

O/L Science

Fundamentals of
Physics



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What is Physics?

Physics is the branch of science that studies matter, energy, and the fundamental forces that govern the behavior of the universe.

$$F = G \frac{m_1 m_2}{d^2}$$

$$i\hbar \frac{\partial}{\partial t} \psi = \hat{H} \psi$$

$$\phi(x) = \frac{1}{\sqrt{2\pi\sigma}} e^{-\frac{(x-\mu)^2}{2\sigma^2}}$$

$$E = mc^2$$

$$ds \geq 0$$

$$= c^2 \frac{\partial^2 u}{\partial x^2}$$

$$\frac{df}{dt} = \lim_{h \rightarrow 0} \frac{f(t+h) - f(t)}{h}$$

Forces

Forces are pushes or pulls that can change the motion of an object

Examples include

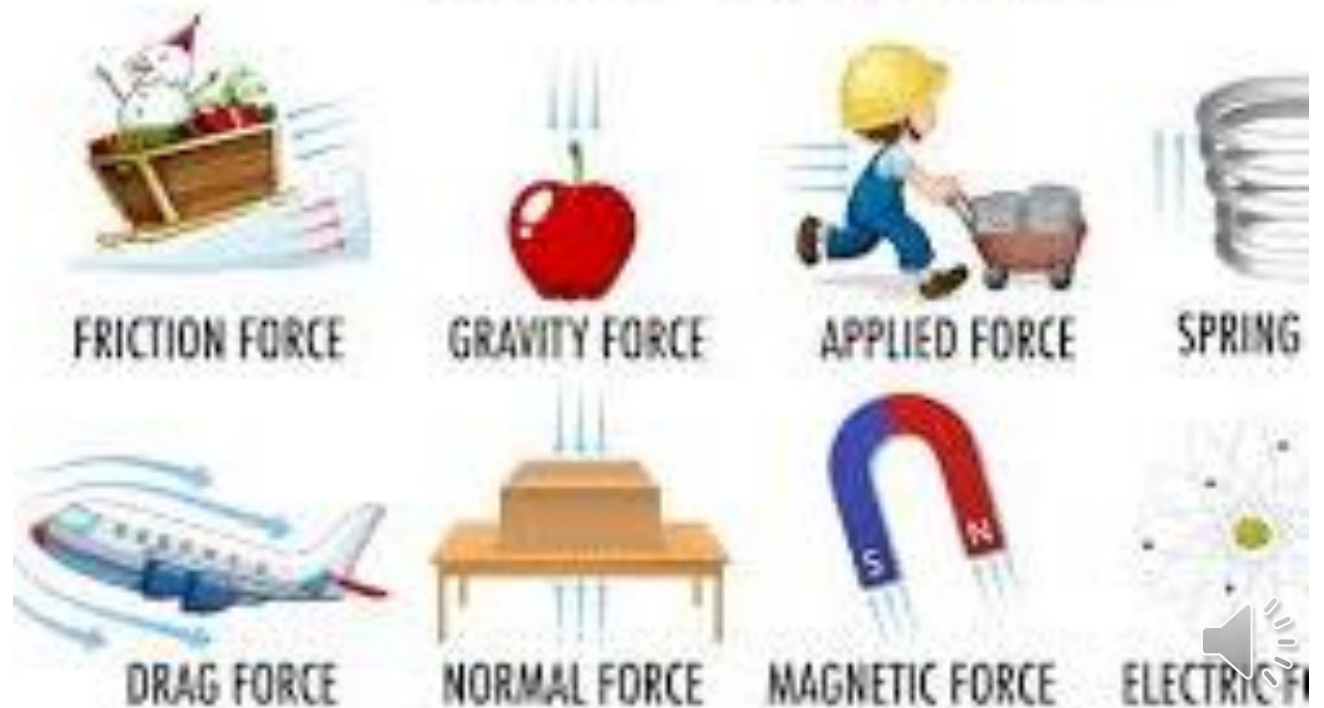
gravity

friction

magnetism

electric force

TYPES OF FORCE



Motion

*Motion is a change in the position of an object over time. It is described by concepts such as **speed**, **velocity**, and **acceleration***



Energy

Energy is the ability to do work or cause a change.

There are different forms of energy, including

- Kinetic (energy of motion)
- Potential (stored energy)





Gravity

Gravity is the force that attracts two objects with mass towards each other.

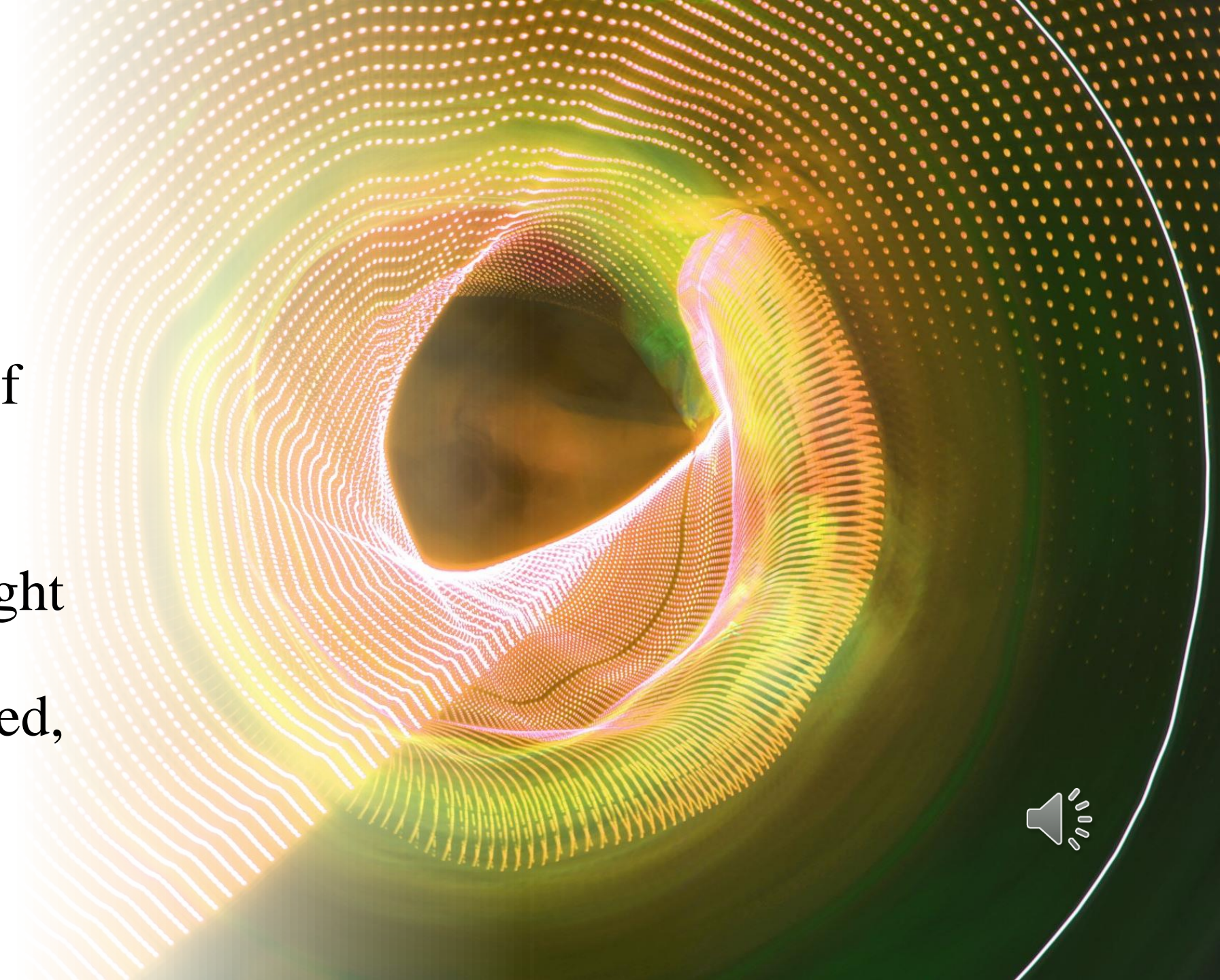
It is responsible for keeping planets in orbit around the sun and objects on Earth.



Light

Light is a form of electromagnetic radiation.

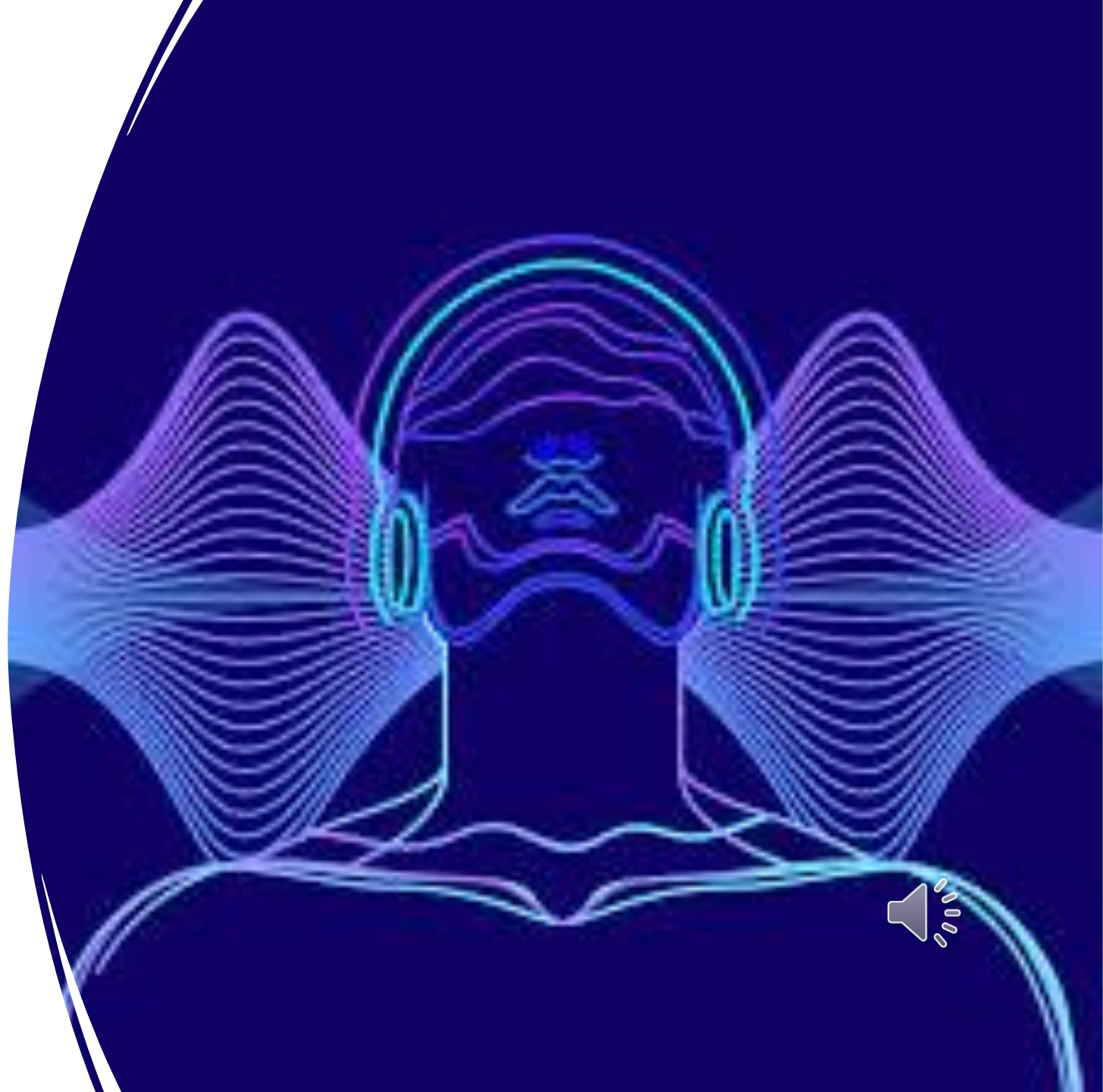
It travels in straight lines and can be reflected, refracted, and absorbed.



Sound

Sound is a form of energy produced by vibrations.

It requires a medium (such as air, water, or solids) to travel.



Electricity

Electricity is the flow of electrons.

It involves concepts like

Voltage

Current

Resistance.





Thermodynamics

Thermodynamics deals with the study of heat and its transformation into different forms of energy.



Covered Points:

- Definition of Physics
- Basic Concepts in Physics
 - Force
 - Motion
 - Energy
 - Gravity
 - Light
 - Sound
 - Electricity



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