

Science on the Gulf

Correlation of NOAA classroom presentations to Next Generation Sunshine State Standards

Examples of presentations and activities include (but not limited to):

Sharks and other elasmobranchs (presentation and exhibit)

Marine Life of Northwest Florida (presentation and activities/games)

Marine Mammals of the Gulf of Mexico (presentation and activities/games)

Fish Ageing (presentation and activities/games)

We may be able to cover any of the following standards/benchmarks at your request and if resources are available.

Grade 6

Big Idea 1: The Practice of Science

- SC.6.N.1.2: Explain why scientific investigations should be replicable.
- 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.1.3: Explain the difference between an experiment and other types of scientific investigation, and explain the relative benefits and limitations of each.
- SC.6.N.1.5: Recognize that science involves creativity, not just in designing experiments, but also in creating explanations that fit evidence.

Big Idea 2: The Characteristics of Scientific Knowledge

- SC.6.N.2.1: Distinguish science from other activities involving thought.
- SC.6.N.2.2: Explain that scientific knowledge is durable because it is open to change as new evidence or interpretations are encountered.
- SC.6.N.2.3: Recognize that scientists who make contributions to scientific knowledge come from all kinds of backgrounds and possess varied talents, interests, and goals.

Big Idea 6: Earth Structures

- 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

Big Idea 7: Earth Systems and Patterns

- SC.6.E.7.3: Describe how global patterns such as the jet stream and ocean currents influence local weather in measurable terms such as temperature, air pressure, wind direction and speed, and humidity and precipitation.

Big Idea 15: Diversity and Evolution of Living Organisms

- 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.

Grade 7

Big Idea 1: The Practice of Science

- SC.7.N.1.2: Differentiate replication (by others) from repetition (multiple trials).
- 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.1.3: Distinguish between an experiment (which must involve the identification and control of variables) and other forms of scientific investigation and explain that not all scientific knowledge is derived from experimentation.
- SC.7.N.1.4: Identify test variables (independent variables) and outcome variables (dependent variables) in an experiment.
- 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.7.N.1.7: Explain that scientific knowledge is the result of a great deal of debate and confirmation within the science community.

Big Idea 6: Earth Structures

- 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.

Big Idea 15: Diversity and Evolution of Living Organisms

- 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.17.3 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.

Big Idea 17: Interdependence

- SC.7.L.17.1 Explain and illustrate the roles of and relationships among producers, consumers, and decomposers in the process of energy transfer in a food web.
- SC.7.L.17.2 Compare and contrast the relationships among organisms such as mutualism, predation, parasitism, competition, and commensalism.
- 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.

Grade 8

Big Idea 1: The Practice of Science

- 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.1.2: Design and conduct a study using repeated trials and replication.
- SC.8.N.1.3: Use phrases such as "results support" or "fail to support" in science, understanding that science does not offer conclusive 'proof' of a knowledge claim.
- SC.8.N.1.4: Explain how hypotheses are valuable if they lead to further investigations, even if they turn out not to be supported by the data.
- SC.8.N.1.5: Analyze the methods used to develop a scientific explanation as seen in different fields of science.
- 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.

Big Idea 2: The Characteristics of Scientific Knowledge

- SC.8.N.2.1: Distinguish between scientific and pseudoscientific ideas.
- SC.8.N.2.2: Discuss what characterizes science and its methods.

Big Idea 18: Matter and Energy Transformations

- SC.8.L.18.1 Describe and investigate the process of photosynthesis, such as the roles of light, carbon dioxide, water and chlorophyll; production of food; release of oxygen.
- SC.8.L.18.3 Construct a scientific model of the carbon cycle to show how matter and energy are continuously transferred within and between organisms and their physical environment.
- SC.8.L.18.4 Cite evidence that living systems follow the Laws of Conservation of Mass and Energy

Grade 9-12

Big Idea 1 The Practice of Science

- SC.912.N.1.1: Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following:
 1. pose questions about the natural world,
 2. conduct systematic observations,
 3. examine books and other sources of information to see what is already known,
 4. review what is known in light of empirical evidence,
 5. plan investigations,
 6. use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs),
 7. pose answers, explanations, or descriptions of events,
 8. generate explanations that explicate or describe natural phenomena (inferences),
 9. use appropriate evidence and reasoning to justify these explanations to others,
 10. communicate results of scientific investigations, and
 11. evaluate the merits of the explanations produced by others.
- SC.912.N.1.2: Describe and explain what characterizes science and its methods.
- 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.1.4: Identify sources of information and assess their reliability according to the strict standards of scientific investigation.
- SC.912.N.1.5: Describe and provide examples of how similar investigations conducted in many parts of the world result in the same outcome.
- 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.1.7: Recognize the role of creativity in constructing scientific questions, methods and explanations.

Big Idea 2: The Characteristics of Scientific Knowledge

- SC.912.N.2.1: Identify what is science, what clearly is not science, and what superficially resembles science (but fails to meet the criteria for science).
- 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.
- SC.912.N.2.5: Describe instances in which scientists' varied backgrounds, talents, interests, and goals influence the inferences and thus the explanations that they make about observations of natural phenomena and describe that competing interpretations (explanations) of scientists are a strength of science as they are a

source of new, testable ideas that have the potential to add new evidence to support one or another of the explanations.

Big Idea 3: The Role of Theories, Laws, Hypotheses, and Models

- SC.912.N.3.5: Describe the function of models in science, and identify the wide range of models used in science.

Big Idea 4: Science and Society

- SC.912.N.4.1: Explain how scientific knowledge and reasoning provide an empirically-based perspective to inform society's decision making.
- SC.912.N.4.2: Weigh the merits of alternative strategies for solving a specific societal problem by comparing a number of different costs and benefits, such as human, economic, and environmental.

Big Idea 6: Earth Structures

- 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.

Big Idea 15: Diversity and Evolution of Living Organisms

- SC.912.L.15.4: Describe how and why organisms are hierarchically classified and based on evolutionary relationships.
- SC.912.L.15.6: Discuss distinguishing characteristics of the domains and kingdoms of living organisms.
- SC.912.L.15.7: Discuss distinguishing characteristics of vertebrate and representative invertebrate phyla, and chordate classes using typical examples.
- SC.912.L.15.12: List the conditions for Hardy-Weinberg equilibrium in a population and why these conditions are not likely to appear in nature. Use the Hardy-Weinberg equation to predict genotypes in a population from observed phenotypes.
- 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.
- SC.912.L.15.14: Discuss mechanisms of evolutionary change other than natural selection such as genetic drift and gene flow.
- SC.912.L.15.15: Describe how mutation and genetic recombination increase genetic variation.

Big Idea 17: Interdependence

- SC.912.L.17.1: Discuss the characteristics of populations, such as number of individuals, age structure, density, and pattern of distribution.
- SC.912.L.17.2: Explain the general distribution of life in aquatic systems as a function of chemistry, geography, light, depth, salinity, and temperature.

- SC.912.L.17.3: Discuss how various oceanic and freshwater processes, such as currents, tides, and waves, affect the abundance of aquatic organisms.
- SC.912.L.17.4: Describe changes in ecosystems resulting from seasonal variations, climate change and succession.
- SC.912.L.17.5: Analyze how population size is determined by births, deaths, immigration, emigration, and limiting factors (biotic and abiotic) that determine carrying capacity.
- 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.
- 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.
- SC.912.L.17.9: Use a food web to identify and distinguish producers, consumers, and decomposers. Explain the pathway of energy transfer through trophic levels and the reduction of available energy at successive trophic levels.
- SC.912.L.17.10: Diagram and explain the biogeochemical cycles of an ecosystem, including water, carbon, and nitrogen cycle.
- 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.17.17: Assess the effectiveness of innovative methods of protecting the environment.
- SC.912.L.17.18: Describe how human population size and resource use relate to environmental quality.
- 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.