

**INQUIRY****Process Skills**

\_\_\_ Interpret, display, analyze and draw conclusions from the results of a scientific investigation. *PhySci-01*

**Technological Design**

\_\_\_ Design, test and evaluate a prototype based on given criteria. *PhySci-02*

**CONTENT****Life Science****Unit 1: Force and Motion****Introductory Skills:**

\_\_\_ Identify metric units and be able to convert units within the system. *PhySci-03*

\_\_\_ Construct and interpret graphs. *PhySci-04*

**Concepts:**

\_\_\_ Describe Newton's 1<sup>st</sup> law and give everyday examples. *PhySci-05*

\_\_\_ Describe Newton's 2<sup>nd</sup> law and give everyday examples. *PhySci-06*

\_\_\_ Describe Newton's 3<sup>rd</sup> law and give everyday examples. *PhySci-07*

\_\_\_ Describe the laws of Conservation of Momentum and Conservation of Energy and relate to issues in the real world. *PhySci-08*

\_\_\_ Use the four-step technique to solve motion problems. *PhySci-09*

**Unit 2: Energy and Systems**

\_\_\_ Calculate work and power for simple machines and describe the relationship between them. *PhySci-10*

\_\_\_ Describe simple machines and calculate their efficiencies and mechanical advantages. *PhySci-11*

\_\_\_ Describe properties of vectors and why they are important. *PhySci-12*

\_\_\_ Describe what is necessary for an object to be in equilibrium. *PhySci-13*

\_\_\_ Analyze the motion of a projectile.

**Unit 3: Matter and Energy**

\_\_\_ Distinguish between atoms, molecules, elements, compounds and mixtures. *PhySci-14*

\_\_\_ Compare and contrast physical and chemical properties of various substances. *PhySci-15*

\_\_\_ Explain the relationship between the pressure, volume and temperature of gases and solve gas law problems. *PhySci-16*

\_\_\_ Describe the structure of atoms, forces that hold them together and important terms that describe them (i.e. atomic number, atomic mass, isotope). *PhySci-17*

\_\_\_ Explain the structure of the periodic table and how it is used to obtain information about the characteristics of an atom. *PhySci-18*

**Unit 4: Energy and Change**

\_\_\_ Describe different forms of energy and diagram how energy flows in a system. *PhySci-19*

\_\_\_ Summarize the laws of thermodynamics and explain real world applications. *PhySci-20*

\_\_\_ Compare and contrast covalent and ionic bonds and describe how energy is stored in bonds. *PhySci-21*

\_\_\_ Compare and contrast types of nuclear reactions and how they differ from chemical reactions. *PhySci-22*

\_\_\_ Explain half life and radioactive decay and give examples of applications in nature and technology. *PhySci-23*

**Unit 5: Electricity**

\_\_\_ Explain how electrical energy is supplied to devices within a circuit and interpret circuit diagrams. *PhySci-24*

\_\_\_ Explain the terms current, resistance and voltage and solve Ohm's Law problems. *PhySci-25*

\_\_\_ Distinguish between conductors, insulators and semiconductors and give examples of every day applications. *PhySci-26*

\_\_\_ Apply background information on electricity to explain concepts related to everyday use (i.e. AC/DC currents, short circuits, circuit breakers, fuses, electricity use in the home, distribution of electricity to buildings). *PhySci-27*

\_\_\_ Describe the properties of positively and negatively charged and neutral objects and name the source of these charges. *PhySci-28*

**Unit 6: Electricity and Magnetism**

\_\_\_ Describe the polar nature of magnets, their interactions and diagram the magnetic field around a permanent magnet. *PhySci-29*

\_\_\_ Build a simple electromagnet and explain how it works. *PhySci-30*

\_\_\_ Describe the magnetic field and the forces generated by an electric current. *PhySci-31*

\_\_\_ Describe how a generator works. *PhySci-32*

\_\_\_ Explain how a transformer works and applications in everyday experience and solve related problems. *PhySci-33*

**Unit 7: Vibrations, Waves and Sound**

\_\_\_ Apply appropriate terminology to wave phenomena and harmonic motion. *PhySci-34*

\_\_\_ Analyze the relationships between period, frequency, wavelength and speed of waves and solve simple problems. *PhySci-35*

\_\_\_ Describe the properties of reflection, refraction, diffraction, interference and absorption of waves. *PhySci-36*

\_\_\_ Describe how sounds are made and the factors that affect the speed of sound. *PhySci-37*

\_\_\_ Explain applications of sound (i.e. Doppler effect, echolocation, musical instruments, ultra sound, sonograms etc.). *PhySci-38*

**Physical Science (Continued)****Unit 8: Light and Optics**

- \_\_\_\_\_ Describe the properties of light and compare to sound waves. *PhySci-39*
- \_\_\_\_\_ Describe how the color of light relates to its energy. *PhySci-40*
- \_\_\_\_\_ List the additive primary colors and compare and contrast to subtractive primary colors. *PhySci-41*
- \_\_\_\_\_ Compare and contrast converging and diverging lenses. *PhySci-42*
- \_\_\_\_\_ Illustrate the reflection, refraction, diffraction and interference of waves using ray diagrams. *PhySci-43*
- \_\_\_\_\_ Describe the electromagnetic spectrum and the properties of each kind of waves. *PhySci-44*

**CONNECTIONS****Science Practices**

- \_\_\_\_\_ Demonstrate lab safety procedures and accepted practices of science. *PhySci-45*
- \_\_\_\_\_ Recognize the importance of accurately reporting data to reach an honest and unbiased conclusion. *PhySci-46*

**S/T/S (Science, Technology and Society)**

- \_\_\_\_\_ Identify important contributions, both historical and current, that have been made by individuals and groups from various cultures to our understanding of physics. *PhySci-47*
- \_\_\_\_\_ Explain how physical science concepts are used in a variety of occupations. *PhySci-48*