High School GPS Physical Science - Cobb County Schools

Problem Based Learning Pacing Guide, 2017-2018

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| **Unit 1: Lab Safety and Molecular Motion** | **Unit2 : Heat, Temperature, & Phases of Matter** | **Unit 3: Atomic Structure & The Periodic Table;**  **Radioactivity** | **Unit 4: Bonding, Nomenclature,**  **Chemical Rxns, Acids & Bases** |
| **Focus:**  *Lab Safety*  *Measurement*  **Focus:**  *Molecular Motion (****SPS5a****)*   * *Particle arrangement and motion in solids, liquids, gases, and plasmas* | **Focus:**  *Heat*  -*definition* ***(SPS7a)***   * + *Specific heat* ***(SPS7c)***   *Heat transfer* ***(SPS 7b)***   * + *Conduction*   + *Convection*   + *Radiation*   Conductors and Insulators ***(SPS7c)***  *Phase changes****(SPS 7d)***   * *Flow of energy during phase changes* * *Analyze heating/cooling curves*   *Gas Laws* ***(SPS5a&b)***   * *Relationship between temperature, pressure, and volume of gases to molecular motion & behavior of gases*   + *Boyles Law*   + *Charles Law* | **Focus:**  *Atomic Structure* ***(SPS 1a)***   * *Atoms, ions, isotopes* * *Atomic number, atomic mass, location and charge of subatomic particles*   *Periodic Table* ***(SPS1b)***   * *Common names and symbols (first 20)* * *# of Valence electrons* * *Locations of metals, non-metals, metalloids* * *Types of ions formed by main group elements* * *Phases at room temp.*   *Predict properties based on location on periodic table* ***(SPS1c)***  **Focus:**   Radioactivity **(SPS4)**   * *Nucleus*   + *Fusion vs. Fission(****SPS4a)***   + *Half-life math* ***(SPS4b)*** * *Practical application of nuclear energy and related problems* ***(SPS4c)*** | **Focus***:*  *Covalent and Ionic**compounds* ***(SPS2a)***   * + *Properties of…*     - *Types of bonds*     - *Elemental composition*     - *Melting point*     - *Boiling point*     - *conductivity*   *Electron movement→bonding* ***(SPS2b)***   * + *Predict formulas for stable binary ionic compounds*   *Use IUPAC nomenclature for* ***(SPS2c)***   * + *Binary ionic*   + *Binary covalent*   **Focus:**  *Chemical reactions and conservation of mass* ***(SPS3a)***   * + *Synthesis*   + *Decomposition*   + *Single replacement*   + *Double replacement*   *Illustrate Conservation of Matter**through**Balancing equations* ***(SPS3b)***  **Focus:**  *Solutions* ***(SPS 6a, b, c)***   * + *Properties: (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****(SPS 6d&e)***   * + *pH scale/properties*   + *classify household chemicals* |
| **SPS 5** | **SPS 5, 7** | **SPS 1, 4** | **SPS 2**, **3, 6** |
| ~2 Weeks | ~2 Weeks | ~4 Weeks | ~6 Weeks |

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| --- | --- | --- | --- | --- | --- | --- |
| **Unit 5: Force and Motion,**  **Transformation of Energy** | **Unit 6: Work & Simple Machines** | **Unit 7: Waves,**  **Transformation of Energy** | **Unit 8: Electricity and**  **Magnetism** | | **EOC Review/ End of Year**  **Project** | |
| **Focus:**   * **Focus:**   *Energy* ***(SPS7a)***   * + *KE, PE, and Transformation/ Conservation*   **Focus:**  *Analyze the motion of objects* ***(SPS8a)***  *-Speed & Velocity*   * + *Acceleration*   + *Graphing velocity & acceleration*   *Force* ***(SPS 8)***   * + *Support Newton’s Three Laws with experimental evidence (relationships among force, mass, velocity, and acceleration)*   *Falling Objects* ***(SPS 8c)***   * Relationship between mass and gravitational force | **Focus:**  *Work* ***(SPS 8e)***   * + *Simple machines*   + *Mechanical advantage*   + *Calculate*     - *Mechanical advantage*     - *Work* | **Focus:**  *Transfer of energy* ***(SPS7a)***   * + *Chemical, mechanical, electromagnetic, light, sound, thermal, electrical, nuclear)*   **Focus:**  *Waves Types & Characteristics* ***(SPS 9b)***   * + *Mechanical*     - *Relationship of wavelength, frequency, energy*   + *Electromagnetic*     - *Relationship of amplitude and energy*   + *Longitudinal*   + *Transverse*   *Wave interactions* ***(SPS 9c)***   * + *Reflection*   + *Refraction*   + *Interference*   *-Diffraction*  *Effect of different media on wave speed of sound vs light waves* ***(SPS9d)***  *Doppler effect* ***(SPS 9e)*** | **Focus:**  *Electron flow* ***(SPS10b)***   * + *AC vs. DC*   + *Circuits*     - *Simple*     - *Parallel*   *Relationship among voltage, current, and resistance* ***(SPS10a)***  *Relationship between magnetism and electricity* ***(SPS10c)***  *-Electromagnets*  *-Simple motors*  *-Generators* | * Create own PBL * Genius Hour * Bottles Rockets | |
| **SPS 7, 8** | **SPS 8** | **SPS 7, 9** | **SPS 10** | **All** | |
| ~5 Weeks | ~3 Weeks | ~5 Weeks | ~ 2 Weeks | ~3 Weeks | |