

Instructional Vocabulary

Physics

Unit 1: Physics Skills and Processes

- **Hypotheses** – tentative and testable statements that must be capable of being supported or not supported by observational evidence
- **Independent variable** – factor that is adjusted by the experimenter to see what effect the change has on the dependent variable
- **Dependent variable** – factor whose value changes because of a change in the independent variable
- **Inference** – a reasonable conclusion or possible hypotheses based on observations
- **Conclusion** – a statement that identifies cause and effect based on evidence
- **International System (SI) Units** – internationally accepted form of the metric system based on meters, kilograms, and seconds
- **Dimensional analysis** – the practice of converting units of measurement using the relationship between units

Unit 2: Kinematics in One Dimension and Graphing Motion

- **Kinematics** – the study of how things move
- **Vector** – physical quantity that has both a magnitude and a direction
- **Scalar** – physical quantity that has a magnitude only
- **Velocity** – vector quantity that measures rate of change of position of an object
- **Acceleration** – vector quantity that measures the rate of change in velocity
- **Displacement** – vector quantity which refers to an object's change in position (final position – initial position)
- **Speed** – scalar quantity that refers to the distance traveled per unit time
- **Distance** – scalar quantity that refers to the total length traveled
- **Average velocity** – total displacement divided by time
- **Instantaneous velocity** – vector quantity that refers to the velocity at any single point in time
- **Frame of reference** – the perspective from which motion is observed
- **Magnitude** – absolute value describing quantity, not direction

Unit 3: Newton's Laws of Motion

- **Force** – a push or pull on an object
- **Inertia** – the resistance of an object to a change in motion
- **Acceleration** – rate of change in velocity of the motion of an object
- **Free body diagram** – a diagram of all forces acting on an object drawn as vectors outward from the center
- **Weight** – the gravitational force that an object exerts due to its mass
- **Mass** – the amount of matter an object contains, a measurement of inertia
- **Net force** – sum of all force vectors into a combined or total force
- **Normal force** – force exerted perpendicular to the surface an object rests on (support force)
- **Friction** – force opposing motion caused by the interaction of surfaces
- **Torque** – the product of the force and the lever arm that may cause rotational motion

Unit 4: Two-Dimensional Motion

- **Tangential velocity** – the instantaneous velocity of a body moving in a circular path
- **Centripetal force** – a force which keeps a body moving with a uniform speed along a circular path and is directed along the radius towards the center
- **Centripetal acceleration** – acceleration towards the center caused by the centripetal force
- **Projectile** – an object projected through space, traveling in two dimensions, that accelerates vertically due to gravity
- **Parabolic pathway** – a curved path followed by projectiles

Unit 5: Universal Gravitation

- **Gravitation** – the mutual attraction between any two objects with mass

Unit 6: Conservation of Energy

- **Conservation of energy** – the fundamental principle of physics that the total energy of an isolated system is constant, despite internal changes
- **Work** – a force applied to an object that results in a displacement in the same direction
- **Kinetic energy** – energy of motion
- **Gravitational potential energy** – energy related to the position of an object
- **Elastic potential energy** – energy related to the stretch or compression of an object
- **Mechanical energy** – the sum of potential and kinetic energy for an object
- **Work-energy theorem** – when work is done on an object, energy changes
- **Power** – rate at which energy is transformed

Unit 7: Conservation of Momentum

- **Conservation of momentum** – the total momentum remains constant unless a net external force acts on a system
- **Momentum** – product of the mass and velocity of an object
- **Kinetic energy** – energy of motion
- **Impulse** – the quantity of force and time applied in a situation

Unit 8: Thermodynamics

- **Under revision**

Unit 9: Mechanical Waves: Properties and Applications

- **Under revision**

Unit 10: Electromagnetic Waves

- **Under Revision**

Unit 11: Electrostatics: Forces, Fields, and Energy

- **Under Revision**

Unit 12: Current Electricity

- **Under Revision**

Unit 13: Magnetic Fields and Electromagnetism

- **Under Revision**

Unit 14: Atomic, Nuclear, Quantum Physics and Relativity

- **Under Revision**

Unit 15: Physics is Everywhere

- **Under Revision**