



Newburyport Science Curriculum Framework Guide -Grade 8

Focus Areas

In Grade 8 the focus on student learning in Science is on the following areas:

1. Earth's Place in the Universe
2. Earth's Systems
3. Earth and Human Activity
4. From Molecules to Organisms: Structures and Processes
5. Heredity: Inheritance and Variation of Traits
6. Biological Evolution: Unity and Diversity
7. Matter and Its Interactions
8. Motion and Stability: Forces and Interactions
9. Materials, Tools, and Manufacturing

Guiding Principles for Grade 8 Science

Earth and Space Science

- Using and developing a model of the Earth-sun system to explain seasons
- Explaining gravity's role in tides and orbital motions in the solar system
- Modeling convection in Earth's interior which cycles Earth's crust
- Interpreting patterns in air mass interactions with partners in weather data
- Describing the effects the ocean has on weather and climate
- Using data to describe human activity and global temperature rise
- Analyzing data to explain uneven distribution of Earth's resources

Life Science

- Constructing an argument for how the environment and genetics influence organism growth
- Describing how food molecules are broken down and rearranged
- Developing a model to explain structural changes to genes and how that result changes proteins
- Comparing asexual and sexual reproduction
- Illustrating that chromosomes contain genes that define proteins
- Using a model to show that sexually reproducing organisms have chromosome pairs
- Using evidence to explain natural selection
- Communicating and synthesizing information about artificial selection

Physical Science

- Developing a model to describe molecular level interactions
- Analyzing properties of substances to identifying chemical reactions
- Develop a model to explain and predict changes in particle motion in phase changes
- Showing substances are rearranged and conserved during reactions
- Modeling Newton's Third Law
- Providing evidence of net force and mass on motion of an object



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Focus Areas

In Grade 6 the focus on student learning in Science is on the following areas:

1. Earth's Systems
2. Earth's Place in the Universe
3. Matter and Its Interactions
4. Motion and Stability: Forces and Interactions
5. Waves and their Applications in Technologies for Information Transfer
6. Engineering Design
7. Materials, Tools, and Manufacturing

Guiding Principles for Grade 8 Science

Technology/Engineering

- Recognizing materials maintain their composition during physical processing
- Describing creation of products using manufacturing processes
- Recognizing that products can be made by humans and computers

Science and Engineering Practices:

1. Ask Questions and Define Problems
2. Develop and Use Models
3. Plan and Carry Out Investigations
4. Analyze and Interpret Data
5. Use Mathematical and Computational Thinking
6. Construct Explanations and Design Solutions
7. Engage in Argument from Evidence
8. Obtain, Evaluate, and Communicate Information