SER No	CONTENT

LESSON PLAN

LESSON PLAN : H 2
HYGIENE AND SANITATION

Periods - Two
Type - Lec
Code - H 2
Year - I / III (SD/SW)

Training Aids

1. Computer Slides, Pointer, Charts, Black Board and Chalk.

Time Plan

2. (a) Introduction - 03 Min
(b) Hygiene - 40 Min
(c) Sanitation - 35 Min
(d) Conclusion - 02 Min

INTRODUCTION

3. Hygiene and Sanitation are fields of medical science which aim to preserve and improve the health of the Individual and of the community as a whole. Its study is aimed at making the cadets aware of the many preventable health hazards and to enable them to look after themselves and their community most efficiently. It seeks to develop in them the concepts of healthy living. This field has nothing to do with religion or social customs but it is simply based on scientific requirements. Personal hygiene involves all aspects of the health of an individual. Responsibility for the maintenance of personal health therefore lies with the individual. Every person must remain in perfect physical, mental and social health, only then can he serve the community and the country well.

AIM

4. To teach the NCC cadets about Hygiene and Sanitation.

PREVIEW

5. The class will be conducted in the following parts:-

(a) Part I - Hygiene.

(b) Part II - Sanitation.

(a)

PART I : HYGIENE

Personal Hygiene

6. Maintenance of personal hygiene is very important in preventing disease. It deals with the practices that help in the maintenance and promotion of a person‘s health. Personal Hygiene helps in the following:-

(a) To maintain a good and clean physique. 219
(b) To maintain good muscle strength.
(c) To maintain clean mouth and teeth.
(d) To maintain resistance to prevent information.
7. **Main Components.** The main components of personal hygiene are:-
(a) **Sleep.** Sleep means the periodical rest of both body and mind and it is extremely essential for a healthy body. The amount of sleep one requires varies with individual age. The average requirement of sleep is about 7 to 8 hours a day.

(b) **Bathing**. Keeping the skin clean and in healthy condition is essential for good health. A bath with a mild soap with warm water in winters and cool water in summers are essential for body cleaning. While bathing, all parts of the body including folds in the skin must be cleaned well. After the bath, the body must be dried properly including the folds in the skin as wetness or dampness will lead to cuts /fungal infection.
(c) **Eating and Drinking.** Properly cooked food with its full nutrient value is beneficial for health. Eat slowly and chew well. Do not swallow hastily. Drink plenty of water between meals and avoid strenuous exercise after a heavy meal.
(d) **Care and Cleanliness of Skin, Hair and Teeth**. Our skin keeps on secreting sweat and hence it is necessary to keep it clean through bathing and by removing dust and dirt.. Regular changing and cleaning of clothing is essential to keep the body fit. Digestive and other disorders take place when decayed teeth and unhealthy gums bleed giving foul smell in the mouth. Teeth should be regularly brushed after the last meal at night and early in the morning. In – sufficient vitamins C & D are the cause of dental decay.
(e) **Exercise**. Organized games and physical exercise are necessary for proper development of the body and mind.

8. **<u>Water Supply and Its Purification.</u>**

(a) **Sources of Water Supply**. The main sources of water supply are:-
(i) **Rain Water**. Most of the fresh water on earth comes from rains. However, most of this water is not fit for consumption due to impurities of the atmosphere.
(ii) **Surface Water.** Surface water is found mainly in rivers and streams or lakes. This water is unfit for human consumption without treatment due to discharge of various types of wastes into it.
(iii) **Underground Streams.** Bore Wells are a good source of potable water supply. However, even these need to be protected from contamination.
(b) **Purification of Water**. Safe drinking water comes only from an authorized source. Purification provides good and safe water by eliminating the suspended matter, harmful salts in solution, bad taste/smell, undesirable colors and germs. The following methods are used for water purification:-
(i) **Boiling and Filtering Water**. Untreated or treated potable water from any unreliable source

must be boiled at 100 degrees for 30 min, cooled and then filtered. Only then will it be fit for consumption.

(ii) **Clarification**. This is the removal of suspended matter through filtration, by passing it though filter beds of gravel and sand or through properly sterilized filters.

(iii) **Sterilization**. This is done by using chlorine gas or bleaching powder.

(iv) **Pinking.** During cholera epidemic potassium permanganate should be used for pinking of wells.

(v) **Precipitation**. This is done by adding alum or some similar chemical to water, which makes all impurities accumulate at the bottom and leaves pure water. This water is then passed through a filter.

Food Hygiene

9. Food is a potential source of infection and is liable to contamination by microorganisms at any point during its journey from the producer to the consumer. Prevention of contamination of food has to be observed from production to handling, distribution and serving. The following are the important components of food hygiene:-

(a) **Milk Hygiene.** Milk is an efficient vehicle for many disease organisms. Contamination of milk may be due to infected animal, human handler or environmental factors. Following aspects should be ensured to obtain clean and safe milk:-

(i) The animal and its surroundings should be healthy and clean. The animal should be properly washed before mulching.

(ii) Milk handler should be free from any communicable disease.

(iii) Milk vessels should be totally clean, sanitized and kept covered.

(iv) Water supply must be safe.

(v) **Pasteurization.** It is the heating of milk to such temperature and for such periods of time, as are required to destroy any pathogens without destruction of nutritive value. It does not alter taste. (Temperature 130 C and time 1 to 2 seconds).

(b). **Meat Hygiene.** The word meat includes various tissues of animal origin. The diseases which may be transmitted through meat are ‗Tapeworm Infestation' and ‗Bacterial Infections' like anthrax, tuberculosis or food poisoning. The **a**nimal intended for slaughter, must be subjected to proper ante mortem and post mortem inspection. Good meat should neither be pale pink nor deep purple nor should it be should not be slimy. Good meat should be elastic to touch and should have agreeable color.

(c) **Fish Hygiene.** Fish for human consumption should be fresh. In fresh fish, the gills are bright red and the eyes are clear and prominent. Consumption of contaminated fish may give rise to fish poisoning.

(d) **Egg Hygiene.** Though the majority of freshly laid eggs are sterile inside, the eggshell may become contaminated by fecal matter from the hen. The egg must be properly washed before cooking.

(e) **Fruits and Vegetables Hygiene.** Fruits and vegetables are an important source for the spread

(b)	of pathogenic organisms, protozoan and helminthes. Fruits and vegetables consumed raw must be washed well before eating. (f) **Hygiene of Eating Places.** (i) Eating places should not be located near filthy places, open drains, animal sheds, manure /soakage pits and other such places. (ii) Floors should be easy to clean, and should be preferably tiled. (iii) Rooms for storage of food should be well ventilated, insect and rat proof and should have adequate lighting. (iv) Perishable and non perishable items should be kept separately. (v) Furniture should be strong and easy to clean. (vi) Refuse should be collected in covered bins and removed regularly. (vii) Water supply should be independent, adequate and safe. (viii) Proper place for cleaning of utensils should be provided. (g) **Hygiene of Food Handlers.** (i) Complete medical examination of food handlers must be done at the time of employment. (ii) Regular health checkups should be done. (iii) Education of food handlers should be regularly educated on health and hygiene aspects. (iv) They should be constantly reminded about hand washing, trimming of nails, covering of hair, wearing of overalls and covering mouth while coughing and sneezing during cooking. **PART II : SANITATION** 10. **Definition.** Sanitation means keeping the living area and its surroundings neat and clean. This involves removal of waste products and refuse. **Waste Products / Refuse** 11. **Types.** Some types of the waste products are :- (a) Human excreta - faeces & urine. (b) Stable litter - horses & cow dung. (c) Dry refuse & garbage - household, municipality, industrial & agricultural. (d) Liquid wastes: household sullage, municipal & industrial effluent. (e) Offensive trade wastes. (f) Dead animals, carcasses & offal of slaughtered animals. 12. **Sources of Refuse .** (a) **Street Refuse.** Refuse that is collected by street cleansing service or scavenging is called street refuse e.g. leaves straw paper etc.

(b) **Market Refuse.** Refuse that is collected from markets is called market refuse. e.g. spoiled vegetable and animals matter.

(c) **Stable Litter.** It contains mainly animal dropping and left over animal feeds.

(d) **Industrial Refuse.** Industrial refuse comprises of a wide variety of waste ranging from

(e) **Domestic Refuse.** The domestic refuse consist of ash, rubbish and garbage.

Disposal of Waste Products / Refuse.

13. **Collection and Removal of Refuse**.

(a) **House Hold Refuse.** Covered galvanized irons bins are placed on brick / cement platforms at convenient distances from the house. These should be used for dumping house hold refuse. This refuse is then collected in covered wheel barrows or municipal vans to prevent blowing out by air.

(b) **Special Refuse.** This is from stables and cowsheds. It is collected in carts and taken to disposal grand at frequent intervals.

(c) **Street Refuse.** Covered dustbins should be placed at suitable intervals along the street and all the sweeping should be dumped in it. It is then collected early morning in covered vans.

14. **Disposal of Refuse.** Various methods for disposal of refuse are:-

(a) **Filling**. In this method the refuse is generally utilized in filling up pits, unsanitary tanks or in reclaiming low land. The area selected should be at least 100-150 feet away from any habitation. No refuse should be left uncovered for more than 72 hrs.

(b) **Controlled Tipping.** Controlled tipping or sanitary landfill is the most satisfactory method of refuse disposal where suitable land is available. Chemical, bacteriological and physical charges occur in buried refuse.

(c) **Incineration.** Hospital refuse, which is particularly dangerous, is best disposed off by incineration .

(d) **Composting**. It is a method of combined disposal of refuse and night soil or sludge.

(e) **Manure Pits.** The garbage, cattle dung, straw and leaves should be dumped into the manure pits and covered with earth, after each days dumping.

(f) **Burial**. This method is suitable for small camps. A trench 1-5m wide and 2m deep is excavated. When the level in the trench is 40 cm from ground level, the trench is filled with earth and comported.

(g) **Sorting**. This method consists of storing refuses in three separate parts for easy disposal:-

(i) **Breeze**. Cinders and pieces of coal are used for making bricks.

(ii) **Soft Core**. Animal and vegetable organic matter, which is used as manure.

(iii) **Hard Core**. Broken bottles and crockery is used for metaling of roads.

15. **Disposal of Human Waste.** Proper disposal of human night soil / excreta are very essential for prevention of various communicable diseases and also to prevent pollution / contamination of soil, water or food (through flies). Various methods are available for disposal of human waste / excreta as per the type of area ie, area with a proper sewage system (sewered areas) and areas without proper sewage system (unsewered areas).

(a) **Sewered Areas.** The latrines used in such areas are mainly the **Flush Latrines.** It implies that ample supply of water is available to flush the night soil away. It is simple and hygienic.

(b) **Unsewered Areas.** There are of various types latrines for such areas:-

(i) **Domestic Latrines**. These are those latrines which are used in houses in areas not having a sewage system. These are of following types:-

(aa) **Bore Hole Latrine.** The latrine consists of a circular hole 30-40 cm in diameter dug vertically in the ground to a depth of 4 to 8 mtr. In loose sandy soil the hole is lined with bamboo matting or earthenware lining.

(ab) **Dug Well Latrine.** A circular pit about 75 cm in diameter and 3 to .5 cm deep is dug into the ground for the reception of the night soil . In sandy soil the depth of the pit may be reduced to 1.5 to 2 mtr.

(ac) **Water Seal Latrine.** The water seal performs two important functions e.g. it prevents access to flies and it prevents escape of foul odour. Out of many designs of water seal latrines, the RCA type is widely adopted.

(ii) **Camp Latrines.** These are of following types:-

(aa) **Deep Trench Latrines**. A pit three feet wide, at least eight feet deep and of a length suitable to the requirement is constructed and wooden seats placed over it with proper partitions and curtains. Soil may necessitate reverting of sides with sand bags, bamboos or wire netting. On vacation of camp, these are filled up with soil to assist in disintegration and prevent breeding of flies.

(ab) **Shallow Trench Latrines.**. For camps of less than a week‘s duration, dig a row of trenches in parallel, each trench being 3 feet long, 1 foot wide and 2 feet deep. Each trench should be 2 feet apart. The ratio is 5 trenches for the first hundred users and three for each subsequent hundred. After defecation, the excreta is covered with loose earth with a shovel or a scoop. These trenches are filled up after 24 hours and new trenches are dug up.

(ac) **Urinals.** The most common urinal used for camps is the **Funnel Urinals** which are constructed over a simple soakage pit.

(c) **Soakage Pits.** These are essential for the disposal of liquid refuse like greasy water from kitchen and waste water from bathrooms. Dig a pit 4 feet by 4 feet and 5 feet to 6 feet deep. Fill with small stones and broken bricks. Cover the top with oiled sacking and put earth or sand 6 inches above. In the centre keep a perforated empty tin of kerosene oil. Fill this tin with layers of gravel or sand and gravel. In this fit remove the strainer daily and replace with fresh one.

(d) **Disposal of Garbage**. Disposal of solid refuse like kitchen garbage, bones etc, be done by burial or burning. The household refuse should be deposited in a covered bin placed outside. Improvised kerosene/oil tins are not advisable. Further disposal should be done under municipal arrangements.

16. **Disposal of Sewage.** Proper disposal and treatment of sewage has assumed great importance today. The disposal of sewage involves treatment and disposal as under :-

(a) **Treatment of Sewage**. Treatment of sewage is brought about by the action of anaerobic and

aerobic bacteria. The different steps involved in this process are:-
(i) Screening.

(ii) Chambering.

(iii) Primary Sedimentation.

(iv) Trickling Filter.
(v) Activated Sludge Process.
(vi) Sludge Digestion.

(vii) Disposal of Effluent.

(b) **Disposal of Sewage**. The sewage is collected by the water carriage system and where no treatment facility is available can be disposed off by:-
(i) **Sea Out Fall.** The sewage is drained into the sea. This is applicable mostly for coastal cities / towns.

(ii) **River Out Fall**. The sewage is drained into the river. This is applicable mostly for cities / towns situated along the rivers or connected by drains.

(iii) **Land Treatment**. Here the sewage is allowed to drain out on the earmarked land / pits. This is mostly applicable to small villages.

(iv) **Oxidation Pond**.

CONCLUSION

17. Hygiene and Sanitation are two sides of a coin, which must be ensured together for best results. These are simple steps which, if taken regularly and correctly can be beneficial to both individuals and community as investing of time and effort in them can lead to saving of lives.