Lab-Aids Correlations for

COLORADO SCIENCE STANDARDS MIDDLE SCHOOL LEVEL

GRADES 6-8

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This document is intended to show how the SEPUP 3rd edition materials align with the 2019-20 *Colorado Middle Level Science Standards*[1].

ABOUT THE COLORADO SCIENCE STANDARDS

The Colorado Academic Standards in science represent what all Colorado students should know and be able to do in science as a result of their preschool through twelfth-grade science education. Specific expectations are given for students who complete each grade from preschool through eighth grade and for high school. These standards outline the essential level of science content knowledge and the application of the skills needed by all Colorado citizens to participate productively in our increasingly global, information-driven society.

ABOUT OUR PROGRAMS

Lab-Aids has maintained its home offices and operations in Ronkonkoma, NY, since 1963. We publish over 200 kits and core curriculum programs to support science teaching and learning, grades 6-12. All core curricula 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 as a result of program use. All programs have extensive support for technology and

[1] https://www.cde.state.co.us/coscience/2020cas-sc-ms

feature comprehensive teacher support. For more information please visit www.lab-aids.com .

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. Since 1987, development of SEPUP materials has been supported by grants from the National Science Foundation and other public and private sources. SEPUP programs include student books, equipment kits, teacher materials, and online digital content, and are available as full year courses, or separately, as 17 units, each taking 3-8 weeks to complete, as listed below.

Middle Level, Grades 6-8

Earth Science	**Life Science**	**Physical Science**
Earth's Resources	Biomedical Engineering	Chemistry of Materials
Geological Processes	Body Systems	Chemical Reactions
Land, Water, and Human Interactions	Ecology	Energy
Solar System and Beyond	From Cells to Organisms	Force and Motion
Weather and Climate	Evolution	Fields and Interactions
	Reproduction	Waves

ABOUT THE LAB-AIDS CITATIONS

The following tables are presented showing GLE, evidence outcomes, and where found in SEPUP.

Citations included in the correlation document are as follows:

* indicates where Performance Expectation is assessed
Unit title, Activity Number
The Chemistry of Materials, 14

Evidence Outcomes,	
Expressed as Performance Expectations	MS-PS1-2
Colorado Skills and SEP	As listed
Crosscutting concepts	As listed

PREPARED GRADUATES	COLORADO GRADE LEVEL EXPECTATION	EVIDENCE OUTCOMES	CO ESSENTIAL SKILLS & SCI/ENGIN PRACTICES	CROSSCUTTING CONCEPTS	WHERE FOUND IN SEPUP
STANDARD 1. PHYSICAL SCIENCE					
1. Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding structure, properties and interactions of matter.	1. The fact that matter is composed of atoms and molecules can be used to explain the properties of substances, diversity of materials, states of matter and phases changes.	MS-PS1-1	Develop a model Analyze and interpret data Gather, read, and synthesize information Connections to NOS	Scale, proportion, quantity Patterns Structure & function Interdependence of SET Influence of SET on society and natural world	*Chemistry of Materials: 2, 6, 7, 12**
		MS-PS1-2			*Chemical Reactions: 1, 2, 3, 4, 5**
		MS-PS1-3			*Chemistry of Materials: 1, 2, 3, 4, 5, 11, 12, 13**
		MS-PS1-4			*Chemistry of Materials:* 8, 9, 10
	2. Reacting substances rearrange to form different molecules, but the number of atoms is conserved. Some reactions release energy and others absorb energy.	MS-PS1-2	Develop a model Undertake a design project Connections to NOS	Energy and matter	*Chemical Reactions: 1, 2, 3, 4, 5**
		MS-PS1-5			*Chemical Reactions: 1, 2, 3, 4, 5, 6, 7**
		MS-PS1-6			*Chemical Reactions: 2, 3, 5, 8, 9, 10, 11**
2. Students can use the full range of science and	3. Motion is described relative to a reference frame	MS-PS2-1	Apply scientific ideas or principles	Systems and system models	*Force and Motion: 1, 10, 11, 12**

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engineering practices to make sense of natural phenomena and solve problems that require understanding interactions between objects and within systems of objects.	that must be shared with others and is determined by the sum of the forces acting on it. The greater the mass of the object, the greater the force needed to achieve the same change in motion.	MS-PS2-2	Plan and conduct an investigation Connections to NOS	Stability and change Connections to ETAS	*Force and Motion: 1, 6, 7, 8, 9, 13**
	4. Forces that act a distance (gravitational, electric, and magnetic) can be explained by force fields that extend through space and can be mapped by their effect on a test object.	MS-PS2-3	Ask questions Engage in argument from evidence Planning and carrying out investigations Connections to NOS	Cause and effect Systems and system models	*Fields and Interactions: 7, 8, 9, 12, 13*, 14*
		MS-PS2-4			*Fields and Interactions: 3, 4, 7**
		MS-PS2-5			*Fields and Interactions: 5, 7, 9, 10, 12**
3. Students can use the full range of science and engineering practices to make sense of natural	5. Kinetic energy can be distinguished from the various forms of potential energy.	MS-PS3-1	Analyze and interpret data Plan and carry out investigations	Scale, proportion and quantity Energy and matter	*Force and Motion: 1, 2, 3, 4, 5**
		MS-PS3-2			*Fields and Interactions: 3, 4, 6, 7, 10, 11**

PREPARED GRADUATES	COLORADO GRADE LEVEL EXPECTATION	EVIDENCE OUTCOMES	CO ESSENTIAL SKILLS & SCI/ENGIN PRACTICES	CROSSCUTTING CONCEPTS	WHERE FOUND IN SEPUP
phenomena and solve problems that require understanding how energy is transferred and conserved.		MS-PS3-3	Construct explanations & design solutions Engage in argument from evidence Connections to NOS		*Energy: 1, 7, 8, 10, 11, 12, 13**
		MS-PS3-4			*Energy: 1, 4, 6, 7, 8**
		MS-PS3-5			*Energy: 2, 3, 4, 5, 6**
	6. Energy changes to and from each type can be tracked through physical or chemical interactions. The relationship between the temperature and the total energy of a system depends on the types, states and amounts of matter.	MS-PS3-3	Construct explanations and design solutions Plan and carry out investigations Engage in argument from evidence Connections to NOS	Scale, proportion and quantity Energy and matter	*Energy: 1, 7, 8, 10, 11, 12, 13**
		MS-PS3-4			*Energy: 1, 4, 6, 7, 8**
		MS-PS3-5			*Energy: 2, 3, 4, 5, 6**
	7. When two objects interact, each one exerts a force on the other that can cause energy to be transferred to and from the object.	MS-PS3-2	Develop and use models	Systems and system models	*Fields and Interactions: 3, 4, 6, 7, 10, 11**

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4. Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how waves are used to transfer energy and information.	8. A simple wave model has a repeating pattern with specific wavelength, frequency, and amplitude and mechanical waves need a medium through which they are transmitted. This model can explain many phenomena which include light and sound.	MS-PS4-1	Use mathematics and computational thinking Connections to NOS	Patterns	*Waves: 1, 2, 3, 7**
		MS-PS4-2			*Waves: 3, 4, 8, 9, 10, 11, 12, 13**
	9. A wave model of light is useful to explain how light interacts with objects through a variety of properties.	MS-PS4-2	Develop and use a model	Structure and function	*Waves: 3, 4, 8, 9, 10, 11, 12, 13**
	10. Designed technologies can transmit digital information as wave pulses.	MS-PS4-3	Obtaining, evaluating and communicating information	Structure and function Connections ETAS Connections to NOS	*Waves: 5, 6*
STANDARD 2. LIFE SCIENCE					

PREPARED GRADUATES	COLORADO GRADE LEVEL EXPECTATION	EVIDENCE OUTCOMES	CO ESSENTIAL SKILLS & SCI/ENGIN PRACTICES	CROSSCUTTING CONCEPTS	WHERE FOUND IN SEPUP
5. Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how individual organisms are configured and how these structures function to support life, growth, behavior and reproduction.	1. All living things are made up of cells, which is the smallest unit that can be said to be alive.	MS-LS1-1	Plan and carry out investigations	Scale, proportion and quantity	*From Cells to Organisms: 1, 2, 3, 4, 9**
		MS LS1-2 MS-LS1-3	Develop and use a model Engage in argument from evidence	Structure and function Systems and system models	*From Cells to Organisms: 6, 7, 8**
					From Cells to Organisms: 10, 14, 15 *Body Systems: 1, 2, 3, 4, 9, 10, 11, 12**
	2. Organisms reproduce, either sexually or asexually, and transfer their genetic information to their offspring.	MS-LS1-4	Engage in argument from evidence	Cause and effect	*Reproduction: 10*, 11**
		MS-LS1-5	Construct explanations and design solutions		*Reproduction: 1, 7**
	3. Sustaining life requires substantial energy and matter inputs.	MS-LS1-6	Construct explanations and design solutions	Energy and matter	*From Cells to Organisms: 12, 13**
		MS-LS1-7	Develop and use models		*From Cells to Organisms: 5, 11** *Body Systems: 5*
	4. Each sense receptor responds to different inputs (electromagnetic,	MS-LS1-8	Obtain, evaluate, and communicate information Connections to NOS	Cause and effect Connections to ETAS	*Body Systems: 6, 7, 8**

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	mechanical, chemical), transmitting them as signals that travel along nerve cells to the brain.			Connections to NOS	
6. Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how living systems interact with the biotic and abiotic environment.	5. Organisms and populations of organisms are dependent on their environmental interactions both with other living things and with nonliving	MS-LS2-1 MS-LS2-2	Analyze and interpret data Construct explanations and design solutions	Cause and effect Patterns Influence of SET on society and natural world Connections to NOS	*Ecology: 5, 6, 9** *Ecology: 2, 8, 10**
	6. Ecosystems are sustained by the continuous flow of energy, originating primarily from the sun, and the recycling of matter and nutrients within the system.	MS-LS2-3	Develop and use models Connections to NOS	Energy and matter Connections to NOS Connections to ETAS	*Ecology: 7, 8, 11, 12**
	7. Ecosystems are dynamic in nature;	MS-LS2-4	Engage in argument from evidence	Stability and change	*Ecology: 1, 2, 3, 4, 5, 6, 13, 14**

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	their characteristics can vary over time. Disruptions to any physical or biological component of an ecosystem	MS-LS2-5	Connections to NOS	Connections to NOS	*Ecology: 2, 4, 15**
7. Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how genetic and environmental factors influence variation of organisms across generations.	8. Heredity explains why offspring resemble, but are not identical to, their parents and is a unifying biological principle. Heredity refers to specific mechanisms by which characteristics or traits are passed from one generation to the next via genes.	MS-LS3-1	Develop and use models Obtain, evaluate, and communicate information	Cause and effect Structure and function Interdependence of SET Connections to NOS	*Reproduction: 1, 3, 8, 12, 13** *Evolution: 3, 4, 5**
		MS-LS3-2			*Reproduction: 1, 2, 3, 4, 5, 6, 8, 9**
8. Students can use the full range of science and engineering practices to make sense of natural	9. Fossils are mineral replacements, preserved remains, or traces of organisms that lived in the past.	MS-LS4-1	Analyze and interpret data Construct explanations and design solutions	Patterns Connections to NOS	*Evolution: 7, 8, 9, 10 11**
		MS-LS4-2			*Evolution: 7, 8, 9, 10 11, 12**
		MS-LS4-3			*Evolution: 12, 13**

PREPARED GRADUATES	COLORADO GRADE LEVEL EXPECTATION	EVIDENCE OUTCOMES	CO ESSENTIAL SKILLS & SCI/ENGIN PRACTICES	CROSSCUTTING CONCEPTS	WHERE FOUND IN SEPUP
phenomena and solve problems that require understanding how natural selection drives biological evolution accounting for the unity and diversity of organisms.	10. Genetic variations among individuals in a population give some individuals an advantage in surviving and reproducing in their environment.	MS-LS4-4	Construct explanations and design solutions Obtain, evaluate, and communicate information	Cause and effect Connections to ETAS Connections to NOS	*Evolution: 1, 2, 3, 4**
		MS-LS4-5			*Evolution: 14, 15, 16**
		MS-LS4-6			*Evolution: 1, 2, 3, 4, 5, 6**
	11. Adaptation by natural selection acting over generations is one important process by which species change over time in response to changes in environmental conditions.	MS-LS4-6	Using mathematics and computational thinking	Cause and effect Connections to NOS	*Evolution: 1, 2, 3, 4, 5, 6**
	12. Biodiversity is the wide range of existing life forms that have adapted to the variety of conditions on Earth, from terrestrial to marine ecosystems.	MS-LS2-5	Engage in argument from evidence	Patterns Energy and matter Interdependence of SET Connections to NOS	*Ecology: 2, 4, 15**
STANDARD 3. EARTH SCIENCE					

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9. Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding the universe and Earth's place in it.	1. Motion is predictable in both solar systems and galaxies.	MS-ESS1-1	Develop and use a model	Patterns Systems and system models Connections to NOS	*Solar System and Beyond: 2, 3, 4, 5, 6, 7, 8, 9**
		MS-ESS1-2			*Solar System and Beyond: 10, 11, 12, 14, 15, 16**
	2. The solar system contains many varied objects held together by gravity. Solar system models explain and predict eclipses, lunar phases, and seasons.	MS-ESS1-2	Develop and use a model Analyze and interpret data	Patterns Scale, proportion, quantity Modeling Connections to NOS	*Solar System and Beyond: 10, 11, 12, 14, 15, 16**
		MS-ESS1-3			*Solar System and Beyond: 1, 10, 11, 12, 13**
10. Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how and why	3. Rock strata and the fossil record can be used as evidence to organize the relative occurrence of major historical events in Earth's history.	MS-ESS1-4	Constructing explanations and design solutions	Scale, proportion, quantity	*Earth's Resources: 9, 10, 11, 12**
	4. Energy flows and matter cycles within and among Earth's systems, including	MS-ESS2-1	Develop and use models	Stability and change	*Geological Processes: 2, 5, 8, 9, 10, 11, 13, 14, 15**

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Earth is constantly changing.	the sun and Earth's interior as primary energy sources. Plate tectonics is one result of these processes.	MS-ESS2-2			*Geological Processes: 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13** *Land, Water, and Human Interactions: 3, 4, 6, 7, 8, 10, 11, 12, 13, 14**
	5. Plate tectonics is the unifying theory that explains movements of rocks at Earth's surface and geological history.	MS-ESS2-3	Analyze and interpret data Connections to NOS	Patterns	*Geological Processes: 10, 11, 12, 13, 14**
	6. Water cycles among land, ocean, and atmosphere, and is propelled by sunlight and gravity. Density variations of sea water drive interconnected ocean currents. Water movement causes weathering and erosion,	MS-ESS2-2	Construct explanations and design solutions Develop and use a model NOS	Scale, proportion, quantity Energy and matter	*Geological Processes: 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13** *Land, Water, and Human Interactions: 3, 4, 6, 7, 8, 10, 11, 12, 13, 14**
		MS-ESS2-4			*Land, Water, and Human Interactions: 2, 5, 7, 8, 9**

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	changing landscape features.	MS-ESS2-5			*Weather and Climate: 2, 3, 7, 9, 10, 11, 12, 13**
		MS-ESS2-6			*Weather and Climate: 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14**
	7. Complex interactions determine local weather patterns and influence climate, including the role of the ocean.	MS-ESS2-5	Develop and use models Collect and analyze data	Cause and effect Systems and system models	*Weather and Climate: 2, 3, 7, 9, 10, 11, 12, 13**
		MS-ESS2-6			*Weather and Climate: 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14**
11. Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how human activities and the	8. Humans depend on Earth's land, ocean, atmosphere, and biosphere for different resources, many of which are limited or not renewable. Resources are distributed unevenly around the planet as a result of past geologic processes.	MS-ESS3-1 MS-ESS3-2	Construct explanations and design solutions	Cause and effect	*Geological Processes: 2, 16, 17** *Earth's Resources: 1, 2, 3, 5, 7, 8, 14**

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Earth's surface processes interact.	9. Mapping the history of natural hazards in a region and understanding related geological forces.	MS-ESS3-2	Analyze and interpret data	Patterns Influence of SET	*Geological Processes: 1, 3, 4, 6, 7, 8, 11, 18**
	10. Human activities have altered the biosphere, sometimes damaging it, although changes to environments can have different impacts for different living things.	MS-ESS3-3 MS-ESS3-4	Construct explanations and design solutions Engage in argument from evidence	Cause and effect Influence of SET NOS	*Land, Water, and Human Interactions: 1, 3, 4, 5, 6, 9, 13, 14, 15, 16** *Earth's Resources: 2, 4, 6, 13**
	11. Human activities affect global warming. Decisions to reduce the impact of global warming depend on understanding climate science, engineering capabilities, and social dynamics.	MS-ESS3-5	Ask Questions	Stability and change	*Weather and Climate: 1, 10, 14, 15, 16**