Next Generation Science Standards

The *Next Generation Science Standards* (*NGSS*) performance expectations that middle and high school students can achieve through completing the *Ecosystems* Unit are listed below. To read a discussion of how the *Carbon TIME* project is designed to help students achieve the performances represented in the NGSS, please see Three-dimensional Learning in *Carbon TIME*.

High School

- Ecosystems: Interactions, Energy, and Dynamics. HS-LS2-1. Use mathematical and or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.
  https://www.nextgenscience.org/pe/hs-ls2-1-ecosystems-interactions-energy-and-dynamics
- Ecosystems: Interactions, Energy, and Dynamics. HS-LS2-2. Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems at different scales.
  https://www.nextgenscience.org/pe/hs-ls2-2-ecosystems-interactions-energy-and-dynamics
- Ecosystems: Interactions, Energy, and Dynamics. HS-LS2-3. Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions.
  https://www.nextgenscience.org/pe/hs-ls2-3-ecosystems-interactions-energy-and-dynamics
- Ecosystems: Interactions, Energy, and Dynamics. HS-LS2-4. Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem.
  https://www.nextgenscience.org/pe/hs-ls2-4-ecosystems-interactions-energy-and-dynamics
- Ecosystems: Interactions, Energy, and Dynamics. HS-LS2-5: Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere.
  https://www.nextgenscience.org/pe/hs-ls2-5-ecosystems-interactions-energy-and-dynamics
- Ecosystems: Interactions, Energy, and Dynamics. HS-LS2-6: Evaluate claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.
  https://www.nextgenscience.org/pe/hs-ls2-6-ecosystems-interactions-energy-and-dynamics
- Earth's Systems. HS-ESS2-6. Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.
  http://www.nextgenscience.org/hsess-es-earth-systems

Middle School

- Matter and Energy in Organisms and Ecosystems. MS-LS1-6. Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy in and out of organisms.
  http://www.nextgenscience.org/msls1-molecules-organisms-structures-processes

- Matter and Energy in Organisms and Ecosystems. MS-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
  http://www.nextgenscience.org/msls2-ecosystems-interactions-energy-dynamics
- Interdependent Relationships in Ecosystems. MS-LS2-2. Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.
  http://www.nextgenscience.org/msls2-ecosystems-interactions-energy-dynamics
- Matter and Energy in Organisms and Ecosystems. MS-LS2-3. Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.
  http://www.nextgenscience.org/msls2-ecosystems-interactions-energy-dynamics
- Matter and Energy in Organisms and Ecosystems. MS-LS2-4. Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
  http://www.nextgenscience.org/msls2-ecosystems-interactions-energy-dynamics
- Earth's Systems. MS-ESS2-1. Develop a model to describe the cycling of earth's materials and the flow of energy that drives this process.
  http://www.nextgenscience.org/msess-es-earth-systems
- Human Impacts. MS-ESS3-4. Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.
  http://www.nextgenscience.org/msess-hi-human-impacts