Soil Pollution

Source for the soil pollution

Domestic waste :
Garbage, glass, plastics, metallic cans, fibers, paints, varnishes, etc,

Industrial wastes: Effluents discharge from

Chemical industries,

Paper and pulp mills,

Textile mills, steel Industries,

Refineries,

Pesticides and Fertilizer industries,

Cement industries, Thermal

and nuclear power plants etc.,

Fly Ash:

Thermal power plants produces “fly ash”.

Huge amount of fly ash dumped in to the soil, thus contaminate the soil.

A portion of fly ash is used for producing cement and making hollow blocks

Rest is used for land filling.

Pesticides:

Pesticides used for the crops reach the soil and persist there for long time.

Eg. DDT, endosulfan, chlorinated hydrocarbons.

Industrial solid wastes (sludge):

Industrial waste containing some organic and inorganic compounds that are refractory and non-biodegradable.

It contains various salts, **toxic substances, metals like Hg, lead, Cr, arsenic, etc**

Leach out toxic substances:

Leach out from agrochemicals , for eg *pesticides, fertilizer*

Leach out of *heavy metals* from the solid waste contaminates the soil.

Sewage Water:

Sewage water contains many pathogenic organisms, bacteria, viruses, which pollute the soil.

Radioactive substances:

Explosion of radio active devices (Nuclear bomb or Nuclear test),

Discharge of radioactive substances from **industries** or from **laboratories**

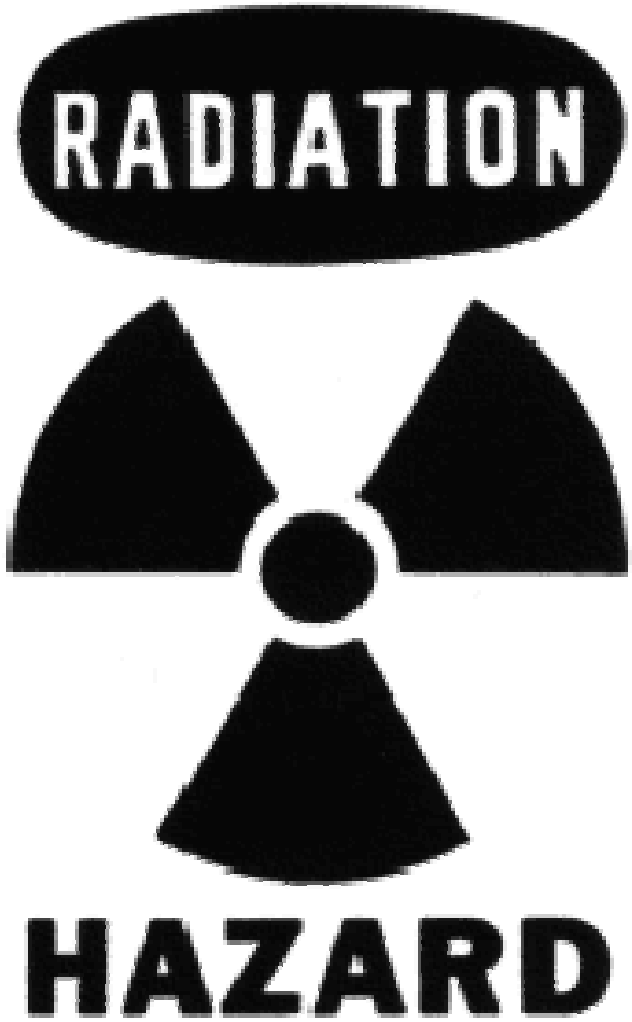
persists long time in the soil and keep emitting radiation

Eg. Isotopes of Uranium, Thorium, Iodine, Cs

Effect of soil Pollution

- Sewage and industrial effluents pollute the soil and ultimately affect **human health**.
- Persistence of toxic pollutant in the soil **affect the flora and fauna**
- There by it changes the **eco-balance**.
- Radio-isotopes enter into the food chain in the grazing animals- it makes **mutation**.
- Some of these isotopes replace essential elements in the body and cause abnormalities.
- Eg **Strontium-90 instead of calcium** gets deposited in the bones and tissues.
- The bones become **brittle and prone** to fracture.

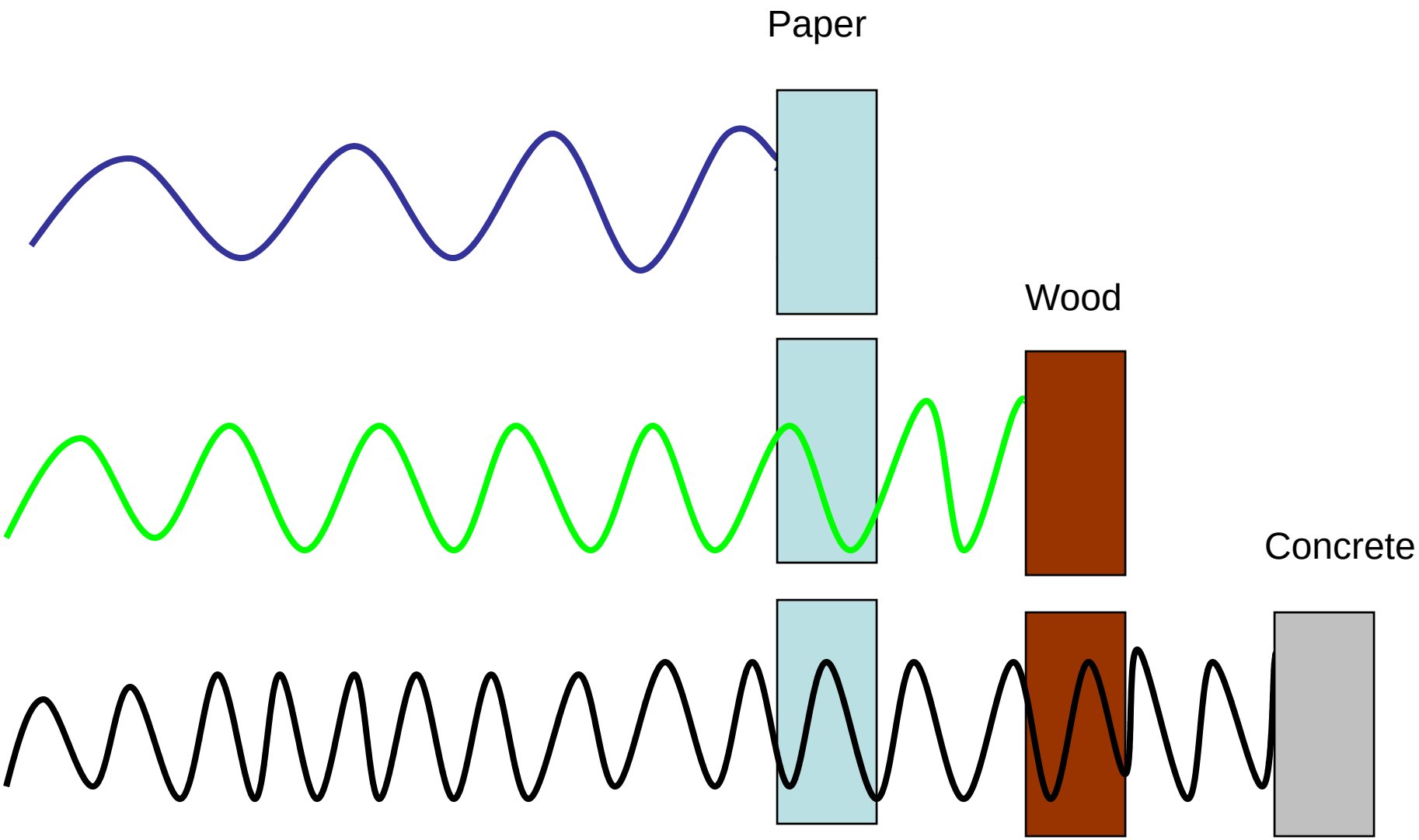
Nuclear or Radiation Hazard



Example of Radiations

- Alpha rays - Fast moving +ve charged particles
- Beta rays - High speed -ve charged particles
- Gamma rays - No Charge – High energy radiation

Energy of the radiation



Source of Radioactivity

- **Natural Sources:**

  Cosmic rays from the space, radioactive **radon-222**,

soil, rocks, air, water and food, which contain one or more

radioactive substances.

- **Anthropogenic Source:**

  Nuclear power plants, nuclear accidents, X-rays.

Effects of Radiations

Genetic damage:

These radiations induces the **mutations** in the DNAs and it affect genes and chromosomes.

These damages transmitted to several generations.

Cancers of bone, thyroid, breast, lungs and skin.

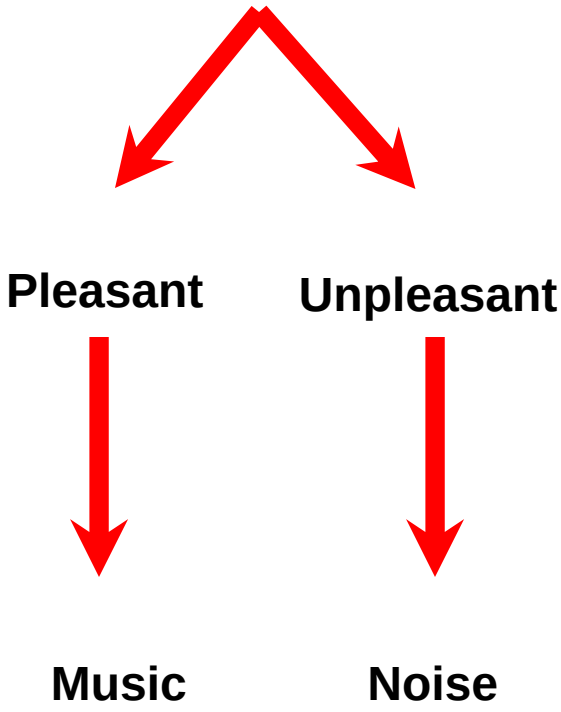
Radioactive isotopes I^{131} accumulates in ***thyroid gland and causes cancer.***

Strontium-90 accumulates in bones by replacing Ca and ***cancer of bone marrow***.

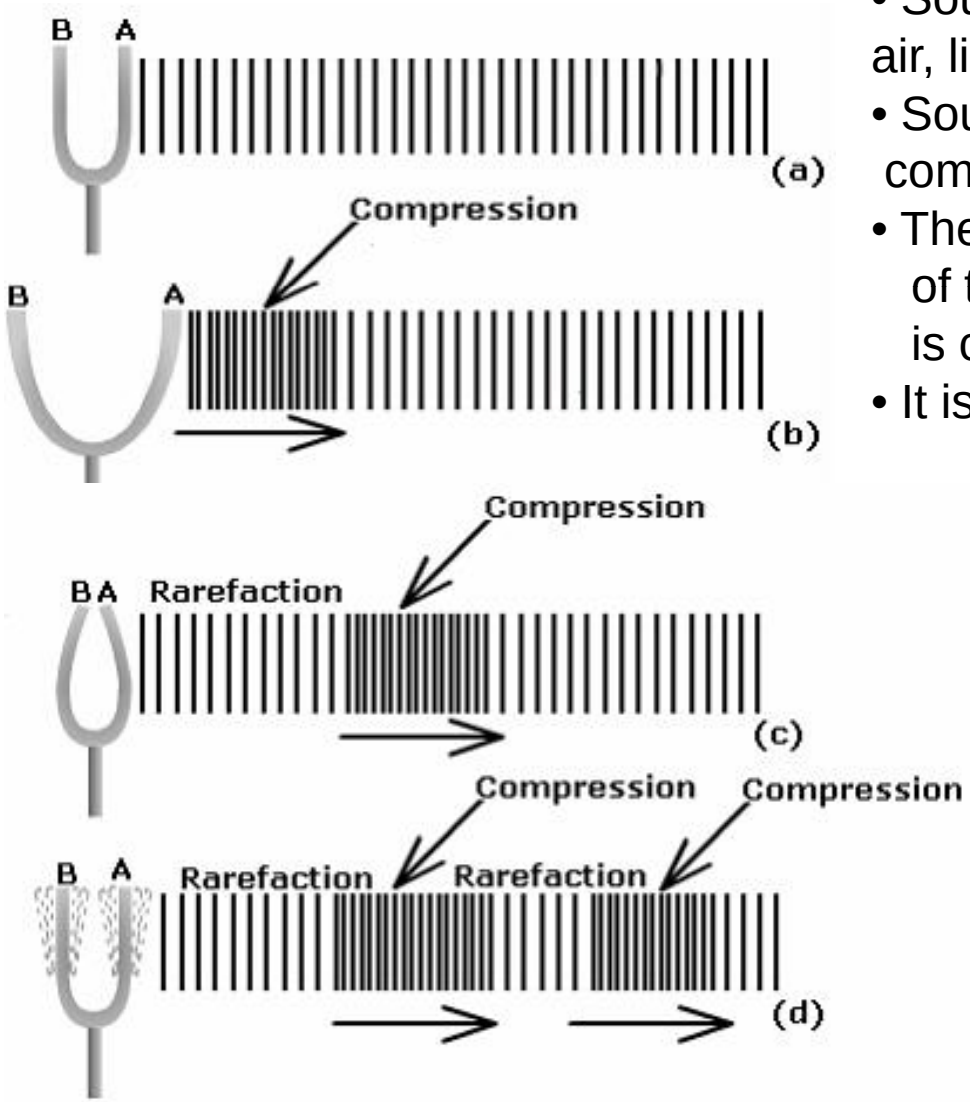
NOISE POLLUTION

Noise Pollution

Source is Mechanical energy from a vibrating source.



Sound wave probagation



- Sound can propagate through a medium of air, liquid, and solid.
- Sound pressure alternately causes compression and refraction.
- The number of compressions and refractions of the molecules of the medium in a unit time is called frequency.
- It is expressed in Hertz

General information about sound

- Every day there is **wide range of sound** pressures, encounter human ear.
- Increase in sound pressure **does not invoke linear response** of human ear.
- A meaning full logarithmic scale has been derived.
- Noise measurements are expressed as **Sound Pressure Level** (SPL) which is ***logarithmic ratio*** of the **sound pressure to a reference pressure**.

SPL is expressed as a dimensionless unit, **decibel (dB)**

The international reference pressure of ***2 x 10^{-5} Pa*** is the ***average threshold of hearing for a healthy ear.***

Source of Noise Pollution:

1. Transportation (air, road, rail)
2. Industrial operations,
3. Construction activities (Social/religious functions, elections etc.,)
4. Electric home appliances.

High level Noise Pollution in some Major cities:

Nanjing (China)	-	105 dB
Rome (Italy)	-	90 dB
New York	-	88 dB
Culcutta	-	85 dB
Mumbai	-	82 dB
Delhi	-	80 dB
Kathmandu	-	75 dB

Effect Of Noise Pollution

- **Interferes with man's Communication**

- ***Hearing damage*:** Noise can cause temporary or permanent hearing loss

- **Physiological and Psychological changes**: Continuous exposure to noise affects the functioning of various systems of the body.

- It may result in hypertension, insomnia, gastro-intestinal and digestive disorders, peptic ulcers, blood pressure changes, behavioral changes, emotional changes etc.,

Sound pollution during Diwali

- During Diwali, people of all ages enjoy firecrackers.
- Undesirable thing is sound pollution.
- Sometime it produces noise more than the permissible limit.
- All the firecrackers should be less than the permissible limit of 125 dB as per the Environmental Protection act (1999).
- Manufactures has to print the dB limit on the crackers

Supreme court guidelines for Noise pollution

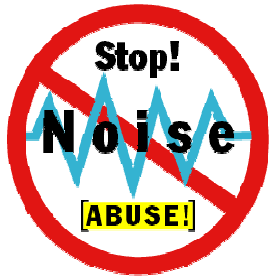
- The manufacture, sale, or use of fire-crackers generating noise level exceeding 125 dB at 4 meter distance from the point of bursting shall be prohibited.

- The use of ***fireworks or fire crackers*** should be permitted between **6.00 p.m and 10.00 p.m**.

- ***No fireworks*** or fire crackers shall be used between ***10.00 p.m and 6.00 a.m***.

- Firework shall not be used at any time in silence zone like ***hospitals, educational institutions, court, religious places***.

Control of Noise Pollution



1. Reduction in sources of noise: Sources of noise pollution like heavy heavy vehicles and old vehicles may not be allowed to use in the populated areas.

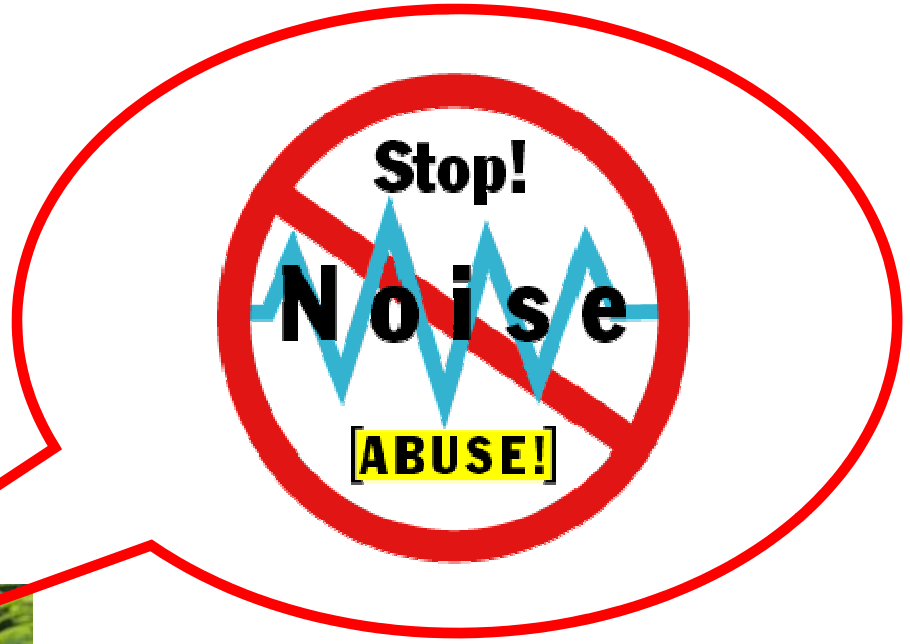
2. Noise making machines should be kept in containers with sound absorbing media.
   The noise path will be in interrupted and will not reach the workers.

3. Proper oiling will reduce the noise from the machinery.

4. Use of sound absorbing silencers: Silencers can reduce noise by absorbing sound.
   For this purpose various types of fibrous materials could be used.

Planting more trees having broad leaves.

5. Through Law: Legislation can ensure that sound production is minimizing at various social functions.
   Unnecessary horn blowing should be restricted especially in vehicle-congested areas.


Stop!
Noise
[ABUSE!]