COMPONENT	OBJECTIVES	COMPETENCY
I The Nature of Science as Inquiry	1. Identify Questions That Can Be Answered Through Scientific Investigations. Students should develop the ability to refine and refocus broad and ill-defined questions. An important aspect of this ability consists of students' ability to clarify questions and inquiries and direct them toward objects and phenomena that can be described, explained, or predicted by scientific investigations. Students should develop the ability to identify their questions with scientific ideas, concepts, and quantitative relationships that guide investigation. **(SC.H.1.3.2)** 2. Design And Conduct A Scientific Investigation. Students should develop general abilities, such as systematic observation, making accurate measurements, and identifying and controlling variables. They should also develop the ability to clarify their ideas that are influencing and guiding the inquiry, and to understand how those ideas compare with current scientific knowledge. Students can learn to formulate questions, design investigations, execute investigations, interpret data, use evidence to generate explanations, propose alternative explanations, and critique explanations and procedures. 3. Use Appropriate Tools And Techniques To Gather, Analyze, And Interpret Data. The use of tools and techniques, including mathematics, will be guided by the question asked and the investigations students design. The use of computers for the collection, summary, and display of evidence is part of this standard. Students should be able to access, gather, store, retrieve, and organize data, using hardware and software designed for these purposes. 4. Develop Descriptions, Explanations, Predictions, And Models Using Evidence. Students should base their explanation on what they observed, and as they develop cognitive skills, they should be able to differentiate explanation from description - providing causes for effects and establishing relationships based on evidence and logical argument. This standard requires a subject matter knowledge base so the students can effectively conduct investigations, because developing explanations establishes connections between the content of science and the contexts within which students develop new knowledge. **(SC.A.1.3.0)**	A. Participate in a variety of activities that develop all students' abilities to: identify scientific questions; design and conduct investigations; use appropriate tools and techniques; compose descriptions, explanations, predictions, and models using evidence; think critically and logically to make the relationships between evidence and explanations; communicate scientific procedures and explanations; and use mathematics in all aspects of scientific inquiry. **(SC.H.1.3.5)**

COMPONENT	OBJECTIVES	COMPETENCY
	5. Think Critically And Logically To Make The Relationships Between Evidence And Explanations. Thinking critically about evidence includes deciding what evidence should be used and accounting for anomalous data. Specifically, students should be able to review data from a simple experiment, summarize the data, and form a logical argument about the cause-and-effect relationships in the experiment. Students should begin to state some explanations in terms of the relationship between two or more variables. **(SC.H.1.3.4)** 6. Recognize And Analyze Alternative Explanations And Predictions. Students should develop the ability to listen to and respect the explanations proposed by other students. They should remain open to and acknowledge different ideas and explanations, be able to accept the skepticism of others, and consider alternative explanations. **(SC.H.1.3.5)** 7. Communicate Scientific Procedures And Explanations. With practice, students should become competent at communicating experimental methods, following instructions, describing observations, summarizing the results of other groups, and telling other students about investigations and explanations. **(SC.H.1.3.4)** 8. Use Mathematics In All Aspects Of Scientific Inquiry. Mathematics is essential to asking and answering questions about the natural world. Mathematics can be used to ask questions; to gather, organize, and present data; and to structure convincing explanations. 9. Different kinds of questions suggest different kinds of scientific investigations. Some investigations involve observing and describing objects, organisms, or events; some involve collecting specimens; some involve experiments; some involve seeking more information; some involve discovery of new objects and phenomena; and some involve making models. **(SC.H.1.3.1)**	

COMPONENT	OBJECTIVES	COMPETENCY
	10. Recognize that current scientific knowledge and understanding guide scientific investigations. Different scientific domains employ different methods, core theories, and standards to advance scientific knowledge and understanding. **(SC.H.1.3.2)**	
	1. Recognize that mathematics is important in all aspects of scientific inquiry and use it in conducting scientific investigations.	B. Participate in a variety of activities that develop all students' understandings of the nature of scientific inquiry.
	2. Recognize that technology used to gather data enhances accuracy and allows scientists to analyze and quantify results of investigations, and this knowledge and technology can eventually become available to everyone. Use technology whenever available to conduct investigations. **(SC.H.3.3.6)**	
	3. Recognize that scientific knowledge is subject to modification as new information challenges prevailing theories and as a new theory leads to looking at old observations in a new way.	
	4. Recognize that scientific knowledge is subject to modification as new information challenges prevailing theories and as a new theory leads to looking at old observations in a new way.	
	5. Recognize that scientific investigations sometimes result in new ideas and phenomena for study, generate new methods or procedures for an investigation, or develop new technologies to improve the collection of data. All of these results can lead to new investigations.	
	6. Recognize and apply the idea that science advances through legitimate skepticism. Asking questions and querying other scientists' explanations is part of scientific inquiry. Scientists evaluate the explanations proposed by other scientists by examining evidence, comparing evidence, identifying faulty reasoning, pointing out statements that go beyond the evidence, and suggesting alternative explanations for the same observations.	

COMPONENT	OBJECTIVES	COMPETENCY
	7. Recognize and apply the idea that scientific investigations sometimes result in new ideas and phenomena for study, generate new methods or procedures for an investigation, or develop new technologies to improve the collection of data. All of these results can lead to new investigations.	
	1. Recognize that women and men of various social and ethnic backgrounds-and with diverse interests, talents, qualities, and motivations-engage in the activities of science, engineering, and related fields such as the health professions. Some scientists work in teams, and some work alone, but all communicate extensively with others. 2. Recognize and apply the ideas that science requires different abilities, depending on such factors as the field of study and type of inquiry. Science is very much a human endeavor, and the work of science relies on basic human qualities, such as reasoning, insight, energy, skill, and creativity-as well as on scientific habits of mind, such as intellectual honesty, tolerance of ambiguity, skepticism, and openness to new ideas. 3. Recognize and apply the ideas that scientists formulate and test their explanations of nature using observation, experiments, and theoretical and mathematical models. Although all scientific ideas are tentative and subject to change and improvement in principle, for most major ideas in science, there is much experimental and observational confirmation. Those ideas are not likely to change greatly in the future. Scientists do and have changed their ideas about nature when they encounter new experimental evidence that does not match their existing explanations. 4. Recognize that in areas where active research is being pursued and in which there is not a great deal of experimental or observational evidence and understanding, it is normal for scientists to differ with one another about the interpretation of the evidence or theory being considered. Different scientists might publish conflicting experimental results or might draw different conclusions from the same data. Ideally, scientists acknowledge such conflict and work towards finding evidence that will resolve their disagreement.	C. As a result of activities, all students should develop understanding of science as a human endeavor and the nature and history of science.

COMPONENT	OBJECTIVES	COMPETENCY
	5. Evaluate the results of scientific investigations, experiments, observations, theoretical models, and the explanations proposed by other scientists. Evaluation includes reviewing the experimental procedures, examining the evidence, identifying faulty reasoning, pointing out statements that go beyond the evidence, and suggesting alternative explanations for the same observations. Although scientists may disagree about explanations of phenomena, about interpretations of data, or about the value of rival theories, they do agree that questioning, response to criticism, and open communication are integral to the process of science. As scientific knowledge evolves, major disagreements are eventually resolved through such interactions between scientists. 6. Many individuals have contributed to the traditions of science. Studying some of these individuals provides further understanding of scientific inquiry, science as a human endeavor, the nature of science, and the relationships between science and society. 7. Recognize that in historical perspective, science has been practiced by different individuals in different cultures. In looking at the history of many peoples, one finds that scientists and engineers of high achievement are considered to be among the most valued contributors to their culture. 8. Recognize that tracing the history of science can show how difficult it was for scientific innovators to break through the accepted ideas of their time to reach the conclusions that we currently take for granted. 9. Recognize that special care must be taken in using animals in scientific research and that in research involving human subjects, the ethics of science require that potential subjects be fully informed about the risks and benefits associated with the research and of their right to refuse to participate. **(SC.H.3.3.2)**	

COMPONENT	OBJECTIVES	COMPETENCY
II Life Science	1. Describe that a population consists of all individuals of a species that occur together at a given place and time. All populations living together and the physical factors with which they interact compose an ecosystem. 2. Describe how populations of organisms can be categorized by the function they serve in an ecosystem. Plants and some microorganisms are producers-they make their own food. All animals, including humans, are consumers, which obtain food by eating other organisms. Decomposers, primarily bacteria and fungi, are consumers that use waste materials and dead organisms for food. Food webs identify the relationships among producers, consumers, and decomposers in an ecosystem. **(SC.G.1.3.4)** 3. Identify sunlight as the major source of energy in an ecosystem. Energy entering ecosystems as sunlight is transferred by producers into chemical energy through photosynthesis. That energy then passes from organism to organism in food webs or energy pyramids. **(SC.B.2.3.1)** 4. Analyze several examples of populations in an ecosystem and explain that the number of organisms an ecosystem can support depends on the resources available and abiotic factors, such as quantity of light and water, range of temperatures, and soil composition. Given adequate biotic and abiotic resources and no disease or predators, populations (including humans) increase at rapid rates. Lack of resources and other factors, such as predation and climate, limit the growth of populations in specific niches in the ecosystem. **(SC.G.1.3.4)** 5. Describe the characteristics of the major biomes of the biosphere.	A. Describe examples of how all organisms must be able to obtain and use resources, grow, reproduce, and maintain stable internal conditions while living in a constantly changing external environment. **(SC.F.2.3.0)**

COMPONENT	OBJECTIVES	COMPETENCY
III Earth and Space Science	1. Demonstrate knowledge of the internal structure of the Earth by constructing a model such as a cross-section showing that the solid earth is layered with a lithosphere; hot, convecting mantle; and dense, metallic core. **(SC.D.1.4.2)** 2. Describe how lithospheric plates on the scales of continents and oceans constantly move at rates of centimeters per year in response to movements in the mantle and cause major geological events, such as earthquakes, volcanic eruptions, and mountain building, result from these plate motions. **(SC.D.1.3.5)** 3. Describe how land forms are the result of a combination of constructive and destructive forces. Constructive forces include crustal deformation, volcanic eruption, and deposition of sediment, while destructive forces include weathering and erosion. 4. Describe the "rock cycle." Old rocks at the earth's surface weather, forming sediments that are buried, then compacted, heated, and often recrystallized into new rock. Eventually, those new rocks may be brought to the surface by the forces that drive plate motions, and the rock cycle continues. **(SC.D.1.3.1)** 5. Describe how soil consists of weathered rocks and decomposed organic material from dead plants, animals, and bacteria. Soils are often found in layers, with each having a different chemical composition and texture. **(SC.D.1.3.4)** 6. Describe how organisms have played many roles in the earth system such as producing some types of rocks and soils and contributing to the weathering of rocks. **(SC.D.1.3.3)** 7. Describe how fossils provide important evidence of how life and environmental conditions have changed.	A. Recognize that the types of physical changes taking place in the earth today (e.g., earthquakes, volcanoes, mountain building, weathering, sedimentation, and glaciation) are the same processes that also occurred in the past. **(SC.D.1.3.1)**

COMPONENT	OBJECTIVES	COMPETENCY
IV Physical Science	1. Identify and demonstrate the differences between a physical change in a substance (i.e., altering the shape, form, volume, or density) and a chemical change (i.e., producing new substances with different characteristics). **(SC.A.1.3.5)** 2. Identify and describe the general properties of the atom (a massive nucleus of neutral neutrons and positive protons surrounded by a cloud of negative electrons) and that single atoms are not visible. **(SC.A.2.3.2)** 3. Based upon activities and observations, describe example of how chemical elements do not break down during normal laboratory reactions involving such treatments as heating, exposure to electric current, or reaction to acids. There are more than 100 known elements that combine in a multitude of ways to produce compounds, which account for the living and nonliving substances that we encounter. 4. Demonstrate that substances react chemically in characteristic ways with other substances to form new substances (compounds) with different characteristic properties.	A. Demonstrate physical properties and the processes of chemical reactions by conducting investigations that illustrate the concepts.
	1. As a result of laboratory activities, explain that the motion of an object can be described by its position, direction of motion, and speed. **(SC.C.1.3.1)** 2. As a result of laboratory activities, explain that an object in motion will continue at a constant speed and in a straight line until acted upon by a force and that an object at rest will remain at rest until acted upon by a force. **(SC.C.2.3.5)** 3. Use laboratory activities to demonstrate that if more than one force acts on an object, then the forces can reinforce or cancel each other, depending on their direction and magnitude. **(SC.C.2.3.3)**	B. Demonstrate the processes of force and motion by conducting investigations that illustrate the concepts.

COMPONENT	OBJECTIVES	COMPETENCY
	4. Identify that many forces (e.g., gravitational, electrical, and magnetic) act at a distance (i.e., without contact). **(SC.C.2.3.1)** 5. As the result of laboratory activities, demonstrate that simple machines can be used to change the direction or size of a force. **(SC.C.2.3.4)**	
V The Interaction of Society and the Environment	1. Describe the risks associated with natural hazards (earthquakes and volcanic eruptions) and with chemical hazards (pollutants in air, water, soil, and food). 2. Describe how overpopulation in an area can damage the environment due to the increased use of resources. **(SC.G.2.3.2)** 3. Identify renewable and nonrenewable resources by researching local, state, national, and international information. **(SC.G.2.3.1)** 4. Explain the impact of man on the extinction of plants and animals. 5. Explain how humans and their activities may deliberately or inadvertently alter the equilibrium in ecosystems. **(SC.G.2.3.4)** 6. Propose solutions to existing and potential problems in the biosphere based on an understanding of the interrelationships of living things and their environment. **(SC.G.2.3.2)**	A. Explain and relate the interaction of the biotic and abiotic factors within the ecological concepts of interdependence, natural resources, cycles, conservation, and the use of energy. **(SC.G.1.3.0)**

COMPONENT	OBJECTIVES	COMPETENCY
VI Science and Technology Design	1. Identify Appropriate Problems for Technological Design. Demonstrate abilities by identifying a specified need, considering its various aspects, and talking to different potential users or beneficiaries, accounting for some needs, the cultural backgrounds and beliefs of different groups can affect the criteria for a suitable product. **(SC.H.3.3.5)** 2. Design A Solution Or Product. Make and compare different proposals in the light of selected criteria and consider (constraints such as cost, time, tradeoffs, and materials needed) and communicate ideas with drawings and simple models. **(SC.H.3.3.5)** 3. Implement A Proposed Design. Organize materials and other resources, plan the work, make good use of group collaboration where appropriate, choose suitable tools and techniques, and work with appropriate measurement methods to ensure adequate accuracy. **(SC.H.3.3.5)** 4. Evaluate Completed Technological Designs Or Products. Use criteria relevant to the original purpose or need, consider a variety of factors that might affect acceptability and suitability for intended users or beneficiaries, and develop measures of quality with respect to such criteria and factors. Suggest improvements and, for the products, try proposed modifications. **(SC.H.3.3.5)** 5. Communicate The Process Of Technological Design. Review and describe any completed piece of work and identify the stages of problem identification, solution design, implementation, and evaluation. **(SC.H.3.3.5)** 6. Relate that technological design should require taking into account constraints such as natural laws, the properties of the materials used, and economic, political, social, ethical, and aesthetic values. **(SC.H.3.3.4)**	A. Collaboratively design and carry out a technology plan that is a solution or a product to an identified problem and communicate the results of the project. **(SC.H.3.3.5)**

COMPONENT	OBJECTIVES	COMPETENCY
	7. Recognize that science ethics demand that scientists must not knowingly subject coworkers, students, the neighborhood, or the community to health or property risks. **(SC.H.3.3.1)** 8. Recognize that technological designs have constraints, are not perfect, have intended benefits and unintended consequences. **(SC.H.3.3.5)**	
VII Comprehensive Health	1. Recognize that regular exercise is important to the maintenance and improvement of health. The benefits of physical fitness include maintaining healthy weight, having energy and strength for routine activities, good muscle tone, bone strength, strong heart/lung systems, and improved mental health. Personal exercise, especially developing cardiovascular endurance, is the foundation of physical fitness. 2. Recognize that the potential for accidents and the existence of hazards imposes the need for injury prevention. Safe living involves the development and use of safety precautions and the recognition of risk in personal decisions. Injury prevention has personal and social dimensions. 3. Research the relationship of the use of tobacco and the increased risk of illness. Students should understand the influence of short-term social and psychological factors that lead to tobacco use, and the possible long-term detrimental effects of smoking and chewing tobacco. 4. Recognize that alcohol and other drugs are often abused substances. Such drugs change how the body functions and can lead to addiction. Food provides energy and nutrients for growth and development. Nutrition requirements vary with body weight, age, sex, activity, and body functioning. 5. Recognize that sex drive is a natural human function that requires understanding. Sex is also a prominent means of transmitting diseases. The diseases can be prevented through a variety of precautions.	A. After utilizing the appropriate components of the Human Growth and Development, Health, Prevention of HIV/AIDS, and Substance Abuse Curriculums, the student will develop and promote a healthy lifestyle.

COMPONENT	OBJECTIVES	COMPETENCY
	6. Investigate substances (for example, radon and lead) in natural environments that are harmful to human beings. Maintaining environmental health involves establishing or monitoring quality standards related to use of soil, water, and air.	