lead4ward STAAR Vocabulary

Words extracted directly from the standard and/or associated with the instruction of the content within the standard.

READINESS STANDARDS - Physics

(P.4) **Science concepts.** The student knows and applies the laws governing motion in a variety of situations. The student is expected to	
(A) generate and interpret graphs and charts describing different types of motion, including the use of real-time technology such as motion detectors or photogates	Motion, Position-time graphs, Velocity-time graphs, Acceleration-time graphs
(B) describe and analyze motion in one dimension using equations with the concepts of distance, displacement, speed, average velocity, instantaneous velocity, and acceleration	Distance, Displacement, Speed, Average velocity, Instantaneous velocity, Acceleration, Vectors, Scalars
(D) calculate the effect of forces on objects, including the law of inertia, the relationship between force and acceleration, and the nature of force pairs between objects	Law of inertia, Law of momentum, Net force, Newton's laws of motion, Vectors
(P.5) **Science concepts.** The student knows the nature of forces in the physical world. The student is expected to	
(B) describe and calculate how the magnitude of the gravitational force between two objects depends on their masses and the distance between their centers	Universal gravitation, Universal gravitation constant
(F) design, construct, and calculate in terms of current through, potential difference across, resistance of, and power used by electric circuit elements connected in both series and parallel combinations	Ohm's Law, Current, Voltage, Series electrical circuit, Parallel electrical circuit, Resistance, Resistors
(P.6) **Science concepts.** The student knows that changes occur within a physical system and applies the laws of conservation of energy and momentum. The student is expected to	
(A) investigate and calculate quantities using the work-energy theorem in various situations	Work-energy theorem, Work, Power
(B) investigate examples of kinetic and potential energy and their transformations	Potential energy, Kinetic energy, Law of conservation of energy
(C) calculate the mechanical energy of, power generated within, impulse applied to, and momentum of a physical system	Mechanical energy, Impulse, Momentum
(D) demonstrate and apply the laws of conservation of energy and conservation of momentum in one dimension	Law of conservation of momentum, Law of conservation of energy, Elastic collisions, Inelastic collisions
(P.7) **Science concepts.** The student knows the characteristics and behavior of waves. The student is expected to	
(B) investigate and analyze characteristics of waves, including velocity, frequency, amplitude, and wavelength, and calculate using the relationship between wavespeed, frequency, and wavelength	Frequency (f), Wavelength (λ), Wave speed, Amplitude, Crest, Trough, Period, Hertz (Hz)

READINESS STANDARDS - Physics

(P.7) **Science concepts.** The student knows the characteristics and behavior of waves. The student is expected to	
(D) investigate behaviors of waves, including reflection, refraction, diffraction, interference, resonance, and the Doppler effect	Reflection, Refraction, Diffraction, Interference, Resonance, The Doppler effect
(P.8) **Science concepts.** The student knows simple examples of atomic, nuclear, and quantum phenomena. The student is expected to	
(A) describe the photoelectric effect and the dual nature of light	Photoelectric effect, Dual nature of light, Wave-particle duality

SUPPORTING STANDARDS - Physics

(P.4) **Science concepts.** The student knows and applies the laws governing motion in a variety of situations. The student is expected to	
(C) analyze and describe accelerated motion in two dimensions using equations, including projectile and circular examples	Projectile motion, Circular motion, Centripetal acceleration
(E) develop and interpret free-body force diagrams	Free-body force diagrams
(F) identify and describe motion relative to different frames of reference	Frame of reference
(P.5) **Science concepts.** The student knows the nature of forces in the physical world. The student is expected to	
(A) research and describe the historical development of the concepts of gravitational, electromagnetic, weak nuclear, and strong nuclear forces	Gravitational forces, Electromagnetic forces, Nuclear forces
(C) describe and calculate how the magnitude of the electrical force between two objects depends on their charges and the distance between them	Coulomb's law, Coulomb's constant, Electric potential difference, Capacitance, Electric fields
(D) identify examples of electric and magnetic forces in everyday life	Electric forces, Magnetic forces, Magnetic fields
(E) characterize materials as conductors or insulators based on their electrical properties	Conductors, Insulators
(G) investigate and describe the relationship between electric and magnetic fields in applications such as generators, motors, and transformers	Electric field, Magnetic field, Electromagnetism, Induction
(H) describe evidence for and effects of the strong and weak nuclear forces in nature	Radioactive decay
(P.6) **Science concepts.** The student knows that changes occur within a physical system and applies the laws of conservation of energy and momentum. The student is expected to	
(E) describe how the macroscopic properties of a thermodynamic system such as temperature, specific heat, and pressure are related to the molecular level of matter, including kinetic or potential energy of atoms	Thermodynamic system, Temperature, Specific heat, Pressure, Kinetic energy, Potential energy

SUPPORTING STANDARDS - Physics

(P.6) **Science concepts.** The student knows that changes occur within a physical system and applies the laws of conservation of energy and momentum. The student is expected to	
(G) analyze and explain everyday examples that illustrate the laws of thermodynamics, including the law of conservation of energy and the law of entropy	Laws of thermodynamics, Law of conservation of energy, Law of entropy, Thermal expansion
(F) contrast and give examples of different processes of thermal energy transfer, including conduction, convection, and radiation	Heat, Temperature, Conduction, Convection, Radiation, Thermal equilibrium
(P.7) **Science concepts.** The student knows the characteristics and behavior of waves. The student is expected to	
(A) examine and describe oscillatory motion and wave propagation in various types of media	Oscillatory motion, Pendulum, Wave propagation, Hooke's Law
(C) compare characteristics and behaviors of transverse waves, including electromagnetic waves and the electromagnetic spectrum, and characteristics and behaviors of longitudinal waves, including sound waves	Transverse waves, Electromagnetic waves, Electromagnetic spectrum, Polarization, Longitudinal waves, Sound waves
(E) describe and predict image formation as a consequence of reflection from a plane mirror and refraction through a thin convex lens	Reflection, Refraction, Concave lens, Convex lens, Real image, Virtual image
(F) describe the role of wave characteristics and behaviors in medical and industrial applications	Echolocation, Sonogram, Doppler systems
(P.8) **Science concepts.** The student knows simple examples of atomic, nuclear, and quantum phenomena. The student is expected to	
(B) compare and explain the emission spectra produced by various atoms	Emission spectra
(C) describe the significance of mass-energy equivalence and apply it in explanations of phenomena such as nuclear stability, fission, and fusion	Mass-energy equivalence, Nuclear stability, Fission, Fusion
(D) give examples of applications of atomic and nuclear phenomena such as radiation therapy, diagnostic imaging, and nuclear power and examples of applications of quantum phenomena such as digital cameras	Nuclear phenomena, Radiation therapy, Diagnostic imaging, Nuclear power, Quantum phenomena, Digital cameras