

FORMAT FOR CORRELATION TO THE GEORGIA PERFORMANCE STANDARDS

Subject Area: Environmental Science

State-Funded Course: 26.06110

Textbook Title: Investigations in Environmental Science: Unit 1: Land Use; Unit 2: Energy Generation; Unit 3: Water Management

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The GPSs for grades K-12 Science and 9-12 Mathematics may be accessed on-line at: <http://www.georgiastandards.org/>.

| <u>Standard</u> (Cite Number) | <u>Standard</u> (Cite specific standard) | <u>Where Taught</u> (If print component, cite page number; if non-print, cite appropriate location.) |
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| SCSh1 | Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science. | |
| SCSh1.a | Exhibit the above traits in their own scientific activities. | U1, U2, U3 |
| SCSh1.b | Recognize that different explanations often can be given for the same evidence. | U2.5 |
| SCSh1.c | Explain that further understanding of scientific problems relies on the design and execution of new experiments which may reinforce or weaken opposing explanations. | U1.3.1e, 1.3.3.e, U2.2.2.c, U2.2.5, U2.2.6, U2.3.1.c, U2.3.5.a, U2.3.5.c-d, U2.6, U3.2.5, U3.2.6, U3.3.1.b, U3.5.3.a, U3.5.4.e |
| SCSh2 | Students will use standard safety practices for all classroom laboratory and field investigations. | |
| SCSh2.a | Follow correct procedures for use of scientific apparatus. | U1.2.1.a, U1.2.3.d, U1.3.3.a, U1.4.3.a, U1.6.2.b, U2.1.2.b, U2.1.3.b,-c, U2.2.1.a, U2.2.2.a-b, U2.3.1.b, U2.3.2.a, U2.3.2.c, U2.3.3.a, U2.3.3.c, U2.3.5.a, U2.5.3.a, U3.1.2.a-b, U3.1.2.d-e, U3.1.3.a, U3.1.3.d, U3.1.4.a-b, U3.1.5.a, U3.1.6.a, U3.1.6.c-d |

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| SCSh2.b | Demonstrate appropriate techniques in all laboratory situations. | U1.2.1.a, U1.2.3.d, U1.3.3.a, U1.4.3.a, U1.6.2.b, U2.1.2.b, U2.1.3.b,-c, U2.2.1.a, U2.2.2.a-b, U2.3.1.b, U2.3.2.a, U2.3.2.c, U2.3.3.a, U2.3.3.c, U2.3.5.a, U2.5.3.a, U3.1.2.a-b, U3.1.2.d-e, U3.1.3.a, U3.1.3.d, U3.1.4.a-b, U3.1.5.a, U3.1.6.a, U3.1.6.c-d |
| SCSh2.c | Follow correct protocol for identifying and reporting safety problems and violations. | |
| SCSh3 | SCSh3. Students will identify and investigate problems scientifically. | U1.2.4.c-d, U1.3.4, U1.6, U2.4, U2.6, U3.6 |
| SCSh3.a | Suggest reasonable hypotheses for identified problems. | U1.2.4.c-d, U1.3.4, U1.6, U2.4, U2.6, U3.6 |
| SCSh3.b | Develop procedures for solving scientific problems. | U1.6, U2.4, U2.6, U3.6 |
| SCSh3.c | Collect, organize and record appropriate data. | U1.6, U2.4, U2.6, U3.6 |
| SCSh3.d | Graphically compare and analyze data points and/or summary statistics. | U1.6, U2.4, U2.6, U3.6 |
| SCSh3.e | Develop reasonable conclusions based on data collected. | U1.6, U2.4, U2.6, U3.6 |
| SCSh3.f | Evaluate whether conclusions are reasonable by reviewing the process and | |

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| | checking against other available information. | |
| SCSh4 | Students will use tools and instruments for observing, measuring, and manipulating scientific equipment and materials. | U1.2.1.a, U1.3.2.a-d, U2.2.2, U2.3.1.b, U2.3.2.a, U2.3.2.c, U2.3.3.c, U3.1.4, U3.2.2.a-b |
| SCSh4.a | Develop and use systematic procedures for recording and organizing information. | U1.3.2.b-d |
| SCSh4.b | Use technology to produce tables and graphs. | |
| SCSh4.c | Use technology to develop, test, and revise experimental or mathematical models. | |
| SCSh5 | Students will demonstrate the computation and estimation skills necessary for analyzing data and developing reasonable scientific explanations. | U1.2.1.a, U2.2.2, U2.3.1.b, U2.3.3.c, U3.1.4, U3.2.2.a-b |
| SCSh5.a | Trace the source on any large disparity between estimated and calculated answers to problems. | |
| SCSh5.b | Consider possible effects of measurement errors on calculations. | |
| SCSh5.c | Recognize the relationship between accuracy and precision | |
| SCSh5.d | Express appropriate numbers of significant figures for calculated data, using scientific notation where | |

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| SCSh5.e | <p>appropriate.</p> <p>Solve scientific problems by substituting quantitative values, using dimensional analysis and/or simple algebraic formulas as appropriate.</p> | |
| SCSh6 | Students will communicate scientific investigations and information clearly. | |
| SCSh6.a | <p>Write clear, coherent laboratory reports related to scientific investigations.</p> | U1.5, U1.6, U2.5, U2.6, U3.2-6 |
| SCSh6.b | <p>Write clear, coherent accounts of current scientific issues, including possible alternative interpretations of the data.</p> | U1, U2, U3 |
| SCSh6.c | <p>Use data as evidence to support scientific arguments and claims in written or oral presentations.</p> | U1, U2, U3 |
| SCSh6.d | <p>Participate in group discussions of scientific investigation and current scientific issues.</p> | |
| SCSh7 | Students will analyze how scientific knowledge is developed. | |
| SCSh7.a | <p>The universe is a vast single system in which the basic principles are the same everywhere.</p> | |
| SCSh7.b | <p>Universal principles are discovered through observation and experimental verification.</p> | U2.5.1.c |

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| SCSh7.c | <p>From time to time, major shifts occur in the scientific view of how the world works. More often, however, the changes that take place in the body of scientific knowledge are small modifications of prior knowledge. Major shifts in scientific views typically occur after the observation of a new phenomenon or an insightful interpretation of existing data by an individual or research group.</p> | |
| SCSh7.d | <p>Hypotheses often cause scientists to develop new experiments that produce additional data.</p> | |
| SCSh7.e | <p>Testing, revising, and occasionally rejecting new and old theories never ends</p> | |
| SCSh8 | <p>Students will understand important features of the process of scientific inquiry.</p> | |
| SCSh8.a | <p>Scientific investigators control the conditions of their experiments in order to produce valuable data.</p> | |
| SCSh8.b | <p>Scientific researchers are expected to critically assess the quality of data including possible sources of bias in their investigations' hypotheses, observations, data analyses, and interpretation</p> <p>Scientists use practices such as peer</p> | |

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| SCSh8.c | <p>review and publication to reinforce the integrity of scientific activity and reporting.</p> | |
| SCSh8.d | <p>The merit of a new theory is judged by how well scientific data are explained by the new theory</p> | |
| SCSh8.e | <p>The ultimate goal of science is to develop an understanding of the natural universe which is free of biases.</p> | |
| SCSh8.f | <p>Science disciplines and traditions differ from one another in what is studied, techniques used, and outcomes sought.</p> | |
| SCSh9 | <p>SCSh9. Students will enhance reading in all curriculum areas by:</p> | Throughout |
| SCSh9.a | <p>.Reading in All Curriculum Areas</p> <ul style="list-style-type: none"> ∞ Read a minimum of 25 grade-level appropriate books per year from a variety of subject disciplines and participate in discussions related to curricular learning in all areas ∞ Read both informational and fictional texts in a variety of genres and modes of discourse ∞ Read technical texts related to various subject areas. | Throughout |
| SCSh9.b | <p>Discussing books</p> <ul style="list-style-type: none"> ∞ Discuss messages and themes from books in all subject areas. | |

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| | <ul style="list-style-type: none"> ∞ Respond to a variety of texts in multiple modes of discourse. ∞ Relate messages and themes from one subject area to messages and themes in another area. ∞ Evaluate the merit of texts in every subject discipline. ∞ Examine author’s purpose in writing. ∞ Recognize the features of disciplinary texts | Throughout |
| SCSh9.c | <p>Building vocabulary knowledge</p> <ul style="list-style-type: none"> ∞ Demonstrate an understanding of contextual vocabulary in various subjects. ∞ Use content vocabulary in writing and speaking. ∞ Explore understanding of new words found in subject area texts. | Throughout |
| SCSh9.d | <p>Establishing context</p> <ul style="list-style-type: none"> ∞ Explore life experiences related to subject area content. ∞ Discuss in both writing and speaking how certain words are subject area related ∞ Determine strategies for finding content and contextual meaning for unknown words. | |
| SEV1 | <p>Students will investigate the flow of energy and cycling of matter within an ecosystem and relate these phenomena to human society.</p> | |

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| SEV1.a | Interpret biogeochemical cycles including hydrologic, nitrogen, phosphorus, oxygen, and carbon cycles. Recognize that energy is not recycled in ecosystems. | |
| SEV1.b | Relate energy changes to food chains, food webs, and to trophic levels in a generalized ecosystem, recognizing that entropy is a primary factor in the loss of usable food energy during movement up the trophic levels. | |
| SEV1.c | Relate food production and quality of nutrition to population growth and the trophic levels | |
| SEV1.d | Relate the cycling of matter and the flow of energy to the Laws of Conservation of matter and energy. Identify the role and importance of decomposers in the recycling process. | |
| SEV1.e | Distinguish between abiotic and biotic factors in an ecosystem and describe how matter and energy move between these. | |
| SEV2 | Students will demonstrate an understanding that the Earth is one interconnected system. | |
| SEV2.a | Describe how the abiotic components (water, air, and energy) affect the biosphere. | |
| SEV2.b | Recognize and give examples of the hierarchy of the biological entities of the biosphere (organisms, populations, communities, | |

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| SEV2.c | <p>ecosystems, and biosphere).</p> <p>Characterize the components that define a Biome.</p> <ul style="list-style-type: none"> ◦ Abiotic Factors – to include precipitation, temperature and soils. ◦ Biotic Factors – plant and animal adaptations that create success in that biome. | |
| SEV2.d | <p>Characterize the components that define fresh-water and marine systems.</p> <ul style="list-style-type: none"> ◦ Abiotic Factors – to include light, dissolved oxygen, phosphorus, nitrogen, pH and substrate. ◦ Biotic Factors – plant and animal adaptations characteristic to that system. | |
| SEV3 | Students will describe stability and change in ecosystems | |
| SEV3.a | <p>Describe interconnections between abiotic and biotic factors, including normal cyclic fluctuations and changes associated with climatic change (i.e. ice ages).</p> | |
| SEV3.b | <p>Explain succession in terms of changes in communities through time to include changes in biomass, diversity, and complexity.</p> | |
| SEV3 .c | <p>Explain how succession may be altered by traumatic events.</p> | |

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| SEV3.d | Explain how biotic and abiotic factors influence populations. | |
| SEV3.e | Describe interactions between individuals (<i>i.e.</i> mutualism, commensalisms, parasitism, predation, and competition). | |
| SEV4 | Students will understand and describe availability, allocation and conservation of energy and other resources | |
| SEV4.a | Differentiate between renewable and nonrenewable resources including how different resources are produced, rates of use, renewal rates, and limitations of sources. Distinguish between natural and produced resources. | |
| SEV4.b | Describe how technology is increasing the efficiency of utilization and accessibility of resources. | |
| SEV4.c | Describe how energy and other resource utilization impact the environment and recognize that individuals as well as larger entities (businesses, governments, etc.) have impact on energy efficiency. | |
| SEV4.d | Describe the relationship of energy consumption and the living standards of societies. | |

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| SEV4.e | <p>Describe the commonly used fuels (<i>e.g.</i> fossil fuels, nuclear fuels, etc.) and some alternative fuels (<i>e.g.</i> wind, solar, ethanol, etc.) including the required technology, availability, pollution problems and implementation problems. Recognize the origin of fossil fuels and the problems associated with our dependence on this energy source.</p> | |
| SEV4.f | <p>Describe the need for informed decision making of resource utilization. (<i>i.e.</i> energy and water usage allocation, conservation, food and land, and long-term depletion)</p> | |
| SEV5 | <p>Students will recognize that human beings are part of the global ecosystem and will evaluate the effects of human activities and technology on ecosystems.</p> | |
| SEV5.a | <p>Describe factors affecting population growth of all organisms, including humans. Relate these to factors affecting growth rates and carrying capacity of the environment.</p> | |
| SEV5.b | <p>Describe the effects of population growth, demographic transitions, cultural differences, emergent diseases, etc. on societal stability.</p> | |
| SEV5.c | <p>Explain how human activities affect global and local sustainability.</p> | |

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| SEV5.d | Describe the actual and potential effects of habitat destruction, erosion, and depletion of soil fertility associated with human activities. | |
| SEV5.e | Describe the effects and potential implications of pollution and resource depletion on the environment at the local and global levels (e.g. air and water pollution, solid waste disposal, depletion of the stratospheric ozone, global warming, and land uses). | |
| SEV5.f | Describe how political, legal, social, and economic decisions may affect global and local ecosystems. | |