



LAB-AIDS CORRELATIONS TO NEBRASKA ASSESSMENT BENCHMARKS FOR SCIENCE

GRADE 8

With Assessment Guidelines information

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. SEPUP materials are supported by grants from the National Science Foundation. All other materials developed by LAB-AIDS. This correlation is intended to show selected locations in SEPUP 2nd Edition programs that support the Nebraska Assessment Benchmarks for Science. It is not an exhaustive list; other locations may exist that are not listed here.

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Key to SEPUP Core Science Programs:

SEPUP programs are available as full year courses, or separately, as units, each taking 3-9 weeks to complete, as listed below.

MIDDLE SCHOOL

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

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.

<i>SEPUP Course/Activity Numbers</i>	<i>Main Unit Issue</i>
IAES Issues and Earth Science	
Studying Soils Scientifically, 1-11	Why don't plants grow in the school garden?
Rocks and Minerals, 12-23	How do diamonds made in a lab compare to diamonds mined from the earth?
Erosion and Deposition, 24-35	Where should Boomtown construct the new buildings?
Plate Tectonics, 36-49	Which site would you recommend for storing nuclear waste?
Weather and Atmosphere, 50-70	Is the growth of Sunbeam City affecting its weather, atmosphere, and water availability?
The Earth in Space, 71-84	Why are there many different calendars?
Earth and the Solar System, 85-98	What kinds of future space missions should we conduct?
IALS Issues and Life Science	
Studying People Scientifically, 1-10	Which proposals have an experimental design worth funding?
Body Works, 11-29	How can you convince people to make choices that reduce their level of heart disease risk?
Cell Biology and Disease, 30-53	How is an emerging disease spread? What can you do to stop it?
Genetics, 54-71	What are the ethical issues involved in using genetic information?
Ecology, 72-88	What are the trade-offs of introducing a species into a new environment?
Evolution, 89-101	What are the trade-offs in deciding whether to save an endangered species or to re-create an extinct one?
Bioengineering, 102-108	How are new solutions to problems in life science developed?
IAPS Issues and Physical Science	
Studying Materials Scientifically, 1-11	How should unidentified materials be handled?
The Chemistry of Materials, 12-29	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, 30 - 52	What does your community do to make its water safe to drink? Whose responsibility is it?
Energy, 53-72	Can you help a family decide what energy improvements they should invest in?
Force and Motion, 73-88	Should noncommercial vehicles be more alike?
Waves, 89-99	Are there situations in which some waves are harmful to your health?

Key to SEPUP Assessment System:

SEPUP materials include research-based assessment system developed by SEPUP and the Berkeley Evaluation and Assessment Research Group (BEAR) in the University of California Graduate School of Education. Forming the core of the SEPUP Assessment System are the **assessment variables** (content and process skills to be assessed), **assessment questions or tasks** used to gather evidence and **scoring guides** for interpreting students' responses (correspond to assessment variables).

The nine assessment variables are:

Designing Investigations (DI)
Organizing Data (OD)
Analyzing Data (AD)
Understanding Concepts (UC)
Recognizing Evidence (RE)
Evidence and Trade-offs (ET)
Communication Skills (CS)
Organizing Scientific Ideas (SI)
Group Interaction (GI)

Types of assessment:

Quick Checks (✓) present opportunities for informal formative assessment and may be used prior to instruction to find out what students know or think. They may also be used to help teachers track students' knowledge of key information or progress in understanding a concept.

Some embedded questions and tasks and all item bank questions are all suitable for summative assessment. Analysis questions are included at the end of each activity.

Citations included in the correlation document are as follows:

IAES 40, 41, 42	40 AQ1, 3, 4
IALS 2, 3, 37	41 AQ3 UC; [IB] D2
IAPS 1, 2, 3	42 [IB] D4, 6, 8-10, 16

IAES 40, 41, 42

40 AQ1, 3, 4

41 AQ3 UC; [IB] D2

42 [IB] D4, 6, 8-10, 16

means that the standard or benchmark may be assessed using Issues and Earth Science (IAES) Activity 40 Analysis Questions 1, 3 and 4, IAES Activity 41 Analysis Question 3 using the Understanding Concepts scoring guide and Item Bank Questions D2, 4, 6, 8-10, and 16 from Unit D Plate Tectonics.

For more information on program assessment and using SEPUP rubrics, consult the Teacher's Guide, TR part III Assessment section.

SEPUP Support for Engineering Design

The Next Generation Science Standards (NGSS) note that science and engineering are somewhat parallel practices and have many similar elements. Scientists ask questions, make observations, and collect and analyze data, in an attempt to make sense of the natural world. Similarly, engineers create, test, and redesign as they respond with solutions to human needs. And just as we use scaffolds in teaching of scientific inquiry to improve student learning and practice, so do we use scaffolds in teaching about engineering for our students. The NGSS emphasize three major phases of the engineering design process.

- DESIGN: Creates design, prototype or plan, noting constraints of proposed use
- TEST: Tests design, prototype or plan, collecting qualitative or quantitative data
- REDESIGN: Evaluates prototype, design or plan, suggests further changes as needed

In addition, the NGSS emphasize the role of design in solving human problems, and of designers in developing criteria for solutions, evaluating solutions, and determining the tradeoffs involved in a design or solution.

The table below shows SEPUP activities that support major elements of engineering design. Some support the initial stages of design, criteria development, and evaluation that precede the full design cycle by suggesting or evaluating scientific or technological solutions to real-world problems. Others involve students in one or all steps of the design cycle as they build, test, and/or redesign prototypes.

Engineering and Design Practices in SEPUP

Course activity with description	Students suggest or evaluate a solution	Students engage in the engineering process		
		Design	Test	Re-design
IAES11: Recommend a soil improvement plan	X			
IAES 32: Design a coastal breakwater		X	X	X
IAES 35: Recommend a site plan for housing development		X		
IAES 49: Evaluate sites for nuclear waste disposal	X			
IAES 67: Design/build wind vane/ anemometer		X	X	X
IAES 98: Recommend a space	X			

mission				
IALS 48: Design an improved hand-washing procedure		X	X	X
IALS 88: Suggest a plan for preventing zebra mussel spread	X			
IALS 104: Design artificial heart valve		X		
IALS 105: Design an artificial bone		X	X	X
IALS 107: Design an energy bar		X	X	X
IALS 108: Design a prosthetic limb		X	X	X
IAPS 12: Recommend a material for a drink container	X			
IAPS 13: Construct a product life cycle for a drink container	X			
IAPS 29: Evaluate options to recommend a "green" computer	X			
IAPS 60: Design an ice preservation chamber		X	X	X
IAPS 63: Improve a calorimeter design			X	X
IAPS 69: Design a better solar collector		X	X	X
IAPS 70: Design a warm & cool home		X		
IAPS 72: Recommend an energy-improvement plan for a home	X	X	X	X
IAPS 73: Evaluate vehicle safety features		X		
IAPS 85: Design a crash test dummy		X		

SCIENCE STANDARDS	SEPUP	
Nebraska Eighth Grade	LOCATION	ASSESSMENT
<i>Science As Inquiry requires students to combine processes and scientific knowledge with scientific reasoning and critical thinking to develop their understanding of science.</i>		
8.2.1 By the end of eighth grade, students will develop the abilities needed to do scientific inquiry.		
<i>Example Indicators:</i>		
Identify questions and form hypotheses that can be examined through scientific investigations.	IAES 16, 55 IALS 8, 14 IAPS 3, 38	16 AQ3 RE; [IB] B7-10 55 Proc DI 8 [IB] A11-16 14 [IB] B16 3 Proc DI; [IB] A16 38 AQ 1-3 AD [IB] C2
Design and conduct a scientific investigation.	IAES 67, 72 IALS 5, 64 IAPS 51, 65 TR II: Science Skills Sheet 5	67 Proc DI 72 [IB] F17 5 [IB] A11-14 64 AQ 1 DCI 51 AQ4 DI, DI; AQ5 ET, [IB] C24 65 Proc DI; D13
Use appropriate tools and techniques to gather, analyze, and interpret data.	IAES 4, 55 IALS 19, 36 IAPS 9, 81 TR II: Science Skills Sheet 1, 2	4 Q1-3 55 Proc DI 19 [IB] B14 36 AQ3 CM, [IB] C24 9 AQ3 UC, [IB] A10-12 81 [IB] E3, 13, 15

SCIENCE STANDARDS	SEPUP	
Nebraska Eighth Grade	LOCATION	ASSESSMENT
Given evidence, develop descriptions, explanations, predictions, and models.	IAES 21, 31 IALS 18, 51 IAPS 17, 39	21 Q3, 5 31 [IB] C12 18 [IB] B9, B17-18, B29 51 AQ4 UC, [IB] C28 17 AQ6 UC 39 AQ7 SI; [IB] C3-4
Show the relationship between evidence and explanations.	IAES 30, 70 IALS 21, 95 IAPS 33, 63	30 [IB] C2, C10 70 AQ3 ET, [IB] E16 21 [IB] B19 95 [IB] F18-21 33 AQ3 RE & SI 63 AQ6 AD; [IB] D20-21
Recognize and analyze alternative explanations and predictions.	IAES 10, 31 IALS 40, 55 IAPS 40, 74	10 Proc GI 31 [IB] C12 40 AQ3 DCI, [IB] C15, C18 55 AQ2 UC 40 AQ1 ET; [IB] C5-7, C19 74 Proc DI; [IB] E1-2, 5-6
Communicate scientific procedures and explanations.	IAES 35, 62 IALS 5, 37 IAPS 27, 33	35 AQ1 ET; [IB] C13 62 AQ4 SI; [IB] E3, 9, 11, 15

SCIENCE STANDARDS	SEPUP	
Nebraska Eighth Grade	LOCATION	ASSESSMENT
		5 [IB] A11-14 37 Act UC, [IB] C14 27 AQ2 CS, AQ3 ET 33 AQ3 RE & SI
Use mathematics in scientific inquiry.	IAES 27, 64 IALS 3, 30 IAPS 12, 75	27 Proc OD; [IB] C8 64 [IB] E5 3 AQ1 ET, AQ4 UC, [IB] A3, A7, A17 30 AQ 1a DCI, [IB] C1, C30-31 12 AQ5 ET; [IB] B1 75 AQ2 UC, [IB] E2, 4-6, 7, 14
Physical Science focuses on science facts, concepts, principles, theories, and models that are important for all students to know, understand and use		
8.3.1 By the end of eighth grade, students will develop an understanding of properties and changes of properties in matter.		
<i>Example Indicators:</i>		
Investigate and demonstrate that characteristic properties of a substance (e.g., density, boiling point, and solubility) do not depend on the amount of the substance.	IAPS 9, 10, 18	9 AQ3 UC, [IB] A10-12 10 AQ1 AD, Proc DI; [IB] A10-12 18 AQ3 AD, [IB] B19-21
Observe, describe, and measure physical and chemical properties of matter.	IAPS 8, 9, 14	8 AQ6 UC; [IB] A9 9 AQ3 UC, [IB] A10-12

SCIENCE STANDARDS	SEPUP	
Nebraska Eighth Grade	LOCATION	ASSESSMENT
		14 [IB] B4-6
Explain that all matter is composed of elements which may combine in a variety of ways to form compounds.	IAPS 16, 17, 28	16 [IB] B7-11 17 AQ6 UC 28 AQ3 ET
Investigate and explain that in chemical reactions new properties are created and total mass is conserved.	IAPS 19, 25, 48	19 [IB] B12-14 25 Q2-3 48 [IB] C13, C21
8.3.2 By the end of eighth grade, students will develop an understanding of motion and forces.		
<i>Example Indicators:</i>		
Investigate and describe the motion of an object by its position, direction of motion, and speed.	IAPS 74, 75, 78	74 Proc DI; [IB] E1-2, 5-6 75 AQ2 UC, [IB] E2, 4-6, 7, 14 78 [IB] E2, 3, 8
Investigate and demonstrate that the speed and/or direction of an object changes when a force is applied to that object.	IAPS 77, 79, 80	77 Proc DI 79 [IB] E10 80 AQ2; [IB] E2, 3, 11, 20
8.3.3 By the end of eighth grade, students will develop an understanding of the forms of energy and how energy is transferred.		
<i>Example Indicators:</i>		
Investigate and describe the transfer of light energy.	IAPS 93-96	93 AQ1
Investigate and demonstrate how energy is transferred using simple machines.	Kit 214	

SCIENCE STANDARDS Nebraska Eighth Grade	SEPUP	
	LOCATION	ASSESSMENT
Investigate and describe how heat is transferred from a warmer object to a cooler object until both reach the same temperature.	IAPS 56, 57, 62	56 AQ3 57 AQ3 UC, [IB] D2-3 62 [IB] D6, D19, D20
Investigate and describe the properties and transfer of sound energy.	N/C	
Investigate and describe the transfer of energy from electrical and magnetic sources to different energy forms (e.g., heat, light, sound, and chemical).	IAPS 58, 65A, 66, 67	58 AQ2 UC, [IB] D4-5, D8 66 Proc DI; [IB] D16 67 AQ5 AD, [IB] D-14
Life Science <i>focuses on science facts, concepts, principles, theories, and models that are important for all students to know, understand, and use.</i>		
8.4.1 By the end of eighth grade, students will develop an understanding of the structure and function in living systems.		
<i>Example Indicators:</i>		
Investigate and describe the levels of organizations: cells, tissues, organs, organ systems, whole organisms, and ecosystems.	IALS 12, 15, 16	12 [IB] B12, B15 15 AQ3 UC, [IB] B2, B5, B25-28 16 AQ4 UC, [IB] B6
Investigate and demonstrate that all living things are composed of cells.	IALS 37, 38, 42	37 Act UC, [IB] C14 38 Q1-6 42 [IB] D3, D7, D16-10, C23
Investigate and explain how cells sustain life through functions (e.g., growth and nutrition).	IALS 39, 42, 82	39 AQ2 DCI, [IB] C6 42 [IB] D3, D7, D16-10, C23

SCIENCE STANDARDS	SEPUP	
Nebraska Eighth Grade	LOCATION	ASSESSMENT
		82 [IB] E5, E13-14, E17
Investigate and describe the specialized function performed by specialized cells (e.g., muscular and skeletal) in multicellular organisms.	IALS 38, 42	38 Q1-6 42 [IB] D3, D7, D16-10, C23
Investigate and describe the human body systems and how they interact.	IALS 12, 18, 24	12 [IB] B12, B15 18 [IB] B9, B17-18, B29 24 AQ 2 UC, [IB] B22, B24
Investigate and explain how disease affects the structure and/or function of an organism.	IALS 31, 34, 37	31 [IB] C8 34 AQ4 ET 37 Act UC, [IB] C14
8.4.2 By the end of eighth grade, students will develop an understanding of reproduction and heredity.		
<i>Example Indicators:</i>		
Investigate and describe how all organisms reproduce through sexual or asexual reproduction.	IAPS 12, 57, 63	12 AQ5 ET; [IB] B1 57 AQ3 UC, [IB] D2-3 63 AQ6 AD; [IB] D20-21
Investigate and describe that in many species, offspring receive hereditary information from the female (eggs) and male (sperm).	IAPS 12, 63	12 AQ5 ET; [IB] B1 63 AQ6 AD; [IB] D20-21
Investigate and explain that chromosomes contain genes which influence heredity.	IAPS 61, 63, 65	61 [IB] D10 63 AQ6 AD; [IB] D20-21 65 Proc DI; D13

SCIENCE STANDARDS	SEPUP	
Nebraska Eighth Grade	LOCATION	ASSESSMENT
Investigate and describe the effects of inherited traits and environmental influences on an organism's characteristics.	IALS 54, 64, 65	54 Proc DI; [IB] D1 64 AQ3 ET, AQ4 AD, [IB] D7 65 Proc DI; D13
8.4.3 By the end of eighth grade, students will develop an understanding of regulation and behavior.		
<i>Example Indicators:</i>		
Investigate and explain how organisms' behaviors enhance their abilities to obtain and use resources, grow, and reproduce.	IALS 72, 83, 101	72 AQ5 UC, [IB] E2, 3, E5, E13-14 83 AQ3 DCI
Investigate and examine how an organism senses change in its internal or external environment and responds to keep conditions within a required range.	IALS 13, 19, 83	13 [IB] B3, B7 19 [IB] B14 83 AQ3 DCI
Investigate and explain how behavior is a response to internal and external stimuli determined by heredity and experience.	IALS 19, 83, 97	19 [IB] B14 83 AQ3 DCI 97 AQ2 CM, [IB] F15, F22-25, F27-28, F30-31
Investigate and explain how an organism's behavior evolves through environmental adaptation.	IALS 97, 99, 101	97 AQ2 CM, [IB] F15, F22-25, F27-28, F30-31 99 AQ2 UC, [IB] 434-36
8.4.4 By the end of eighth grade, students will develop an understanding of populations and ecosystems.		
<i>Example Indicators:</i>		

SCIENCE STANDARDS	SEPUP	
Nebraska Eighth Grade	LOCATION	ASSESSMENT
Investigate and describe that a population consists of all individuals of a species at a given place and time.	IALS 83, 84, 85	83 AQ3 DCI 84 [IB] E19-20, E26-27, E34 85 AQ1 UC, [IB] E21-23
Investigate and analyze the living and nonliving factors that determine the number of organisms an ecosystem can support.	IALS 83, 84, 85	83 AQ3 DCI 84 [IB] E19-20, E26-27, E34 85 AQ1 UC, [IB] E21-23
Describe an organism by the function it serves in an ecosystem (e.g., producer, consumer, and decomposer).	IALS 78, 79, 81,	78 [IB] E7-10, E16 79 AQ1 UC, [IB] E2-3, E7-11, E16, E35 81 AQ5 UC, [IB] E2, 3, E5, E13-14
Investigate and explain how energy entering ecosystems as sunlight is transferred by producers into chemical energy through photosynthesis, and that energy then passes from organism to organism in food webs.	IALS 78, 81, 82	78 [IB] E7-10, E16 81 AQ5 UC, [IB] E2, 3, E5, E13-14 82 [IB] E5, E13-14, E17
8.4.5 By the end of eighth grade, students will develop an understanding of diversity and adaptations of organisms.		
<i>Example Indicators:</i>		
Explain how internal structures, similarity of chemical processes, (e.g., photosynthesis and respiration) and evidence of common ancestry demonstrate unity among organisms.	IALS 38, 39, 81	38 Q1-6 39 AQ2 DCI, [IB] C6 81 AQ5 UC, [IB] E2, 3, E5, E13-14
Investigate and explain how organisms adapt to	IALS 83, 84, 86	83 AQ3 DCI

SCIENCE STANDARDS	SEPUP	
Nebraska Eighth Grade	LOCATION	ASSESSMENT
living and nonliving factors in a biome.		84 [IB] E19-20, E26-27, E34 86 AQ1 CM
Investigate and explain how environmental changes created by nature and by humans may cause species extinction.	IALS 72, 95, 101	72 AQ5 UC, [IB] E2, 3, E5, E13-14 95 [IB] F18-21
Earth and Space Science focuses on the science facts, concepts, principles, theories, and models that are important for all students to know, understand, and use		
8.5.1 By the end of eighth grade, students will develop an understanding of the structure of the earth.		
<i>Example Indicators:</i>		
Investigate and describe the crust, mantle, and core of the earth.	IAES 38, 46, 47	38 AQ5 UC; [IB] D1, D15 46 [IB] D16 47 [IB] D16
Investigate and describe how a combination of constructive and destructive forces create land forms.	IAES 32, 33, 48,	32 Proc GI; [IB] C11, C12 33 Q3-4 48 AQ4 UC; [IB] D14, D16
Investigate and describe the composition of soils.	IAES 4, 5, 6	4 Q1-3 5 AQ5 UC; [IB] A3-4 6 AQ3 AD, [IB] A8-9
Investigate and describe the water cycle.	IAES 62	62 AQ4 SI; [IB] E3, 9, 11, 15

SCIENCE STANDARDS Nebraska Eighth Grade	SEPUP	
	LOCATION	ASSESSMENT
Investigate and describe the composition of the atmosphere at different altitudes.	IAES 64, 65	64 [IB] E5 65 Q1-3
Investigate and describe the influence of topography, location, and oceans on climate.	IAES 57, 58, 66	57 [IB] E10 58 [IB] E6 66 AQ2 UC; [IB] E12-13
Investigate and describe the effect of living organisms on weathering and the atmosphere.	IAES 29, 30, 70	29 AQ2 UC; [IB] C1, C3 30 [IB] C2, C10 70 AQ3 ET, [IB] E16
8.5.2 By the end of eighth grade, students will develop an understanding of the earth’s history.		
<i>Example Indicators:</i>		
Investigate and describe how earth processes that occur today (e.g., volcanism, weather, and erosion) are similar to those that occurred in the past.	IAES 21, 42, 47	21 Q3, 5 42 [IB] D4, 6, 8-10, 16 47 [IB] D16
Investigate and use the fossil record to provide evidence and explain how environmental conditions have changed.	IAES 39, 40, 41	39 [IB] D5, D13 40 Q1, 3, 4 41 AQ3 UC; [IB] D2
8.5.3 By the end of eighth grade, students will develop an understanding of the earth in the solar system.		
<i>Example Indicators:</i>		
Investigate and list the components of the solar system.	IAES 86, 88, 90	86 Q3 88 AQ2 UC, [IB] G3, G13, G17 90 [IB] G9, 16, 18

SCIENCE STANDARDS	SEPUP	
Nebraska Eighth Grade	LOCATION	ASSESSMENT
Investigate and describe the motion of objects in the solar system that support the concepts of day, year, eclipses, and phases of the moon.	IAES 73, 74, 80	73 AQ1 UC 74 AQ3 CM, [IB] E6, E18 80 [IB] E2-3, E7-10, E15, E16, E25
Investigate and describe the influence of gravity on objects in the solar system.	IAES 95, 96	95 [IB] F18-21 96 AQ2 DCI
Investigate and describe the sun as the major source of energy that influences the atmosphere and the earth's surface.	IAES 55, 58, 60	55 Proc DI 58 [IB] E6 60 [IB] E3, E8-9
Investigate and describe the effect of the tilt of the earth's axis on seasons.	IAES 76, 77, 78	76 AQ4 AD 77 [IB] F10-12 78 AQ2 UC