LAB-AIDS CORRELATIONS TO NORTH DAKOTA SCIENCE STANDARDS

GRADES 6-8

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 North Dakota Learning Standards 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.

SEPUP Course/Activity Numbers	Main Unit Issue
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 seven assessment variables are:

Designing Investigations (DI)
Organizing Data (OD)
Analyzing Data (AD)
Understanding Concepts (UC)
Evidence and Trade-offs (ET)
Communication Skills (CS)
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) Q1, 3, 4
IALS 2, 3, 37	(41) Q3 UC; [IB] D2
IAPS 1, 2, 3	(42) [IB] D4, 6, 8-10, 16

IAES 40, 41, 42   40 Q1, 3, 4
41 Q3 UC; [IB] D2
42 [IB] D4, 6, 8-10, 16

means that the standard or benchmark may be assessed using Issues and Earth Science Activity 40 Analysis Question 1, 3 and 4, IAES Activity 43 Analysis Question 3 using Understanding Concepts scoring guide and Item Bank Question D2 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 Frameworks (NGSF) notes 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 NGSF emphasizes 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 NGSF emphasizes 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	
North Dakota Grade 6	**LOCATION**	**ASSESSMENT**
Standard 1: Students understand the unifying concepts and processes of science.		
MODELS		
6.1.1. Construct a model to represent concepts, features, or phenomena in the real world (e.g., solar system, earth's interior)	IAES 28, 73 IALS 3, 95 IAPS 39, 70	(73) Q1: UC, Quick check (3) Q1: RE, Q4: UC (39) Q7: SI, Proc: Proc: DI
SYSTEMS		
6.1.2. Identify systems that are composed of subsystems (e.g., solar system, cell, ecosystems.)	IAES 11, 22 IALS 42, 83 IAPS 17, 71	(11) Q2: RE, ET (22) Q7: UC [IB] G: 3,9 (42) Quick check (83) DI [DI] C: 23 [IB] B: 1, (17) Q6: UC (71) Q1: UC
CONSTANCY AND CHANGE		
6.1.3. Explain the connection between cause and effect in a system	IAES 32, 55 IALS 51, 72 IAPS 13, 72	(55) Quick check [IB] A: 11,14 (51) Q1: AD, Q4: UC [IB] B: 3, 7 (72) Q6: ET (13) Proc: RE

SCIENCE STANDARDS	SEPUP	
North Dakota Grade 6	**LOCATION**	**ASSESSMENT**
		(72) Q1: ET [IB] A: 17
FORM AND FUNCTION *No benchmark expectations at this level*		
Standard 2: Students use the process of science inquiry.		
UNDERSTANDINGS ABOUT SCIENTIFIC INQUIRY		
6.2.1. Explain the components of a scientific investigation (e.g., hypothesis, observation, data collection, data interpretation, communication of results, replicable)	IAES 16, 55 IALS 8, 48 IAPS 3, 51 Science Skills Student Sheet 5	(16) Proc: DI (55) Proc: DI [IB] A: 1,13 (8) Proc: DI [IB] A: 14-19 (48) Proc: DI (3) Proc: DI (51) Proc: DI [IB] A: 16, B: 19-21
6.2.2. Select alternative methods of scientific investigations (e.g., library, internet, field work) to address different kinds of questions.	IAES 47, 51 IALS 73, 86 IAPS 1, 72	(47) Quick check (51) Proc: OD (73) Proc: UC, CS (86) Q1: CS (72) Q1: ET

SCIENCE STANDARDS	SEPUP	
North Dakota Grade 6	**LOCATION**	**ASSESSMENT**
6.2.3. Identify biases that may affect data collection and analysis (e.g., gender, race, religion, economic, generational.)	N/C	
ABILITIES NECESSARY TO DO SCIENTIFIC INQUIRY		
6.2.4. Use appropriate tools and techniques to gather and analyze data	IAES 4, 55 IALS 19, 36 IAPS 9, 81 TR II: Science Skills Sheet 1, 2	(4) Quick check (55) Proc: DI, Quick check [IB] C: 8-9, B: 7-9 (19) Q3B: AD, Q4: OD (36) Q3: SI (9) Q1: AD, Quick check [IB] C: 17-18
6.2.5. Use data from scientific investigations to determine relationships and patterns	IAES 7, 15 IALS 38, 75 IAPS 2, 16	(15) Quick check [IB] A: 13, [IB] E: 12-13 [IB] A: 17 (2) Q2: UC (16)Quick check [IB] C: 17-18
Standard 3: Students understand the basic concepts and principles of physical science.		

SCIENCE STANDARDS	SEPUP	
North Dakota Grade 6	**LOCATION**	**ASSESSMENT**
PROPERTIES OF MATTER		
6.3.1.　Organize materials according to similar properties (e.g., physical, chemical)	IAPS 6, 14, 15	(6) Q6: AD (15) Q5: UC
FORCE AND MOTION		
6.3.2.　Use simple machines to change forces	Kit 214	
FORMS OF ENERGY		
6.3.3.　Identify different forms of energy (e.g., chemical, mechanical, heat, sound)	IAPS 56, 58, 66	(58) Q2: UC (66) Proc: DI [IB] D: 4,8
6.3.4.　Identify sources of energy (e.g., sun, wind, moving water, nuclear, fossil fuels, food)	IAPS 58, 64, 69	(58) Q2: UC (64) Q4: AD [IB] D: 7
VIBRATIONS AND WAVES		
6.3.5.　Explain how vibrations create wavelike disturbances that spread out from the source	N/C	
Standard 4: Students understand the basic concepts and principles of life science.		
STRUCTURE AND FUNCTION		
6.4.1.　Identify single- or multi-celled organisms.	IALS 36, 38, 44	(36) Q3: SI Quick check [IB] C: 31
ORGANISMS AND THEIR ENVIRONMENTS *No benchmark expectations at this level*		
GENETICS AND REPRODUCTION		

SCIENCE STANDARDS	SEPUP	
North Dakota Grade 6	LOCATION	ASSESSMENT
6.4.2. Explain why reproduction is necessary for the continuation of the species (e.g., asexual, sexual)	IALS 57, 63, 96	(63) Q1: UC (96) Proc: OD, Q2a: AD
Standard 5: Students understand the basic concepts and principles of earth and space science.		
WEATHER, SEASONS, AND CLIMATE		
6.5.1. Identify adverse weather conditions and how humans prepare for them	IAES 30, 50, 52,	(30) Quick check [IB] E: 16 [IB] D: 1,3-4,10
CHARACTERISTICS OF THE EARTH		
6.5.2. Explain how rocks are formed (e.g., melting, cooling, metamorphism, combinations of minerals)	IAES 19, 21, 22	(19)Quick check (22) Q7: UC [IB] B: 11
6.5.3. Describe the characteristics of the layers of the Earth (i.e., crust, mantle, core)	IAES 38	(38) Q5: UC Quick check [IB] D: 10-11,15
THE SOLAR SYSTEM		
6.5.4. Identify the basic characteristics (e.g., composition, rings) of objects (e.g., planets, sun, small bodies) in the solar system	IAES 86, 88, 89	(88) Q2: UC Quick check (89) Proc: RE [IB] G: 14,17,19
Standard 6: Students understand relations between science and technology.		
TECHNOLOGICAL DESIGN		
6.6.1. Identify examples of how technologies have evolved	IAES 42, 87 IALS 37, 70, 103	[IB] G: 15

SCIENCE STANDARDS	SEPUP	
North Dakota Grade 6	**LOCATION**	**ASSESSMENT**
	IAPS 21, 85	(37) Proc: UC, CS
		(70) Q2: RE, SI
		[IB] D: 19
		(85) Proc: CS
6.6.2. Design a product or solution to a problem given constraints (e.g., limits of time, costs, materials and environmental factors)	IAES 35, 67	(35) Q1: ET, CS
		(67) Proc: DI
	IALS 107, 109	(107) Q4: ET
		(109) Proc: DI,SI
		[IB] G: 23,25
	IAPS 11, 29	(11) Q1: ET
		(29) Q1: ET
6.6.3. Explain the relationship between science and technology	IAES 87, 94	(94) Quick check
		[IB] G: 15
	IALS 102, 108	(108) Q3: ET, Quick check
		[IB] G: 24
	IAPS 21, 29	(29) Q1: ET
		[IB] G: 5-12
Standard 7: Students understand relations between science and personal, social, and environmental issues.		
SCIENCE AND ENVIRONMENTAL ISSUES		
6.7.1. Explain how natural hazards affect populations, resources, and the environment (e.g., floods, storms, hurricanes, volcanoes, earthquakes)	IAES 30, 42, 52,	(30) Quick check

SCIENCE STANDARDS	SEPUP	
North Dakota Grade 6	**LOCATION**	**ASSESSMENT**
6.7.2. Explain how recycling and conservation affect populations, resources, and the environment	IAES 12, 24 IALS 83, 101 IAPS 12, 64	(83) Proc: CS Quick check (101) Q5b: ET (12) Q5: ET (64) Q3: ET, Q4: AD [IB] B: 18-23
Standard 8: Students understand the history and nature of science.		
PEOPLE IN SCIENCE		
6.8.1. Identify various settings in which scientists may work alone or in a team (e.g., industries, laboratories, field work)	IAES 34, 50, 85 IALS 4, 25, 72 IAPS 1, 52, 55	(34) Q1: RE (4)Q8: UC, SI, Quick check (72) Q6: ET (52) Q1: ET (55) Q1: UC, Quick check
SCIENTIFIC KNOWLEDGE		
6.8.2. Identify scientific advances that have resulted in new ideas and further advances	IAES 42, 87 IALS 37, 50 IAPS 22, 71	[IB] G: 15 (37)Proc: UC,CS (22) Proc: OD (71) Q1: ET, Quick check

SCIENCE STANDARDS	SEPUP	
North Dakota Grade 7	**LOCATION**	**ASSESSMENT**
Standard 1: Students understand the unifying concepts and processes of science.		
MODELS		
7.1.1. Explain how models can be used to illustrate scientific principles (e.g., osmosis, cell division)	IALS 12, 30, 40	(12) Quick check (30) Q1a: AD (40) Proc: OD, Q3: AD
SYSTEMS		
7.1.2. Identify the components (e.g., tissues, organs, living and nonliving things) within a system (e.g., body systems, ecosystems)	IALS 15, 16, 83	(15) Quick check (15) Q3: UC (16) Quick check (16) Q7: UC (83) Proc: DI,CS, Quick check [IB] C: 16, E: 12
CONSTANCY AND CHANGE		
7.1.3. Identify examples of feedback mechanisms (e.g., hunger, perspiring)	IALS 12, 13, 19	(12)Quick check (13) Q4: AD (19) Q3b: AD, Q4: OD, Quick check
FORM AND FUNCTION		
7.1.4. Identify the relationship between form and function (e.g., wings, fins and feet)	IALS 16, 21, 23	(16) Q6: UC, Q7: UC, Quick check (23) Q7: UC, Quick check [IB] B: 26-27
Standard 2: Students use the process of science		

SCIENCE STANDARDS	SEPUP	
North Dakota Grade 7	**LOCATION**	**ASSESSMENT**
inquiry.		
UNDERSTANDINGS ABOUT SCIENTIFIC INQUIRY *No benchmark expectations at this level*		
ABILITIES NECESSARY TO DO SCIENTIFIC INQUIRY		
7.2.1. Communicate the results of scientific investigations using an appropriate format (e.g., journals, lab reports, diagrams, presentations, discussions)	IAES 3, 72 IALS 1, 39 IAPS 1, 51 TR: Literacy Transparency 2,Literacy Student Sheet 1a, 1b	(72) Proc: DI, Quick check [IB] A: 12, C: 9 (39) Proc: OD, Q2: AD, SI [IB] A: 9-11 (51) Q4: DI, SI, Q5, ET [IB] A: 16
Standard 3: Students understand the basic concepts and principles of physical science.		
PROPERTIES OF MATTER *No benchmark expectations at this level*		
FORCE AND MOTION *No benchmark expectations at this level*		
FORMS OF ENERGY *No benchmark expectations at this level*		
ENERGY TRANSFER AND TRANSFORMATION		

SCIENCE STANDARDS	SEPUP	
North Dakota Grade 7	**LOCATION**	**ASSESSMENT**
7.3.1. Explain how forms of energy can be transferred. (e.g., photosynthesis, metabolism, battery)	IAES 46, 55 IALS 15, 81 IAPS 58, 65	(55) Quick check (15) Q3: UC, Quick check (81) Proc: DI, Q5: UC [IB] E: 15 (58) Q2: UC [IB] D: 4-5
VIBRATIONS AND WAVES *No benchmark expectations at this level*		
Standard 4: Students understand the basic concepts and principles of life science.		
STRUCTURE AND FUNCTION		
7.4.1. Explain the functions of the cell (e.g., growth, metabolism, reproduction, photosynthesis, response)	IALS 39, 40, 42	(39) Q2: AD, SI (40) Q3: AD (42) Quick check [IB] C: 6
7.4.2. Identify levels of organization in living systems (e.g., cells, tissues, organs, organ systems, organisms, ecosystems)	IALS 15, 16, 83	(15) Q3: UC, Quick check (16) Q6: UC, Q7: UC, Quick check (83) Proc: CS, Quick check [IB] C: 16
GENETICS AND REPRODUCTION		
7.4.3. Identify the characteristics of reproduction (e.g., sexual, asexual)	IALS 57, 63	(63) Q1: UC [IB] C: 3-4

SCIENCE STANDARDS	SEPUP	
North Dakota Grade 7	**LOCATION**	**ASSESSMENT**
INTERDEPENDENCE AMONG ORGANISMS		
7.4.4. Identify interactions among organisms and their environment (e.g., competition, mutualism, predator/prey, consumers, producers)	IALS 83, 95, 96	(83) Proc: CS, Quick check (96) Proc: OD, Q2a: AD [IB] E: 32-37
DIVERSITY AND UNITY AMONG ORGANISMS		
7.4.5. Classify organisms (e.g., taxonomic groups)	IALS 44, 75, 76	[IB] E: 38, 41-42
7.4.6. Explain how different adaptations help organisms survive	IALS 95, 95, 101	(96) Proc: OD, Q2a: AD (101) Q5b: ET, Quick check [IB] F: 40-41
Standard 5: Students understand the basic concepts and principles of earth and space science.		
WEATHER, SEASONS, AND CLIMATE		
7.5.1. Identify the factors (e.g., latitude, altitude, mountains, bodies of water) that affect the Earth's climate	IAES 53, 57, 58	(53) Quick check (57) Quick check (58) Quick check [IB] E: 10,12-13
7.5.2. Explain how seasons affect organisms (e.g., hibernation, photoperiodism, migration)	N/C	
CHARACTERISTICS OF THE EARTH		
7.5.3. Identify the Earth's renewable and nonrenewable resources (e.g., solar, wind,	IAES 12	

SCIENCE STANDARDS	SEPUP	
North Dakota Grade 7	**LOCATION**	**ASSESSMENT**
fossil fuels, water, soil, metals)	IAPS 64, 68, 69	(64) Q3: ET, Q4: AD [IB] D: 7
Standard 6: Students understand relations between science and technology.		
TECHNOLOGICAL DESIGN *No benchmark expectations at this level*		
TECHNOLOGY AND SOCIETY		
7.6.1. Identify ways in which technology has influenced the course of history and improved the quality of life	IAES 42, 87 IALS 37, 70, 103 IAPS 21, 85	 Proc: UC,CS (70) Q2: RE, SI (85) Proc: CS
7.6.2. Identify technologies (e.g., communication, agriculture, information processing, transportation) that are influenced by societies	IAES 15, 23 IALS 28, 51 IAPS 22, 27	(15) Quick check (23) Q3: ET (51) Proc: OD, Q1: AD, Q4: UC (22) Proc: OD (27) Proc: OD, Q2: CS, Q3: ET
7.6.3. Identify intended benefits and unintended consequences that result from the development and use of technologies	IAES 35, 49 IALS 52, 87 IAPS 23, 52	(35) Proc: CS, Q1: ET (49) Q2: ET [IB] E: 29-30 (52) Q5: UC, (87) Q1: ET [IB] G: 24-25 (52) Proc: CS, Q1: ET [IB] C: 24, D: 21

SCIENCE STANDARDS	SEPUP	
North Dakota Grade 7	**LOCATION**	**ASSESSMENT**
Standard 7: Students understand relations between science and personal, social, and environmental issues.		
SCIENCE AND PERSONAL HEALTH		
7.7.1. Explain how science affects personal health (e.g., injury prevention, immunization, organ transplant, medical scanning devices)	IALS 9, 26, 49 IAPS 85, 86, 88	(9) Q3: RE, ET (26) Q4: UC (49) Q6: ET (85) Proc: CS (88) Q2: ET [IB] C: 25-26,28 [IB] E: 19
7.7.2. Identify the factors (e.g., pollution, heredity, diet, virus, bacteria, parasite) that may result in disease.	IALS 30, 33,	(30) Proc: OD, Q1a: AD (53) Q2: RE, Q3: ET [IB] C: 34-35.39
SCIENCE AND ENVIRONMENTAL ISSUES		
7.7.3. Explain how overpopulation affects organisms, resources, and environments (e.g., depletion of food resources, habitat availability, increased loss due to disease, parasites and predators	IALS 73, 84, 85	(73) Proc: UC,CS (84) Q1a: OD, Q1b: AD, Q3a: OD, Q3b: AD (85) Q1a: AD Q1b: AD Q1c: UC [IB] E: 22-24
SCIENCE AND SOCIAL ISSUES		
7.7.4. Explain the impact of science on food technology (e.g., preservatives, packaging,	N/C	

SCIENCE STANDARDS	SEPUP	
North Dakota Grade 7	LOCATION	ASSESSMENT
genetically modified organisms)		
Standard 8: Students understand the history and nature of science.		
PEOPLE IN SCIENCE		
7.8.1. Explain how science is influenced by human qualities (e.g., reasoning, insightfulness, creativity, life-long learning)	IAES 42, 87 IALS 25, 108 IAPS 16, 72	[IB] G: 20 (108) Q3: ET (16) Quick check (72) Q1: ET [IB] G: 5-11
SCIENTIFIC KNOWLEDGE		
7.8.2. Explain the importance of keeping clear and accurate records of scientific investigations (e.g., Darwin's research, DaVinci's notebooks, Galileo's notes, Goodall's observations)	IAES 20, 72 IALS 47, 94 IAPS 14, 41	(72) Proc: DI, Quick check (47) Q2: AD, Q3: SI (94) Q3: UC (41) Proc: OD, Q2: AD

SCIENCE STANDARDS	SEPUP	
North Dakota Grade 8	**LOCATION**	**ASSESSMENT**
Standard 1: Students understand the unifying concepts and processes of science.		
MODELS *No benchmark expectations at this level*		
SYSTEMS		
8.1.1. Organize changes (e.g., patterns, cycles) that occur sequentially in systems	IAES 27, 79 IALS 18, 98 IAPS 13, 75	(27) Proc: OD, Quick check (18) Q5b: SI (98) Proc: OD,AD (75) Q2: UC
CONSTANCY AND CHANGE *No benchmark expectations at this level*		
FORM AND FUNCTION *No benchmark expectations at this level*		
Standard 2: Students use the process of science inquiry.		
UNDERSTANDINGS ABOUT SCIENTIFIC INQUIRY		
8.2.1. Explain how science advances through legitimate skepticism	IAES 42, 73 IALS 37, 94 IAPS 33	(73) Q1: UC, Quick check (37) Proc: UC (94) Q3: UC, Quick check (33) Q3: RE,SI
ABILITIES NECESSARY TO DO SCIENTIFIC INQUIRY		
8.2.2. Use evidence to generate descriptions, explanations, predictions, and models	IAES 28, 42 IALS 37, 94	[IB] A: 13-14 (94) Q3: UC

SCIENCE STANDARDS	SEPUP	
North Dakota Grade 8	**LOCATION**	**ASSESSMENT**
	IAPS 32, 65	Quick Check [IB] A: 27 (65) Proc: DI [IB] A: 7-8
8.2.3. Use basic mathematics and statistics (e.g., operations, mean, median, mode, range, and estimation) to interpret quantitative data	IAES 27, 51 IALS 17, 54 IAPS 56, 74	(27) Proc: OD (51) Proc: OD [IB] C: 8-9 (17) Proc: OD (54) Proc: OD [IB] A: 9-11 (74) Proc: DI [IB] A: 11-12
8.2.4. Design and conduct a scientific investigation (e.g., making systematic observations, making accurate measurements, identifying and controlling variables)	IAES 16, 55 IALS 5, 48 IAPS 3, 38	(16) Proc: DI (55) Proc: DI (5) Proc: DI (48) Proc: DI (3) Proc: DI (38) Proc: DI
Standard 3: Students understand the basic concepts and principles of physical science.		
PROPERTIES OF MATTER		
8.3.1. Identify elements and compounds	IAPS 16, 17, 20	(16) Quick check (17) Q6: UC [IB] B: 9-11
8.3.2. Explain the relationship between phases	IAPS 35	(35) Q1: AD

SCIENCE STANDARDS	SEPUP	
North Dakota Grade 8	**LOCATION**	**ASSESSMENT**
of matter and temperature		
FORCE AND MOTION		
8.3.3. Interpret the effect of balanced and unbalanced forces on the motion of an object (e.g., convection currents, orbital motion, tides)	IAES 46, 82, 84 IAPS 81	(82) Q3: AD (84) Proc: UC, Quick check [IB] F: 3, [IB] G: 10,12 [IB] E: 3
8.3.4. Explain how all objects exert gravitational force and this force is affected by the distance between the masses of the objects	IAES 95, 96	(95) Q4: AD (96) Quick check
ENERGY TRANSFER AND TRANSFORMATION		
8.3.5. Identify when heat can be transferred by conduction, convection, or radiation.	IAES 46 IAPS 58, 59, 70	 (58) Q2: UC
VIBRATIONS AND WAVES		
8.3.6. Explain the characteristic properties (e.g., wavelength, frequency) and behaviors (e.g., reflection, refraction) of waves	IAPS 93-99	(93) Q1 (97) Q6
Standard 4: Students understand the basic concepts and principles of life science.		
STRUCTURE AND FUNCTION *No benchmark expectations at this level*		
GENETICS AND REPRODUCTION *No benchmark expectations at this level*		
INTERDEPENDENCE AMONG ORGANISMS		

SCIENCE STANDARDS	SEPUP	
North Dakota Grade 8	**LOCATION**	**ASSESSMENT**
No benchmark expectations at this level		
DIVERSITY AND UNITY AMONG ORGANISMS *No benchmark expectations at this level*		
NATURAL SELECTION AND BIOLOGICAL EVOLUTION		
8.4.1. Identify the evidence of biological evolution. (e.g., adaptation, radiation, extinction) as found in the fossil record	IALS 93, 96, 99	(93) Q4: UC (96) Proc: OD, Q2a: AD (99) Q2: UC [IB] F: 18-21
Standard 5: Students understand the basic concepts and principles of earth and space science.		
WEATHER, SEASONS, AND CLIMATE		
8.5.1. Explain how factors (i.e., fronts, winds, air masses, air pressure, humidity, temperature, location) affect weather	IAES 57, 64, 69	(57) Quick check (69) Proc: CS
GEOLOGIC PROCESSES		
8.5.2. Understand the rock cycle	IAES 22	(22) Q7: UC [IB] B: 4-5,11
8.5.3. Explain the water cycle	IAES 62 IAPS 39	(62) Q4: SI [IB] E: 3,11,15 (39) Q7: SI
8.5.4. Explain how landforms are changed (e.g., crustal deformation, volcanic eruption, deposition, weathering, erosion)	IAES 28, 29, 37	(29) Q2: UC [IB] C: 3,12, D: 8
8.5.5. Identify evidence for plate tectonics theory (e.g., fit of continents, location of earthquakes, volcanoes, mid-ocean ridge,	IAES 40, 45, 48	(45) Quick check

SCIENCE STANDARDS	SEPUP	
North Dakota Grade 8	**LOCATION**	**ASSESSMENT**
plate boundaries)		(48) Q4: UC [IB] D: 9,12,14
8.5.6. <u>Identify</u> a variety of methods (e.g., rock sequences, fossil correlation, radiometric dating) used to determine geologic time	IALS 90, 92, 93	(90) Q4: UC (93) Q4: UC [IB] F: 8-10
8.5.7. Explain the changes Earth has undergone over geologic time (e.g., fossil record, plate tectonics, climate change, glaciation)	IAES 26, 39, 41 IALS 90, 92, 93	(41) Q3: UC, Quick check [IB] D: 13 (90) Q4: UC (93) Q4: UC [IB] F: 6-10
CHARACTERISTICS OF THE EARTH		
8.5.8. Explain how phenomena on Earth (i.e., day, year, seasons, lunar phases, eclipses, tides) are related to the position and motion of the Sun, Moon, and Earth	IAES 74, 75, 76	(75)Quick check (76) Q4: AD [IB] F: 1-7, 9-16
THE UNIVERSE		
8.5.9. Identify characteristics of stars (e.g., color, size, temperature, life cycle)	N/C	
8.5.10. Identify the composition (e.g., stars, galaxies) and scale of the universe	IAES 86, 88, 90	(88) Q2: UC, Quick check (90) Quick check [IB] G: 9, 18
Standard 6: Students understand relations between science and technology.		
TECHNOLOGY AND SOCIETY *No benchmark expectations at this level*		

SCIENCE STANDARDS	SEPUP	
North Dakota Grade 8	**LOCATION**	**ASSESSMENT**
Standard 7: Students understand relations between science and personal, social, and environmental issues.		
SCIENCE AND SOCIAL ISSUES		
8.7.1. Explain the interaction of science and technology with social issues (e.g., mining, natural disasters)	IAES 30, 49 IALS 71, 88 IAPS 29, 44	(30) Quick check (49) Q2: ET [IB] C: 13, D: 14, G: 20 (71) Q2: ET, CS (88) Q2: AD, Q3: ET [IB] F: 42 (29) Q1: ET (44) Q5: UC [IB] D: 21
Standard 8: Students understand the history and nature of science.		
PEOPLE IN SCIENCE *No benchmark expectations at this level*		
SCIENTIFIC KNOWLEDGE		
8.8.1. Explain how many people from various cultures have made important contributions to the advancement of science and technology	IAES 42, 87 IALS 37, 108 IAPS 16, 80	 (37) Proc: UC, CS (108) Q3: ET, Quick check (16)Quick check (80) Q2: UC Quick Check