



## 12

# HOUSING

Food, shelter and clothing are our basic needs. Fulfilment of these basic needs is of utmost importance. Our primary needs are food, clothing and shelter. All animals make shelters for their young ones. Human beings call shelter a house. There are many types of houses. Your relations may be staying in a small house in a village. Radha's friend, Shanti lives in a flat and another friend, Rajni lives in a big bungalow in a city. A family starts living in a 'house' and makes it a 'home' by sharing, loving and jointly performing different household activities.



Fig. 12.1

We all need a house to live but now the question arises about its selection. This selection means what features or special qualities to look for in a house. There are many important considerations such as location, surroundings, sanitation etc. You will find answers to these and some other questions in this lesson.



## OBJECTIVES

After studying this lesson, you will be able to:

- describe the functions of a home;
- evaluate the site of your own house for the required features;
- identify different areas in the house for efficient functioning, and
- maintain hygiene inside and outside the house.

## 12.1 FUNCTIONS OF A HOME

In general the words 'Home' and 'House' are used interchangeably. But there is a difference.



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**‘House’** is physical construction made of brick, sand, cement, stone etc.



**Fig. 12.2**

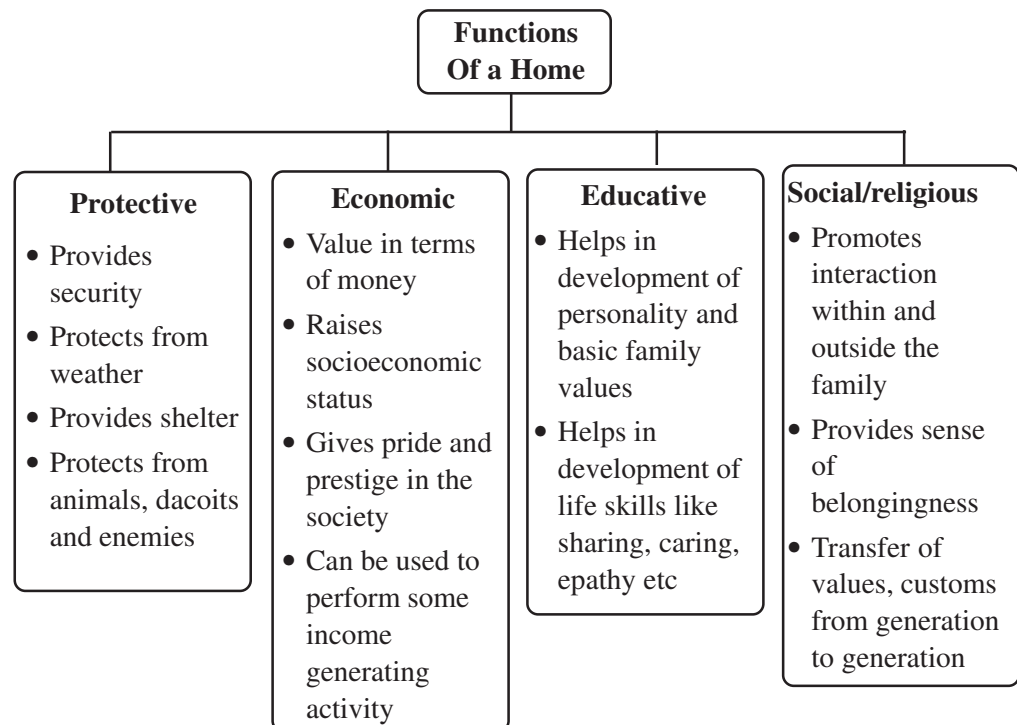
A **‘house’** becomes **‘Home’** when all the family members start living there and enjoy all the happiness, love and affection, health, ease, comfort, social and entertainment activities



**Fig. 12.3**

Now you must have understood that a home is much more than a house. A house has to be converted into a home. We all know the importance of a home. As the saying goes, “East or west home is the best”. It will therefore, be not very difficult to understand the functions of a home.

Home provides not only the shelter but also provides security and belongingness. It provides for physical and emotional needs of all the family members. For children it provides education in basic values like respect for elders, love and affection to others, health, religion, discipline and responsibility. It is a place for loving and celebrating together. Figure 12.4 lists the function of a home.



**Fig. 12.4**

## 12.2 SITE SELECTION FOR A HOUSE

Now you understand that our home meets many of our needs. Do you think that selection or construction of a house is an easy task? No, not at all. It involves a lot of money and cannot be changed often. It is important that certain points are kept in mind so that a wise decision is made.

The place where we construct a house is called a **site**. Site of your house plays an important role in its selection. Do you agree? Let us see how you can select proper site for your house.

- **Neighbourhood:** Attention must be given to the environment and the neighbourhood where the house is to be located. The house should be in the area which is developed in all aspects. A place is called a developed area when it has electricity, roads and drainage laid out. Common facilities like post office, banks, school and markets are available near by.



Fig.12.5

- **Physical features:** While selecting a site, choose a house in an open area. It should not be close to heavy traffic areas. These can affect health and activities due to air and noise pollution. Low lying areas should be avoided due to danger of flooding or water logging. An elevated site provides better view to the house.
- **Soil:** The foundation of the house should be strong for it to stand on. The foundation depends upon the type of soil. The soil should be firm till 2 to 5 feet below the surface for a strong foundation.

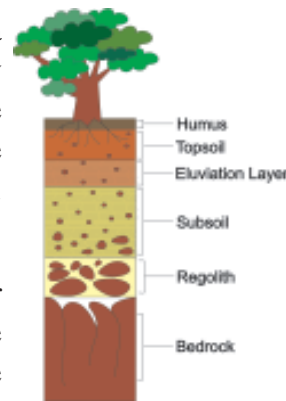


Fig.12.6

While constructing a house, it is important to consider the type of soil in a region. Loose soil creates problem for the house in later years as the house may tilt due to shifting of soil. The sandy and gravel type of soils tend to make the house hot to live in. Rocky surface is good for foundation but does not absorb water and creates problems in laying of drainage pipes.

- **Sanitary requirements:** You must have seen vacant plots filled with garbage. Such a piece of land is not recommended for construction of a house. A house built on such a plot will have uneven soil level and



Fig.12.7



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drainage problems. The site should be filled with fresh and firm soil and elevated to the level of the road outside.

**Practical convenience:** Adults living in a house have to go to their jobs and children have to go to school or college. To meet our daily needs, we need a market. To travel, transport facilities such as railway station or bus stand is required. Similarly, a family needs practical conveniences such as post office, bank and hospital nearby. These should be within reasonable walking distance of a house.



Fig. 12.8



**ACTIVITY 12.1**

**Evaluate your own house against the required features**

Required features	Existing features of your house (Yes or No)	Can you help to improve (Yes or No) If yes, give suggestions for improvement
Developed area		
Matching social and economic status		
Have open space		
Away from heavy traffic		
Elevated ground		
Proper water supply		
Electricity		
Pucca Roads		
Drainage and sewerage facility		
Proximity to banks		
Proximity to post office		
Proximity to markets.		
Proximity to hospitals		

### 12.3 AREAS IN THE HOUSE

Our home consists of different parts. An ideal home is the one that provides space for all the functions of the family. In order to understand this, we first need to know the functions or activities performed in a home. These are cooking, eating, sleeping, bathing, storing, entertaining, studying etc. To perform these multiple activities, we need adequate space. However, this is not possible for all of us. We can make the best use of the available spaces to make a house functional and be comfortable for all the occupants. Can you think of ways to carry out your household activities smoothly? Let's find out some ways and means to make a home more comfortable and functional.

**The following general points will help you:**

- First of all make a list of all the activities which take place in each room.
- Mark space for every activity.
- Try to combine the activities so that they can be carried out in a common area. For example, dining can be combined with kitchen or drawing room or study can be combined with bedroom.
- Take care not to over crowd the room with too much furniture.
- Try to use multi-purpose furniture like sofa cum bed. At night, the sofa can be pulled out and used as a bed for sleeping. The dining table can be used for studying also. Two or more boxes can be joined together and converted into a settee. These multi purpose furniture items are available in the market.
- Some pieces of furniture can be used as storage units and room dividers. For example, the drawing room can be partitioned with shelves on either side. Books can be placed on the shelf facing the living room, whereas, crockery items can be stored in the shelves on the dining room side.
- Storage can be provided in the furniture itself like bed with boxes, tables and stools with drawers etc.
- The space below the staircase can be converted into a storeroom or converted into a toilet.

Let us study the different types of rooms in a house:

#### **Living room or combined living-dining**

**room:** It is a place to entertain guests, relaxation, reading and entertainment. It should be near the entrance of the building. Sometimes in small houses, it can be combined with dining room, as it adds space and is useful for holding family functions. Furniture is arranged in such a manner that people can talk to each other comfortably.



Fig.12.9: A living Room



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Good lighting is needed for reading as well as other purposes.

**Bedrooms:** Bedrooms should be placed carefully, as we spend 1/3<sup>rd</sup> of our life in sleep and taking rest. They should offer privacy and be free from noise. Rectangular bedrooms are more convenient for accommodating beds, other furniture and storage. Preferably bedroom should be attached to bathroom or toilet. A dressing table can be provided in this room.

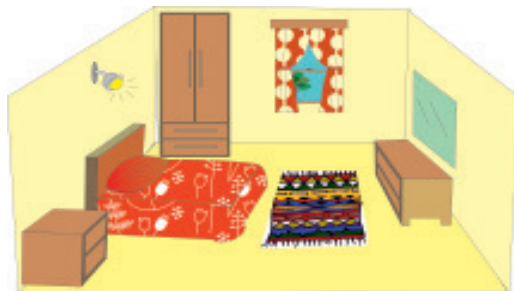


Fig.12.10: A

**Bathroom:** A combination of bathing space, water closet and wash area is referred to as a bathroom. Floor should be non slippery and easy to clean. At least one wall of a bathroom should be exposed to outside for proper light and air to avoid dampness and also to offer ventilation.



Fig.12.11: A Bathroom

**Kitchen:** Ideally kitchen should be in the east or north east direction to get direct sunlight during morning. Sunlight has disinfectant properties which kills the germs. A kitchen should have a good drainage system. For sanitation wire-mesh doors should be provided to keep away flies and mosquitoes. Sufficient lighting both during the day time and night should be ensured for doing tasks comfortably. One wall of kitchen must be on exterior side of the house for providing good light and air. Exhaust fan can be installed to take away smoke. By all means cross ventilation has to be provided here. Sufficient storage space above and below the work counter facilitates smooth functioning of the work. The kitchen should have light colours on walls which reflect maximum light. Traditionally Indian women work on the floor. However, these days standing kitchens are becoming the norm in cities.



Fig.12.12 Sitting kitchen

By carefully planning the rooms and following the above tips, our family can enjoy a comfortable house.



### ACTIVITY 12.2

You want to create space for studying in a two room house. Here one room is used mainly for sleeping and the other for entertaining guests and sitting. Present your plan giving adequate reasons. Use the following table for your answers and give reasons.

Rooms/areas	Used for any other activities	Problems faced	Your suggestions for study area
Sitting room			
Sleeping room			



### INTEXT QUESTIONS 12.1

1. Write the type of function (protective, economic, social/religious and educative) against the activities given below

	Activity	Functions
a.	Celebrating Diwali	
b.	Keeping paying guest	
c.	Caring of children and old people	
d.	Taking tuitions	
e.	Learning to respect others and be responsible	
f.	Having meals together with the family	

2. State which aspect of site selection relates to the following situation. One example is given below.

	Situation	Site features
E.g.	Open space provides children with place to play.	Physical features
a.	House in an area having proper water supply, electricity, roads and drainage facility.	



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b.	Houses built on loose soil have poor foundations.	
c.	Plots filled with garbage are unhygienic for building houses.	
d.	The child has to start very early for school.	
e.	The elevated soil with slopes drains away water soon.	
f.	House in a quiet area.	

**3. Match the column A and column B. Write the correct number of response ( i, ii, etc) from column B. In the Answer box against its match.**

	Column A		Column B	Answer
a.	Ideal home	i	Entertainment	
b.	Small rooms	ii	Privacy	
c.	Drawing room	iii	Exhaust fan	
d.	Bathroom	iv	Provides space for all the functions	
		v	Multipurpose furniture	

**4. You want to make your room look more spacious. Given below are two options in one set. Choose the one which is the most suitable.**

- Heavy furniture or Light furniture
- Single use furniture or Multi use furniture
- Combine kitchen and dining room or Kitchen and sitting room
- Light colours on walls or Dark colours on walls

## 12.4 MAINTAINING HYGIENE INSIDE AND OUTSIDE THE HOUSE

Observe your home for the following aspects

Does it get proper sunlight? Is it well ventilated? Is it kept clean, both in and around? Is it exposed to loud noise? Does the area have proper drainage, sewerage and garbage management system?

Let us examine the aspects which are important in maintaining hygiene for a healthy living. Three aspects need special care. These are:

- Light



- Ventilation
- Sanitation

Let us discuss each one of these in detail.

### 12.4.1 Light

Proper lighting is important to perform various activities in the house. It also enhances the beauty of the house, particularly during the evening hours. Every house has two types of lighting:

- Natural Lighting:** The light that we receive from natural sources i.e. the sun.
- Artificial Lighting:** The light that we receive from artificial sources such as tube light, bulbs.

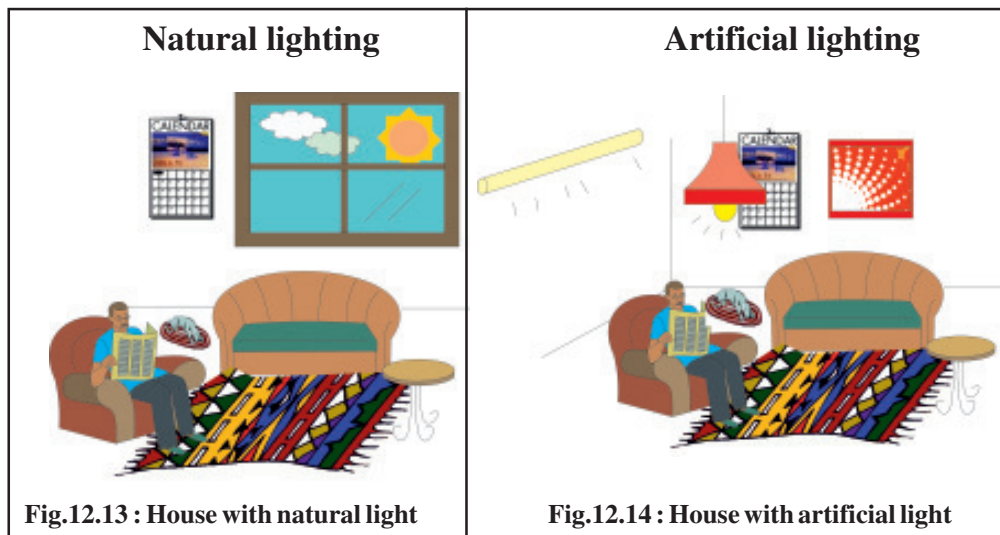


Fig.12.13 : House with natural light

Fig.12.14 : House with artificial light

When you check the lighting in your home, you must make sure that most of the rooms get some sunlight during the day. Can you say why? The answer to this question lies in your science lessons. Sunlight is important for all the rooms but more specially for kitchen and bathrooms where water is used frequently. If sunlight does not enter into these areas they will remain dark and damp. It will encourage the entry of mosquitoes and cockroaches. It is not very hygienic to stay in such a house. This increases the chances of infections and fungal diseases. You must have observed that even plants when placed in a darkroom soon lose their luster, droop and wither.

Sometimes it is not possible to have natural light in each and every corner of the house. So we use artificial light. In the evening, we need artificial lighting. When artificial light has to be used, make sure that it is not too strong and that it falls on the work that you are doing and not on your eyes. The glare from the light falling directly on your eyes will make it difficult for you to see. Your eyes may also ache and start watering. You should be careful that for studying, there should be proper lighting, otherwise, your eyes will get tired soon.





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### 12.4.2 Ventilation

You know that houses have doors, windows, ventilators and exhaust fans. These are made to allow fresh air inside the house and remove stale air. Fresh air is essential for healthy living. This is the reason why we must ensure that the house that we live in has proper ventilation. It can be done through natural or artificial sources.

*Ventilation means to circulate fresh air and driving out foul air in order to freshen up the interiors of a house.*

Windows of the rooms should be kept open. Even in winters, when it is very cold, at least one window of the room should be kept open so that fresh air circulates freely. The air circulation in rooms should be sufficient to remove smoke, bad smells, moisture and fumes that offend and also control cold drafts in winter. Cross ventilation is desirable and can be achieved by placing windows on two different sides of the house or by having door and window across from each other in a room.

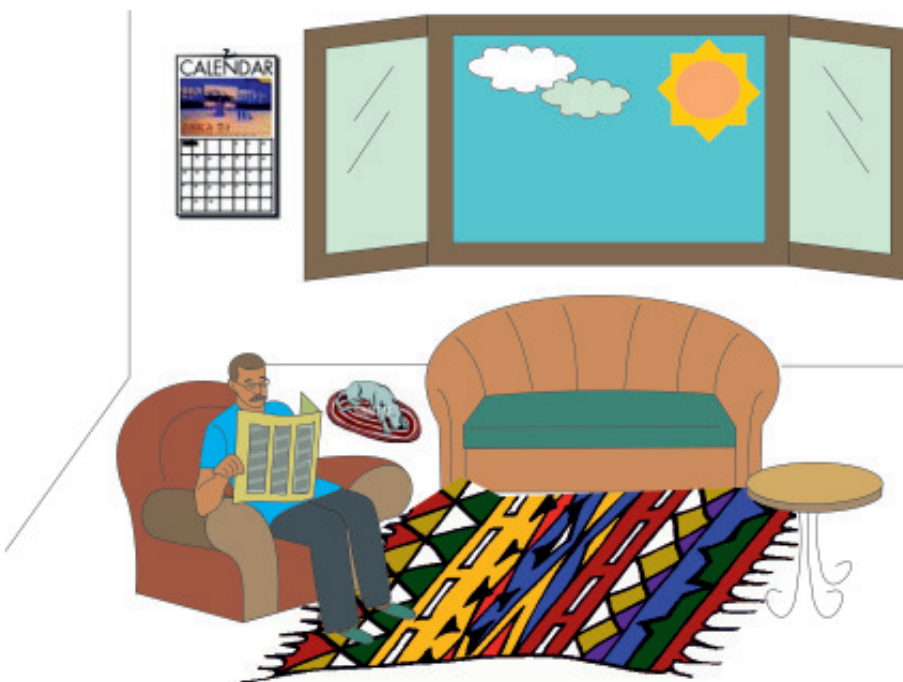


Fig.12.15

You must remember that the openings at the floor level help to bring in fresh air and the openings near the ceilings drive out stale air.

### 12.4.3 Sanitation:

Can you say why it is important to keep our homes and surroundings clean? Clean surroundings keep insects and germs away from us. In order to prevent the spread



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of diseases and to keep our environment healthy there are many activities which are to be performed and many facilities which are to be created for maintaining sanitation. The most important ones are:

- maintaining cleanliness,
- removal of garbage and
- disposal of excreta.

Let us discuss each one of these in detail.

### (a) Maintaining cleanliness:

Dust is a great enemy of our health, as most of the diseases are spread by it. Cleaning is basic to maintaining hygiene but it is a heavy household task compared to others. It involves physical labour and a lot of time has to be spent in keeping the house clean and comfortable for the family. Encourage your family members to place items at their respective places to maintain cleanliness.

Cleaning is of many types. You must have observed your house being cleaned everyday. The store is cleaned only weekly or may be monthly. The entire house is thoroughly cleaned only before Diwali or some major festival or special occasion like a marriage in the family or a birth celebration. So we can say that cleaning is a daily, weekly and seasonal activity.

### Types of cleaning

Let us find out about the types of cleaning and the activities to be performed under these.

#### Daily cleaning

- Sweeping and mopping of floors
- Dusting surfaces
- Cleaning of rugs and carpets
- Making beds in the morning
- Tidying up objects in every room



Fig.12.16

#### Weekly cleaning

- Thorough cleaning of different surface areas and materials like bathrooms, toilets and wash basins
- Removing cobwebs
- Cleaning shelves of kitchens



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- Cleaning door handles and other fittings
- Polishing the wooden surfaces and other areas
- Cleaning mirrors and pictures

**Spring or seasonal cleaning**

- Airing mattresses, cushions, pillow, rugs and carpets in sunlight
- Washing curtains
- Thorough cleaning of rooms after removing all furniture
- Cleaning the store room
- Cleaning and polishing of the wood work and getting any repairs done



Fig.12.17

**General points to be considered for cleaning rooms**

- Thorough knowledge of the methods of cleaning go a long way in simplifying heavy work.
- One way to keep a house clean is to prevent dirt getting into the house by using special pair of footwear for indoor use and foot mats. It prevents outside dirt getting into the house.
- Fine wire mesh door and windows block entry of dust and insects.
- In daily cleaning : start from inner most part of the house and move towards cleaning outward areas. All beds should be made before starting cleaning. Open doors and windows to allow fresh air to enter. Sweep the rooms with a soft broom. Sweeping should be followed by dusting of furniture. Brush carpets or rugs. Finish by mopping floors. A disinfectant like phenyl may be added to the water for mopping the floor.

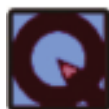
Ensure regular cleaning using proper methods to simplify work at home and work place to save time and energy

**Cleaning of different surfaces and materials:**  
 The house has different surfaces like walls, mirrors, pictures, tiles, toilet floors. There are many items to be cleaned such as plastic mugs, buckets and metal objects. In order to clean these, different materials are required.



Notes

Surfaces	Materials required
Floors	Broom, brushes, soap or detergent, water, kerosene oil, lime and phenyl
Ceramic tiles, kitchen and bathroom tiles	Soap or detergent, commercial tile cleaners, vinegar, mild hydrochloric acid
Plastic mug, buckets, chairs, taps	Luke warm soap or detergent solution, scrubber, vinegar, kerosene ( Avoid hard cleaners) and soda
Glass/mirror windows glass/mirror	Moist newspaper pad, vinegar and commercial glass cleaner
Metal taps, brass taps	Lemon, vinegar, tamarind, hot soapy water and salt
Wood surfaces	Soft cloth, sponge wrung out of a mild soap solution and vinegar



### INTEXT QUESTIONS 12.2

- Given below in the box is a jumbled list of activities related to cleaning. Place each under the category of daily, weekly or seasonal.

Dusting, cleaning before Diwali, sweeping of floor, removing cobwebs, polishing of furniture, cleaning of metal objects, making beds, washing curtains, cleaning bathrooms, cleaning of tiles in toilets, cleaning of stores, cleaning carpets with a brush, tidying up rooms, cleaning drains, mopping of floor, cleaning of washbasins.

Daily activities	Weekly activities	Seasonal activities

- (b) **Removal of garbage:** The garbage from the house, dust collected through sweeping and waste materials like fruit and vegetable peels from the kitchen should be put in a covered dust bin. This dust bin should be emptied into a packet everyday and this packet of waste should be disposed off in the public garbage bin in the street. This method of waste disposal works very effectively and is sanitary too. Household waste generally has two kinds of waste



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material. Kitchen waste that is vegetables and fruit peels are bio-degradable and other household waste like polythene bags and plastic bottles are non-bio degradable. These should be segregated and disposed off separately. In rural areas, a pit should be dug for disposal of bio-degradable household garbage. It should be covered with soil. After some time, the garbage will turn into manure which can be used in the kitchen garden.



Fig.12.18

- (c) **Disposal of waste water:** There is generally a fair amount of waste water generated from our home. Waste water from the bathroom, washing place and kitchen should be led by a drainage pipe to a kitchen garden or a soakage pit. We should never let waste water stagnate near the house. There are some localities where drainage system has not been provided. This is also true in rural areas. Therefore, soakage pits are the best alternative for disposing off waste water.
- (d) **Disposal of Human excreta – sanitary latrines:** Hygienic disposal of human waste is necessary to prevent spreading of diseases. It is important that all people use proper latrines. Otherwise, diseases would spread through flies sitting on food, drinking polluted water, eating contaminated raw fruits and vegetables. Germs can enter our body even when we walk barefoot.

Let us look now at some of the ways of safe disposal of human excreta.

- a. **Water Closet:** In a majority of large towns, human excreta is removed through the water carriage system. In this, along with the household waste water, the faeces and urine are carried away by a flush of water through a system of drains and sewers. A water closet is a sanitary installation for reception of the human excreta. It is connected to a sewer through a pipe.



Fig.12.19: A water closet with a raised seat



Fig.12.20: A squatting pan water closet

Water closet system is the most sanitary method for removal of human excreta

### Soakage Pit

- These are very important for areas where there is no drainage system.
- They are cheap and easy to construct.
- A suitable soakage pit is about 2 metres deep, 1 meter wide and long enough to deal with the household waste water. The average length is 2-3 meters.
- Fill one third of the pit with coarse stones, preferably over burnt bricks of  $\frac{3}{4}$  size. The middle portion is filled with small stones and pebbles and the upper most portion with sand.
- The soakage pit may be covered with earth and grass.
- The waste water from the house is led through a drainage pipe to the soakage pit. The waste gradually percolates and soaks away into the ground from the pit.
- Soakage pits should not be constructed near a well. Can you think why? Yes, the water in the well may get contaminated.

However, this system does not work unless there is plenty of water for the purpose. Also, it is expensive to construct.

As a result, in most of the villages and many of the towns in India, we find that the closets and sewerage system are not there. In such circumstances, pit latrines or the bore latrines may be constructed.

- b. Septic tanks:** As you know, sewerage system is the ideal solution for the disposal of human and other wastes, but it costs too much. It requires a lot of water. Septic tank is another alternative. These can be seen in semi urban areas or localities where sewerage system has still not been laid. This method basically involves constructions of concrete tank or pits. Household drains are connected to these pits.

You must have observed the logo of “Sulabh Shauchalaya”. These toilets are based upon the principle of septic tanks.

### Advantages of septic tanks

- Hygienic
- Low cost and easy to construct than the water closet system
- Does not pollute surface or ground water
- Free from foul smell



Notes



## Notes

- Maintenance is easy and cost low
  - Needs only 1.5 to 2 liters of water for flushing as compared to 13-14 lit. of water in a conventional flush toilet
  - Does not require cleaning of pits
  - The sludge from the pits is a good manure
  - Gases are dispersed into the soil
  - Eliminates mosquitoes, insects and fly breeding
- c. **Pit latrine:** A pit is dug to receive human excreta. The pit should be more than 3 metres deep. This is to prevent flies from sitting on it as flies rarely live in holes as deep as this. The soil should be sandy and allow the liquid portion of the excreta to drain away. Otherwise, the pit will fill up quickly. Water should be added daily to help the faeces to flow down and get decomposed. This is ideal only in case of temporary use for few days.

There can be a concrete platform around the opening of the hole and raised foot stands. The opening of the hole should be covered with a lid. This will discourage flies attracted by smell and also prevent foul smell from spreading but this system is not very hygienic as it allows the discharge to pollute the ground water.



## ACTIVITY 12.3

1. Identify the type of waste disposal method your family uses in your home (Covered bins or uncovered bins). Now analyse the problems faced by you with existing waste disposal method for solid waste inside and outside your home. Now collect the following information:
  - a. Inside home
    - i. How is waste collected?
    - ii. How often are the bins cleaned?
    - iii. Is there a foul smell from the waste?
    - iv. Are the drains blocked?
  - b. Outside home
    - i. Is there a heap of waste or garbage in the street?
    - ii. Is there foul smell from waste spreads?
    - iii. Are animals gathering around the waste?
    - iv. Do drains get blocked?





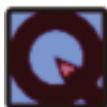
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- v. How far are the municipality garbage bins located?
- vi. Is the number of bins adequate to the amount of garbage generated?
- vii. How often are the garbage bins emptied?
- viii. Are the garbage bins covered?

2. Discuss with friends of locality or in the study centre the following:

How satisfactory is the disposal of waste inside and outside the house? What can be done and how to sort out the problems/ improve the present status?

Individual level	Community level	Panchayat/ MCD level



### INTEXT QUESTIONS 12.3

1. State whether the statements given below are true or false.
  - a. Sunlight acts as a mild disinfectant
  - b. Indoor plants turn yellow when placed in brightly lit rooms.
  - c. People living in dark and dingy rooms are more prone to falling sick.
  - d. Circulation of air removes stale air and brings in fresh air.
  - e. ventilators provide light and fresh air in rooms.
2. Why is cross ventilation important for maintaining a healthy environment inside the house? Suggest ways to ensure cross ventilation in a house.
3. Tick mark ( $\surd$ ) the most appropriate answer:
  - a. Soakage pits provide a hygienic method for the disposal of \_\_\_\_\_.
    - i. garbage
    - ii. waste water
    - iii. human excreta
    - iv. all of these
  - b. Disposal of human excreta through water carriage system is generally not found in rural areas because it \_\_\_\_\_.
    - i. requires plenty of water

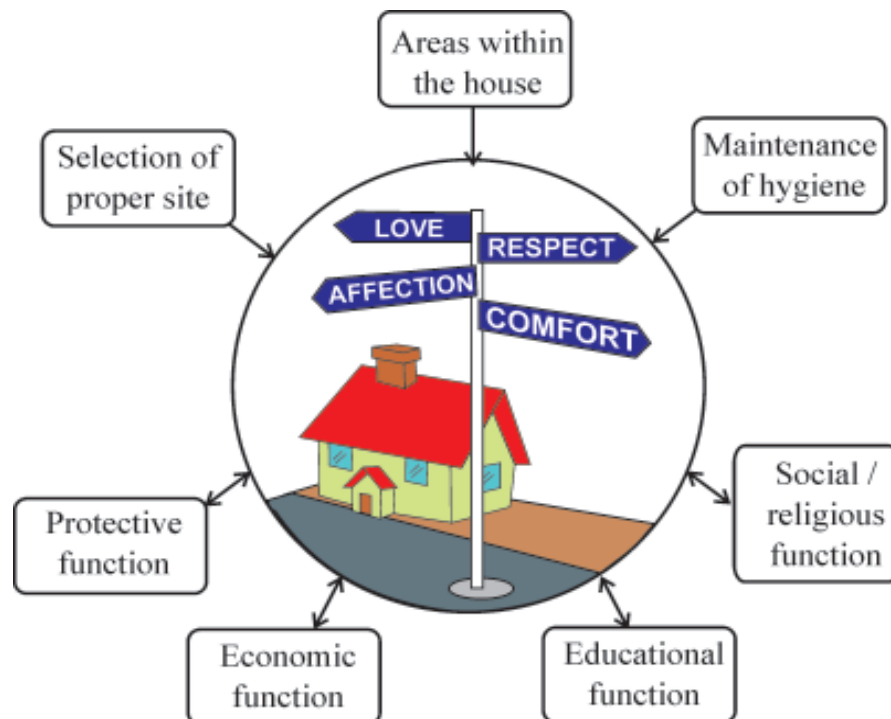


**Notes**

- ii. is expensive to construct
  - iii. requires a common system of removal
  - iv. all the above
- c. The purpose of ventilation is \_\_\_\_\_.
- i. to give ample light
  - ii. to circulate the fresh air
  - iii. to bring in ample light and air
  - iv. none of these
- d. The ideal method of disposal of human excreta at community level is \_\_\_\_\_.
- i. water closet
  - ii. pit latrine
  - iii. septic tank
  - iv. any of these
- e. An ideal method of garbage disposal in a village is construction of a \_\_\_\_\_.
- i. garbage pit
  - ii. placement of garbage bins
  - iii. throwing garbage on the sides of sheets
  - iv. none of the above



**WHAT YOU HAVE LEARNT**





### TERMINAL EXERCISE

1. State any three functions performed by your home.
2. State any four important points to be considered while selecting a house and tell why you consider these important.
3. Name two sources of lighting in the house and state why each one is important.
4. State any three advantages of ventilation.
5. What are the effects of poor lighting on your health?
6. Which method do you suggest is ideal for the disposal of human excreta and waste water and why?
7. Name two cleaning agents you will use to clean window glass panes?
8. Suggest two ways you will adopt to make a one room house appear spacious.
9. Write any three essential planning tips for designing a good kitchen.
10. List any four activities which are performed in a kitchen.
11. Think of the situation given below and answer the questions.

The festival of Diwali is approaching and your mother is not keeping well. You want to help your mother in cleaning and decorating your home for the festival.

- a. List the activities that need to be performed for cleaning and decorating your home.
- b. Sequence these activities in an order.
- c. Assign specific activities and tasks to different family members. What criteria will you keep in mind while doing this?



### ANSWER TO INTEXT QUESTIONS

#### 12.1

1.
  - a. Religious
  - b. Economic
  - c. Protective
  - d. Economic
  - e. Social
  - f. Social



Notes



**Notes**

2.
  - a. Neighbourhood
  - b. Soil conditions
  - c. Sanitary requirements
  - d. Practical convenience
  - e. Physical features
  - f. Practical convenience
3.
  - iv a.
  - v b.
  - i c.
  - i d.
4. Refer to the text.

**12.2**

1.

Daily activities	Weekly activities	Seasonal activities
Dusting	Removing cobwebs	Cleaning before Diwali
Sweeping	Cleaning of metal objects	Washing curtains
Making beds	Cleaning of toilet tiles	Cleaning of store
Cleaning bathroom	Cleaning of washbasin	
Tidying up rooms	Polishing furniture	
Cleaning carpets with brush		
Cleaning drains		

**12.3**

1.
  - a. True
  - b. False
  - c. True
  - d. True
  - e. True
2. It provides good circulation of air in the room.
  - Cross ventilation is possible when a window opens on to each of two different sides of the house and direct flow of air can take place between the two openings.
  - By placement of door and windows across from each other.
3.
  - a. i
  - b. ii
  - c. ii
  - d. i
  - e. i