



LAB-AIDS CORRELATIONS FOR THE MONTANA MIDDLE LEVEL

SCIENCE STANDARDS

GRADE 8 EXIT STANDARDS

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 programs that support the Montana Grade 8 Exit Standards. It is not an exhaustive list; other locations may exist that are not listed here.

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Key to Programs:

SEPUP programs are available as full year courses, or separately, as units, which are listed below.

- **IAES = *Issues and Earth Science***
Studying Soils 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
Earth and the Solar System, 85-98
- **IALS = *Issues and Life Science***
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, 102-108
- **IAPS = *Issues and Physical Science***
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

Supplementary Product Offerings

The following LAB-AIDS kits and modules address one or more of your state science standards. This listing is primarily for customers not using core SEPUP programs, as most standards are addressed using the core SEPUP programs; however, in a few cases, SEPUP customers may wish to supplement their core programs with one or more of the following products from the LAB-AIDS catalog.

Key to Supplementary Products

LAB-AIDS Applied Science Concept Kits

7	HUMAN GENETICS EXPERIMENT
9	NORMAL MITOSIS
25	ENZYME ACTIVITY STUDY
32	BIOLOGY & CHEMISTRY OF SOIL EXPERIMENT
37	BASIC OWL PELLET STUDY
38	MODELING AND COMPARING FOSSIL FUEL & BIOFUEL COMBUSTION
61	PLANT CELL STUDY
62	THE STUDY OF THE STRUCTURE & FUNCTION OF MITOCHONDRIA
63	DIFFERENTIATION OF CELLS EXPERIMENT
70	GENETICS CONCEPTS
71	MOLECULAR MODEL OF DNA & ITS REPLICATION
78	SICKLE CELL CONCEPTS
79	STRAWBERRY DNA EXTRACTION
80	INTRODUCTION TO pH MEASUREMENT
82	PROPERTIES OF ACIDS AND BASES EXPERIMENT
84	IDENTIFICATION OF CHEMICAL REACTIONS
85	DETERMINATION OF CHEMICAL FORMULAS
91	NATURAL SELECTION EXPERIMENT
92	IMMUNOLOGY AND EVOLUTION EXPERIMENT
125	INDIVIDUAL BASIC STUDENT MOLECULAR MODEL SET
129	FIRST INTRODUCTION TO MOLECULAR MODELS
130	MOLECULAR MODEL
131	ORGANIC CHEMISTRY MOLECULAR MODEL
132	ORGANIC CHEMISTRY (FUNCTIONAL GROUPS) MODEL
133	ORGANIC CHEMISTRY (ISOMERS) MODEL
140	SUBLEVEL ORBITALS OF ATOM
309	INTRODUCTION TO CONDUCTIVITY EXPERIMENT
400	INTRODUCTION TO MINERAL CRYSTALS
401	GEOMETRY OF CRYSTAL STRUCTURE
402	MINERAL STRUCTURE-CLEAVAGE & FRACTURE
430	ROCK CYCLE: AN INTERACTIVE EXPLORATION THROUGH GEOLOGIC TIME
437	MODELING AND INVESTIGATING WATERSHEDS
442	MODELING STREAM EROSION AND DEPOSITION
450	INTRODUCTION TO RADIOACTIVITY & HALF LIFE
501	DIAMOND CRYSTAL MOLECULAR MODEL
502	GRAPHITE CRYSTAL MOLECULAR MODEL
701	CHEMILUMINESCENCE DEMONSTRATION
1101	INTRODUCTION TO SOIL
1102	SOIL COMPOSITION AND STRUCTURE
1270	INVESTIGATING HUMAN HEREDITY

SEPUP Applied Science Concept Kits

39S	BIOFUELS: INVESTIGATING ETHANOL PRODUCTION & COMBUSTION
206S	MEASURING ENERGY EFFICIENCY
318S	SOIL NUTRIENTS AND FERTILIZERS

351S	EXPLORING NEWTON’S FIRST LAW: INERTIA
352S	CLASSIFYING OBJECTS IN THE SOLAR SYSTEM
403S	CLASSIFYING SEDIMENTARY, METAMORPHIC & IGNEOUS ROCK
404S	THE ROCK CYCLE ACTIVITY
406S	EXAMINING FOSSILS
436S	MODELING CONVECTION CURRENTS
438S	PLATE TECTONICS: PLATE BOUNDARY COMPUTER SIMULATION
439S	MAKING AND INTERPRETING TOPOGRAPHIC MAPS
440S	COPPER MINING AND EXTRACTION
443S	CORRELATING SEDIMENTARY STRATA
445S	PLATE TECTONICS: EXAMINING EVIDENCE FOR CONTINENTAL DRIFT
550S	CLASSIFYING ANIMALS
603S	INVESTIGATING AND APPLYING GENETICS

LAB-AIDS Modules

P110	INVESTIGATING LIGHT
P120	COLOR AND SPECTRUM
P130	REFLECTION AND REFRACTION
P210	FORCE AND MOTION
P610	DENSITY: UNDERSTANDING THROUGH EXPERIMENTAL DESIGN

SEPUP Modules

DM-2	DECISION MAKING: PROBABILITY AND RISK TAKING
EHR-2	INVESTIGATING ENVIRONMENTAL HEALTH RISKS
EI-2	ENVIRONMENTAL IMPACT: COMPARING INDUSTRIES
ES-2	INVESTIGATING ENERGY FROM THE SUN
FS-2	INVESTIGATING FOOD SAFETY
FV-2	GROUNDWATER CONTAMINATION: TROUBLE IN FRUITVALE
HC-2	HOUSEHOLD CHEMICALS: BETTER BY DESIGN
HM-2	HAZARDOUS MATERIALS INVESTIGATION: THE BARREL MYSTERY
PL-2	LIVING WITH PLASTICS
SP-2	INVESTIGATING WASTEWATER: SOLUTIONS AND POLLUTION
TT-2	THRESHOLDS AND TOXICOLOGY
WD-2	WASTE DISPOSAL: COMPUTERS AND THE ENVIRONMENT

NEW Applied Science Content kits

31	PHOTOSYNTHESIS, PLANTS, AND FOOD
211	WAVES, SOUND AND LIGHT
213	ELECTRIC MOTORS AND GENERATORS
905	SELECTIVE BREEDING
109S	ELEMENTS AND THE PERIODIC TABLE
220S	INVESTIGATING PHOTOVOLTAIC CELLS
434S	CONTAMINANTS AND THE WATER CYCLE

NEW Applied Science Content kits in progress

[89]	MODELING CHEMICAL EQUILIBRIUM
[212]	ENERGY TRANSFER: MOTION OF A PENDULUM
[214]	SIMPLE MACHINES
[215]	ELECTRICAL CONDUCTIVITY AND CIRCUITRY
[216]	MAGNETIC FIELDS AND ELECTROMAGNETS
[405]	IDENTIFYING ROCK FORMING MINERALS
[207S]	CONVERTING GRAVITATIONAL POTENTIAL ENERGY TO KINETIC ENERGY

Recommended Scope and Sequence

Please contact our Regional Sales Manager for options.

Key to assessment terms

The SEPUP assessment system uses analysis questions (AQ) in the student book activities, short answer or brief constructed response (BCR) to prompts in the student book activities, and item bank test questions in the Teacher's Guide (TG), most of which are selected-response (SR) type. The following key can be used to interpret how the program works for the following citation:

IALS 75 Q4 ET; IB E-2, 3, 5, 6-8

IB = Test item bank questions, this citation means questions 2, 3, 5, and 6-8 from IALS item bank **E** measure student performance

IALS 75 AQ 4 ET, IB E-2, 3, 5, 6-8

UC, AD, ET, etc. represent SEPUP **assessment variables** (UC = Understanding concepts; AD = Analyzing data; ET = Using evidence and tradeoffs; DI = Designing and conducting investigations; GI = Group interactions; CM = Communicating scientific information). The above citation means that analysis question 4 of the activity can be used to measure student performance on the ET variable, and assessment item bank E, questions 2, 3, 5, 6-8 can also be used for this purpose.

For more information, consult the Teacher's Guides.

<i>SCIENCE STANDARDS</i>	<i>SEPUP</i>		<i>LAB-AIDS KITS</i>
	<i>LOCATION</i>	<i>ASSESSMENT</i>	
Content Standard 1 —Students, through the inquiry process, demonstrate the ability to design, conduct, evaluate, and communicate results and reasonable conclusions of scientific investigations.	IAES 16, 67 5 IALS 86, 109 IAPS 28, 65	(16) Proc: DI, Q3: RE (67) Proc: DI [IB] A: 1 (86) Q1: CS (109) Proc: DI, SI [IB] A: 1-3 [IB] G: 24-25 (28) Q3 :ET (65) Proc :DI [IB] A:16, 17	
BENCHMARKS			
1. Identify a question, determine relevant variables and a control, formulate a testable hypothesis, plan and predict the outcome of an investigation, safely conduct scientific investigation, and compare and analyze data	IAES 67, 72 IALS 5, 48 IAPS 51, 65 TR II: Science Skills Sheet 5	(67) Proc: DI (72) Proc: DI, Quick check (5) Q7: DI, SI (48) Proc: DI, Q4: UC (51) Q4: DI, SI, Q5: ET (65) Proc: DI	
2. Select and use appropriate tools including technology to make measurements (in metric units), gather, process and analyze data from scientific investigations	IAES 4, 55 IALS 19, 36 IAPS 9, 81 TR I: Safety Student Sheet 1 TR II: Science Skills Sheet 1, 2	(4) Quick check (55) Proc: DI (19) Q4: OD, Q3b: AD	
3. Review, communicate and defend results of investigations, including considering alternative explanations	IAES 3, 72 IALS 1, 39 IAPS 1, 51 TR: Literacy Transparency 2, Literacy Student Sheet 1a, 1b	(72) DI, Quick check (39) OD, Q2: AD, SI (51) Q4:DI, SI, Q5: ET	
4. Create models to illustrate scientific concepts and use the model to predict change. (e.g., computer simulation, stream table, graphic representation)	IAES 28, 43 IAPS 17, 36 IALS 18, 65	(17) Q6: UC (36) Q8: UC (18) Q5b: SI (65) Q8: UC, Quick check	
5. Identify strengths and weakness in an investigation design	IAES 67, 72 IALS 8, 83	(67) Proc: DI (72) Proc: DI (8) Proc: DI (83) Proc: DI	

SCIENCE STANDARDS	SEPUP		LAB-AIDS KITS
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	IAPS 54, 77	(54) Proc: DI (77) Proc: DI	
6. Compare how observations of nature form an essential base of knowledge among the Montana American Indians	Local Issue		
Content Standard 2 —Students, through the inquiry process, demonstrate knowledge of properties, forms, changes and interactions of physical and chemical systems.	IAPS 14, 19, 65	(19) Proc: OD (65) Proc: DI	
BENCHMARKS			
1. Classify, describe, and manipulate the physical models of matter in terms of: elements, and compounds, pure substances and mixtures, atoms, and molecules	IAPS 17, 20, 36	(17) Q6: UC [IB] A: 3, 6 [IB] B: 7-13	
2. Examine, describe, compare and classify objects and substances based on common physical properties and simple chemical properties	IAPS 15, 16, 18	(15) Q5: UC [IB] B: 7-11 (18) Q3: AD	
3. Describe energy and compare and contrast the energy transformations and the characteristics of light, heat, motion, magnetism, electricity, sound and mechanical waves	IAPS 58, 66, 67	(58) Q2: UC (66) Proc :DI (67) Q5: AD, Quick check [IB] D: 4, 5, 8	
4. Model and explain the states of matter are dependent upon the quantity of energy present in the system and describe what will change and what will remain unchanged at the particulate level when matter experiences an external force or energy change	IAPS 36, 38, 39	(36) Q8: UC (38) Proc: DI, Q1-3: AD (39) Proc: DI, Q7: SI [IB] B: 7	
5. Describe and explain the motion of an object in terms of its position, direction, & speed as well as the forces acting upon it	IAPS 74, 75, 81	(74) Proc: DI (75) Q2: UC [IB] E: 13, 14	
6. Identify, build, describe, measure, and analyze mechanical systems (e.g., simple and complex compound machines) and describe the forces acting within those systems	Not covered		LAB AIDS 214 (Simple Machines)
7. Give examples and describe how energy is transferred and conserved (e.g. electric to light and heat [light bulb], chemical to mechanical [fuel to propulsion])	IAPS 57, 58, 66	(57) Q3: UC Quick check (58) Q2: UC (66) Proc: DI [IB] D: 4, 5	
Content Standard 3 —Students, through the inquiry process, demonstrate knowledge of characteristics, structures and function of living things, the process and diversity of life, and how living organisms interact with each other and their environment.	IALS 12, 76, 83	(83) Proc: DI, CS Quick check [IB] E: 29-33	
BENCHMARKS			
1. Compare the structure and function of prokaryotic cells (bacteria) and eukaryotic	IALS 16, 38, 42	(16) Q6: UC, Q7: UC Quick check	

SCIENCE STANDARDS	SEPUP		LAB-AIDS KITS
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cells (plant, animal, etc.) including the levels of organization of the structure and function, particularly with humans	7	(42) Quick check	
2. Explain how organisms and systems of organisms obtain and use energy resources to maintain stable conditions (e.g., food webs, photosynthesis, respiration)	IALS 15, 78, 81	(15) Q3: UC (78) Quick check (81) Proc: UC [IB] E: 14, 15, 17	
3. Communicate the differences in the reproductive processes of a variety of plants and animals using the principles of genetic modeling (e.g., Punnett squares)	IALS 57, 61, 62	(62) Proc: AD, Q3a: UC, Quick check	
4. Investigate and explain the interdependent nature of populations and communities in the environment and describe how species in these populations adapt by evolving	IALS 83, 95, 96	(83) Proc: DI, CS, Quick check [IB] E: 29-33 (95) Q4:AD [IB] F :4, 7, 10-13	
5. Create and use a basic classification scheme to identify plants and animals	IALS 44, 75, 76	[IB] E: 41, 42	
Content Standard 4 —Students, through the inquiry process, demonstrate knowledge of the composition, structures, processes and interactions of Earth’s systems and other objects in space.	IAES 29, 48, 88	(29) Q2: UC (48) Q4: UC (88) Q2: UC, Quick check [IB] F: 10-16 [IB] G: 10, 11, 13, 14	
BENCHMARKS			
1. Model and explain the internal structure of the earth and describe the formation and composition of earth’s external features in terms of the rock cycle and plate tectonics and constructive and destructive forces	IAES 22, 28, 42	(22) Q7: UC [IB] B: 5, 6, 11 [IB] D: 8-12	
2. Differentiate between rocks types and minerals types and classify both by how they are formed and the utilization by humans	IAES 15, 16, 17	(15) Quick check (16) Quick check Proc: DI, Q3: RE [IB] B:7-10	
3. Use fossils to describe the geological timeline	IAES 39 IALS 90, 92, 93	(90) Q3: SI (93) Q4: UC [IB] F :6-10	
4. Describe the water cycle, the composition and structure of the atmosphere and the impact of oceans on large-scale weather patterns	IAES 57, 58, 62	(57) Quick check (58) Quick check [IB] E: 7, 10, 12-13 (62) Q4: SI	
5. Describe and model the motion and tilt of earth in relation to the sun, and explain the concepts of day, night, seasons, year, and climatic changes	IAES 74, 76, 79	(76) Q4: AD [IB] F: 2-10	
6. Describe the earth, moon, planets and other objects in space in terms of size, force of gravity, structure, and movement in relation to the sun	IAES 89, 91, 92	(89) Proc: RE (91) Q4: UC [IB] G: 2, 11	
7. Identify scientific theories about the origin and evolution of the earth and solar system	Not covered		

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Content Standard 5 —Students, through the inquiry process, understand how scientific knowledge and technological developments impact communities, cultures and societies.	IAES 42, 87 IALS 37, 70, 103 IAPS 21, 85	(37) Proc: UC, CS (70) Q2 :RE, SI (85) Proc: CS	
BENCHMARKS			
1. Describe the specific fields of science and technology as they relate to occupations within those fields	IAES 34, 35, 53 IALS 11, 32, 103		
2. Apply scientific knowledge and process skills to understand issues and everyday events	IAES 11, 35 IALS 70, 88 IAPS 29, 72	(11) Q2: RE, ET (35) Q1: ET (70) Q2: RE (88) Proc: SI, Q2:AD, Q3: ET (29) Q1: ET (72) Q1: ET	
3. Simulate collaborative problem solving and give examples of how scientific knowledge and technology are shared with other scientists and the public	IAES 72, 98 IALS 53, 88 IAPS 11, 32	(72) Quick check, Proc: GI (98) Q2:ET,CS (53) Proc: GI, Q2: RE, Q3: ET (88) Proc: GI, SI, Q2: AD, Q3: ET (11) Proc: GI (32) Proc: GI	
4. Use scientific knowledge to investigate problems and their proposed solutions and evaluate those solutions while considering environmental impacts	IAES 35, 49 IALS 53, 87 IAPS 11, 29	(35) Q1: ET (49) Q2: ET (53) Q2: RE, Q3: ET (87) Q1: ET (11) Q1: ET (29) Q1:ET, Proc: CS	
5. Describe how the knowledge of science and technology influences the development of the Montana American Indian cultures	Local Issue		
Content Standard 6 —Students understand historical developments in science and technology.	IAES 42, 87 IALS 37, 108 IAPS 16, 80	(37) UC, CS (108) Q3: ET, Quick check (16) Quick check (80) Q2: UC, Quick check	
BENCHMARKS			
1. Give examples of scientific discoveries and describe the Interrelationship between technological advances and scientific understanding, including Montana American Indian examples	IAES 42, 87 IALS 37, 71 IAPS 16, 80 Plus local issue	(37) Proc: UC, CS (71) Q2: ET, CS (16) Quick check (80) Q2: UC, Quick check	
2. Identify major milestones in science that have impacted science, technology, and society	IAES 8, 42 IALS 37, 94	(37) UC, CS (94) Quick check, Q3:	

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	IAPS 16, 33	UC (16) Quick check (33) Q3: RE, SI	
3. Describe and explain science as a human endeavor and an ongoing process	IAES 23, 30 IALS 99, 103 IAPS 29, 72	(23) Q3: ET (30) Quick check (99) Q2: UC (29) Q1:ET, Proc: CS (72) Q1: ET	