

Science Curriculum: High School Physical Science, GSE based Pacing; 4.21.18 DRAFT v.5

Some Schools have opted to follow the state Curriculum Map ending with Waves

(There is no mandatory pacing for individual lessons or task in this course, but this expectation will support collaboration and transient students)

	First 18 Weeks (Semester)				
Scientific Inquiry in 3D	Unit 1: Atomic Structure & The Periodic Table; Radioactivity	Unit 2: Bonding, Nomenclature, Chemical Rxns	Unit 3: Solutions & Acids & Bases	Unit 4: Energy-Heat, Temperature, & Transformations Set-up	
3 Dimensions	SPS1 & SPS4	SPS2 & SPS3	SPS5 & SPS6 (tough assessments)	SPS7 & SPS4	
1 Week	5 Weeks	6 Weeks	3 Weeks	3 Weeks	
Creating an Academic Discourse Culture Crosscutting Concepts Science and Engineering Practices Explain your expectations for a Yearlong Energy Capstone Project	Focus: - Atomic Structure - Average weighted atomic mass - Average atomic diameter - Models - Bohr/Lewis dot - Periodic Table - Periodic trends # of Valence electrons - Ions formed • Radioactivity - Nuclear Isotopes - Fusion vs. Fission (Alpha, Beta, & Gamma radiation) - Decay Half-life Definition - Calculations - Predict properties based on location on periodic table	Focus: - Properties of Matter - Density - Conductivity - Physical/Chemical - Properties & Changes - Molecular Motion - Covalent and Ionic compounds - Electron movement → bonding - Covalent - Ionic - Predict formulas for stable binary ionic compounds - Use IUPAC nomenclature for - Binary ionic - Binary covalent - Chemical reactions and reaction types - Synthesis - Decomposition - Single replacement - Double replacement - Rate of reactions - Conservations of Matter - Balancing equations	Focus: - Gas Laws - Boyles Law - Charles Law - Relationship between temperature, pressure, and volume of gases to molecular motion & behavior of gases - Solutions - Solute - Solvent - Conductivity - Concentration - Factors affecting rate of dissolution in different solvents - Read solubility curve to interpret effects of temperature on solubility Focus: - Acids and Bases - pH scale - strong/weak acids - strong/weak bases - neutralization reaction - household chemicals	Focus: Energy - Transformations - gPE, ME, KE - Conservation >>Be alert for opportunities to connect transformations to electricity/magnetism << Focus: - Heat - Capacity - Specific heat - Temperature - Definition - Scales (°F; °C ↔ K) - Heat transfer - Conduction - Convection - Radiation - Conductors - Insulators - Phase changes - Phases of Matter (all 4) - Diagrams - Triple-point - Temperature vs. heat - Practical application of nuclear energy and related problems (Element d) * Applications of Radioactivity	

Second 18 Weeks (Semester)

Unit 5: Waves	Unit 6: Electricity	Unit 7: Magnetism	Unit 8: Force & Motion; Work & Power	Project-based Learning
SPS9 & SPS7	SPS10 & SPS7	SPS10 & SPS7	SPS8	Capstone
2 Weeks	3 Weeks	3 Weeks	8 Weeks	2 Weeks
Focus: - Types & Characteristics - Mechanical - Electromagnetic - Longitudinal - Transverse - Wavelength - Wave speed - Different media - Doppler Effect Models - Waves interactions - Reflection - Refraction - Interference - Diffraction - Light & Sound Energy - Transformations - gPE, ME, KE - Conservation >>Be alert for opportunities to connect transformations <<	Focus: [Capstone prep begins continue Energy transformation] - Static Electricity - Friction - Induction - Conduction - Electron flow - AC vs. DC - Current - Resistance - Voltage - Circuits <i>Inquiry</i> - Simple - Parallel - Difference of potential energy - Current (resistance and voltage) - Conductor (force →friction) - Induction - Chemical cell - Conductivity through solutions	Focus: - Domains - magnetic application <i>Inquiry</i> - Motors - Generators - Permanent magnets - Electromagnets Energy - Transformations - gPE, ME, KE - Conservation >>Be alert for opportunities to connect transformations to electricity/magnetism << EOC Review Begins Keep in mind to emphasize Chemistry in final reviews before EOC.	Focus: - Work & Power - Simple machines - Mechanical advantage - Efficiency - Calculate - Power - Mechanical advantage - Efficiency - Work - Speed & Velocity - Transformations of Energy gPE, ME, KE - Kinetic - Potential - Acceleration - Graphing velocity & acceleration - Momentum – conservation of momentum - Force - Balanced and unbalanced - Net force - Friction - Surface/surface - Air resistance - Newton's Laws - Inertia $F=ma$ ~Gravity (10 m/s/s) - Free-fall & weight - Third law	Systems and system models Cause & Effect Energy & Matter Science and Engineering Practices

EOC given in early May. Keep in mind to emphasize **Chemistry** in final reviews before EOC. The final two weeks will be utilized for Capstone presentations and longer investigations.

***Energy is taught throughout the course.*

These skills should **not** be taught as one separate unit, but rather incorporated inside of other units as they are addressed in the Science and Engineering Practices (SEP).

- *Lab Safety*
- *Significant figures*
 - *Precision*
 - *Accuracy*
- *Scientific notation*
- *SI and Metric units*
- *Conversions*
- *Science and Engineering Practices*
 - [Asking questions \(for science\) and defining problems \(for engineering\)](#)
 - [Developing and using models](#)
 - [Planning and carrying out investigations](#)
 - [Analyzing and interpreting data](#)
 - [Using mathematics and computational thinking](#)
 - [Constructing explanations \(for science\) and designing solutions \(for engineering\)](#)
 - [Engaging in argument from evidence](#)
 - [Obtaining, evaluating, and communicating information](#)
- [Understanding Science](#)
 - *Theories vs. Laws (CER)*
 - *Variables (Plan & Carry Out)*
 - *Inference vs. Observation (Models and Designs)*
- *Graphing Skills (When to use which one)*
 - *Line graphs*
 - *Pie (circle) graphs*
 - *Bar graphs*