

# Appendix I: SALI and the National Science Education Standards

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As a complete course, *Science and Life Issues* (SALI) provides approximately one school year of science instruction. To help you evaluate course content, SALI activities have been correlated to the National Science Education Standards (NSES). The NSES Science Content Standards are divided into three levels: K–4, 5–8, and 9–12. The NSES middle school standards are intended to help guide instruction for the four-year period covering grades 5–8. For this reason, SALI addresses many, but not all, of these standards. Other instructional materials, including those developed by SEPUP, may be used to help address these standards in their entirety.

Shown below are correlations to all of the elements of the following NSES Science Content Standards: Science as Inquiry (A), Life Science (C), Science and Technology (E), Science in Personal and Social Perspectives (F), and History and Nature of Science (G). In addition, correlations to certain elements of Earth Science (D) have also been included. Because of the spiralling nature of concept development in SALI, a specific activity may not address all aspects of a standard. However, all of the activities correlated to a particular standard work together to develop student understanding and mastery of the identified content. For more information on the content of a specific SALI activity or unit, please consult the Unit Overviews provided in the Introduction to this Teacher's Guide or the SALI Student Book.

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### A: Science as Inquiry

Guide to the Content Standard		SALI Activity
<b>Abilities Necessary to Do Scientific Inquiry</b>	Identify questions that can be answered through scientific investigations.	1, 2, 3, 5, 8, 9, 10, 14, 17, 19, 26, 35, 36, 38, 39, 40, 41, 47, 48, 50, 54, 60, 64, 69, 74, 77, 81, 82, 83, 86, 106
	Design and conduct a scientific investigation.	9, 14, 16, 24, 36, 47, 48, 64, 81, 83, 86
	Use appropriate tools and techniques to gather, analyze, and interpret data.	3, 4, 5, 7, 9, 14, 16, 17, 19, 21, 22, 26, 27, 30, 31, 32, 35, 36, 38, 39, 43, 46, 47, 48, 51, 53, 54, 59, 60, 62, 64, 66, 73, 74, 77, 78, 80, 81, 82, 83, 86, 90, 91, 93, 95, 96, 98, 106
	Develop descriptions, explanations, predictions, and models using evidence.	3, 4, 5, 7, 9, 10, 14, 16, 17, 19, 21, 22, 26, 27, 32, 36, 38, 39, 40, 41, 43, 44, 46, 47, 48, 51, 53, 54, 55, 58, 59, 60, 62, 64, 66, 68, 70, 74, 75, 76, 77, 81, 82, 83, 84, 86, 90, 91, 93, 95, 96, 98, 99, 100
	Think critically and logically to make the relationships between evidence and explanations.	3, 4, 7, 9, 10, 11, 14, 17, 19, 21, 22, 26, 27, 30, 32, 36, 38, 39, 40, 41, 43, 46, 47, 48, 50, 51, 53, 54, 58, 59, 60, 62, 64, 68, 70, 74, 75, 76, 77, 81, 83, 84, 85, 86, 87, 88, 89, 91, 94, 96, 98, 100
	Recognize and analyze alternative explanations and predictions.	2, 4, 9, 10, 11, 14, 16, 17, 21, 24, 27, 30, 32, 36, 38, 39, 40, 41, 43, 44, 46, 47, 48, 53, 54, 58, 59, 62, 64, 68, 70, 74, 75, 76, 77, 81, 83, 84, 86, 88, 90, 91, 94, 96, 98, 99
	Communicate scientific procedures and explanations.	1, 2, 7, 9, 10, 14, 21, 22, 24, 27, 36, 39, 40, 41, 44, 46, 47, 48, 51, 53, 62, 64, 65, 69, 70, 74, 75, 77, 81, 83, 86, 93, 99, 100
	Use mathematics in all aspects of scientific inquiry.	3, 4, 7, 8, 9, 10, 14, 16, 17, 19, 22, 27, 30, 51, 54, 59, 60, 62, 64, 77, 78, 83, 84, 85, 86, 91, 92, 95, 96, 98, 100
<b>Understandings about Scientific Inquiry</b>	Different kinds of questions require different kinds of scientific investigations.	1, 2, 3, 4, 5, 7, 8, 9, 10, 12, 14, 16, 17, 18, 19, 21, 22, 24, 25, 26, 27, 30, 31, 33, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 46, 47, 48, 51, 54, 55, 58, 59, 60, 64, 65, 68, 70, 73, 74, 77, 78, 81, 82, 83, 86, 90, 93, 100, 102, 104, 106, 107
	Different scientific domains have different approaches to scientific study.	1, 2, 3, 8, 10, 12, 14, 18, 25, 26, 31, 33, 34, 35, 36, 37, 38, 39, 42, 43, 47, 48, 50, 54, 55, 60, 64, 69, 73, 74, 77, 78, 81, 82, 83, 85, 86, 90, 93, 100
	Mathematics is important to scientific inquiry.	3, 4, 7, 8, 9, 10, 14, 16, 17, 19, 22, 27, 30, 47, 51, 54, 59, 60, 62, 64, 72, 77, 83, 84, 85, 86, 96, 98, 100
	Technology can be used to gather data more accurately and to analyze and quantify results.	3, 7, 16, 19, 25, 26, 35, 36, 37, 38, 39, 43, 44, 46, 47, 48, 50, 54, 59, 60, 62, 64, 65, 69, 70, 73, 82, 86, 87, 89, 100, 106
	Scientific explanations emphasize evidence, and are accepted until displaced by better ones.	2, 6, 7, 8, 10, 17, 19, 21, 23, 25, 28, 30, 32, 33, 34, 37, 40, 42, 43, 44, 45, 47, 48, 50, 53, 54, 58, 60, 68, 74, 77, 78, 81, 82, 83, 85, 88, 90, 91, 92, 93, 94, 96, 99
	Science advances through skepticism and debate.	2, 4, 10, 21, 25, 32, 33, 34, 37, 44, 48, 50, 60, 74, 83, 87, 88, 90, 91, 92, 94, 99
	Scientific investigations may lead to new ideas or investigations.	2, 4, 5, 9, 10, 14, 17, 19, 21, 25, 26, 27, 33, 34, 36, 38, 39, 40, 43, 44, 45, 47, 48, 50, 51, 52, 53, 59, 60, 62, 64, 74, 77, 78, 81, 82, 83, 85, 86, 88, 90, 91, 94, 96, 99

## C: Life Science

	N Guide to the Content Standard	SALI Activity
<b>Structure and Function in Living Systems</b>	Living systems demonstrate structure and function. Levels of organization include cells, organs, tissues, organ systems, whole organisms, and ecosystems.	12, 13, 14, 15, 16, 17, 18, 21, 22, 23, 24, 27, 28, 29, 37, 38, 39, 40, 41, 42, 43, 44, 46, 49, 56, 57, 63, 69, 72, 75, 82, 99, 104, 106
	All organisms are composed of either one or many cells.	37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 49, 57, 63, 82, 92, 100
	Cells carry on life functions, such as taking in nutrients.	37, 38, 39, 40, 41, 42, 45, 46, 50, 57, 63
	In multicellular organisms, specialized cells, which may be grouped as tissues or organs, perform specialized functions.	12, 13, 14, 15, 17, 18, 21, 22, 23, 25, 28, 29, 37, 38, 41, 42, 46, 49, 56, 82, 106
	Humans have systems for digestion, respiration, reproduction, circulation, excretion, movement, control and coordination, and for protection from disease.	6, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 46, 49, 50, 51, 52, 56, 57, 63, 104, 105, 106
	Disease is a breakdown in structure or function of an organism.	13, 20, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 37, 42, 44, 45, 46, 49, 50, 51, 52, 53, 56, 63, 66, 67, 104, 105
<b>Reproduction and Heredity</b>	All living systems reproduce sexually or asexually.	49, 57, 58, 59, 60, 63, 65, 66, 73, 96, 97
	Sexual reproduction involves the production of eggs and sperm; sexually produced offspring are not identical to either parent.	57, 63, 65, 68, 70
	Heredity is the passage of genetic information from one generation to another.	54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 70, 71, 94, 97
	Heredity information is contained in genes, located in chromosomes of each cell. An inherited trait can be determined by one or many genes.	57, 58, 59, 60, 61, 62, 63, 65, 66, 67, 68, 69, 70, 71, 100
	Some traits are inherited and others result from interactions with the environment.	54, 55, 56, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 70, 71, 94, 97
<b>Regulation and Behavior</b>	All organisms must be able to obtain and use resources, grow, reproduce, and maintain internal conditions in a changing external environment.	12, 13, 14, 15, 16, 17, 18, 29, 36, 37, 39, 40, 41, 42, 44, 45, 47, 50, 57, 72, 73, 77, 79, 81, 84, 85, 88, 89, 92, 94, 95, 96, 97, 101
	An organism must regulate its internal environment in order to survive.	12, 13, 14, 15, 16, 17, 18, 19, 22, 25, 26, 27, 28, 29, 40, 41, 42, 43, 46, 50
	Behavior is one kind of response to stimulus.	73, 74, 83, 88, 89, 94, 96, 101
	An organism's behavior evolves through adaptation to its environment.	74, 84, 94, 95, 96, 97, 101
<b>Populations and Ecosystems</b>	A population consists of all individuals in a species at a given place and time. Ecosystems are composed of populations and physical factors.	72, 73, 74, 77, 78, 79, 80, 83, 84, 85, 86, 87, 88, 96
	Populations of organisms can be identified as producers, composers, or decomposers. Food webs describe the relationships among these groups.	73, 78, 79, 80, 81, 82, 86, 88
	For ecosystems, the major source of energy is the sun. Producers use photosynthesis to transfer this energy into chemical energy.	79, 80, 81, 82, 86
	The number of organisms in an ecosystem depend on biotic and abiotic factors. The size of populations change based on these factors.	72, 73, 77, 78, 79, 83, 84, 85, 86, 87, 88, 89
<b>Diversity and Adaptations of Organisms</b>	The millions of species of animals, plants, and microorganisms on earth share a common ancestry.	75, 76, 89, 90, 92, 94, 97, 98, 99, 100
	The process of natural selection accounts for the diversity of species on earth.	94, 95, 96, 97, 98, 99, 100, 101
	Extinction occurs when a species is unable to adapt to environmental changes. Fossil evidence indicates that most of the species that have lived on earth non longer exist.	89, 90, 91, 92, 94, 96, 97, 98, 99, 101

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### D: Earth and Space Science

Guide to the Content Standard		SALI Activity
Structure of the Earth System	Land forms are the result of constructive (deposition of sediment, etc.) and destructive (weathering, erosion) forces.	90, 93
	Some changes in the solid earth can be described as the "rock cycle."	90
	Soil consists of weathered rocks and organic material. Soil is often found in layers, each having different composition and texture.	93
Earth's History	Modern earth processes, such as erosion, have occurred in the past, as have catastrophes such as the impact of an asteroid or comet.	89
	Fossils provide important evidence of how life and environmental conditions on earth have changed over time.	90, 91, 92, 93, 97, 98, 99

### E: Science and Technology

Guide to the Content Standard		SALI Activity
Abilities of Technological Design	Identify appropriate problems for technological design.	102, 103, 104, 105, 108
	Design a solution or product.	16, 102, 104, 105, 108
	Implement a proposed design.	16, 104, 105, 108
	Evaluate completed technological designs or products.	16, 104, 105, 108
	Communicate the process of technological design.	16, 104, 105, 108
Understandings about Science and Technology	Scientific inquiry and technological design have similarities and differences.	102, 103, 104, 105, 106, 107, 108
	Different people in different cultures have made and continue to make contributions to science and technology.	2, 4, 8, 10, 15, 19, 23, 25, 26, 29, 33, 34, 37, 50, 71, 85, 86, 87, 103, 107, 108
	Science and technology are reciprocal.	102, 103, 104, 105, 107, 108
	All technological solutions have associated trade-offs and risks.	16, 102, 103, 104, 105, 106, 108
	Technological designs have constraints.	16, 37, 104, 105, 106, 108
	Technological solutions have both predictable and unpredictable benefits and consequences.	102, 104, 105, 106, 108

## F: Science in Personal and Social Perspectives

N Guide to the Content Standard		SALI Activity
<b>Personal Health</b>	Regular exercise is important to the maintenance and improvement of health.	16, 17, 19, 20, 22, 28, 29
	Injury prevention can reduce the potential for accidents.	
	The use of tobacco increases the risk of illness.	28, 29
	Alcohol and other drugs are often abused substances that can change how the body functions.	13, 15, 28, 29
	Food provides energy and nutrients for growth and development.	2, 13, 14, 15, 16, 18, 81
	Sex, a natural human function, can be a means of transmitting disease.	31, 44, 45
	Natural environments may contain substances that are harmful to humans.	47, 48, 49, 50, 51, 53
<b>Populations, Resources, and Environments</b>	When an area becomes overpopulated, the environment will become degraded due to increased use of resources.	72, 73, 77, 84, 87, 88
	Causes of environmental degradation and resource depletion vary.	73, 77, 84, 87, 88
<b>Natural Hazards</b>	Natural hazards can change or destroy habitats, damage property, and harm or kill humans.	89
	Human activities can also induce hazards or accelerate the speed of natural changes.	72, 73, 82, 87, 88, 89, 101
	Addressing natural hazards presents personal and societal challenges.	
<b>Risks and Benefits</b>	Risk analysis can be used to determine the options for reducing or eliminating risk.	11, 20, 28, 29, 30, 48, 52, 53, 56, 67, 87, 88, 101
	Risks may be associated with natural, chemical, biological, social, or personal hazards.	2, 10, 11, 13, 20, 26, 28, 29, 33, 34, 47, 48, 50, 52, 53, 56, 67, 72, 87, 88, 101
	Individuals can use a systematic approach to analyzing risks and benefits.	4, 10, 11, 19, 20, 22, 26, 28, 29, 30, 48, 52, 56, 67, 87, 88, 89, 101
	Important personal and social decisions are made based on perceptions of benefits and risks.	3, 4, 10, 11, 13, 19, 20, 25, 26, 28, 29, 30, 33, 34, 47, 48, 49, 50, 51, 52, 53, 56, 67, 68, 70, 72, 87, 88, 89, 101
<b>Science and Technology in Society</b>	Science influences how society thinks about itself and the environment.	2, 8, 10, 20, 25, 29, 33, 34, 37, 42, 45, 47, 48, 49, 50, 52, 53, 56, 67, 68, 71, 72, 73, 87, 88, 89, 94, 101
	Societal challenges often inspire scientific research and influence funding decisions.	2, 8, 10, 20, 25, 29, 33, 34, 37, 42, 45, 50, 53, 68, 70, 71, 72, 73, 87, 88, 104
	Technology influences society through its products and processes.	8, 13, 20, 25, 35, 37, 42, 45, 50, 67, 68, 69, 70, 87, 100, 103, 104, 105, 107, 108
	Science and technology have advanced through contributions of many different people.	2, 10, 23, 25, 33, 34, 37, 42, 45, 50, 53, 71, 86, 87, 94, 97, 103, 107, 108
	Scientists and engineers work in many different settings.	2, 4, 8, 10, 15, 20, 25, 26, 29, 33, 34, 37, 42, 45, 48, 50, 52, 53, 67, 69, 71, 72, 74, 77, 82, 85, 86, 87, 91, 99, 100, 102, 103, 104, 105, 107, 108
	Prior knowledge and consent are required for research involving human subjects or potential damage to property.	2, 3, 4, 8, 10, 25, 33, 34, 37, 49, 50, 53, 56, 68
	Science cannot answer all questions and technology cannot solve all human problems or meet all human needs.	1, 2, 8, 10, 13, 16, 20, 25, 28, 29, 33, 34, 37, 42, 48, 49, 50, 56, 67, 68, 69, 70, 71, 72, 73, 87, 88, 89, 101, 103, 108

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### G. History and Nature of Science

Guide to the Content Standard		SALI Activity
<b>Science as a Human Endeavor</b>	A diversity of people work, either cooperatively or individually, in science and related fields.	2, 4, 8, 10, 15, 19, 23, 25, 26, 29, 33, 34, 37, 50, 67, 71, 72, 74, 77, 82, 85, 86, 87, 91, 99, 100, 103, 107, 108
	Science requires different abilities, depending on the field of study and type of inquiry.	1, 2, 15, 16, 19, 23, 25, 26, 33, 35, 37, 42, 48, 50, 53, 69, 72, 77, 82, 85, 86, 87, 90, 91, 99, 104, 105, 107, 108
<b>Nature of Science</b>	Scientists formulate and test explanations of nature using observations, experiments, and models.	2, 3, 4, 8, 10, 25, 33, 34, 37, 42, 45, 47, 48, 50, 53, 59, 60, 69, 77, 81, 83, 85, 86, 91, 94, 97, 104
	In areas of scientific research, scientists may disagree and produce conflicting explanations.	2, 4, 10, 25, 33, 34, 37, 45, 48, 49, 50, 53, 60, 72, 77, 87, 88, 91, 94
	Scientific inquiry involves evaluating and reviewing scientific ideas and processes.	2, 4, 5, 7, 9, 10, 25, 33, 34, 37, 42, 50, 44, 45, 47, 48, 53, 60, 72, 77, 81, 83, 85, 87, 88, 91, 94, 97, 104
<b>History of Science</b>	Many individuals have contributed to the traditions of science.	2, 10, 23, 25, 33, 34, 37, 42, 45, 50, 56, 59, 60, 71, 94, 97, 107, 108
	Throughout its history, science has been practiced by different individuals in different cultures.	2, 10, 25, 33, 34, 37, 42, 45, 50, 56, 60, 71, 94, 97, 101, 107, 108
	Tracing the history of science can show changes in scientific ideas over time.	2, 10, 23, 25, 33, 34, 37, 40, 42, 45, 49, 50, 56, 60, 63, 72, 94, 97