

GOOD  
MORNING



# NOISE POLLUTION



# What is Noise ?

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- **Sound that which is unwanted and distrupts one's quality of life, is known as NOISE.**
- **Normal sound becomes undesirable when it disturbs our normal activities such as working , sleeping and during conversation.**
- **World Health Organization stated that “Noise must be recognized as a major threat to human well-being”.**

# Types of Noise:-

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## External Noise:-

- Atmospheric noise.
- Extraterrestrial noise.
- Industrial noise.
- Man made noise.

## Internal Noise:-

- Thermal noise.
- Shot noise.
- Transit time noise.
- Miscellaneous noise.

# What is Noise Pollution ?

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- **Sound that is unwanted or that disrupts the activity or balance of human or animal life is called as noise.**
- **When there is lot of noise in the environment, then it is termed as noise pollution.**

# Sources of Noise Pollution:-

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## THESE ARE THE MAIN SOURCES OF NOISE POLLUTION :-

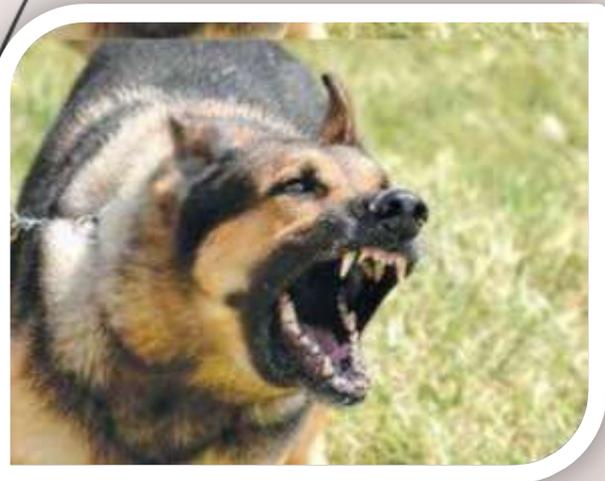
- Household sources.
- Social Events.
- Commercial & Industrial Activities.
- Transportation.

# Household Sources:-

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- ❑ **Gadgets like food mixer, grinder, vacuum cleaner, washing machine and dryer, cooler, air conditioners, can be very noisy and injurious to health.**
- ❑ **Others include loud speakers of sound systems and TVs, ipods and ear phones.**
- ❑ **Another example may be your neighbour's dog barking all night everyday at every shadow it sees, disturbing everyone else in the apartment.**

# Household Sources:-



# Social Events:-

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- **Places of worship, discos and gigs, parties and other social events** also create a lot of noise for the people living in that area.
- In many market areas, people sell with **loud speakers**, others shout out offers and try to get customers to buy their goods.
- It is important to note that when these events are not often, they can be called “**Nuisance**” rather than noise pollution.

# Social Events:-



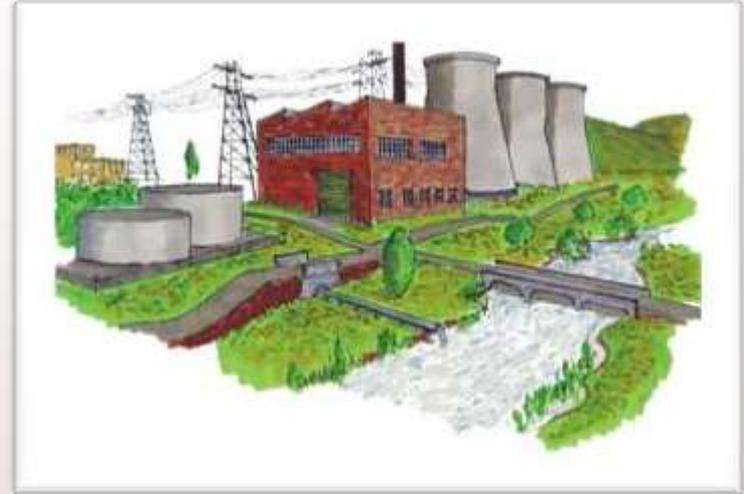
# Commercial & Industrial

## Activities:-

- Printing presses, manufacturing industries, construction sites contribute the noise pollutions in large cities.
- In many industries it is a requirement that people always wear earplugs to minimize their exposure to heavy noise.
- People who work with noisy equipments are required to wear noise-proof gadgets.

# Commercial & Industrial

## Activities:-



# Transportation:-

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- **Aeroplanes flying over houses close to busy airports.**
- **Over ground and Under ground trains ,vehicles on roads, these are constantly making a lot of noise.**



# Transportation:-

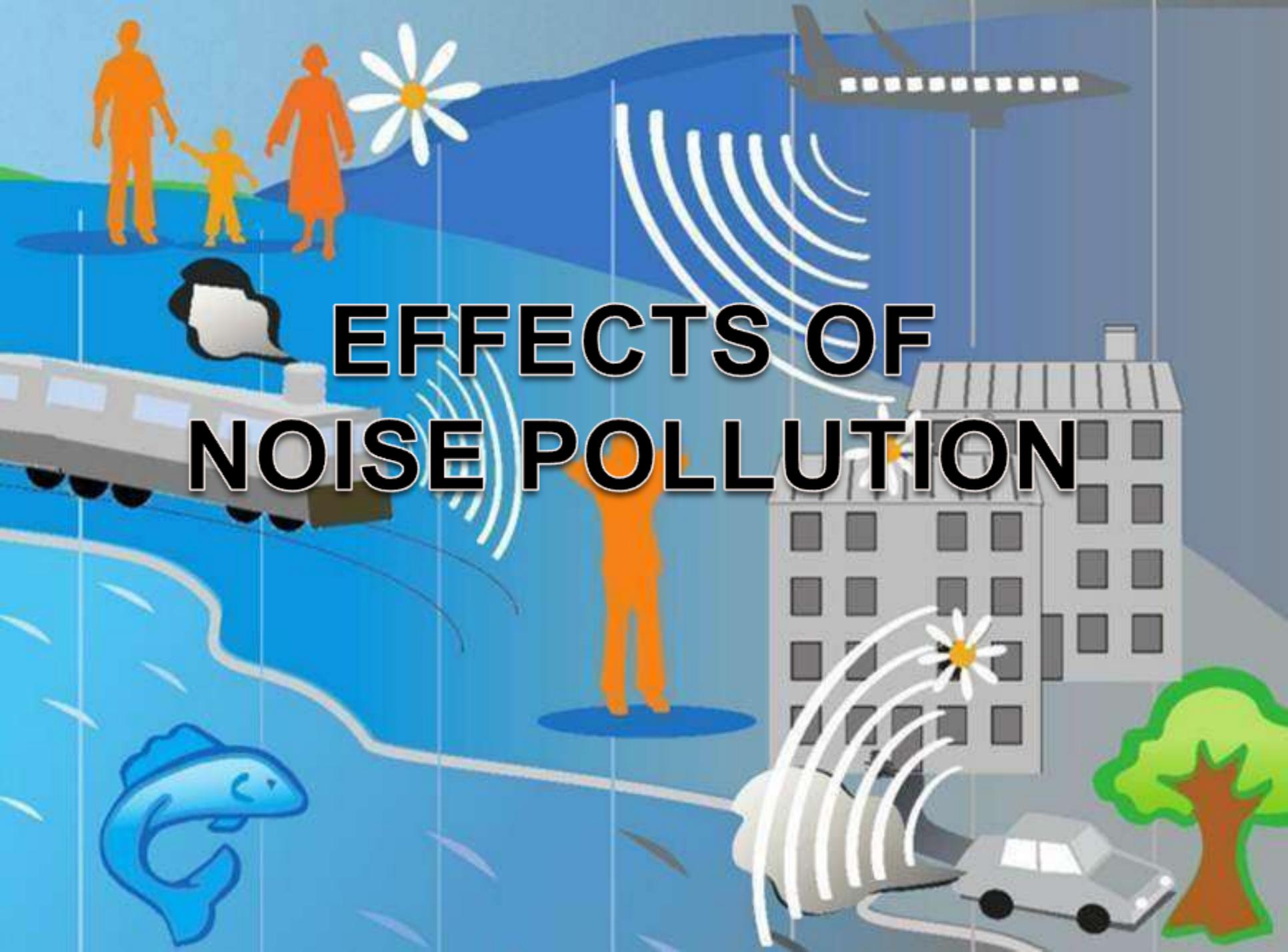


# Noise Levels:-

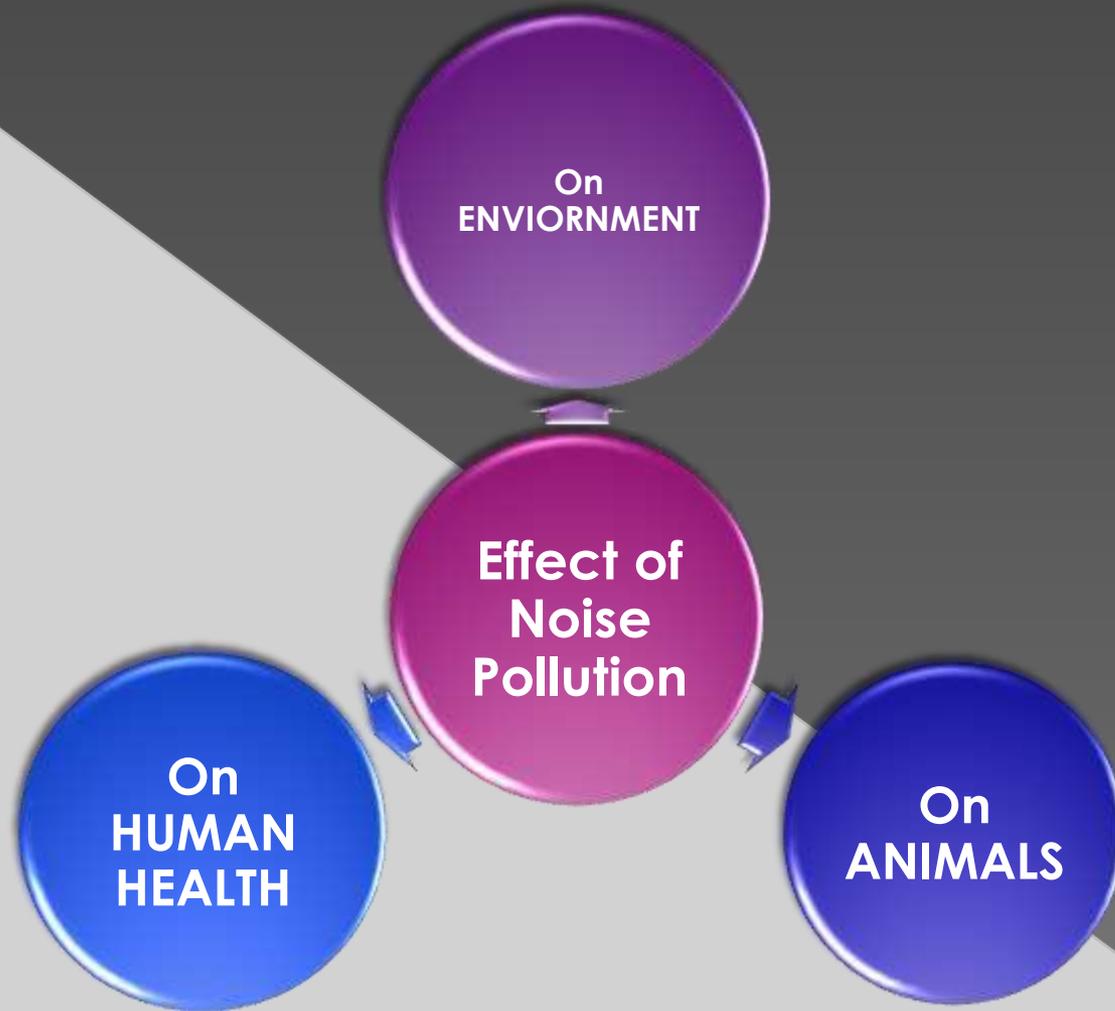


TYPE OF THE VEHICLE	NOISE LEVEL
Luxury Bus	77dB
Small passenger Car	79dB
Miniature passenger Car	84dB
Sports car	91dB
Motor cycle (4 stroke)	94dB
Motorcycle (2 stroke)	80dB



An illustration depicting the effects of noise pollution. In the background, a family of three (a man, a woman, and a child) stands on a grassy hill under a large white daisy. An airplane flies in the sky above them. In the foreground, a grey train moves across a blue track, with a penguin on its roof. A person stands on a blue circular patch of ground, looking up at the sky. To the right, a grey multi-story building is shown with a car parked in front of it. A green tree stands next to the car. In the bottom left corner, a blue fish is swimming in the water. White curved lines radiating from the train, the person, and the car represent sound waves. The text "EFFECTS OF NOISE POLLUTION" is written in large, bold, black letters across the center of the image.

# EFFECTS OF NOISE POLLUTION



# ON HUMANS:-

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- **Noise pollution is the reason for cause of nervous disorder, headache, high blood pressure and short memory.**
- **Depression and fatigue, which considerably reduces the efficiency of a person.**
- **Frustration and difficulty in concentration, disturbance of rest, physical and mental fatigue.**
- **Chronic exposure to noise may cause noise-induced hearing loss.**

# More effects on humans:-



**DEAFNESS**

**ANNOYANC**



**STRESS**



# ON ANIMALS:-

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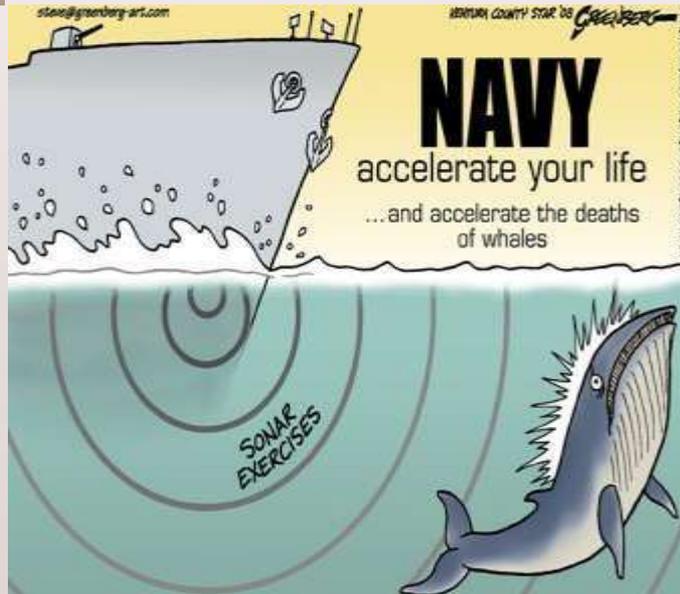
- **Noise pollution damages the nervous system of animal.**
- **Increase of death by altering the prey/predator detection and avoidance.**
- **Animal looses the control of it's mind.**
- **Creates problems in their use of sounds in reproduction and navigation.**
- **They becomes dangerous and attacking.**

# ON ANIMALS:-

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- Noise pollution from ship engines and sonar systems make it difficult for marine mammals like whales & dolphins, & prevent it from communicating, finding food, and avoiding hazards.
- Excessive noise has the ability to raise an animal's heartbeat speed and even harms an animal's metabolism.

# More effects on animals:-



# ON ENVIORNMENT:-

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- Noise also has detrimental effects on the growth of some plants.
- Birds as well rely on hearing to help find them to prey, hence they are seriously disadvantaged by noise.
- Because the noise is breaking the earths barrier and that could lead to destruction of the world in about 2-3 yrs.
- Noise pollution causes poor quality of crops in pleasant atmosphere.

# Prevention of Noise Pollution:-

- **Do not use car horns unnecessarily.** Areas like hospitals and campuses are silence zones and horning is prohibited there.



# Prevention of Noise Pollution:-



- Motors, machines and vehicles also produce loud noises when not maintained properly. Proper maintenance should be carried out for better perfo

# Prevention of Noise Pollution:-

- **Turn off the engine of your car or motorbike when you are not using it. It stops the annoying hum, and reduces air pollution also!**



# Prevention of Noise **Pollution:-**

- If you are working in an area where there are loud noises, you must wear earplugs to prevent loss of hearing.



# Prevention of Noise Pollution:-

- ❑ Rake leaves by hand, don't use a noisy leaf blower.
- ❑ Trim bushes or shrubs by hand, don 't use a noisy bush trimmer.
- ❑ Don 't blast music on the radio or computer or speakers. Be considerate of your own ears and those of other around you.
- ❑ Train your dog not to bark so much.
- ❑ Do noisy things (dishes, hammering, ect.) over or on a rubber mat to reduce noise



Thank you

# SOLID WASTE MANAGEMENT



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# Wastes are of 3 types

- ▶ Solid Waste
- ▶ Sewage – Waste water from a community containing solid and liquid excreta, derived from houses, street and yard washings, factories and industries.
- ▶ Sullage – Waste water which does not contain human excreta.

# SOLID WASTE

The term solid wastes include

- Garbage (food wastes).
- Rubbish (paper, plastics, wood, metal, glass etc).
- Demolition products (bricks, masonry, pipes).
- Sewage treatment residues (sludge & solids from the coarse screening of domestic sewage).
- Dead animals, manure and other discarded materials.



# Solid waste: “a health hazard”

- ▶ It decomposes and favours fly breeding.
- ▶ Attracts rodents and vermin.
- ▶ The pathogens may be conveyed back to man’s food through flies and dust.
- ▶ Possibility of water, soil and air pollution.
- ▶ Heaps of refuse present an unsightly appearance and nuisance from bad odors.





# Sources of Refuse

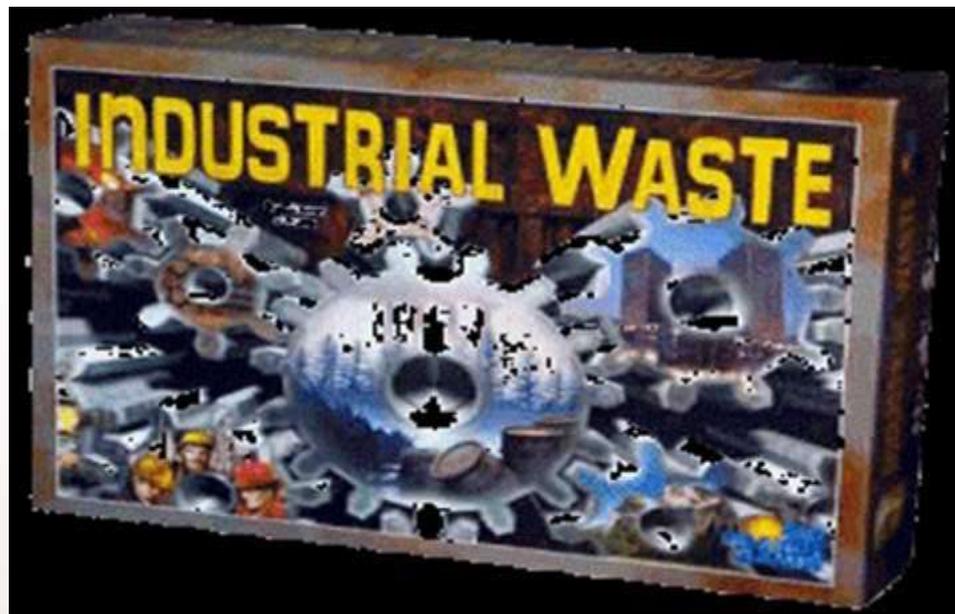
- Refuse that is collected by the street cleansing service or scavenging is called **street refuse**. It consists of leaves, straw, paper, animal droppings and litter of all kinds.
- Refuse that is collected from markets is called **market refuse**. It contains a large proportion of putrid vegetable and animal matter.



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- Refuse that is collected from stables is called **stable litter**. It contains mainly animal droppings and left-over animal feeds.
  - **Industrial refuse** comprises a wide variety of wastes ranging from completely inert materials such as calcium carbonate to highly toxic and explosive compounds.
  - The **domestic refuse** consists of ash, rubbish and garbage. Ash is the residue from fire used for cooking and heating. Rubbish comprises paper, clothing, bits of wood, metal, glass, dust and dirt.  
  
Garbage is waste matter arising from the preparation, cooking and consumption of food.



**Stable litter**



**Industrial refuse**



**Domestic refuse**



# STORAGE

- ▶ The galvanized steel dust bin with close fitting cover is a suitable receptacle for storing refuse. The capacity of a bin will depend upon the number of users and frequency of collection.
- ▶ The output of refuse per capita per day in India is estimated to vary from 1/10 to 1/20 c.ft.



- ▶ For a family of 5 members, a bin having a capacity of  $\frac{5}{10}$  or  $\frac{1}{2}$  c.ft. would be needed. If collection is done once in 3 days, a bin having a capacity of  $1 \frac{1}{2}$  or 2 c.ft. would be adequate.
- ▶ A recent innovation in the western countries is the "paper sack." Refuse is stored in the paper sack, and the sack itself is removed with the contents for disposal and a new sack is substituted.



- *Public Bins* - They are kept on a concrete platform raised 2 to 3 inches above ground level to prevent flood water entering the bins. In bigger municipalities, the bins are handled and emptied mechanically by lorries fitted with cranes.



# COLLECTION

- ▶ The method of collection depends upon the funds available. House-to-house collection is by far the best method of collecting refuse.
- ▶ In India, there is no house-to-house collection system. People are expected to dump the refuse in the nearest public bin, which is usually not done.
- ▶ The refuse is then transported in refuse collection vehicles to the place of ultimate disposal.

- ▶ The *Environmental Hygiene Committee* (1949) recommended that municipalities and other local bodies should arrange for collection of refuse not only from the public bins but also from individual houses.
- ▶ A house-to-house collection will result in a simultaneous reduction in the number of public bins. The open refuse cart should be abandoned and replaced by enclosed vans.





# METHODS OF DISPOSAL

The principal methods of refuse disposal are :-

- a) Dumping
- b) Controlled tipping or sanitary land-fill
- c) Incineration
- d) Composting
- e) Manure pits
- f) Burial

# DUMPING

- ▶ Refuse is dumped in low lying areas partly as a method of reclamation of land but mainly as an easy method of disposal of dry refuse. As a result of bacterial action, refuse decreases considerably in volume and is converted gradually into humus.
- ▶ Kolkata disposes of its refuse by dumping and the reclaimed land is leased out for cultivation



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- ▶ WHO Expert Committee (1967) condemned dumping as "a most insanitary method that creates public health hazards, a nuisance, and severe pollution of the environment". Dumping should be outlawed and replaced by sound procedures.

# CONTROLLED TIPPING

- ▶ Controlled tipping or sanitary landfill is the most satisfactory method of refuse disposal where suitable land is available. It differs from ordinary dumping in that the material is placed in a trench or other prepared area, adequately compacted, and covered with earth at the end of the working day.
- ▶ The term "modified sanitary landfill" has been applied to those operations where compaction and covering are accomplished once or twice a week.

- ▶ *The trench method* : Where level ground is available, the trench method is usually chosen. A long trench is dug out - 2 to 3m (6-10 ft.) deep, 4 to 12 m(12-36 ft.) wide, depending upon local conditions.
- ▶ The refuse is compacted and covered with excavated earth. Where compacted refuse is placed in the fill to a depth of 2 m (6 ft.), it is estimated that one acre of land per year will be required for 10,000 population.



- ▶ *The ramp method* : This method is well suited where the terrain is moderately sloping. Some excavation is done to secure the covering material.
- ▶ *The area method* : This method is used for filling land depressions, disused quarries and clay pits. The refuse is deposited, packed and consolidated in uniform layers up to 2 to 2.5 m (6-8 ft.) deep.



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- ▶ Each layer is sealed on its exposed surface with a mud cover at least 30 cm (12 inches) thick. Such sealing prevents infestation by flies and rodents and suppresses the nuisance of smell and dust. This method often has the disadvantage of requiring supplemental earth from outside sources.



# INCINERATION

- ▶ It is the method of choice where suitable land is not available.
- ▶ Hospital refuse which is particularly dangerous is best disposed of by incineration.
- ▶ Incineration is not a popular method in India because the refuse contains a fair proportion of fine ash which makes the burning difficult.

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- ▶ A preliminary separation of dust or ash is needed. All this involves heavy outlay and expenditure, besides manipulative difficulties in the incinerator.
  
  - ▶ There are 3 basic kinds of incinerators:
    - a) Double – chamber pyrolytic
    - b) Single – chamber furnaces
    - c) Rotary kilns

# Pyrolytic Incinerators

- ▶ Most reliable and commonly used process for health care waste.
- ▶ They are called Double – chamber incinerators as they comprise of:
  - A Pyrolytic chamber
  - A Post combustion chamber





Suitable for:

- ▶ Infectious waste (including sharps) and pathological waste
- ▶ Pharmaceutical and chemical residues.

Inadequate for:

- ▶ Genotoxic waste
- ▶ Radioactive waste
- ▶ Non risk health care waste

# Single – Chamber Incinerator

- ▶ This can be used for health – care waste if a pyrolytic incinerator cannot be afforded.
- ▶ This type of incinerator treats waste in batches.
- ▶ Loading and de-ashing operations are performed manually.





- This method should only be used as a last resort as it is difficult to burn the waste completely without generating potentially harmful smoke.

- Drawbacks:

- The process will cause emission of black smoke, fly ash and potentially toxic gases.
- Exhaust gas cleaning is not practical – can cause air pollution

# Rotary Kiln

- ▶ They comprise of a rotating oven and a post-combustion chamber.
- ▶ Rotary kilns may operate continuously and adaptable to a wide range of loading devices.
- Used for:
- ▶ Infectious waste and pathological wastes.
- ▶ Cytotoxic waste





▶ Inadequate for:

- Radio – active wastes

▶ Capacity of rotary kilns: *0.5 – 3 tonnes/hour*

▶ Disadvantages:

- Well trained personnel required
- Energy consumption is high.
- Equipment and operation costs are high.

# COMPOSTING

- ▶ It is a process of nature whereby organic matter breaks down under bacterial action resulting in the formation of relatively stable humus-like material, called the compost which has considerable manurial value for the soil.
- ▶ The principal by products are carbon dioxide, water and heat.

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- ▶ The heat produced during composting - 60 deg C or higher, over a period of several days- destroys eggs and larvae of flies, weed seeds and pathogenic agents.
  - ▶ The end-product compost contains few or no disease producing organisms, and is a good soil builder containing small amounts of the major plant nutrients such as nitrates and phosphates.

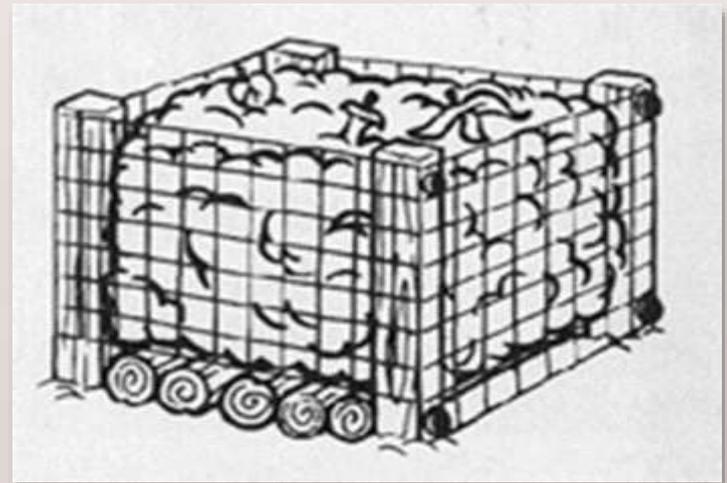
The following methods of composting are now used :

- ❑ **Bangalore method (Anaerobic method)**
- ❑ **Mechanical composting (Aerobic method)**

# MECHANICAL COMPOSTING

- ▶ Aerobic method/ Indore method
- ▶ Compost is manufactured on large scale.
- ▶ The refuse is first cleared of salvable materials such as rags, bones, metal glass, items which are rendered to interfere in grinding.
- ▶ It is then pulverized in pulverizing equipment in order to reduce size of the particle to less than 2 inches.

- ▶ The pulverized refuse is then mixed with sewage, sludge or night soil in a rotating machine and incubated.
- ▶ The entire process of composting is complete in 4-6 weeks.



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- ▶ This method of composting is in function in some of the developed countries, e.g., Holland, Germany, Switzerland, Israel.
  - ▶ Cities such as Delhi, Nagpur, Mumbai, Chennai, Pune, Allahabad, Hyderabad, Lucknow and Kanpur have offered to join the Government for setting up pilot plants for mechanical composting.

# MANURE PITS

- ▶ Manure pits is the best method of refuse disposal by individual house holders.
- ▶ The garbage ,cattle dung, straw and leaves should be dumped into the manure pits.



- ▶ Two such pits will be needed, when one is closed, the other will be in use. In 5 to 6 month's time, the refuse is converted into manure which can be returned to the field. This method of refuse disposal is effective and relatively simple in **rural communities**.



# BURIAL

- ▶ This method is suitable for small camps.
- ▶ A trench 1.5m wide and 2 m deep is excavated and at end of each day the refuse is covered with 20 -30 cm of earth



# VERMICOMPOSTING

- ▶ Municipal solid waste is highly organic in nature, so vermicomposting has become an appropriate alternative for the safe, hygienic and cost effective disposal of it.
- ▶ In this method earthworms feed on the organic matter present in the solid waste and convert into casting (ejected matter) rich in plant nutrients.

- Vermicomposting has been used in various cities of India like Hyderabad, Bangalore, Mumbai and Faridabad.



# LIGHT

Adequate lighting is essential for an efficient vision. When subjected to inadequate lighting conditions, the human visual apparatus is put to strain which leads to general fatigue and loss of efficiency. For an efficient vision the following criteria of light is usually applied.

**(a) Sufficient light:** The lighting should be sufficient for the eye to easily discern the object and surrounding without any strain. An illumination of 15-20 foot candles is accepted as basic minimum for satisfactory vision.

**(b) Distribution:** The light should be uniformly distributed having the same intensity over the whole field of work.

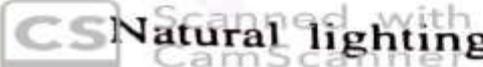
**(c) Absence of Glare:** Glare is harsh dazzling light. It is best exemplified by the automobile head lights at night due to excessive contrast. The eye does not tolerate glare as it causes acute discomfort and reduces critical vision.

**(d) Absence of sharp shadows:** Shadows should not be present in the field of vision as they cause confusion to the eye.

**(e) Steadiness:** Light should be projected constantly without any interruption. Flickering of light causes strain to the eye and may lead to accidents.

**(f) Surroundings:** For efficient vision, the color schemes in the rooms and halls is important. Ceilings and roofs should ideally have a reflection factor of 80 percent; walls 50 to 60 percent and furniture 30 to 40 percent. Reflection from floor should be minimum-not more than 15-20 percent.

## Natural Lighting:

 Natural lighting is obtained partly from the visible sky and partly

from reflection. Considerable amount of light comes to rooms by reflection from light coloured objects. Perfect utilization of natural light depends on careful design, location and orientation of buildings. Natural lighting varies with the time of the day. Proper orientation of buildings, removal of obstructions in the way of lighting, placement and size of windows and interior designing of rooms can improve the daylight illumination.

### **Artificial Lighting :**

Day light may not meet the adequate requirement of illumination during all the hours and on cloudy days. On many occasions, it has to be supplemented by artificial lighting for adequate illumination, which should be as close as possible to daylight in composition. There are five systems of artificial lighting.

- (a) **Direct Lighting:** In this system 99-100 percent of light is directly projected towards working area. It is economical and efficient but it casts sharp shadows which are not desirable.
- (b) **Semi Direct:** In this system 10-40 percent of the light is projected upwards which in turn is reflected back by the ceiling on the object.
- (c) **Indirect:** It does not strike a surface directly because 90-100 percent of the light is projected towards the ceiling and walls. It produces general illumination of the whole room.
- (d) **Semi-indirect:** Here 60-90 percent of light is directed upwards and the rest towards the working area.
- (e) **Direct-Indirect:** In this system light is distributed equally towards the ceiling and the working area.

## Methods of Artificial Lighting:

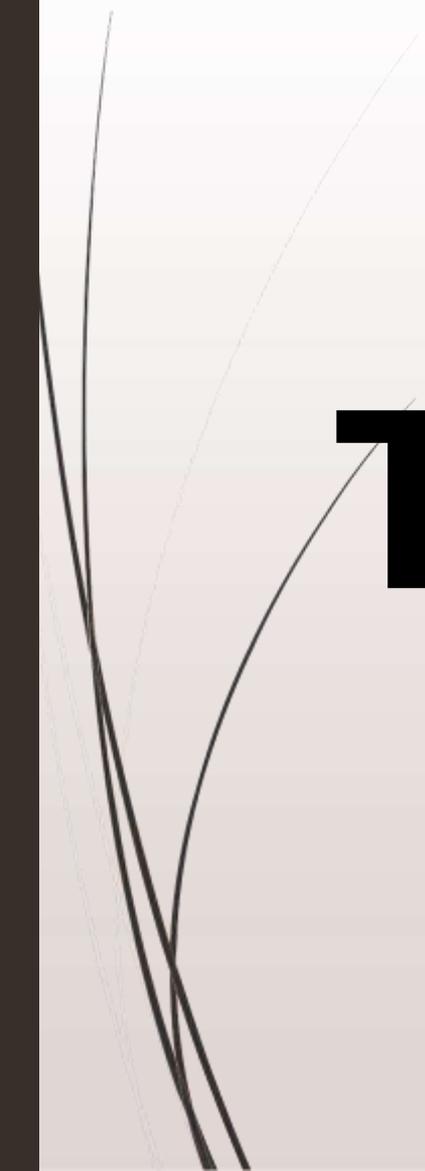
Filament lamps are most widely used source of artificial lighting. The electric current heats up the tungsten filament and the light emitted depends upon the temperature. The hotter filaments produce bluer light. Fluorescent lamps are the better source of artificial light. They are economical in the consumption of electricity, cool, efficient and the light emitted by fluorescent lamps simulates natural light. These lamps are made of glass tube filled with mercury vapor and an electrode fitted at each end. The inside of the tube is coated with fluorescent chemicals which absorb practically all ultraviolet radiation and emit radiation in the visible range.

## **Lighting Standards:**

The human eyes respond to a range of illumination ranging from 0.1 lux (full moonlight night) to 1,00,000 lux (bright sunshine). The visual efficiency increases with the increase of illumination but the curve flattens out at higher levels. A practical rule is that the illumination level should be 30 times higher than the level at which the task can just be done.

## **Biological Effects of Light:**

Light has been shown to produce interesting biological effects. The observation that daylight could cause the *in vitro* degradation of bilirubin has been used as therapeutic measure for controlling the hyperbilirubinemia in premature infants. Other biological effects of light include the effect on biological rhythms of body temperature, physical activity, stimulation of melanin synthesis, activation of precursors in the biosynthesis of vitamin D, adrenocortical secretion and food consumption.



**THANK  
YOU**