

Next Generation Science Standards

The *Next Generation Science Standards* (NGSS) performance expectations that middle and high school students can achieve through completing the Animals 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

- HS. From Molecules to Organisms: Structures and Processes. HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
<http://www.nextgenscience.org/msls1-molecules-organisms-structures-processes>
- HS. Matter and its Interactions. HS-PS1-4. Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy.
<http://www.nextgenscience.org/hsp1-matter-interactions>
- HS. Matter and its Interactions. HS-PS1-7. Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.
<http://www.nextgenscience.org/hsp1-matter-interactions>
- HS. From Molecules to Organisms: Structures and Processes. HS-LS1-6. Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules.
<http://www.nextgenscience.org/msls1-molecules-organisms-structures-processes>
- HS. From Molecules to Organisms: Structures and Processes. HS-LS1-7. Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy.
<http://www.nextgenscience.org/msls1-molecules-organisms-structures-processes>
- HS. 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.
<http://www.nextgenscience.org/hsls2-ecosystems-interactions-energy-dynamics>

Middle School

- MS. Matter and its Interactions. MS-PS1-1. Develop models to describe the atomic composition of simple molecules and extended structures.
<http://www.nextgenscience.org/msps1-matter-interactions>
- MS. Matter and its Interactions. MS-PS1-2. Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.
<http://www.nextgenscience.org/msps1-matter-interactions>
- MS. Matter and its Interactions. MS-PS1-5. Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.
<http://www.nextgenscience.org/msps1-matter-interactions>

- MS. From Molecules to Organisms: Structures and Processes. MS-LS1-3. Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.

<http://www.nextgenscience.org/msls1-molecules-organisms-structures-processes>