

**BILLINGS PUBLIC SCHOOLS
SCIENCE
EIGHTH GRADE**

Grade Eight Overview: In eighth grade, students will through the inquiry process, develop their understanding of basic physics and chemistry principles. Students will independently question, hypothesize, design experiments, collect and analyze data, communicate the results of their experiments, and make inferences about their inquiries.

Teachers will use these questions to guide instruction:

*What is the importance of a simple investigation by direct inquiry?
Why is it important to identify variables by using appropriate tools to communicate results?
How do you describe the different states of matter and changes instates as related to the Kinetic Theory of Matter?
How can different types of chemical reactions be identified and classified?
How is energy transferred from one form to another?
What are the relationships between forces and motion?
What are the major milestones in physical science and what were the impacts on society?
What occupations utilize scientific technology and what are the societal effects?*

LEARNING OBJECTIVES

- I. Students, through the inquiry process, demonstrate the ability to design, conduct, evaluate, and communicate results and reasonable conclusions of scientific investigations.**
1. The learner will identify and communicate testable questions.
 2. The learner will safely design and conduct experimental investigations using appropriate tools and metric measurements.
 3. The learner will identify, understand and manipulate dependent and independent variables and controls.
 4. The learner will interpret and communicate the experimental results with appropriate data and graphical representations.
- II. Students, through the inquiry process, demonstrate knowledge of properties, forms, changes and interactions of physical and chemical systems.**
5. The learner will review atomic structure and Periodic Table classification system.
 6. The learner will review concepts of gravity and Newton's Laws of Motion with emphasis on the effect of gravity on the structure and movement of the solar system.
 7. The learner will review classification of matter in terms of elements, compounds, mixtures and states of matter with an emphasis on rocks and mineral formations and utilization.
 8. The learner will review classification of matter in terms of elements, compounds, mixtures and states of matter with an emphasis on atmospheric structure and composition.
 9. The learner will demonstrate understanding of simple chemical reactions and chemical formulas.
 10. The learner will demonstrate understanding of and ability to use basic formulas related to Newton's Laws of Motion.
 11. The learner will demonstrate understanding of energy transformations and the characteristics of light, heat, magnetism, electricity, sound, and mechanical waves.
 12. The learner will demonstrate understanding of simple and complex mechanical systems and describe the forces acting within those systems.
- III. Students, through the inquiry process, demonstrate knowledge of characteristics, structures and function of living things, the process of diversity of life, and how living organisms interact with each other and their environment.** *None purposefully written for this standard for eighth grade*

IV. Students, through the inquiry process, demonstrate knowledge of the composition, structures, processes and interactions of Earth's systems and other objects in space. *None purposefully written for this standard for eighth grade*

V. Students, through the inquiry process, understand how scientific knowledge and technological developments impact communities, cultures, and societies.

13. The learner will apply the scientific inquiry process to investigate current scientific issues and the impact on regional problems.

VI. Students understand historical developments in science and technology.

14. The learner will recognize examples of scientific progress throughout history.
15. The learner will discuss and explain science as an ongoing process.