Chapter 4, THE PERCEPTION OF LIGHT AND SOUND

-**A wave** is a disturbance that travels through a medium. A wave transports energy; it does not transport matter.

-**Longitudinal Wave**: moves parallel to the motion of it's medium. Example: Sound waves, a slinky.

- Divided into regions of compression and regions of rarefaction

-**Sound Waves** are longitudinal waves produced by the vibration of an object and transmitted to the object's environment.

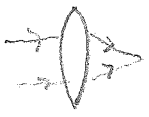
- The Decibel Scale measures the relative intensity of sounds to human ears.
- For every 10dB sound increases x10, not +10
- EX: 1 $\xrightarrow{\times 10}$ 10dB $\xrightarrow{\times 10}$ 20dB $\xrightarrow{\times 10}$ 30dB $\xrightarrow{\times 10}$ 40dB... 40dB 10000x louder than 1dB
- Sounds above 100 dB are damaging to the human ear.
- Frequency of sound waves (UNIT: Hz) determines if we can hear it or not. Humans can hear 20 - 20 000Hz. Sounds under 20Hz are called infrasound. Sounds over 20 000Hz are called ultrasound.

-**Transverse wave**: moves perpendicular to the motion of it's medium. Examples: water surface, electromagnetic waves (Radio → Gamma).

- Wavelength: Distance between crests — shorter means more energy
- Amplitude: "Height" from mid-line (rest position)
- Frequency: # of crests per sec. — ↑ means more energy

-Light is an electromagnetic wave that is visible to the human eye. (p.111-116)

- Lenses refract **light** (cause the wave to deviate or change direction)
- There are 2 types of lenses:
  - **Converging:** lenses that cause light to focus on the other side.



    - Ex: Magnifying Glass, Human eye (cornea)
    - Corrects hyperopia (farsightedness) and ~~hyperopia~~ Presbyopia (aging eye muscles)
    - Produces an image that is varies, varies, and varies.
  - **Diverging:** lenses that cause light to separate apart on the other side

    - Corrects myopia (nearsightedness)
    - Produces an image that is virtual, upright, and smaller.

Chapter 3. THE BEHAVIOUR OF FLUIDS

-**A Fluid** is a substance that has the capacity to Flow and assume the shape of the container into which it has been poured.

-A fluid can be a liquid or a gas.

-**A compressible fluid** is a fluid whose volume can change. Gases are compressible fluids.
-**An incompressible fluid** is a fluid whose volume cannot change. Liquid are incompressible fluids

-**Pressure** is a Force applied perpendicular to a surface. FORMULA: $P = \frac{F}{A}$ UNITS: Pa (Pascals)

-If force increases, pressure ↑. If force decreases, pressure ↓.
-If surface area increases, pressure ↓. If surface area decreases, pressure ↑.

-The pressure exerted on an object by an incompressible fluid (like water) depends on:

- The depth of the object in the fluid.
- The density of the fluid.

-Pressure on an object in an incompressible fluid depends on the _____ and the _____

-For a compressible fluid, if pressure ↑ volume decreases, and if pressure ↓ volume increases.

-3 General Principles

- Fluid moves from high P to low P
- In a closed container, P is uniformly (evenly) distributed.
- Transfer of P can ↑ the force involved.