7th Grade Science – NYSSLS-Aligned Curriculum Overview

In 7th grade science, students continue to deepen their understanding of scientific concepts through inquiry, analysis, and engineering design. The curriculum emphasizes collaboration, data-driven explanations, and the application of knowledge to real-world systems using the New York State Science Learning Standards (NYSSLS).

Scientific Thinking, Graphing & Tools

Students apply the scientific method, construct graphs, and use lab tools and microscopes to collect and analyze data.

Standards:

- *MS-ETS1-1*: Define problems with criteria and constraints
- *SEP*: Analyzing Data, Constructing Explanations, Argument from Evidence
- *Crosscutting Concepts*: Patterns; Cause and Effect

Possible Activities:

- CER Graphing Mystery Challenge
- Tool Olympics Lab Stations
- Microscope Practice Slides Lab

Cells & Human Body Systems

Students explore cell theory, cell structures, and how cells work together to form tissues and organ systems in the human body.

Standards:

- *MS-LS1-1*: Structure and function of cells
- *MS-LS1-2*: Systems of the body working together
- *MS-LS1-3*: Feedback mechanisms and homeostasis

Possible Activities:

- Microscope Lab: Comparing plant vs. animal cells
- Cell Analogy Project
- Body System Travel Brochure

Properties & States of Matter
Students examine the particle nature of matter, phase changes, and physical vs. chemical properties.
Standards:

- *MS-PS1-4*: Phase changes and particle motion
- *MS-PS1-1*: Particle model and structure of matter
- *MS-PS1-2*: Substances and characteristic properties

Possible Activities:

- Particle Simulation Models
  Mystery Matter Lab
- Phase Change Observations

Chemical Reactions
Students investigate chemical changes and reactions, including conservation of mass and signs of chemical change.
Standards:

- *MS-PS1-2*: Analyze substances before and after a reaction
- *MS-PS1-5*: Evidence of chemical reactions
- *MS-PS1-6*: Synthetic materials and natural resources

Possible Activities:

- Baking Soda and Vinegar Balloon Reaction
- Elephant Toothpaste Lab
- Physical vs. Chemical Change Sorting

Genetics & Heredity
Students explore DNA, genes, inherited traits, Punnett squares, and genetic mutations.
Standards:

- *MS-LS3-1*: Inheritance and variation of traits
- *MS-LS3-2*: Gene mutations and influence on traits
- *MS-LS1-4*: Asexual vs. sexual reproduction

Possible Activities:

- Alien Genetics Lab
- Punnett Square Family Tree

- Create a Monster – Genetic Traits Activity

Natural Selection & Evolution
Students investigate evidence of evolution, adaptations, and the impact of environmental change on populations.
Standards:

- *MS-LS4-1*: Fossil evidence of evolution
- *MS-LS4-2*: Natural selection
- *MS-LS4-4*: Adaptations
- *MS-LS4-6*: Evidence from anatomy and molecular biology

Possible Activities:

- Beaks of Finches Lab
- Peppered Moth Simulation
- Cladogram Construction

Ecosystems & Energy Flow
Students examine energy transfer, food webs, matter cycling, and interactions between organisms.
Standards:

- *MS-LS2-1*: Resource availability and population dynamics
- *MS-LS2-2*: Interactions in ecosystems
- *MS-LS2-3*: Cycling of matter and energy
- *MS-LS2-4*: Disruptions and biodiversity
- *MS-LS2-5*: Engineering solutions for ecosystem stability

Possible Activities:

- SAVVAS Food Web Simulation
- Build-a-Biome Ecosystem Project
- Energy Pyramid Card Sort

Human Impact on the Environment
Students investigate how human activity affects ecosystems and explore engineering solutions to reduce environmental impact.
Standards:

- *MS-ESS3-3*: Apply scientific principles to reduce human impact
- *MS-ETS1-2*: Evaluate design solutions
- *MS-ETS1-3*: Analyze and refine designs

Possible Activities:

- Plastic Pollution PSA Project
- SAVVAS Engineering Design Challenge
- Renewable Energy Comparison Poster