

High School:

Interpretation of Data and Graphs:

BIOLOGY:

SCSh3. Students will identify and investigate problems scientifically.

- a. Suggest reasonable hypotheses for identified problems.
- b. Develop procedures for solving scientific problems.
- c. Collect, organize and record appropriate data.
- d. Graphically compare and analyze data points and/or summary statistics.
- e. Develop reasonable conclusions based on data collected.
- f. Evaluate whether conclusions are reasonable by reviewing the process and checking against other available information.

SCSh4. Students use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.

- a. Develop and use systematic procedures for recording and organizing information.
- b. Use technology to produce tables and graphs.
- 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.

- a. Trace the source on any large disparity between estimated and calculated answers to problems.
- b. Consider possible effects of measurement errors on calculations.
- c. Recognize the relationship between accuracy and precision.
- d. Express appropriate numbers of significant figures for calculated data, using scientific notation where appropriate.
- e. Solve scientific problems by substituting quantitative values, using dimensional analysis and/or simple algebraic formulas as appropriate.

SB4. Students will assess the dependence of all organisms on one another and the flow of energy and matter within their ecosystems.

- a. Investigate the relationships among organisms, populations, communities, ecosystems, and biomes.
- c. Relate environmental conditions to successional changes in ecosystems.
- d. Assess and explain human activities that influence and modify the environment such as global warming, population growth, pesticide use, and water and power consumption.
- f. Relate animal adaptations, including behaviors, to the ability to survive stressful environmental conditions.

Earth Science:

SES3. Students will explore the actions of water, wind, ice, and gravity that create landforms and systems of landforms (landscapes).

- a. Describe how surface water and groundwater act as the major agents of physical and chemical weathering.
- d. Relate the past and present actions of ice, wind, and water to landform distribution and landscape evolution.
- e. Explain the processes that transport and deposit material in terrestrial and marine sedimentary basins, which result, over time, in sedimentary rock.

Ecology:

SEC1. Students will analyze how biotic and abiotic factors interact to affect the distribution of species and the diversity of life on Earth.

- a. Characterize the biotic and abiotic components that define various biomes and aquatic life zones.
- b. Explore how global climate patterns and biogeography affect the distribution and abundance of species on Earth.
- c. Investigate factors that lead to the species richness of an ecosystem and describe the importance of biodiversity.

SEC2. Students will investigate factors influencing population density, dispersion, and demographics.

- a. Evaluate factors that regulate population growth to include intraspecific competition in population growth and population density.
- b. Analyze models that predict population growth.

SEC3. Students will explore and analyze community interactions.

- a. Compare and contrast species interactions (e.g. predation, parasitism, mutualism, commensalism, and competition) and adaptations that have evolved in response to interspecific selective pressures.
- b. Explore ecological niches and resource partitioning.
- c. Identify dominant, keystone, foundation, and endangered species and their roles in ecosystems and communities, locally and globally.
- d. Analyze species diversity as it relates to the stability of ecosystems and communities.
- e. Evaluate ecological succession in terms of changes in communities over time and the impact of disturbance on community composition.

SEC4. Students will analyze biogeochemical cycles and the flow of energy in ecosystems.

d. Explore the importance of primary productivity in ecosystems.

SEC5. Students will assess the impact of human activities on the natural world, and research how ecological theory can address current issues facing our society, locally and globally.

e. Research the ecological impact of agriculture (historical and modern) in the environment and its implications for feeding the world's population

Environmental Science:

SEV2. Students will demonstrate an understanding that the Earth is one interconnected system.

- a. Describe how the abiotic components (water, air, and energy) affect the biosphere.
- b. Recognize and give examples of the hierarchy of the biological entities of the biosphere (organisms, populations, communities, ecosystems, and biosphere).
- c. Characterize the components that define a Biome. Abiotic Factors – to include precipitation, temperature and soils. Biotic Factors – plant and animal adaptations that create success in that biome.
- d. Characterize the components that define fresh-water and marine systems.
 - 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.

- a. Describe interconnections between abiotic and biotic factors, including normal cyclic fluctuations and changes associated with climatic change (i.e. ice ages).
- b. Explain succession in terms of changes in communities through time to include changes in biomass, diversity, and complexity.
- d. Explain how biotic and abiotic factors influence populations.