NEWTON'S 1ST LAW OF MOTION

The idea that the tendency of things to resist change in motion is called "Inertia." Newton refined Galileo's idea, stating:

NEWTON'S 2ND LAW OF MOTION

Links the fundamental idea of acceleration and force in a more profound concept. Mass, one of the most important rules of nature, is central.

TERMS REGARDING NEWTON'S 1ST LAW

- **Inertia**: The property of things to resist change in motion.
- **Newton's 1st Law of Motion**: Every object in a state of rest or uniform speed in a straight line will remain in that state unless acted on by a nonzero net force.
- **Force**: In simplest sense, a push or pull that resists an object's motion.
- **Net force**: The vector sum of forces that act on an object.
- **Mechanical equilibrium**: The state of an object or system where there are no changes in motion.
- **Mechanical equilibrium rule**: For any object or system of objects in equilibrium, the net force is zero. EF = 0.

TERMS REGARDING NEWTON'S 2ND LAW

- **Force**: Any influence that can cause an object to be accelerated.
- **Friction**: The resistive force that opposes the motion or attempted motion of an object either past another object with which it is in contact or through a fluid.
- **Mass**: The quantity of matter in an object.
- **Volume**: The quantity of space an object occupies.
- **Newton's 2nd Law**: The acceleration of an object is directly proportional to the net force acting on it, is in the direction of the net force, and is inversely proportional to the mass of the object.
- **Freefall**: Motion under the influence of gravitational pull only.
PROPERTIES OF MATTER

Characteristics of an atom.

Atoms are incredibly tiny.

Atoms are numerous.

Atoms are perpetually moving.

Atoms are ageless.

NEWTON'S 3RD LAW OF MOTION

Law of Action-Reaction.

Fundamental idea of "Every action there is always an opposed equal reaction."
HEAT

Concept of temperature, Heat and Expansion.

TEMPERATURE is the quantity that indicates warmth with respect to some standard.

HEAT is the energy transferred from one object to another because of temperature difference.

THERMAL EXPANSION is the idea of when temperature of a substance is increased, its molecules or atoms increase in volume, length, or surface area.

SOUND

Concept of Vibration

Period “vibration” in space over time creates a wave. Wave is only audible if the vibration in a material medium. Solid, liquid or gas. If no medium, no sound.

REGARDING SOUND

The one thing we hear.

Mechanical & electromagnetic. Cannot travel in a vacuum.

Wavespeed - The speed with which waves are a particular point wave speed=frequency * wavelength.

Wavespeed - The speed with which waves are a particular period. The time in which the vibration is completed.

Frequency - A measure of the wave motion per unit time.

Regardling Sound

REGARDING HEAT

The only thing we hear.

Concept of vibration. Period “vibration” in space over time.

THERMAL EXPANSION is the idea of when temperature of a substance is increased, its molecules or atoms increase in volume, length, or surface area.

REGARDSING HEAT

The one thing we hear.

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Concept of vibration. Period “vibration” in space over time.

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MAGNETISM

The concept of electromagnetism is a unified framework in which electric and magnetic effects are seen as different aspects of the same phenomenon. The presence of moving charged particles gives rise to a magnetic field, which can interact with other magnetic fields and charged particles, resulting in forces and torques. This interaction is governed by Maxwell's equations, which describe how electric and magnetic fields are generated and propagate. The magnetic field is perpendicular to the direction of current and is characterized by its strength and direction, which can be described using vectors.

ELECTRICITY

The concept of electrostatics is fundamental in understanding how electric charge is distributed and how it interacts with other electric charges. Electricity is a form of energy that can be transferred through conductors or insulators. The flow of electric charge is known as current, and it is measured in amperes. The SI unit of electric charge is the coulomb. The electric field is a vector field that describes the force experienced by an electric charge at a given point. Electric charges attract or repel each other, and this interaction is described by Coulomb's law, which states that the force between two charges is directly proportional to the product of their charges and inversely proportional to the square of the distance between them.

TERMS REGARDING ELECTRICITY

Electricity - A general term for electrical phenomena, much like gravity has to do with gravitational phenomena or sociology with social phenomena.

Electrostatics - The study of stationary electric charge.

Conservation of charge - Electric charge is neither created nor destroyed. The total change before an interaction equals the total change after.

Coulomb's Law - The relationship between electrical force, charge, and distance. The force is greatest when the charges are opposite in sign and is zero when the charges are the same. When the distance between the charges is doubled, the force is reduced to one-fourth of its original value.

Conductor - Any material having free charged particles that easily flow through it when an electrical force acts on them.

Insulator - A material without free charged particles which does not conduct.

Semiconductor - A material with properties that fall between a conductor and an insulator, whose resistance can be affected by adding impurities.

REGARDING MAGNETISM

Magnetic force - The force between magnets, where opposite poles attract and like poles repel. The force is proportional to the product of the magnetic charges and inversely proportional to the square of the distance between them.

Magnetic lines - The region of magnetic influence around a magnet. The lines are closed loops, and the magnetic field is strongest at the poles. The force between moving charged particles and a magnetic field is given by the Lorentz force law, which states that the force is perpendicular to both the electric field and the velocity of the charged particle.

Magnetic domains - Clustered regions of aligned magnetic atoms. When these regions are aligned with one another, the material becomes a magnet.

Electromagnet - A magnet whose field is produced by an electric current.

Electronics - The study of electric phenomena, especially those that do not involve moving charged particles.
COLOR

The concept of visible frequencies within the visible spectrum. Color is a physiological response specific to the viewer. Color is not definite and appears as different frequencies differently to each viewer. While similar, infinite to be exactly the same when received. Visible light is the visibility of all light. Black is the absence of light. White light is the visibility of all frequencies visible. Inside visible violet, color is not definite and appears as that specific to the viewer. Color is a physiological response the visible spectrum concept of visible frequencies within.

COLOR

REGARDING COLOR

Some frequencies appear as light and others as shadow. The darker part of a shadow where all light is blocked. A partial shadow that appears where light is present. A part of the electromagnetic spectrum extending from radio waves to gamma waves. The range of electromagnetic spectrum. The term applied to measurable invisible frequencies extending in frequency from radio waves. The term applied to measurable invisible frequencies extending in frequency from radio waves to gamma waves. The electromagnetic spectrum is the term applied to measurable invisible frequencies extending in frequency from radio waves to gamma waves.

REGARDING LIGHT

Light is the only thing we see. Rays. Visible light Ultraviolet & Gamma Radiation, radio waves, microwaves, infrared, the spectrum. Visible light is only a fraction of light waves. Term identifying the frequency of electromagnetic waves that contain the frequency of electromagnetic waves that contain radiant energy, electric & magnetic fields.

Electromagnetic Waves

An electric & magnetic field oscillating at right angles to each other make up electromagnetic waves. Vibrating electric & magnetic fields constitute electromagnetic waves. An electromagnetic wave is a wave of oscillating electric & magnetic fields. The electromagnetic spectrum is the term identifying electromagnetic waves extending from radio waves to gamma waves.

Electromagnetic Spectrum

The range of electromagnetic waves extending from radio waves to gamma waves. The term identified the frequency of electromagnetic waves extending from radio waves to gamma waves. The term applied to measurable invisible frequencies extending in frequency from radio waves to gamma waves.
INTRODUCTION TO BASIC PHYSICS PRINCIPLES

BY BRETT SHIPLEY

PHYSICS 1010

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