

Ecology

Adopted 2019

Obtain, evaluate, and communicate information on how biotic and abiotic factors interact to influence the distribution of species and the diversity of life on Earth. **SEC1**

- a. Develop a model describing the organizational structure of a habitat within an ecosystem. **SEC1.A**
- b. Ask questions to predict the cause and effect of varying levels of abiotic and biotic factors on a habitat in Georgia. **SEC1.B**
- c. Construct an argument based on evidence to explain factors that lead to sustainability of biodiversity in an ecosystem. **SEC1.C**

Obtain, evaluate, and communicate information to analyze factors influencing population growth, density, and dispersion. **SEC2**

- a. Construct an explanation of factors that regulate population density and growth within communities. **SEC2.A**
- b. Develop and use models to predict population dispersion as a result of population growth and resource availability. **SEC2.B**
- c. Construct an explanation to describe how population growth and dispersion are influenced by natural selection. **SEC2.C**

Obtain, evaluate, and communicate information to construct explanations of community interactions. **SEC3**

- a. Construct an argument based on evidence to support how species interactions (e.g., predation, parasitism, mutualism, commensalism, and competition) and adaptations are a response to selective pressures. **SEC3.A**
- b. Obtain, evaluate, and communicate information about various ecological niches within habitats and determine how interactions between species lead to resource partitioning. **SEC3.B**
- c. Construct an explanation based on evidence that describes the impact of keystone, invasive, native, indicator, and rare species in Georgia ecosystems. **SEC3.C**
- d. Construct an explanation about species diversity and how it relates to the stability of ecosystems and communities. **SEC3.D**
- e. Develop a model to explain ecological succession in terms of changes in communities over time and the impact of disturbance on community composition. **SEC3.E**

Obtain, evaluate, and communicate information about biogeochemical cycles and how the flow of energy influences ecosystems. SEC4

- a. Plan and carry out an investigation of the movement of nitrogen and phosphorus through an ecosystem as a limiting factor in plant communities related to aquatic system succession. SEC4.A**

- b. Construct an explanation of the movement of carbon through an ecosystem. SEC4.B**

- c. Develop a model utilizing the first and second laws of thermodynamics and the law of conservation of matter to explain and illustrate the flow of energy and matter in ecosystems. SEC4.C**

- d. Construct an argument based on evidence to explain the relationship between net primary productivity and biodiversity. SEC4.D**

Obtain, evaluate, and communicate information on the impact of natural and anthropogenic activities on ecological systems. SEC5

- a. Analyze and interpret data on the ecological impacts of sustainable and non-sustainable use of natural resources and predict the cause and effect of unsustainable use of natural resources on ecosystems. SEC5.A**

- b. Construct an argument based on evidence to predict the impact of climate change on an ecosystem. SEC5.B**

- c. Construct an argument based on evidence of the consequences of habitat fragmentation and habitat loss on biodiversity in relation to island biogeography. SEC5.C**

- d. Obtain, evaluate, and communicate mitigation strategies to reduce the impacts of non-sustainable activities on Georgia ecosystems. SEC5.D**