Idaho Partners - Science Standards for Grades 5-6

The Idaho GLOBE Partnership
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602. SCIENCE STANDARDS . GRADES 5-6.

The samples associated with the content standards are meant to illustrate meaning and to represent possible areas of applications. They are not intended to be an exhaustive list, but are samples of applications that would demonstrate learning.

3. **UNIFYING CONCEPTS OF SCIENCE.**

Standard - The student will:	Content Knowledge and Skills:	Samples of Applications:
1. Understand systems, order, and organization.	1. Know that a system is an organized group of related objects that form a whole.	1. Using a clear plastic container, create a biome using soil, plants, and earthworms. 2. Explain the water cycle

		3. Earth as a System Activity 4. Blue Marble Activity
1. Understand concepts and processes of evidence, models, and explanation.	1. 1. Know that observations and data are evidence on which to base scientific explanations and predictions.	1. Compare biomes with different variables such as light, temperature, water. 2. Compare and graph temperature data from GLOBE schools in various latitudes and longitudes .
	1. 1. Know the difference between observations and inferences.	1. Use GLOBE remote sensing images to find differences between observation and inference. 2. During a GLOBE investigation experiment, discuss the difference between observation and inference.
	1. 1. Use models to explain or	1. ESS poster activity.

	demonstrate a concept.	
	1. 1. Develop skills to create scientific explanations based on scientific knowledge, logic, and analysis.	1. 1. GLOBE student research projects 2. Students propose project
1. Understand constancy, change, and measurement.	1. 1. Recognize that some concepts in science do not change with time.	1. Water Cycle 2. Seasons Investigation 3. Hydrology Investigation
	1. 1. Analyze changes that occur in and among systems.	1. GLOBE investigations. 2. Measure the temperature of air in different colored shelters over time.
	1. 1. Measure using standard and metric systems	1. Measure various objects (temperature, volume, weight, length) using both metric and

	with an emphasis on the metric system.	customary systems.
1. Understand the theory that evolution is a process that relates to the gradual changes in the universe and of equilibrium as a physical state.	1. 1. Understand the relationships of past, present, and future.	1. GLOBE soil investigation 2. Create and demonstrate an erosion model with sand, gravel, humus, and dirt before and after addition of vegetation and other soil components. 3. Seasons investigation 4. GLOBE Phenology
1. Understand concepts of form and function.	1. 1. Understand that the shape or form of an object or system is frequently related to its use or function.	1. GLOBE Bird Activity 2. GLOBE Macroinvertabrates

4. **CONCEPTS OF SCIENTIFIC INQUIRY.**

Standard - The student will:	Content Knowledge and Skills:	Samples of Applications:
1. Understand scientific inquiry and develop critical thinking skills.	1. Develop questions that can be answered by conducting scientific experiments.	1. GLOBE student research projects
	1. Conduct scientific investigations using controls and variables when appropriate.	1. GLOBE student research projects. 2. Conduct an experiment to test several variables.
	1. Select and use appropriate tools and techniques to gather and display data.	1. 1. GLOBE graphing and Visualization 2. GLOBE manual mapping of Land Cover
	1. Analyze data in order to develop descriptions, explanations, predictions, and models using evidence.	1. Develop an explanation using GLOBE data 2. GLOBE graphing and Visualizations

	1. Develop a hypothesis based on observations.	1. GLOBE student research projects
	1. Compare alternative explanations and predictions.	1. Discuss and recognize other possible variables.
	1. Communicate scientific procedures and explanations.	1. Have class present data to a music teacher in written or oral form. Present data to the class in a meaningful way. 2. Present findings on the GLOBE student research site

5. **CONCEPTS OF PHYSICAL SCIENCE.**

Standard - The student will:	Content Knowledge and Skills:	Samples of Applications:
1. Understand the structure and function of matter and molecules and their interactions.	1. Explore and describe the differences among elements, compounds, and mixtures.	1. n/a

	1. Explore and calculate properties of matter.	1. n/a
	1. Compare differences among solids, liquids, and gases using the concept of density: explore the effect of temperature on density.	1. n/a
	1. Understand the nature of physical change and how it relates to physical properties.	1. n/a
1. Understand chemical reactions.	1. 1. Observe and know that substances react with each other to form new substances with different properties.	1. n/a
1. Understand concepts of motion and forces.	1. 1. Observe the effects of different forces (gravity and friction) on the movement, speed, and direction of an object.	1. n/a
	1.	1. n/a

	1. Investigate different forms of energy.	

6. **CELLULAR AND MOLECULAR CONCEPTS.**

Standard - The student will:	Content Knowledge and Skills:	Samples of Applications:
1. Understand the cell is the basis of form and function for all living things and how living things carry out their life functions.	1. Explore the different structural levels of which an organism is comprised: cells, tissues, organs, organ systems, and organisms.	1. n/a
	1. Recognize the structural differences between plant and animal cells.	1. 1. n/a
	1. Explore the concept that traits are passed from parents to offspring.	1. n/a

7. **INTERDEPENDENCE OF ORGANISMS AND BIOLOGICAL CHANGE.**

   Interdependence of Organisms and Biological Change standards do not apply at this grade level.

8. **MATTER, ENERGY, AND ORGANIZATION IN LIVING SYSTEMS.**

Standard - The student will:	Content Knowledge and Skills:	Samples of Applications:
1. Understand the relationship between matter, energy, and organization to trace matter as it cycles and energy as it flows through living systems and between living systems and the environment.	1. Know that the energy for life is primarily derived from the sun through photosynthesis.	1. Plant grass in small container. Put some grass in the dark and some in the sunlight. Compare results. 2. GLOBE grassland protocol 3. GLOBE Biomass protocol

7. **EARTH AND SPACE SYSTEMS.**

Standard - The student will:	Content Knowledge and Skills:	Samples of Applications:
1. Understand scientific theories of origin and subsequent changes in the universe and earth systems.	1. Investigate the interactions between the solid earth, oceans, atmosphere, and organisms.	1. Research topics: pollution, oceans affect on climate, global warming, weather, plate tectonics or continental drift.

		2. GLOBE Investigations 3. Student Research projects 4. GLOBE visualizations
	1. Know the water cycle and its relationship to weather and climate.	i. Students explain the water cycle and illustrate an example..
	• Identify cumulus, cirrus, and stratus clouds and their relationship to weather changes.	i. GLOBE Cloud ID protocol
	• Know that fossils are evidence of past life forms.	1. n/a
1. Understand geo-chemical cycles and energy in the earth system.	1. 1. 1. Know the rock cycle and identify the three classifications of rocks.	1. n/a
	1. 1. 1. Know the layers and	1. n/a

	composition of the earth.	

7. **TECHNOLOGY.**

Standard - The student will:	Content Knowledge and Skills:	Samples of Applications:
1. Understand the relationship between science and technology and develop the abilities of technological design and application.	1. Know that science and technology are human endeavors interrelated to each other, to society, and to the work place.	1. Participate in a GLOBE web chat 2. Scientists Corner
	1. Compare scientific inquiry and technological design in terms of activities, results, and influences on individuals and society: know that science enables technology and vice versa.	1. n/a
	1. Create a tool to perform a specific function.	i. GLOBE densiometers, clinometers, transparency tubes

	• Use available and appropriate technology.	i. Use GLOBE website
	• Explore the elements of technological design, which include the following: - Identify a problem; - Propose a solution; - Implement a proposed solution; - Evaluate the solution and its consequences; - Communicate the problem, process, and solution.	1. 1. n/a.

7. **PERSONAL AND SOCIAL PERSPECTIVES.**

Standard - The student will:	Content Knowledge and Skills:	Samples of Applications:
1. Understand common environmental quality issues, both natural and human induced.	1. Identify issues for environmental studies.	1. Research an environmental issue and describe its impact on the United States

		using GLOBE data.
1. Understand the causes and effects of population change.	1. 1. Understand the effect of technological development and human population growth on the United States and/or the world.	1. Compare and contrast pictures of your study sites today and ten years ago 2. Take a field trip to the local sewage treatment center or water treatment plant. 3. Clean up the schoolyard, park or waterway.
1. Understand the importance of natural resources and the need to manage and conserve them.	1. 1. Understand the differences between renewable and nonrenewable resources.	1. Separate lunchroom trash into renewable and nonrenewable resources.
	1. 1. Understand the conservation of natural resources.	1. Compare and contrast the different forms of transportation and their impact on

		natural resources, for instance, public transportation, automobiles, bicycles. 2. Map these transportation items on a LandSat Image using manual mapping techniques
1. Understand different uses of technology in science and how they affect our standard of living.	• Identify examples of technologies used in these scientific fields: - Food production; - Environmental cleanup; - Advances in medicine; - Communications; - The space program; - Weather forecasting.	n/a

- **HISTORY OF SCIENCE.**

Standard - The student will:	Content Knowledge and Skills:	Samples of Applications:
• Understand the	• Understand major	• Choose a scientist in the Scientist

significance of major scientific milestones.	contributions of various scientists and researchers.	Corner from a topic studied this year and explain how their contribution was significant to society.

- **INTERDISCIPLINARY CONCEPTS.**

Standard - The student will:	Content Knowledge and Skills:	Samples of Applications:
• Understand that interpersonal relationships are important in scientific endeavors.	• Work in teams to solve problems.	• Work in cooperative teams to solve problems. • Given a problem, students attempt to solve individually then solve the same problem in groups. Compare results.
• Understand technical communication.	Read, understand, and follow technical instructions.	Follow instructions to perform a GLOBE protocol

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