

## BONE VALLEY IMAGES EDUCATIONAL OBJECTIVES

### Sunshine State Standards following grades 5-12

#### **Students will:**

**- learn the importance of recording data in a field journal, with an emphasis on using their own powers of scientific observation while working in a group comparing and contrasting data collected**

SC.5.N.1.1 Define a problem, use appropriate reference materials to support scientific understanding, plan and carry out scientific investigations of various types such as: systematic observations, experiments requiring the identification of variables, collecting and organizing data, interpreting data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.

SC.5.N.1.6 Recognize and explain the difference between personal opinion/interpretation and verified observation.

SC.5.N.2.1 Recognize and explain that science is grounded in empirical observations that are testable; explanation must always be linked with evidence.

SC.6.N.1.1 Define a problem from the sixth grade curriculum, use appropriate reference materials to support scientific understanding, plan and carry out scientific investigation of various types, such as systematic observations or experiments, identify variables, collect and organize data, interpret data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.

SC.6.N.1.4 Discuss, compare, and negotiate methods used, results obtained, and explanations among groups of students conducting the same investigation.

SC.7.N.1.1 Define a problem from the seventh grade curriculum, use appropriate reference materials to support scientific understanding, plan and carry out scientific investigation of various types, such as systematic observations or experiments, identify variables, collect and organize data, interpret data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.

SC.7.N.1.6 Explain that empirical evidence is the cumulative body of observations of a natural phenomenon on which scientific explanations are based.

SC.8.N.1.1 Define a problem from the eighth grade curriculum using appropriate reference materials to support scientific understanding, plan and carry out scientific investigations of various types, such as systematic observations or experiments, identify variables, collect and

organize data, interpret data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.

SC.8.N.1.6 Understand that scientific investigations involve the collection of relevant empirical evidence, the use of logical reasoning, and the application of imagination in devising hypotheses, predictions, explanations and models to make sense of the collected evidence.

SS.8.G.6.2 Illustrate places and events in U.S. history through the use of narratives and graphic representations.

SC.912.N.1.3 Recognize that the strength or usefulness of a scientific claim is evaluated through scientific argumentation, which depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented.

SC.912.N.1.6 Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied.

SC.912.N.2.4 Explain that scientific knowledge is both durable and robust and open to change. Scientific knowledge can change because it is often examined and re-examined by new investigations and scientific argumentation. Because of these frequent examinations, scientific knowledge becomes stronger, leading to its durability.

- **understand the reasons for the building of Hoover Dyke around Lake Okeechobee and how the structure affects both people living in the area and the natural KLOE system**

SC.7.E.6.6 Identify the impact that humans have had on Earth, such as deforestation, urbanization, desertification, erosion, air and water quality, changing the flow of water.

SC.8.N.4.1 Explain that science is one of the processes that can be used to inform decision making at the community, state, national, and international levels.

SS.8.G.5.2 Describe the impact of human modifications on the physical environment and ecosystems of the United States throughout history.

SC.912.L.17.19 Describe how different natural resources are produced and how their rates of use and renewal limit availability.

SC.912.L.17.20 Predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability.

SS.912.G.5.6 Analyze case studies to predict how a change to an environmental factor can affect an ecosystem.

**- understand the predictability and logistics behind the KLOE system, with a focus on the Everglades as a natural and interrupted ecosystem**

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**- understand the significance of human actions, including their own, in the protection of natural resources such as water and its pollution and redirection in the Everglades area**

SS.5.C.2.5 Identify ways good citizens go beyond basic civic and political responsibilities to improve government and society.

SS.6.G.3.2 Analyze the impact of human populations on the ancient world's ecosystems.

SC.8.N.4.2 Explain how political, social, and economic concerns can affect science, and vice versa.

SS.8.G.5.1 Describe human dependence on the physical environment and natural resources to satisfy basic needs in local environments in the United States.

SC.912.L.17.11 Evaluate the costs and benefits of renewable and nonrenewable resources, such as water, energy, fossil fuels, wildlife, and forests.

SC.912.L.17.12 Discuss the political, social, and environmental consequences of sustainable use of land.

SC.912.L.17.13 Discuss the need for adequate monitoring of environmental parameters when making policy decisions.

SC.912.L.17.15 Discuss the effects of technology on environmental quality.

SC.912.L.17.16 Discuss the large-scale environmental impacts resulting from human activity, including waste spills, oil spills, runoff, greenhouse gases, ozone depletion, and surface and groundwater pollution.

SC.912.L.17.18 Describe how human population size and resource use relate to environmental quality.

SS.912.C.2.4 Evaluate, take, and defend positions on issues that cause the government to balance the interests of individuals with the public good.

SS.912.C.2.8 Analyze the impact of citizen participation as a means of achieving political and social change.

SS.912.G.2.5 Use geographic terms and tools to analyze case studies of debates over how human actions modify a selected region.

SS.912.G.3.3 Use geographic terms and tools to explain differing perspectives on the use of renewable and non-renewable resources in Florida, the United States, and the world.

SS.912.G.5.2 Analyze case studies of how changes in the physical environment of a place can increase or diminish its capacity to support human activity.

SS.912.G.5.4 Analyze case studies of how humans impact the diversity and productivity of ecosystems.

**- understand that characteristics of flora and fauna observed in the scrub habitat enable the organisms to survive in this ancient and inhospitable place and these specific adaptations have been inherited over many generations**

SC.5.L.14.2 Compare and contrast the function of organs and other physical structures of plants and animals, including humans, for example: some animals have skeletons for support -- some with internal skeletons others with exoskeletons -- while some plants have stems for support.

SC.5.L.17.1 Compare and contrast adaptations displayed by animals and plants that enable them to survive in different environments such as life cycles variations, animal behaviors and physical characteristics.

SC.6.L.15.1 Analyze and describe how and why organisms are classified according to shared characteristics with emphasis on the Linnaean system combined with the concept of Domains.

SC.7.L.16.1 Understand and explain that every organism requires a set of instructions that specifies its traits, that this hereditary information (DNA) contains genes located in the

chromosomes of each cell, and that heredity is the passage of these instructions from one generation to another.

SC.7.L.15.2 Explore the scientific theory of evolution by recognizing and explaining ways in which genetic variation and environmental factors contribute to evolution by natural selection and diversity of organisms.

SC.7.L.15.3 Explore the scientific theory of evolution by relating how the inability of a species to adapt within a changing environment may contribute to the extinction of that species.

SC.912.L.15.7 Discuss distinguishing characteristics of vertebrate and representative invertebrate phyla, and chordate classes using typical examples.

SC.912.L.17.6 Compare and contrast the relationships among organisms, including predation, parasitism, competition, commensalism, and mutualism.

SC.912.L.17.7 Characterize the biotic and abiotic components that define freshwater systems, marine systems and terrestrial systems.

**- learn that organisms living in the xeric scrub have a variety of specific adaptations, both structural and behavioral, that allow them thrive in an area of extreme temperature and lack of water**

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SC.912.L.15.13 Describe the conditions required for natural selection, including: overproduction of offspring, inherited variation, and the struggle to survive, which result in differential reproductive success.

**- understand the effect the loss and change of the scrub has on the endemic and endangered species that thrive there**

SC.5.L.15.1 Describe how, when the environment changes, differences between individuals allow some plants and animals to survive and reproduce while others die or move to new locations.

SC.5.N.2.1 Recognize and explain that science is grounded in empirical observations that are testable; explanation must always be linked with evidence.

SC.7.N.2.1 Identify an instance from the history of science in which scientific knowledge has changed when new evidence or new interpretations are encountered.

SC.7.L.17.3 Describe and investigate various limiting factors in the local ecosystem and their impact on native populations, including food, shelter, water, space, disease, parasitism, predation, and nesting sites.

SC.912.L.17.8 Recognize the consequences of the losses of biodiversity due to catastrophic events, climate changes, human activity, and the introduction of invasive, non-native species.

SS.5.G.3.1 Describe the impact that past natural events have had on human and physical environments in the United States through 1850.

SS.6.G.3.2 Analyze the impact of human populations on the ancient world's ecosystems.

**- learn that Florida looked very different in the past and the processes that have shaped the state have produced the prime conditions for the fossilization process**

SC.6.E.6.1 Describe and give examples of ways in which Earth's surface is built up and torn down by physical and chemical weathering, erosion, and deposition.

SC.6.E.6.2 Recognize that there are a variety of different landforms on Earth's surface such as coastlines, dunes, rivers, mountains, glaciers, deltas, and lakes and relate these landforms as they apply to Florida.

SC.7.E.6.2 Identify the patterns within the rock cycle and relate them to surface events (weathering and erosion) and sub-surface events (plate tectonics and mountain building).

SC.7.L.15.1 Recognize that fossil evidence is consistent with the scientific theory of evolution that living things evolved from earlier species.

SC.912.E.6.2 Connect surface features to surface processes that are responsible for their formation.

SC.912.E.6.4 Analyze how specific geologic processes and features are expressed in Florida and elsewhere.

SC.912.E.6.5 Describe the geologic development of the present day oceans and identify commonly found features.

**- understand that the fossilization process involves a chemical change and replacement of minerals under pressure, producing fossils with different properties than the original bones**

SC.912.L.15.1 Explain how the scientific theory of evolution is supported by the fossil record, comparative anatomy, comparative embryology, biogeography, molecular biology, and observed evolutionary change.

SC.912.P.8.2 Differentiate between physical and chemical properties and physical and chemical changes of matter.