

Concepts with an asterisk (*) should be taught throughout the year.

(NT) – Not Tested

Eighth Grade Science CIP Pacing Guide

August 2017

1 st Nine Weeks	1 st Nine Weeks	2 nd Nine Weeks	2 nd Nine Weeks
<p><u>Measurement and Investigations (PS.1)</u></p> <ul style="list-style-type: none"> • (*) Safety in the classroom (chemical and equipment) (PS.1 a) NT • How to use equipment necessary for the class (PS.1d) • Measurement (PS.1 b, c, d) • Numbers are expressed in scientific notation where appropriate (PS.1 e) • Identify independent and dependent variables, constants, controls, and repeated trials (PS.1 f) • Construct and interpret data tables showing the independent and dependent variables, derived quantities, and the number of trials (PS.1g) • Data tables with mean, median, & mode (PS.1h) • Interpreting and creating graphs (PS.1i) • Valid conclusions are made after analyzing data (PS.1j) 	<p><u>Models of atomic structure (PS.3)</u></p> <ul style="list-style-type: none"> • The contributions of Dalton, Thomson, Rutherford, and Bohr in understanding the atom (PS.3 a) • The modern model of atomic structure (PS.3 b) <p><u>The Periodic Table of Elements (PS.4)</u></p> <ul style="list-style-type: none"> • Symbols, atomic number, atomic mass, chemical families (groups and periods) (PS.4 a) • Classification of elements as metals, metalloids, and nonmetals (PS.4 b) • Simple compounds (formulas and nature of bonding) (PS.4 c) 	<p><u>States and forms of energy and energy transformation (PS.6)</u></p> <ul style="list-style-type: none"> • Potential and kinetic energy (PS.6 a) • Mechanical, chemical, electrical, thermal, radiant, and nuclear energy (PS.6 b) <p><u>Heat transfer and its applications (PS.7)</u></p> <ul style="list-style-type: none"> • Conduction, convection, and radiation (PS.7 c) • Applications of heat transfer (heat engines, thermostat, refrigeration, heat pumps) (PS.7d) <p><u>Work, Force, Motion (PS. 10)</u></p> <ul style="list-style-type: none"> • Speed, velocity, acceleration (PS.10a) • Newton’s Laws of Motion (PS.10 b) • Work, force, mechanical advantage, efficiency, and power. (PS.10 c) • Technological applications of work, force, and motion (PS.10 d) 	<p><u>Electricity and Magnetism (PS.11)</u></p> <ul style="list-style-type: none"> • Static electricity, current electricity, and circuits (PS.11 a) • Relationship between a magnetic field and an electric current (PS.11 b) • Electromagnets, motors, and generators and their uses (PS.11 c) • Conductors, semiconductors, and insulators (PS.11 d) <p><u>The nature and technological applications of light (PS.9)</u></p> <ul style="list-style-type: none"> • Wavelength, frequency, speed, amplitude, crest, and trough (PS.9 a) • The wave behavior of light (reflection, refraction, diffractions, inference) (PS.9 b) • Images formed by lenses and mirrors (PS.9 c) • The electromagnetic spectrum (PS.9 d) • Technological applications of light (PS.9 e)

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<ul style="list-style-type: none"> • Research methods are used to investigate practical problems and questions; current applications of physical science concepts are used (PS.1 k, n) (* PS.1n – NT) • Research skills including presenting results in written form (PS.1 f, L) (* PS.1L-NT) • (*) Models and simulations are constructed and used to illustrate and explain phenomena (PS.1 m) NT <p>PS.1 is introduced and tested during the first nine weeks but reviewed throughout the year.</p> <p><u>Changes in Matter and the structure of matter (PS.2)</u></p> <ul style="list-style-type: none"> • The particle theory of matter (PS.2 a) • Elements, compounds, mixtures (PS.2 b) • Solids, liquids, gases (PS.2 c) • Characteristics of types of matter based on physical and chemical properties (PS.2 f) 	<hr style="border: 1px solid black; margin-bottom: 10px;"/> <p><u>Changes in Matter and the structure of matter (PS.2)</u></p> <ul style="list-style-type: none"> • Acids, bases, and salts (PS.2 b) • Chemical properties (acidity, basicity, combustibility, reactivity) (PS.2 e) <p><u>Law of Conservation of Matter and Energy (PS.5)</u></p> <ul style="list-style-type: none"> • Physical changes (PS.5 a) • Nuclear reactions (products of fusion and fission) (PS.5 c) • Chemical changes (types of reactions, reactants, and products; and balanced equations) (PS.5 b) 	<hr style="border: 1px solid black; margin-bottom: 10px;"/>	<p><u>The nature and technological applications of sound (PS.8)</u></p> <ul style="list-style-type: none"> • Wavelength, frequency, speed, amplitude, rarefaction, and compression (PS.8 a) • Resonance (PS.8 b) • The nature of mechanical waves (compression) (PS.8 c) • Technological applications of sound (PS.8 d)

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<p><u>Changes in Matter and the structure of matter (PS.2)</u></p> <ul style="list-style-type: none">Physical properties (shape, density, solubility, odor, melting point, boiling point, color) (PS.2 d) <p><u>Temperature scales and concepts (PS.7)</u></p> <ul style="list-style-type: none">Celsius and Kelvin temperature scales and absolute zero (PS.7 a) NTPhase change, freezing point, melting point, boiling point, vaporization, condensation (PS.7 b)			

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Eighth Grade Science Vocabulary

1 st Nine Weeks	1 st Nine Weeks	2 nd Nine Weeks	2 nd Nine Weeks
PS. 1 a, f-n Scientific method Hypothesis Observation Model PS. 1 b-e Meter Volume Mass Weight Temperature Thermometer Area Density Derived unit PS. 1 g Independent variable Dependent variable PS. 1 f-n Constant Control Variable Analyzing PS. 1 a-e Graduated cylinder Triple beam balance	PS. 2 b Element Compound Mixture PS. 2 b,f Acid Base Salt pH indicators Combustibility PS. 5 c Reaction Reactant Product Coefficient Molecule Subscript PS. 4 a Atom Atomic number Atomic mass Periods Families/groups PS. 4 b Metals Nonmetals	PS. 6 a,b Energy Kinetic energy Potential energy Mechanical energy PS. 5 Energy conversion Law of conservation of energy Energy resources Nonrenewable resources Renewable resources Energy transformations PS. 7 d Conduction Convection Radiation PS. 10 a Speed Velocity Acceleration PS. 10 b Newton's Laws of Motion Friction Inertia Momentum	PS.11a,b,c Electricity Magnetism Law of electrical charges Static electricity Electrical force Insulator Conductor Current Complete circuit Parallel circuit Series circuit Magnet Magnetic force Magnetic pole Magnetic field Electric field Electromagnet Generator Transformer Electric motor Coil Voltage Ampere

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Spring scale Celsius PS. 7 a Kelvin PS. 7 a Fahrenheit PS. 7 a Meniscus PS. 1 c Metric prefix units PS. 2 a,c Matter Gravity PS. 2 d-f Physical properties Chemical properties Physical changes Chemical changes PS. 2 a,c PS. 7. b States of matter Solid Liquid Gas Plasma Melting Freezing Vaporizing Boiling Evaporation	Metalloids PS. 4 c Chemical formula PS. 3 a Atom Models PS. 3 b Atomic structure Neutron Electron Proton Electron shells Electron cloud Valence electron PS. 5 b Fission Fusion Isotopes PS. 4c Ions Ionic bonding Covalent bonding PS. 5c Balanced equation Law of Conservation of Matter Endothermic reactions Exothermic reactions	PS. 10 c Work Force Mechanical advantage Mechanical efficiency Power Newton Joule Watt PS. 10 d Simple machines Compound machines Fulcrum 1 st , 2 nd , 3 rd class levers (<i>not on EKSP</i>)	PS. 9 a,b,c Refraction Reflection Diffraction Interference Wave Medium Electromagnetic spectrum Visible light Electromagnetic wave Law of reflection Absorption Scattering Opaque Translucent Transparent Transverse wave Compressional/ longitudinal wave Crest Trough PS.8 a,b,c Wave length Amplitude Mechanical wave Pitch

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Condensation Sublimation PS. 2 b Elements Compounds Mixtures			Seismic wave Infrasonic Ultrasonic Hertz Doppler effect Decibel Echo echolocation Resonance Frequency Sonar Ultrasound