2023-2024
Jackson County Schools
9-12 Physical Science Pacing Guide

1st Quarter

Introduction to Physical Science

Standard 2 - Scientific Method
Plan and carry out investigations (e.g., squeezing a balloon, placing a balloon on ice) to identify the relationships that exist among the pressure, volume, density, and temperature of a confined gas.

***Focus Standard 1 - Periodic Table** Proficiency Scale
Use the periodic table as a model to predict the relative properties and trends (e.g., reactivity of metals; types of bonds formed, including ionic, covalent, and polar covalent; numbers of bonds formed; reactions with oxygen) of main group elements based on the patterns of valence electrons in atoms.

ASIM:
- ➔ Cartesian Diver
- ➔ Temperature-Volume Relationship of Gases
- ➔ Periodic Table
- ➔ Journey Into the Atom

Writing Component - Narrative
Topic of your choice

Additional Resources:
AMSTI Learning Resources
ACT Sample Questions
ACT Sample Test

2nd Quarter

Chemical Bonding and Solutions

***Focus Standard 3 - Bonding and Naming Compounds** Proficiency Scale
Analyze and interpret data from a simple chemical reaction or combustion reaction involving main group elements.

***Focus Standard 5 -Mass Conservations During Reactions** Proficiency Scale
Use mathematical representations to support and verify the claim that atoms, and therefore mass, are conserved during a simple chemical reaction.

Standard 4 - Acids and Bases
Analyze and interpret data using acid-base indicators (e.g., color-changing markers, pH paper) to distinguish between acids and bases, including comparisons between strong and weak acids and bases.

***Focus Standard 6 - Radiation**
Develop models to illustrate the concept of half-life for radioactive decay.
Standard 6a - Research and communicate information about types of naturally occurring radiation and their properties.
Standard 6b - Develop arguments for and against nuclear power generation compared to other types of power generation.
Proficiency Scale

ASIM:
- ➔ Evidence of Chemical Reactions
- ➔ Law of Conservation of Matter
- ➔ Using Indicators and the pH Scale
- ➔ Analyzing Radiation
- ➔ Half-Life Simulation

Writing Component - Descriptive
Topic of your choice

Additional Resources:
AMSTI Learning Resources
ACT Sample Questions
ACT Sample Test

3rd Quarter

Energy and Motion

***Focus Standard 7** - **Motion** **Proficiency Scale**
Analyze and interpret data for one- and two-dimensional motion applying basic concepts of distance, displacement, speed, velocity, and acceleration (e.g., velocity versus time graphs, displacement versus time graphs, acceleration versus time graphs).

***Focus Standard 8** - **Forces** **Proficiency Scale**
Apply Newton's laws to predict the resulting motion of a system by constructing force diagrams that identify the external forces acting on the system, including friction (e.g., a book on a table, an object being pushed across a floor, an accelerating car).

***Focus Standard 9a** - **Motion** **Proficiency Scale**
Use the laws of conservation of mechanical energy and momentum to predict the result of one-dimensional elastic collisions

***Focus Standard 11** - **Energy** **Proficiency Scale**
Design and conduct investigations to verify the law of conservation of energy, including transformations of potential energy, kinetic energy, thermal energy, and the effect of any work performed on or by the system.

ASIM:
- ➔ Analyzing Motion Using Graphs
- ➔ Run for It
- ➔ Batter Up
- ➔ Force Diagrams
- ➔ Horizontal Friction
- ➔ Bouncy
- ➔ Ball Energy and Work
- ➔ Energy and Power

Writing Component - Expository
Topic of your choice

Additional Resources:
AMSTI Learning Resources
ACT Sample Questions
ACT Sample Test

4th Quarter

Electricity and Waves

Standard 12 - Simple Machines and Work
Design, build, and test the ability of a device (e.g., Rube Goldberg devices, wind turbines, solar cells, solar ovens) to convert one form of energy into another form of energy.

***Focus Standard 10** - **Electricity** Proficiency Scale
Construct simple series and parallel circuits containing resistors and batteries and apply Ohm's law to solve typical problems demonstrating the effect of changing values of resistors and voltages.

***Focus Standard 13** - **Waves and Energy** Proficiency Scale
Use mathematical representations to demonstrate the relationships among wavelength, frequency, and speed of waves (e.g., the relation $v = \lambda f$) traveling in various media (e.g., electromagnetic radiation traveling in a vacuum and glass, sound waves traveling through air and water, seismic waves traveling through Earth).

ASIM:
- ➔ Rube Goldberg Machine
- ➔ Electrical Circuits
- ➔ Wave Speed PhET

Writing Component - Persuasive
Topic of your choice

Additional Resources:
AMSTI Learning Resources
ACT Sample Questions
ACT Sample Test 14
ACT Sample Test 17