Life Cycles of Plants and Animals as online content support for IALS Genetics Act 62]</p>
<p>MS-LS1-5. Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.</p> <p>[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.]</p>	<p>IALS Genetics (54-71)</p>
<p>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.</p> <p>[Assessment Boundary: Assessment does not include</p>	<p>IALS Experimental Design (5-6)</p> <p>[LAB-AIDS Clarification Statement: Basic nerve function, but not memory formation, is covered.]</p>

Disciplinary Core Idea	SEPUP Unit Title
mechanisms for the transmission of this information.]	
MS-LS3 Heredity: Inheritance and Variation of Traits	
<p>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.</p> <p>[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.]</p>	<p>[LAB-AIDS Clarification Statement: Under review for further development.]</p>
<p>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.</p> <p>[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.]</p>	<p>IALS Genetics (57-63, 65, 66)</p>
MS-LS4 Biological Evolution: Unity and Diversity	
<p>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.</p> <p>[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.]</p>	<p>http://sepuplhs.org/pdfs/ials_humanreproduction.pdf</p> <p>[LAB-AIDS Clarification Statement: Under development.]</p>
<p>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.</p> <p>[Clarification Statement: Emphasis is on using simple probability statements and proportional reasoning to construct explanations.]</p>	<p>IALS Ecology (84) IALS Evolution (95-97)</p>
<p>MS-LS4-5. Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.</p>	<p>IALS Genetics (54, 56-57, 67-71) IALS Evolution (91)</p>

Disciplinary Core Idea	SEPUP Unit Title
[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.]	[LAB-AIDS Clarification Statement: Emphasis on genetic testing, not genetic modification, in the middle level.]
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.]	IALS Evolution (95-97)

Disciplinary Core Idea	SEPUP Unit Title
MS-ESS1 Earth's Place in the Universe	
MS-ESS1-1. Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons. [Clarification Statement: Examples of models can be physical, graphical, or conceptual.]	IAES Earth in Space (71-84)
MS-ESS1-2. Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system. [Clarification Statement: Emphasis for the model is on gravity as the force that holds together the solar system and Milky Way galaxy and controls orbital motions within them. Examples of models can be physical (such as the analogy of distance along a football field or computer visualizations of elliptical orbits) or conceptual (such as mathematical proportions relative to the size of familiar objects such as their school or state).] [Assessment Boundary: Assessment does not include Kepler's Laws of orbital motion or the apparent retrograde motion of the planets as viewed from Earth.]	IAES Exploring Space (88-91) [LAB-AIDS Clarification Statement: Content is address but independent student development of models are not.]
MS-ESS1-3. Analyze and interpret data to determine scale properties of objects in the solar system. [Clarification Statement: Emphasis is on the analysis of data from Earth-based instruments, space-based telescopes, and spacecraft to determine similarities and differences among	IAES Exploring Space (86, 88, 90, 91, 93, 94)

Disciplinary Core Idea	SEPUP Unit Title
<p>solar system objects. Examples of scale properties include the sizes of an object's layers (such as crust and atmosphere), surface features (such as volcanoes), and orbital radius. Examples of data include statistical information, drawings and photographs, and models.] [Assessment Boundary: Assessment does not include recalling facts about properties of the planets and other solar system bodies.]</p>	
MS-ESS2 Earth's Systems	
<p>MS-ESS2-5. Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.</p> <p>[Clarification Statement: Emphasis is on how air masses flow from regions of high pressure to low pressure, causing weather (defined by temperature, pressure, humidity, precipitation, and wind) at a fixed location to change over time, and how sudden changes in weather can result when different air masses collide. Emphasis is on how weather can be predicted within probabilistic ranges. Examples of data can be provided to students (such as weather maps, diagrams, and visualizations) or obtained through laboratory experiments (such as with condensation).] [Assessment Boundary: Assessment does not include recalling the names of cloud types or weather symbols used on weather maps or the reported diagrams from weather stations.]</p>	IAES Weather and Atmosphere (63-69)
<p>MS-ESS2-6. Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.</p> <p>[Clarification Statement: Emphasis is on how patterns vary by latitude, altitude, and geographic land distribution. Emphasis of atmospheric circulation is on the sunlight-driven latitudinal banding, the Coriolis effect, and resulting prevailing winds; emphasis of ocean circulation is on the transfer of heat by the global ocean convection cycle, which is constrained by the Coriolis effect and the outlines of continents. Examples of models can be diagrams, maps and globes, or digital representations.] [Assessment Boundary: Assessment does not include the dynamics of the Coriolis effect.]</p>	IAES Weather and Atmosphere (54-58, 66)

Grade 8

Disciplinary Core Idea	SEPUP Unit Title
MS-PS1 Matter and Its Interactions	
<p>MS-PS1-3. Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.</p> <p>[Clarification Statement: Emphasis is on natural resources that undergo a chemical process to form the synthetic material. Examples of new materials could include new medicine, foods, and alternative fuels.] [Assessment Boundary: Assessment is limited to qualitative information.]</p>	<p>IAPS Chemistry of Materials (12, 13, 21, 22, 23)</p> <p>[LAB-AIDS Clarification Statement: Issue emphasis on life cycle of material]</p>
<p>MS-PS1-5. Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.</p> <p>[Clarification Statement: Emphasis is on law of conservation of matter and on physical models or drawings, including digital forms, that represent atoms.] [Assessment Boundary: Assessment does not include the use of atomic masses, balancing symbolic equations, or intermolecular forces.]</p>	<p>IAPS Chemistry of Materials (25) IAPS Water (49)</p> <p>[LAB-AIDS Clarification Statement: Focus on conservation of mass before and after a reaction, not on number of particles]</p>
<p>MS-PS1-6. Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.*</p> <p>[Clarification Statement: Emphasis is on the design, controlling the transfer of energy to the environment, and modification of a device using factors such as type and concentration of a substance. Examples of designs could involve chemical reactions such as dissolving ammonium chloride or calcium chloride.] [Assessment Boundary: Assessment is limited to the criteria of amount, time, and temperature of substance in testing the device.]</p>	<p>[LAB-AIDS Clarification Statement: Under development.]</p>
MS-PS2 Motion and Stability: Forces and Interactions	
<p>MS-PS2-1. Apply Newton’s Third Law to design a solution to a problem involving the motion of two colliding objects.*</p> <p>[Clarification Statement: Examples of practical problems could include the impact of collisions between two cars, between a car and stationary objects, and between a meteor and a space vehicle.] [Assessment Boundary: Assessment is limited to vertical or horizontal interactions in one dimension.]</p>	<p>IAPS Force and Motion (74-86)</p> <p>[LAB-AIDS Clarification Statement: Newton’s Third Law not well addressed, and discussion deals primarily with mass, acceleration, and force.]</p>
<p>MS-PS2-2. Plan an investigation to provide evidence that the change in an object’s motion depends on the sum of the</p>	<p>IAPS Force and Motion (74-82)</p>

Disciplinary Core Idea	SEPUP Unit Title
<p>forces on the object and the mass of the object.</p> <p>[Clarification Statement: Emphasis is on balanced (Newton’s First Law) and unbalanced forces in a system, qualitative comparisons of forces, mass and changes in motion (Newton’s Second Law), frame of reference, and specification of units.] [Assessment Boundary: Assessment is limited to forces and changes in motion in one-dimension in an inertial reference frame and to change in one variable at a time. Assessment does not include the use of trigonometry.]</p>	<p>[LAB-AIDS Clarification Statement: Frame of reference is not well addressed.]</p>
MS-PS4 Waves and Their Applications in Technologies for Information Transfer	
<p>MS-PS4-1. Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.</p> <p>[Clarification Statement: Emphasis is on describing waves with both qualitative and quantitative thinking.] [Assessment Boundary: Assessment does not include electromagnetic waves and is limited to standard repeating waves.]</p>	<p>IAPS Waves (90-91)</p> <p>[LAB-AIDS Clarification Statement: Amplitude and energy are discussed but not using explicit mathematical representations.]</p>
<p>MS-PS4-2. Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.</p> <p>[Clarification Statement: Emphasis is on both light and mechanical waves. Examples of models could include drawings, simulations, and written descriptions.] [Assessment Boundary: Assessment is limited to qualitative applications pertaining to light and mechanical waves.]</p>	<p>IAPS Waves (93-98)</p> <p>[LAB-AIDS Clarification Statement: Dual, e.g., quantum or particle nature of light, is not discussed at the middle level.]</p>
<p>MS-PS4-3. Integrate qualitative scientific and technical information to support the claim that digitized signals (sent as wave pulses) are a more reliable way to encode and transmit information.</p> <p>[Clarification Statement: Emphasis is on a basic understanding that waves can be used for communication purposes. Examples could include using fiber optic cable to transmit light pulses, radio wave pulses in wifi devices, and conversion of stored binary patterns to make sound or text on a computer screen.] [Assessment Boundary: Assessment does not include binary counting. Assessment does not include the specific mechanism of any given device.]</p>	<p>[LAB-AIDS Clarification Statement: Under review for further development.]</p>

Disciplinary Core Idea	SEPUP Unit Title
MS-LS1 From Molecules to Organisms: Structures and Processes	
MS-LS1-7. Develop a model to describe how food is	IALS Body Works (12-15)

Disciplinary Core Idea	SEPUP Unit Title
<p>rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.</p> <p>[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.]</p>	<p>IALS Cell Biology and Disease (39)</p>
MS-LS4 Biological Evolution: Unity and Diversity	
<p>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.</p> <p>[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.]</p>	<p>IALS Evolution (89-101)</p>
<p>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.</p> <p>[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.]</p>	<p>IALS Evolution (95-99)</p>

Disciplinary Core Idea	SEPUP Unit Title
MS-ESS1 Earth's Place in the Universe	
<p>MS-ESS1-4. Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history.</p> <p>[Clarification Statement: Emphasis is on how analyses of rock formations and the fossils they contain are used to establish relative ages of major events in Earth's history. Examples of Earth's major events could range from being very recent (such as the last Ice Age or the earliest fossils of homo sapiens) to very old (such as the formation of Earth or the earliest evidence of life). Examples can include the formation</p>	<p>IAES Plate Tectonics (39) [addresses Earth time]</p> <p>IALS Evolution (92-93) [addresses rock strata]</p>

Disciplinary Core Idea	SEPUP Unit Title
<p>of mountain chains and ocean basins, the evolution or extinction of particular living organisms, or significant volcanic eruptions.] [Assessment Boundary: Assessment does not include recalling the names of specific periods or epochs and events within them.]</p>	
MS-ESS2 Earth's Systems	
<p>MS-ESS2-1. Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.</p> <p>[Clarification Statement: Emphasis is on the processes of melting, crystallization, weathering, deformation, and sedimentation, which act together to form minerals and rocks through the cycling of Earth's materials.] [Assessment Boundary: Assessment does not include the identification and naming of minerals.]</p>	<p>IAES Rocks and Minerals (19-22, 28-29)</p>
<p>MS-ESS2-2. Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.</p> <p>[Clarification Statement: Emphasis is on how processes change Earth's surface at time and spatial scales that can be large (such as slow plate motions or the uplift of large mountain ranges) or small (such as rapid landslides or microscopic geochemical reactions), and how many geoscience processes (such as earthquakes, volcanoes, and meteor impacts) usually behave gradually but are punctuated by catastrophic events. Examples of geoscience processes include surface weathering and deposition by the movements of water, ice, and wind. Emphasis is on geoscience processes that shape local geographic features, where appropriate.]</p>	<p>IAES Erosion and Deposition (28-30) IAES Plate Tectonics (37-39, 41-42, 44, 45, 46, 47)</p>
<p>MS-ESS2-3. Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.</p> <p>[Clarification Statement: Examples of data include similarities of rock and fossil types on different continents, the shapes of the continents (including continental shelves), and the locations of ocean structures (such as ridges, fracture zones, and trenches).] [Assessment Boundary: Paleomagnetic anomalies in oceanic and continental crust are not assessed.]</p>	<p>IAES Plate Tectonics (40-42, 44-45)</p>
MS-ESS3 Earth and Human Activity	
<p>MS-ESS3-1. Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.</p>	<p>[LAB-AIDS Clarification Statement: Under review for further development.]</p>

Disciplinary Core Idea	SEPUP Unit Title
<p>[Clarification Statement: Emphasis is on how these resources are limited and typically non-renewable, and how their distributions are significantly changing as a result of removal by humans. Examples of uneven distributions of resources as a result of past processes include but are not limited to petroleum (locations of the burial of organic marine sediments and subsequent geologic traps), metal ores (locations of past volcanic and hydrothermal activity associated with subduction zones), and soil (locations of active weathering and/or deposition of rock).]</p>	
<p>MS-ESS3-2. Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.</p> <p>[Clarification Statement: Emphasis is on how some natural hazards, such as volcanic eruptions and severe weather, are preceded by phenomena that allow for reliable predictions, but others, such as earthquakes, occur suddenly and with no notice, and thus are not yet predictable. Examples of natural hazards can be taken from interior processes (such as earthquakes and volcanic eruptions), surface processes (such as mass wasting and tsunamis), or severe weather events (such as hurricanes, tornadoes, and floods). Examples of data can include the locations, magnitudes, and frequencies of the natural hazards. Examples of technologies can be global (such as satellite systems to monitor hurricanes or forest fires) or local (such as building basements in tornado-prone regions or reservoirs to mitigate droughts).]</p>	<p>IAES Weather and Atmosphere (50-52, 67, 68-70)</p> <p>[LAB-AIDS Clarification Statement: Emphasis on severe weather effects and forecasting.]</p>
<p>MS-ESS3-4. Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth’s systems.</p> <p>[Clarification Statement: Examples of evidence include grade-appropriate databases on human populations and the rates of consumption of food and natural resources (such as freshwater, mineral, and energy). Examples of impacts can include changes to the appearance, composition, and structure of Earth’s systems as well as the rates at which they change. The consequences of increases in human populations and consumption of natural resources are described by science, but science does not make the decisions for the actions society takes.]</p>	<p>[LAB-AIDS Clarification Statement: Under review for further development.]</p>