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Prototype Action-oriented  
School Health Curriculum  
for Primary Schools

# Teacher's Resource Book



Units 10-12

**TEACHER'S RESOURCE BOOK**

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for Primary Schools

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UNITED NATIONS CHILDREN'S FUND  
MIDDLE EAST AND NORTH AFRICA REGIONAL OFFICE



WORLD HEALTH ORGANIZATION  
REGIONAL OFFICE FOR THE EASTERN MEDITERRANEAN

Alexandria

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Ministries of Education and Health of WHO EMR Member States were sent the first draft of the prototype curriculum material; many sent in their useful comments. The draft was also reviewed by the Institutes of Education and Child Health, of the University of London, Centre of Education Development of Sudan, Health Science Centre of the University of Colorado in the United States, and the International Child Health Department of Paediatrics, University Hospitals in Uppsala, Sweden.

Special thanks are due to Dr David Morley, who pioneered the CHILD-to-child programme and chaired the EMRO workshop on the subject, and to Mr David Werner, whose books **Where There's no Doctor**, and **Helping Health Workers Learn** have provided very practical guidance as well as inspiration for primary health workers everywhere.

Apart from individuals mentioned in the text, acknowledgement is due to the work done by Mr Isam Ahmed Hassoun, former Under-Secretary of Education of Sudan, and Dr Kamal Islam, public health specialist and Assistant Director of CARE in Bangladesh, who conducted the situation analysis, compiled the material and prepared the first draft; and Mr Jack C.S. Ling, Visiting Professor of Communication, University of Southwestern Louisiana and former Director of Information and Education for both WHO and UNICEF, who was editor and leader of the working group that finalized the prototype curriculum.

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Health Education Department of Kuring-gai College in Australia and Chairman of the School Health Education Committee of the International Union of Health Education.

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## FOREWORD

Efforts towards achieving Health For All (HFA) by the Year 2000 will hopefully move a step further by the publication of this Prototype Action-Oriented School Health Education Curriculum. It is the first fruit of a joint WHO-UNICEF regional plan to promote health education in the schools of Member States.

It is hoped that this Prototype will provide the base on which each country can build its own programmes which are well-planned and sequentially developed to suit the age, developmental level and needs of pupils in both urban and rural schools. Careful needs assessment will be a key factor in the preparation of such programmes.

Establishment of key centres for initial training of teachers for this field as well as ongoing in-service programmes will be essential, as will the provision of culturally, socially and geographically appropriate teaching and learning resources.

A great deal of work has been put into developing the Prototype Curriculum. Comments on the first draft coming from different quarters, including education development institutes, government ministries in the Region, and technical units of WHO, have been incorporated into this text.

Acceptance, use and programme development will require further efforts by Member States. The Eastern Mediterranean Regional Office (EMRO) of WHO and the Middle East and North Africa Office (MENA) of UNICEF are both committed to this endeavour, which aims at educating and preparing children for a healthy way of life and a productive role as citizens of tomorrow.



Richard Reid  
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## INTRODUCTION

The Action-Oriented School Health Education Project has produced a Prototype Curriculum comprising a **Teacher's Guide**, a **Teacher's Resource Book**, and a set of **National Guidelines** for the implementation of the project. The **Guide** and the **Resource Book**, as prototype material, are no more than trial models, and they are to be read and treated as such.

It is quite obvious that this **Teacher's Resource Book** is by no means comprehensive. Indeed, some will find that a number of essential subjects are either missing altogether or inadequately handled; others will find some of the material totally irrelevant to their needs. Also, certain subjects, by their very nature, would have to be dealt with by specialists in the areas concerned, and, therefore, only brief outlines are included in the anticipation of a more substantive input being made by experts who could place them within the appropriate social and cultural context.

As trial models, both the **Guide** and this **Resource Book** are meant to arouse interest and provoke reaction, so that other curricula, more in line with national needs and circumstances, can be developed. If the subjects dealt with in the **Book** prove useful stimuli for further addition, adaptation, modification and revision, the purpose of the exercise will have been served.

It should be noted that the **Book** is intended for teachers in charge of health topics in primary schools for children aged 6 – 13. It is to be used in conjunction with the **Guide**, which describes the approaches and methods recommended for conducting health learning for pupils in primary grades.

The **Book** contains 22 units. Each unit is divided into topics and each topic, in turn, is supported by proposed activities. Where a topic proves too long, it is divided into subtopics before breaking it down into learning activities. Each learning activity is accompanied by corresponding suggestions as to the grade level, at which it can be taught, and the specific subject, in which it can be incorporated.

Resource material for each topic or set of learning activities has been provided. Much of this material is derived, with minor adjustments, from sources referred to in the text.

One of the main objectives of the **Book** is to assist teachers to initiate activities that will bring about a shift from emphasis on instruction to emphasis on providing pupils with learning opportunities and experience, i.e. making the educational process action-oriented and, therefore, more experiential.

Many of the details and information given (e.g. on pit latrines, snake bites, night blindness, etc.) are primarily addressed to teachers in rural areas. Rural schools outnumber urban ones in many parts of the region; they have their special needs, but very limited resources and facilities. Being far removed from professional medical help, the teacher often needs to perform the tasks of a primary health care worker.

It cannot be overemphasized, however, that each country is expected to select and adapt topics and learning activities appropriate to its needs; indeed, there will be variations within a country or even within a province or district. It is hoped that the country will integrate the topics and activities into subjects currently taught in its schools, and in accordance with its requirements. Although an ideal approach would be for health education to be treated as a separate subject, or to be provided under the coordination of one teacher with a background in science; yet, realities indicate that resources for education are such that integration of the health issues into existing academic subjects would have to be the actual approach employed.

**Some of the material in the book is addressed to the teacher and is not to be presented to school children directly.**

It is further hoped that this material will assist the teacher to provide practical advice and help to pupils and other members of the community, with a view to involving them in activities that can improve their health and the health of the community.

## HOW TO USE THE TEACHER'S RESOURCE BOOK

Select a topic under the unit you want to teach.

### **Identifying learning activities**

Once the topic is selected you may refer to the relevant section and read the major activities listed under the topic. There are activities the pupils are expected to perform. You may like to modify, or suggest, an activity, or introduce a new one more appropriate to your situation.

### **Deciding on the grade to which the activity can be taught, and the subject into which it can be integrated.**

Suggestions are made regarding the grade or grades, at which each activity can be taught, and the subject into which it can be integrated. It is important that local circumstances be taken into consideration when deciding on these two points.

### **Reference material**

Under each topic and each set of learning activities appears the relevant reference material in brackets. It is important to read the entire section indicated before embarking on the activities.

### **Application**

Finally, these guidelines apply where the same teacher teaches all subjects to the same class. Where different teachers alternate in teaching the same class, it is imperative that the Resource Book be first processed by those in charge of developing primary school curricula.



**SECTION C**  
**COMMUNITY HEALTH**





**UNIT 10. PUBLIC CLEANLINESS (SANITATION)**

- 10.1. OUR NEIGHBOURHOOD – MAKING IT BETTER
- 10.2. MAKING A SOAK PIT
- 10.3. REFUSE DISPOSAL
- 10.4. CONTROL OF VECTORS IN THE VILLAGE
  - 10.4.1. CONTROL OF FLIES
  - 10.4.2. CONTROL OF LICE
  - 10.4.3. CONTROL OF MOSQUITOES
  - 10.4.4. CONTROL OF BEDBUGS
  - 10.4.5. CONTROL OF COCKROACHES
  - 10.4.6. CONTROL OF RATS



UNIT 10 : PUBLIC CLEANLINESS (SANITATION)

TOPIC	LEARNING ACTIVITIES AND REFERENCE TO RESOURCE MATERIAL	SUBJECT	GRADE
<p>10.1. Our neighbourhood – making it better</p> <p><b>Learning activities:</b></p> <ul style="list-style-type: none"> <li>- Draw and Label a map of the local community depicting things that affect pupils' health: e.g. house, school, market, stream, roads, health centre, etc.</li> <li>- Draw maps of home or school showing general conditions of the environment.</li> <li>- Identify areas on the map which are bad for pupils' health.</li> <li>- Demonstrate areas on the map which are good for maintaining personal cleanliness or public cleanliness.</li> <li>- Participate in daily/weekly cleaning of the school environment including the classroom.</li> <li>- Participate in monthly/quarterly cleaning of the neighbourhood.</li> </ul> <p><b>Resource material:</b></p> <p>Our neighbourhood: Making it better (10.1)</p>	<p>Geography</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p>	<p>2 – 6</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p>	
<p>10.2. Making a soak pit</p> <p><b>Learning activities:</b></p> <ul style="list-style-type: none"> <li>- Describe a soak pit and state its function.</li> <li>- Justify why having a soak pit in school and at home is advantageous.</li> <li>- List the materials necessary for making a soak pit.</li> <li>- Participate with other teachers and students in making a soak pit school.</li> <li>- Participate with parents in making a soak pit at home.</li> </ul> <p><b>Resource material:</b></p> <p>Making a soak pit (10.2)</p>	<p>Physical education</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p>	<p>5 – 6</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p>	

UNIT 10. (Cont.): PUBLIC CLEANLINESS (SANITATION)

TOPIC	LEARNING ACTIVITIES AND REFERENCE TO RESOURCE MATERIAL	SUBJECT	GRADE
<p><b>10.3. Refuse disposal</b>  <b>Learning activities:</b></p>	<ul style="list-style-type: none"> <li>- State the reasons why indiscriminate disposal of refuse is not good for health.</li> <li>- Describe two ways to safely dispose of refuse in school or at home.</li> <li>- Explain how compost pits are made.</li> <li>- List materials required to make compost.</li> <li>- Participate in making one compost pit at school or at home with other pupils, teachers or parents.</li> <li>- Utilize metal bins with lids to dispose of solid waste materials at school or at home.</li> </ul>	<p>Rural Education</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p>	<p>4-6</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p> <p>1-3</p>
<p><b>Resource material:</b></p>	<p>Refuse disposal (10.3)</p>		
<p><b>10.4. Control of vectors in the village</b>  <b>Learning activities:</b></p>	<ul style="list-style-type: none"> <li>- List at least five insects or animals that are responsible for spreading diseases.</li> <li>- Draw three of the insects/animals.</li> </ul>	<p>Art</p> <p>»</p>	<p>4-6</p> <p>»</p>
<p><b>Resource material:</b></p>	<p>Control of vectors in the village (10.4.)</p>		

UNIT 10. (Cont.): PUBLIC CLEANLINESS (SANITATION)

TOPIC	LEARNING ACTIVITIES AND REFERENCE TO RESOURCE MATERIAL	SUBJECT	GRADE
<p><b>Control of flies</b></p> <p><b>Learning activities:</b></p> <ul style="list-style-type: none"> <li>- Explain five ways by which flies harm us.</li> <li>- List five ways to protect ourselves from flies around the house.</li> <li>- Decide on five interventions which the pupils can make in the house to control flies.</li> <li>- Participate in activities to control flies around the house and in the community.</li> <li>- Make one fly swatter using local material.</li> <li>- Deposit flies (dead) every day in the class.</li> </ul> <p><b>Resource material:</b></p> <p>Control of flies (10.4.1.)</p>	<p>Science/Hygiene, Home Econ.</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p>	<p>4 – 6</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p>	
<p><b>10.4.2. Control of lice</b></p> <p><b>Learning activities:</b></p> <ul style="list-style-type: none"> <li>- State three ways to control spread of lice</li> <li>- Demonstrate one method for getting head lice out of the hair.</li> <li>- Participate with pupils and family members in activities related to control of head lice and disposing of them.</li> </ul> <p><b>Resource material:</b></p> <p>Control of lice (10.4.2.)</p>	<p>Science/Hygiene, Home Econ.</p> <p>»</p> <p>»</p>	<p>4 – 6</p> <p>»</p> <p>»</p>	

## UNIT 10. (Cont.): PUBLIC CLEANLINESS (SANITATION)

TOPIC	LEARNING ACTIVITIES AND REFERENCE TO RESOURCE MATERIAL	SUBJECT	GRADE
<b>Learning activities:</b>	<ul style="list-style-type: none"> <li>- State why mosquitoes are harmful.</li> <li>- Describe what protective measures can be taken to protect ourselves from mosquitoes in the house.</li> <li>- Identify mosquito breeding places in the school or around the house or community.</li> <li>- Organize efforts and destroy mosquito breeding places in and around the school and at home.</li> <li>- Participate with other community members and school authorities in mosquito control activities.</li> </ul>	Science/Hygiene, Home Econ. » » » »	4-6 » » » »
<b>Resource material:</b>	Control of mosquitoes (10.4.3.)		
<b>Learning activities:</b>	<ul style="list-style-type: none"> <li>- List the hiding places of bedbugs.</li> <li>- Describe why bedbugs are harmful.</li> <li>- Explain to parents the methods of controlling bedbugs within the house.</li> <li>- Participate in activities related to control of bedbugs.</li> </ul>	Science/Hygiene, Home Econ. » » »	4-6 » » »
<b>Resource material:</b>	Control of bedbugs (10.4.4.)		

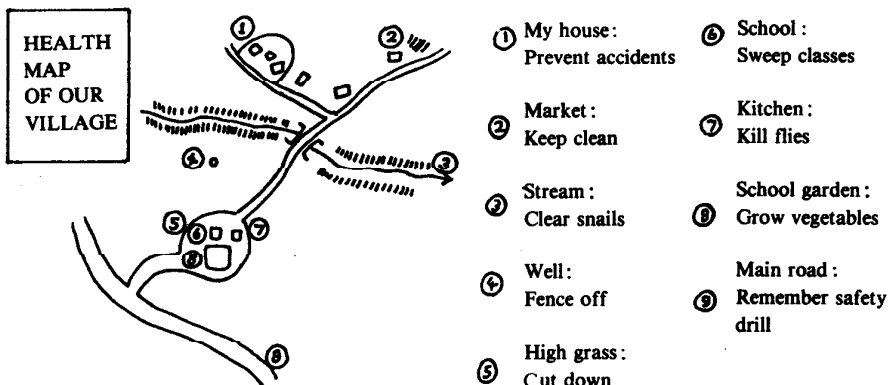
UNIT 10. (Cont.): PUBLIC CLEANLINESS (SANITATION)

TOPIC	LEARNING ACTIVITIES AND REFERENCE TO RESOURCE MATERIAL	SUBJECT	GRADE
<p><b>10.4.5. Control of cockroaches</b></p> <p><b>Learning activities:</b></p>	<ul style="list-style-type: none"> <li>- List the hiding places of cockroaches.</li> <li>- State three ways by which cockroaches harm us.</li> <li>- Suggest five ways by which we can prevent cockroaches.</li> <li>- List ways of controlling cockroaches at home.</li> <li>- <b>Participate</b> with parents in activities leading to control of cockroaches.</li> </ul>	<p>Science/Hygiene, Home Econ.</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p>	<p>4-6</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p>
<p><b>Resource material:</b></p>	<p>Control of cockroaches (10.4.5.)</p>		
<p><b>10.4.6. Control of rats</b></p> <p><b>Learning activities:</b></p>	<ul style="list-style-type: none"> <li>- List the hiding places of rats both inside and outside houses.</li> <li>- <b>Explain</b> why rats are harmful.</li> <li>- <b>Identify</b> activities that will protect our houses from being infested with rats.</li> <li>- <b>Participate</b> in selective activities related to control of rats at home and in the community.</li> </ul>	<p>Science/Hygiene, Home Econ.</p> <p>»</p> <p>»</p> <p>»</p>	<p>4-6</p> <p>»</p> <p>»</p> <p>»</p>
<p><b>Resource material:</b></p>	<p>Control of rats (10.4.6.)</p>		





## 10.1. OUR NEIGHBOURHOOD – MAKING IT BETTER



### The idea

A community can become healthier:

- when the people in it UNDERSTAND better what their problems are and how they are caused;
- when the people COMMUNICATE with one another and discuss what they can do to make their lives better;
- when they ACT to improve community health.

Children are important members of the community, and this activity is designed to help them play a part in improving their neighbourhood. The activity is designed to:

- encourage pupils to find out ALL the factors which help or hinder children from growing up healthy;
- encourage them to think about how the community can help its children;
- lead older pupils to think about actions they themselves can take to improve matters;
- help pupils find ways they can use to pass on these ideas to younger children.

Who could introduce the activity to children?

You could introduce the activity during health, science or other suitable lessons on the timetable, or during/after school programmes such as Young Farmers' Club.

YOUTH BRIGADE LEADERS, HEALTH WORKERS and other people who work with children could introduce the activity.

COMMUNITY DEVELOPMENT OFFICERS could introduce the activity as part of a larger programme of working in the community.

### The activity

#### MAPPING THE COMMUNITY

Children could map their local community. This could be done using copies of maps already prepared, or children could make their own maps. Children first need to discuss what should be shown on the map to help them to decide what could be done to make their community a better place in which to grow up. Children could identify:

- areas where animals and insects that spread diseases live;
- areas where accidents could easily happen to young children;
- areas where people spread diseases.

In some schools and with younger children it will be difficult to make a map of the neighbourhood; instead they can make a plan or a picture map of:

- their homes;
- the school;
- the way to school.

Parents will like to look at these on Open Days.

#### OPEN DAY – CHILDREN'S WORK

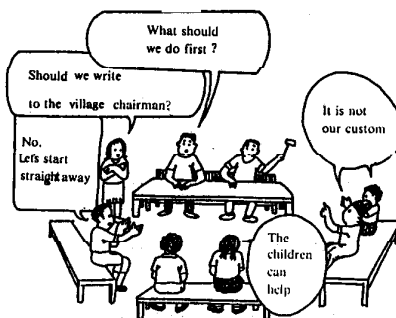


#### Deciding what can be done

Children could look at their map and talk about what they have found. They need time to discuss what can be done and by whom. The children may decide that action should be taken by different groups within the community.

CHILDREN THEMSELVES could tell other children in the school about their work. Children could try to make their school a healthier place. They could clear insect breeding places. They could talk with their parents about how improvements were made in the community in the past. Children could talk with teachers about what the school could do if teachers and pupils worked together.

THE COMMUNITY could help itself through community action. Children could find out what types of action are possible. The community may also have to tell government officials about their needs. Role play and drama can help children to understand how communities make decisions, e.g. children assume roles such as council members, policemen, health aides, agricultural officers, farmers, elders and young teachers. The children could hold a council meeting to discuss village health problems.



A 'council' meeting

LOCAL GOVERNMENT OFFICIALS may be able to help. Children should find out how they can do so.

CENTRAL GOVERNMENT may also be able to help. Children should discuss how they could find out what government plans are for their community.

**Spreading ideas to others**

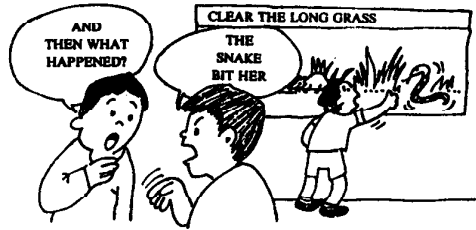
Children need to discuss:

- who they should pass ideas on to;
- how they should pass on their ideas, and how they can help YOUNGER CHILDREN understand and help.

**CHILD-to-child action**

- children could spread ideas to their friends and families.
- children could spread ideas through organized groups such as boy scouts and youth brigades.
- children could spread the ideas to younger children in school and at home.
- children could organize action campaigns and games, such as "Find the mosquito larvae", "Fly catching", "A clean school compound".

With encouragement many activities are possible. Not only will children understand better and become more aware, but older and younger children will learn to communicate better. Some of the communication activities in which older children could become involved are:



- reading books or writing cards for younger children;
- drawing posters and helping younger ones to talk about them;
- designing health games to play with smaller children;
- making plays and puppet shows for younger children;
- organizing small children into teams to compete in cleaning up activities.

#### **Who needs to be involved?**

Whoever introduces the activity, parents may have to be informed.

Head teachers need to be involved if the activity is introduced in school. If children are to see its value, the school must demonstrate its interest and support. The headmaster should make time available for the survey.

Teachers of higher and lower classes will need to cooperate so that older and younger children can work together.

The local health worker needs to be involved in as many of the activities as possible.

#### **Finding out how well the activity worked**

Children could compare their maps with maps made during previous years to spot changes.

You could observe whether, as a result of the activity, children make better use of maps in geography lessons, whether they show more knowledge of life cycles, hygiene, water-borne diseases, and so on, in their science lessons.

You could talk with the children after examinations to find out if the activity helped them to answer questions appropriately in the examination.

School and Community education workers could periodically assist the community in identifying any discernible changes as a result of the activity.

Curriculum workers can analyse the results of public examinations to observe children's performance on items related to the activity.

**Source:** CHILD-to-child Programme, op. cit.

## 10.2. MAKING A SOAK PIT

### What is a soak pit?

A soak pit is a place to pour waste water. A hole is dug in the ground and filled with loose stones and gravel. It is made so water will seep quickly through the stones and run into the earth. When water is scarce, you may wish to use waste water for the garden, instead of pouring it into the soak pit.

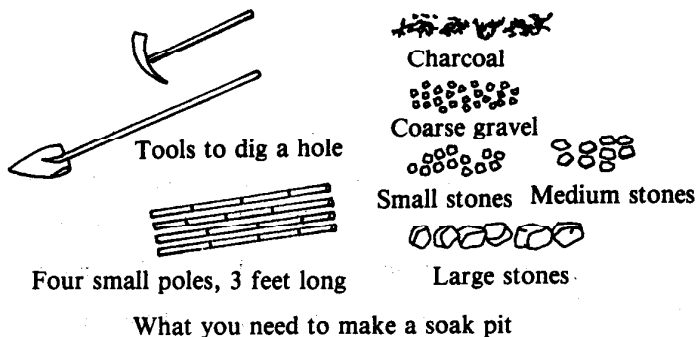
### Why make a soak pit?

When waste water is thrown out on the hard ground, it collects in little puddles. It may stand for days before it dries up or soaks in. This makes a muddy place where mosquitoes like to lay their eggs. Mosquitoes cause sickness.

### Where should a soak pit be located?

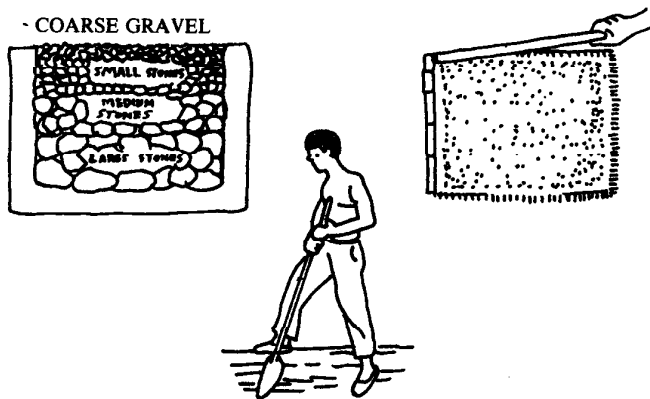
You can place a dish-washing table or a laundry bench over a soak pit. Or you may build a soak pit under the tap where pupils drink water at school.

Place soak pits near where you wash dishes, take baths, and wash clothes. This will make it easier for you to pour waste water in them. Do not place soak pits near a spring or well.



### How to make a soak pit?

- Step 1 : Dig a hole three feet deep, three feet long, and three feet wide. If you strike a big rock so that you cannot move before you reach three feet deep, fill up the hole and choose another place.
- Step 2 : Place a layer of the largest stones in the bottom of the hole so they touch each other but do not overlap.
- Step 3 : Then place two or three layers of the medium stones on top of the large stones.
- Step 4 : Add small stones to almost fill the pit.
- Step 5 : Spread a layer of the smallest stones or coarse gravel on top. If you have charcoal, a last layer of charcoal will help to make the top smooth. Smooth the top so that the centre is a little lower than the edges.
- Step 6 : Dig a small, shallow trench on all four sides of the pit, for the poles.
- Step 7 : Lay the poles in the trench and pack the soil around to make them firm. Leave the poles a little above the soil to make a rim around the pit. This rim will help to keep water from running off.



### Is one soak pit enough?

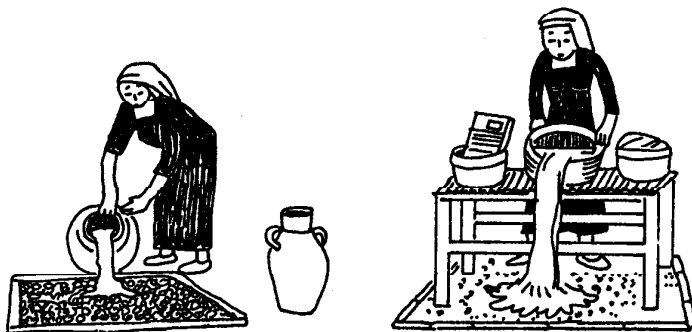
A. Some families may need more than one soak pit.

Most of the waste water round the house comes from washing dishes, cleaning and scrubbing, washing hands, taking baths and washing clothes.

How many soak pits will you need to catch all this waste water?

This will depend on how close together the places where you do the jobs are.

You may need two or more – one away from the house for the bath house and where you wash clothes, and one near the house to catch the waste water from dish-washing and cleaning.



B. Schools may need to build a series of soak pits if the water source is other than piped water supply and without any permanent drainage system.



### **How to keep a soak pit clean?**

Do not throw peelings, waste food, or anything but water on top of the pit. These things will block it up so the water will not soak in. When grease collects on top, lightly scrape it off. Keep the top of the soak pit clean.



### **How to get people to make soak pits?**

To get families to make soak pits:

A. Find places where stones and gravel are available.



B. Get village families interested by talking to them about waste water – what they do with it and why waste water should not be poured out on the ground around the house.

### 10.3. REFUSE DISPOSAL

Refuse, or solid waste, is produced by man wherever he lives, works, or happens to be.

The indiscriminate disposal of refuse:

- is unsightly;
- produces offensive smells;
- attracts insects and vermin – particularly flies, cockroaches, and rats;
- may be involved in the spread of disease;
- may cause fires;
- may cause pollution of air, water, or food.

The amount and type of refuse produced varies greatly from one community to another, and so does the means of getting rid of it. A family living by themselves farming their own land produce relatively little refuse. The little that they do produce should be got rid of by burning or by burying. When people live together in villages, and particularly in towns, more refuse is produced and it becomes a greater health problem unless it is properly stored, collected, and disposed of.

#### **Types of refuse**

##### DOMESTIC REFUSE

This usually consists of bits of food left over, or the skins, husks, and shells of potatoes, maize, and coconuts; waste paper, including wrapping and newspapers; worn-out clothing and shoes; and broken vessels and utensils such as cooking and water pots, bottles, tins, etc.

##### STREET REFUSE

This consists mainly of paper and food dropped by the public, and commercial refuse around markets, hotels, and other public places. Abandoned wrecks of cars are also found.

##### REFUSE DISPOSAL IN RURAL AREAS

This is seldom a problem for individual houses because little refuse is produced. What is produced should be put in a pit or burnt so as to keep the area around the house clean.

Shops and eating houses, and especially markets, produce more refuse, however. You can mobilize the support of the village committee and arrange for the refuse to be collected and got rid of regularly, especially after market days. Any of the simple methods described below may be used.

1. Crude dumping. This is an unsanitary method of disposal and though commonly used it should be discouraged for the reasons given at the beginning of this section.
2. Controlled tipping. This means depositing refuse into depressions or large holes in the ground. These should be situated at least half a kilometre away from the settlement, preferably out of sight and down-wind. They should be dry or properly drained. After each day's refuse has been deposited, it should be covered with a firm layer of earth.

3. Incineration (burning). This may be done in a variety of ways, some of which are much better than others. Simple 'open-air' burning is not very effective. Rubbish waiting to be burned harbours vermin and gets blown about.



An incinerator.

4. Composting. This is a cheap and convenient method of disposing of refuse which should be used more often.

NATURAL FERTILIZERS.



Compost Pile

### Making a compost pit

Compost is a mixture of animal wastes, garbage, and plant materials. You can use compost to enrich the soil for gardening and farming. You can make compost in different ways. Most of these ways involve the same process of allowing the wastes, garbage, and plant materials to decay and form a rich mixture called humus. One method, a compost pit, is very useful for a small garden. Common materials such as

kitchen scraps, rich garden soil, fresh vegetation, fresh cut weeds or grass, and animal wastes are arranged in a small pit dug in the ground. The pit protects the compost from the sun and wind. Contact a rural sanitation or health inspector in your area. He will be able to tell you the best method to follow. Or, follow these steps to make a compost pit:

- (a) Get these tools and materials:  
Shovel  
Pitchfork or metal rake  
Watering can, bucket, or hose



- (b) Decide where to make the pit. Locate the compost pit in a small area at least ten metres from the house. It should be at least five metres and downhill from any water source.

- (c) Dig a hole 750 mm wide, 1.5 metres long, and about one metre deep.



- (d) Loosen the ground so there is about 10 mm of loose soil at the bottom of the pit.

- (e) Throw grass, weeds, leaves, or wastes from the kitchen on top of the loose soil. You can also throw animal wastes into the pit. When this material is about 250 mm deep, add another 10 mm layer of soil.

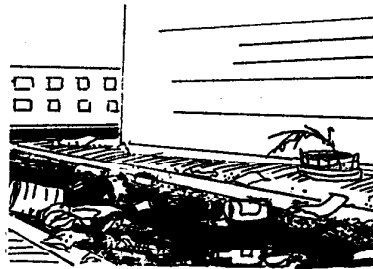
Add the soil quickly after you place the plant materials and kitchen scraps in the pit. The soil contains organisms that speed up the decaying process. Also, the soil layer controls the smell and prevents flies from laying eggs in the compost.



- ( f ) Water the pit after you add each layer. Keep the compost pit moist, but do not soak it. A compost pit needs the proper mixture of air, soil, nutrients, organisms and water. Too little water or too much water will slow down the decaying process.
- ( g ) Make the layers loose. Do not pack them down. Movement of air in the pit speeds up the decaying process.
- ( h ) Turn the contents of the compost pit every two months in the summer and every three months in the winter. Turning the contents rearranges the materials in the pit and ensures that any disease-causing organisms are killed by the heat in the centre of the pile.
- ( i ) Cover the pit with soil when it fills up. Mark the location of the compost pit.  
You can use the contents of the compost pit for fertilizer after six months.

**Refuse disposal in towns**

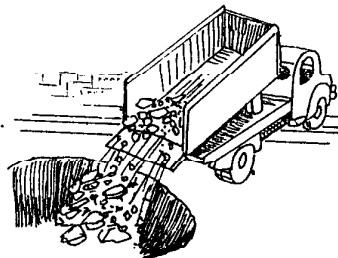
This is much more of a problem. The proper arrangements for storage, collection, and disposal of refuse are expensive. The health department, or sometimes the town engineer's department, may be responsible for refuse disposal but they do not usually have enough money to do the job properly.



Refuse should be stored in proper containers—plastic or metal bins with lids, or polythene bags. There should be enough of them to store the refuse until it is collected. Where many bins are used, as in blocks of flats, they should, if possible, be kept together on a concrete stand under cover and where dogs and cats cannot upset them.



Collection must be arranged regularly, using either hand carts, tractors and trailers, or more expensive special trucks. Regular cleaning and maintenance of the containers is just as important. Disposal is most often done by controlled tipping outside the town. In practice



these tips are seldom controlled adequately and often cause smells and fires. It is very important that they should be as far away from houses as possible. Large-scale tips may be used for reclaiming land for future use such as playing fields. Other methods such as incineration or dumping out at sea may also be used.

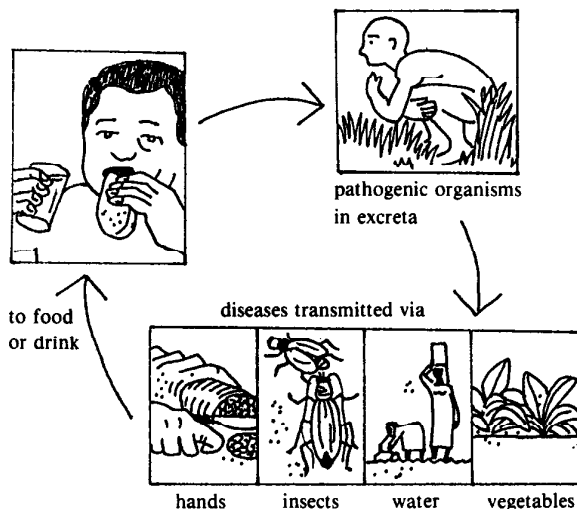
**Source:**

1. Community Health by C.H. Wood, J.P. Vaughan, H. de Glanville (AMRF).
2. Community Health, Medex Series No. 31.
3. Where there is no doctor, op. cit.

**Excreta Disposal**

The hygienic disposal of excreta is important because the infective organisms for many diseases leave the body in the faeces and some in the urine. (Excreta are faeces and urine; sewage is excreta + water + anything else people put down the drains.) Faecal organisms may infect people directly, or sometimes after an intermediate stage, which may be either free-living or in an intermediate host. The following diseases can all be spread from faeces: bacillary and amoebic dysentery, the typhoid fevers, cholera, poliomyelitis, infective hepatitis A, food poisoning, schistosomiasis (intestinal), and all the intestinal worms. Urine carries the infective ova of urinary bilharzia. (For more details about germs and infection see Unit 3.)

All animals and humans produce excreta and when many people are living together it becomes very important to dispose of their excreta safely. This is because excreta (faeces) can be the sources of so much sickness in the community by contaminating water, insects, hands and vegetables.



## Infection From Ingestion of Food or Drink Contaminated with Faeces

Many people in rural areas still defaecate in the bush. To improve sanitation it is necessary both to provide simple facilities which are cheap and easily made by any family, and also to help people understand the importance of using them. There are many local customs and taboos that make this difficult. You as a teacher together with the local health workers must find out what these are in order to be able to change them gradually.

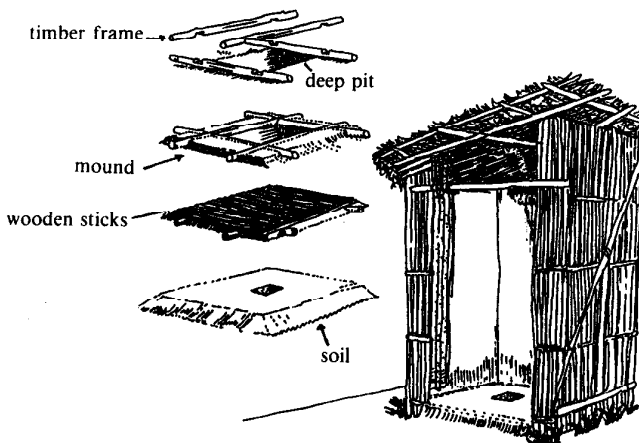
The most important method of excreta disposal in rural areas is the pit latrine, and all health workers should know how to construct a simple latrine and be able to teach people why they are important. In towns, toilets are often the best method of excreta disposal. The construction of these is more complicated and expensive and can only be done by experienced workers.

Pupils can help by carrying the message home to their families, as well as by participating in the construction of latrines where they are needed.

### Pit latrines

A pit latrine consists of a hole in the ground, a plate for squatting over or standing on when defaecating or urinating, and a hut to give privacy and protection from the weather. The main purpose of the latrine is to deposit faeces where they are kept away from flies (and feet and fingers).

Build latrines (out-houses, toilets) so dogs and other animals cannot reach the human waste. A deep hole with a little house over it works well. A cheap simple plan for designing the covering of the hole is provided below. This form of traditional pit latrine is commonly used in many developing countries. Foot rests may be added.



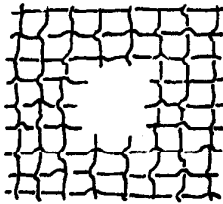
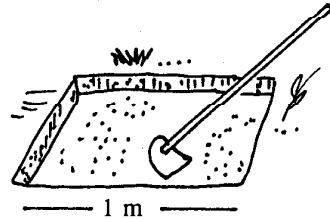
## Better latrines

The latrine or out-house shown on the previous page is very simple and costs almost nothing to make, and is more suited to household than school, but it is open at the top and lets in flies.

Closed latrines are better because the flies stay out and the smell stays in. A closed latrine has a platform or slab with a hole in it and a lid over the hole. The slab can be made of wood or cement. Cement is better because the slab fits more tightly and will not rot.

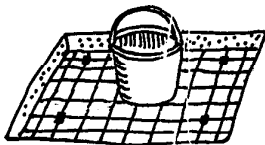
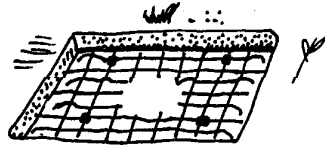
One way to make a cement slab:

1. Dig a shallow pit, about one metre square and 7 cm deep. Be sure the bottom of the pit is level and smooth.



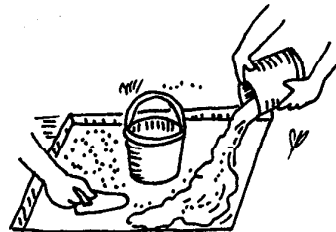
2. Make or cut a wire mesh or grid one metre square. The wires can be 1/4 to one cm thick and about 10 cm apart. Cut a hole about 25 cm across in the middle of the grid.

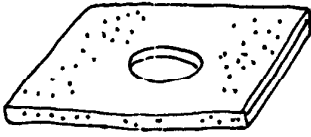
3. Put the grid in the pit. Bend the ends of the wires, or put a small stone at each corner, so that the grid stands about 3 cm off the ground.



4. Put an old bucket in the hole in the grid.

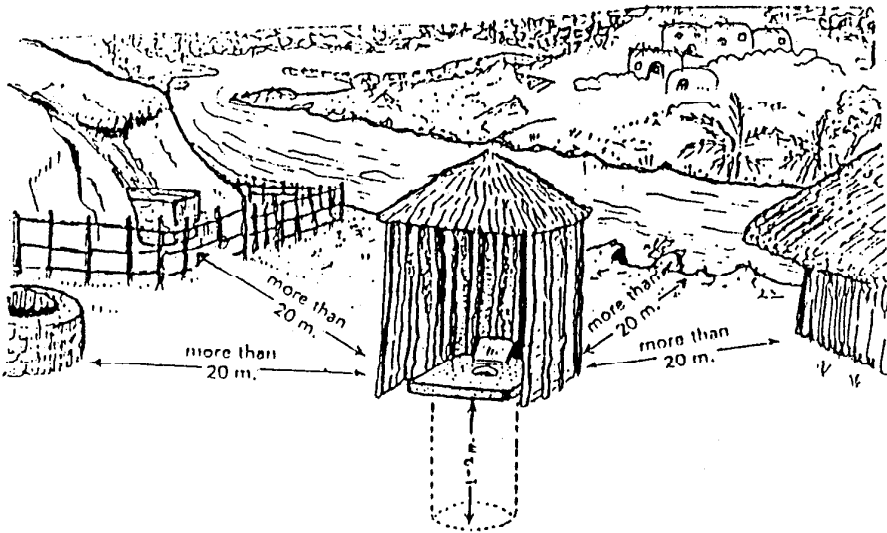
5. Mix cement with sand, gravel and water and pour it until it is about 5 cm thick. (With each shovel of cement mix 2 shovels of sand and 3 shovels of gravel.)





6. Remove the bucket when the cement is beginning to get hard (about 3 hours). Then cover the cement with damp cloths, sand, hay, or a sheet of plastic and keep it wet. Remove slab after 3 days.

To make the closed latrine, the slab be placed over a round hole in the ground. Dig the hole a little less than 1 metre across and between 1 and 2 metres deep.

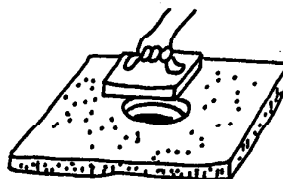


To be safe, the latrine should be at least 20 metres from all houses, wells, springs, rivers, or streams. If it is anywhere near where people go for water, be sure to put the latrine downstream.

Keep your latrine clean. Wash the slab often. Teach children and others not to get it dirty.

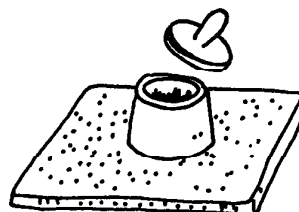


Be sure the hole in the slab has a cover and that the cover is kept in place. A simple cover can be made of wood.



If you prefer to sit when you use the latrine, you can make a cement seat like this:

You will have to make a mould or you can use two buckets of different sizes, one inside the other.



#### **Advantages of pit latrines in rural areas**

1. Most villages in the country have a lot of space and good soil for the digging of pit latrines.
2. Pit latrines are cheap to construct.
3. They do not need much special knowledge to construct. Local people need just a simple explanation and a little supervision.
4. The materials for construction can easily be obtained locally.
5. Pit latrines do not need a piped water supply.
6. When properly made and used they are clean and produce minimum nuisance.
7. Pit latrines are easy to use and faecal matter is completely disposed of at the same time.
8. A pit latrine when full can easily be covered over and abandoned and another one made without incurring much expense.
9. A filled and covered pit fertilizes the soil, and plants like bananas grow very well over it.

#### **Source:**

1. Community Health by C.H. Wood, J.P. Vaughan, H. de Glanville.
2. Where there is no doctor – By David Werner, op.cit.
3. Sanitation Without Water – Winblad et al (1978).

#### **10.4. CONTROL OF VECTORS IN THE VILLAGE**

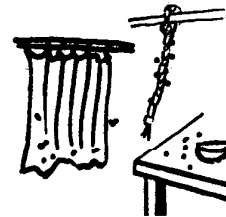
There are a number of insects and animals responsible for spreading some of the common diseases of rural areas. In addition to protecting water supplies and improving refuse and excreta disposal, food hygiene and housing, it is useful to

consider what can be done to control the vectors themselves. There are sometimes large national and international programmes for the control of vectors. Their description is beyond the scope of this resource book. However, there are also some steps which individuals may take themselves, or better still, together with their neighbours or the village community, which can greatly reduce the health hazards involved. It must be emphasized that the most effective control measure is basic sanitation, and that the use of chemicals and insecticides, especially by children, can be dangerous.

#### 10.4.1. CONTROL OF FLIES

##### Behaviour

- Flies are active in daylight and artificial light.
- They avoid wind and draughts.
- They rest on edges and rough surfaces.
- They buzz with their wings.



##### Why are flies harmful?

- Flies live in filth: in faeces, garbage and dead animals.
- Flies land on dirty things.
- Germs are carried on flies' feet.
- Flies land on food and dishes, and people eat the germs with their food.
- Flies eat organisms in faeces, garbage and meat.
- Flies leave droppings on food and people eat the droppings with their food.
- Fly droppings contain organisms that cause diseases.



##### To Control Flies in the House

- Keep stored food in covered containers or plastic bags.
- Cover prepared food with plastic (wrap or bag), metal or glass.
- Bury human waste and animal dung.

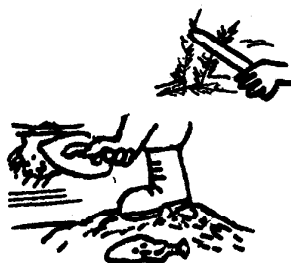


- Cover latrine (outhouse, toilet) and garbage containers.
- Clean and dry food surfaces tables and other surfaces.
- Kill flies with fly swatters and put dead flies in garbage containers.



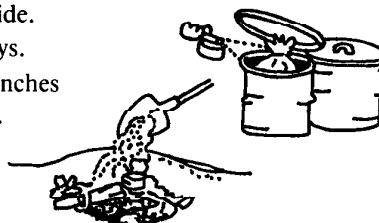
#### To Control Flies Around the House

- Clean areas where animals eat and live.
- Screen windows and doors with wire netting.
- Patch up all holes in ceilings, walls and floors.
- Hang strings soaked in insecticide, or flypaper.
- Bury dead animals and step hard on the earth.
- Cut down weeds near the house.



#### To Control Flies in the Community

- Keep garbage containers covered.
- Spray garbage containers with insecticide.
- Collect garbage at least every three days.
- Cover landfill (garbage) with 6 inches (15 cm) of compacted earth or burn it.



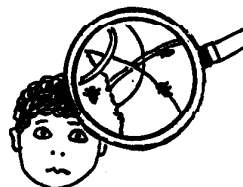
### 10.4.2. CONTROL OF LICE

#### Behaviour

Where do head lice live?

- On the head, in the hair.
- Mostly behind ears and on back of head.

Head lice suck blood five times a day.

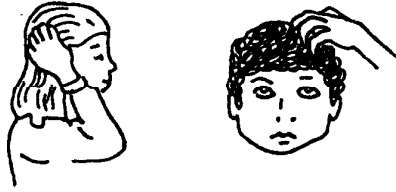


How do you know you have them?

- Scalp itches.
- Eggs on hair near scalp.

Why are head lice harmful?

- They bite people.
- Bites cause itching.
- Scratching can cause infections.



To get head lice out of hair

- Squash eggs (nits) and adults.
- Use comb with teeth close together
- Wash hair with:
  - 10-minute insecticide.
  - 8-hour insecticide.
  - 24-hour insecticide.



How to use insecticide

Procedure to wash hair:

- Shampoo and dry hair.
- Add emulsion.
- Leave on insecticide for time required.
- Shampoo hair again.
- Dry hair.
- Comb hair to remove dead lice adults and loosened eggs.

Repeat the procedure in 8 to 10 days if needed.

- Shaving hair can be an easy and most practical method, especially in rural areas.



How to control spread of lice?

- Do not share a comb, hair brush or cap with anyone.
- Treat hair daily with emulsion and shampoo.
- Wash hair brush, comb, and cap daily until lice are gone.

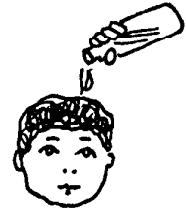


### Different Head Louse Treatments

1. Wash the head thoroughly; then apply a mixture of equal parts of Kerosene oil and olive oil; apply at night, the head being well oiled and wrapped with a towel or close-fitting bonnet. Next morning wash with soap and warm water; then treat the head with vinegar or 10% acetic acid which will loosen the "nits" or eggs; comb thoroughly with a fine comb; repeat on 2 or 3 successive nights.

**Material needed:**

- 1/2 ounce of Kerosene
- 1/2 ounce of olive oil
- soap or shampoo
- vinegar or 10% acetic acid

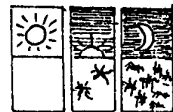


2. Wash the head thoroughly; soak a large towel in 10% tincture of larkspur (Delphinium) and wrap around head like a turban; allow to remain for 6 to 8 hours or overnight. Remove towel and wash the head thoroughly with soap and warm water. Repeat the treatment if necessary.

**Material needed:**

- 10% tincture of larkspur (delphinium)
- soap or shampoo
- vinegar or 10% acetic acid.

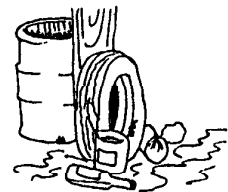
3. Seat the patient in such a way that the hair falls into a deep basin. Pour the solution, same as above, over the hair so that it falls into the basin and rub it well into the hair and head, particularly about the nape of the neck and back of the ears; continue this for at least 10 minutes; drain the hair carefully but do not wring out; wrap the head with a flannel cloth or thick towel and leave for an hour. Then remove the wrapping and allow the hair to dry.



### 10.4.3. CONTROL OF MOSQUITOES

#### Behaviour

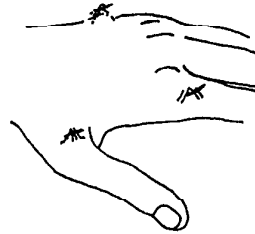
- Adult mosquitoes are active at night.
- They rest during the day in and around the house.
- They bite people and animals anywhere.
- They lay their eggs in quiet waters:



In bottles, tin cans.  
 Rain barrels.  
 Ponds and lakes.  
 Puddles and gutters.  
 Water with sewage in it.

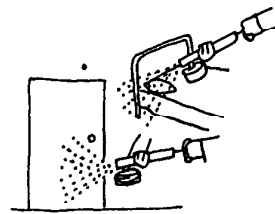
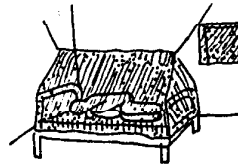
Why are mosquitoes harmful?

- They bite and make skin itch.
- They carry organisms that cause disease (e.g. malaria, encephalitis and filariasis).



**To Control Mosquitoes in the House**

- Cover water storage with netting or wood.
- Use netting or screens:
  - Over windows
  - Over beds and especially cribs
- Apply insect repellent:
  - On clothing and bed sheets
  - Around doors and windows
  - In dark corners
- Use yellow light.



**To Control Mosquitoes around the House**

Prevent standing water:

- Cut open cans at both ends and crush.
- Turn over pans and trays.
- Fill in tree stump holes.
- Cut up tyres and turn over.
- Drain all pipes, water collecting barrels and flat roofs.
- Bury all litter, bottles and jars.



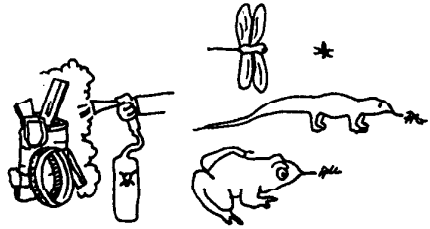
## To Control Mosquitoes in the Community

Use biological control:

- Dragonfly larvae eat mosquito eggs, wigglers and tumbler.
- Toads and frogs eat adult mosquitoes.
- Lizards eat adult mosquitoes.

Select chemical control:

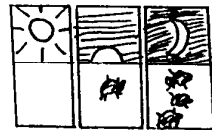
- Spray trash and garbage with chemicals.
- Clean drainage ditches.
- Fill in holes that collect water.



### 10.4.4. CONTROL OF BED BUGS

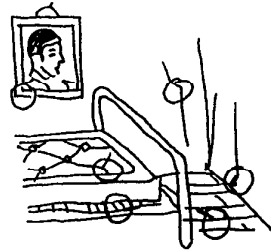
#### Behaviour

- Bed bugs hide during the day.
- They feed on blood at night.
- Some feed on people.
- Some feed on animals.



Where do they hide?

- In cracks in the wall.
- Behind baseboards.
- In springs of a bed.
- On the edge of a mattress.
- Under wallpaper and pictures.



How do we know we have bed bugs?

- They leave blood spots.
- They have an unpleasant smell.



Why worry about bed bugs?

- Bites cause small, hard, white swellings.
- Swelling can cause itching, heat, redness and pain.
- Scratching can cause infections.
- They may be carriers of diseases.



## To Control Bed Bugs in the House

Reduce hiding places:

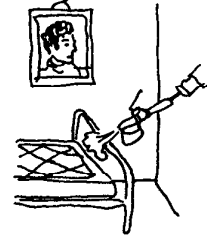
- Use paint instead of wallpaper.
- Plug cracks and crevices, their hiding places.
- Make all walls, ceiling and floors smooth.



## Methods to Control them

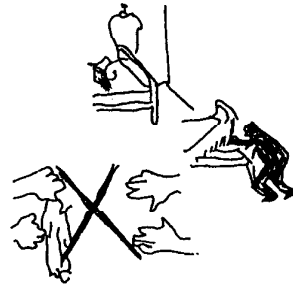
Select approved insecticides:

- Spray household surfaces.
- Residual insecticides for bedding, slats, mattresses, wooden furniture and fixtures and cracks and crevices in walls and flooring.
- Non-residual insecticides for infant bedding and cribs.
- Air and dry treated bedding or mattresses before re-using.



## Household maintenance

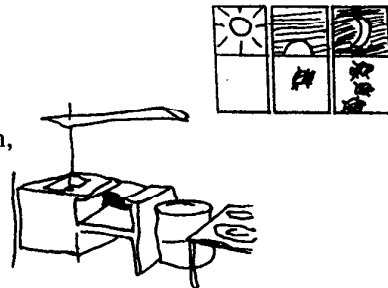
- Keep bedding and clothing clean.
- Hang up clothing. Do not pile clothing onto the bed or floor.
- Do not share clothing with other persons.
- Make frequent checks to see if they have returned.



## 10.4.5. CONTROL OF COCKROACHES

### Behaviour

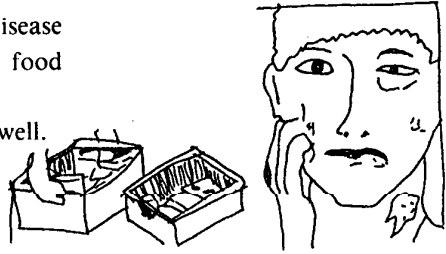
- They are active at night.
- They hide during the day in the kitchen, furniture and almost everywhere.
- They like small, dark and damp spaces.
- They fit into very narrow spaces.
- Cockroaches live in groups.





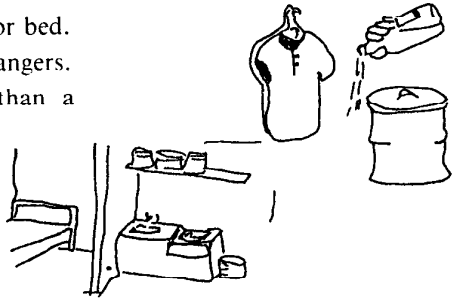
### Why are cockroaches harmful?

- They can carry organisms that cause disease (plague, typhoid fever, leprosy, and food poisoning).
- They can make skin itch and eyelids swell.
- They can spoil food.



### To Maintain Order in the Home

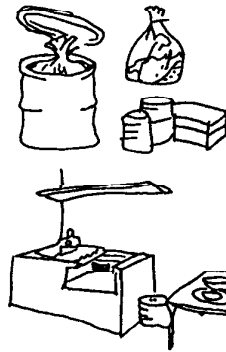
- Avoid piles of clothing on the floor or bed.
- Hang up clothing on nails, pegs or hangers.
- Plug all holes and cracks bigger than a thumb.
- Keep rubbish bins tightly covered.
- Avoid standing water and dampness.
- Wash empty soda bottles.



### To Control Cockroaches

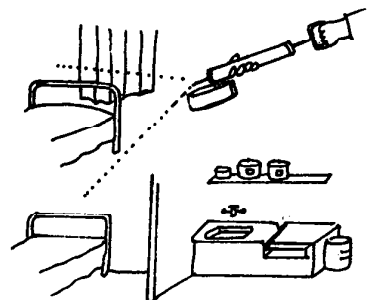
Protect food supplies:

- Cover or put all foods in refrigerator.
- Keep stored food in glass or metal containers or plastic bags.
- Cover prepared food with plastic (wrap or bag), metal or glass lids.
- Wrap garbage in plastic and store in durable cans.
- Do not use open containers, paper bags or boxes.



### To Control with Insecticides

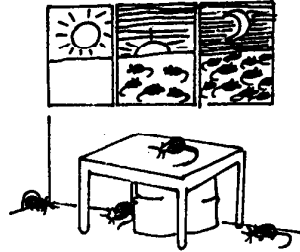
- In food areas, spray in cracks and crevices.
- In non-food areas, spray or brush around door and window casings, closets, storage areas, opening around pipes, and entries from outdoors.
- Place bait traps away from people and household animals.



## 10.4.6. CONTROL OF RATS

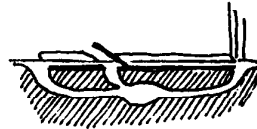
### Behaviour

- Rats sleep during the day.
- They come out at dusk.
- Rats eat anything.
- Rats like garbage.
- Rats like to hide.
- Rats burrow, jump, climb and swim.
- Rats bite through wood, concrete and soft metal.



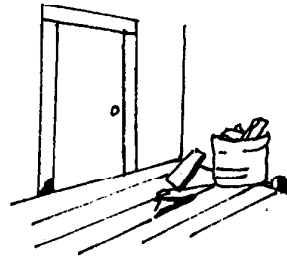
Rats live in nests:

- In burrows in the ground.
- Near water-drains, streams and sewers.
- In the garbage.
- Under the house.
- Between house walls and floor spaces.



What are nests made of?

- Twigs, grass, garbage, food and newspapers.



Why are rats harmful?

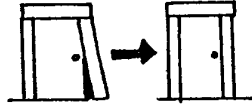
- Rats carry diseases.
- They bite people.
- They leave their droppings and urine on food, on cooking tools and tables.
- Fleas and lice live in rat fur; they also bite people.
- Rats damage houses and furniture.
- They eat people's food.



### To Control Rats In and Around the House:

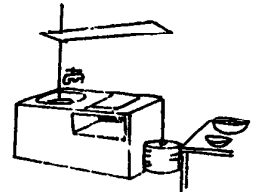
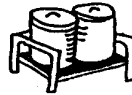
Get rid of hiding places:

- Cut off tree branches and tall weeds.
- Plug all holes and cracks bigger than a thumb.
- Make windows and doors fit securely.



### Control Rats by Maintaining Good Sanitation

- Store food in glass or pottery jars, metal cans or bins.
- Store garbage in heavy metal garbage cans with fitted lids.
- Build a platform for garbage cans 18 inches (45 cm) above ground.
- Collect garbage and refuse often.



### To Control Rats by Laying a Trap

Bait a trap with:

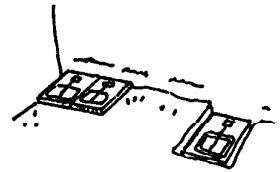
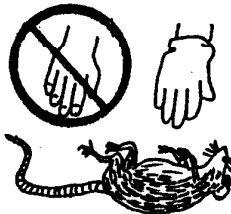
- Peanut butter, meat, fish or grains.

Place baited trap away from children:

- On runways and near droppings.
- Near food sources.

To empty a trap:

- Never touch a dead rat.
- Wear rubber gloves.
- Wrap rat in plastic, before burial.



Trapping Tips:

- Use two traps together.
- Enlarge trigger.

**Hide Trap:**

- Sink trap in ground.
- Bury trap in pan of grain.
- Place bait on sawdust and bury trap in pan in sawdust.

**To Control rats by using poisons**

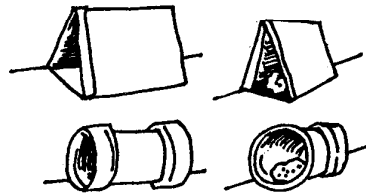
Learn to use them:

- Follow directions on container.
- Wear gloves.
- Keep away from food, children and pets.



Where to place them:

- In bait boxes, under boards.
- Fasten bait box to floor.
- In rats' path.



- Sources:**
- 1) Community Health op. cit.
  - 2) WHO Vector Control Services Training and Information Guide: Lice, 1985 VBC/TS/85.3.



**UNIT 11. WATER AND HEALTH**

- 11.1. ALL LIVING THINGS NEED WATER
- 11.2. SOURCES OF WATER IN THE COMMUNITY
- 11.3. CONTAMINATION OF WATER SOURCES AND HOW TO PROTECT THEM
- 11.4. SAFE DRINKING WATER
- 11.5. THE ROLE OF WATER IN PREVENTING COMMON SICKNESS



**UNIT 11: WATER AND HEALTH**

TOPIC	LEARNING ACTIVITIES AND REFERENCE TO RESOURCE MATERIAL	SUBJECT	GRADE
<p><b>11.1. All living things need water</b></p> <p><b>Learning activities:</b></p>	<ul style="list-style-type: none"> <li>- Perform a simple survey on ten families showing how water is used.</li> <li>- List the different uses of water as identified in the survey.</li> <li>- Identify the four most important uses of water based on results of the survey.</li> <li>- Draw pictures of plants and animals in different situations showing their dependence on water for survival.</li> </ul>	<p>Mathematics</p> <p>»</p> <p>»</p> <p>Art</p>	<p>1-3</p> <p>»</p> <p>»</p> <p>»</p>
<p><b>Resource material:</b></p>	<p>All living things need water (11.1.)</p>		
<p><b>11.2. Sources of water in the community</b></p>			
<p><b>Learning activities:</b></p>	<ul style="list-style-type: none"> <li>- Identify and list sources of water available in the community/school/home.</li> <li>- Present findings in class.</li> <li>- Draw and label sources of water available to the community/school/home and display them in class.</li> <li>- List advantages and disadvantages of each source.</li> </ul>	<p>Geography</p> <p>»</p> <p>»</p> <p>»</p>	<p>3-4</p> <p>»</p> <p>»</p> <p>»</p>
<p><b>Resource material:</b></p>	<p>Sources of water in the community (11.2.)</p>		



UNIT 11. (Cont.): WATER AND HEALTH

TOPIC	LEARNING ACTIVITIES AND REFERENCE TO RESOURCE MATERIAL	SUBJECT	GRADE
<p>11.3. Contamination of water sources and how to protect them</p> <p><b>Learning activities:</b></p> <ul style="list-style-type: none"> <li>- List at least two ways indicating how water is contaminated at its sources.</li> <li>- Describe ways of protecting different sources of water supplies available in the community/home/school.</li> <li>- Communicate to parents the information related to contamination of water.</li> </ul>	<p>Contamination of water sources and how to protect them (11.3.)</p>	<p>Science/Hygiene, Home Econ.</p> <p>»</p> <p>»</p> <p>»</p>	<p>3-4</p> <p>»</p> <p>»</p>
<p><b>Resource material:</b></p>			
<p>11.4. Safe drinking water</p> <p><b>Learning activities:</b></p> <ul style="list-style-type: none"> <li>- Identify methods currently employed by families in purifying water at home.</li> <li>- Present findings in class.</li> <li>- List the three main methods used for cleansing water.</li> <li>- Describe and demonstrate the three-pot storage system.</li> <li>- Demonstrate in class how filtration works in cleansing water.</li> <li>- List three ways of sterilizing water.</li> <li>- Demonstrate the simplest and safest method of sterilization.</li> <li>- Communicate to parents simple appropriate methods for purifying water at home/school.</li> </ul>	<p>Contamination of water sources and how to protect them (11.3.)</p> <p>Safe drinking water</p>	<p>Science/Hygiene, Home Econ.</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p>	<p>4-6</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p>
<p><b>Resource material:</b></p>	<p>Safe drinking water (11.4.)</p>		

UNIT 11. (Cont.): WATER AND HEALTH

TOPIC	LEARNING ACTIVITIES AND REFERENCE TO RESOURCE MATERIAL	SUBJECT	GRADE
<p><b>11.5.</b> The role of water in preventing common sickness</p> <p><b>Learning activities:</b></p> <ul style="list-style-type: none"> <li>- Participate in conducting a survey of five families to identify common diseases related to lack of water or the use of dirty water.</li> <li>- Present findings in class.</li> <li>- List at least three uses of water which are related to prevention of diseases.</li> <li>- List at least five ways of using water in treating illness.</li> <li>- Prepare health messages related to water and health.</li> <li>- Communicate to parents health messages related to water and health.</li> <li>- Write a composition under the title "Water and I."</li> <li>- Read CHILD-to-child Reader "Dirty Water."</li> </ul> <p><b>Resource material:</b></p> <p>The role of water in preventing common sickness (11.5.)</p>	<p>Science/Hygiene, Home Econ.</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p> <p>Language</p> <p>»</p>	<p>2-4</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p> <p>»</p>	



### 11.1. ALL LIVING THINGS NEED WATER

Every living thing needs water! Humans can exist for a longer period of time without food than they can without water. Man's need for water is vital to every system in the human body, particularly the system that flushes out waste products. Humans and animals take water from all the food they eat, as well as the liquids they drink. Some animals, such as Koala bears and desert rats, never drink any water. They obtain all of their liquid nourishment from the leaves of the plants upon which they feed. Plants need water to circulate nutrients within their structure and to hold themselves rigid. Animals and plants are capable of using water directly from the natural source, but humans should use water that has been treated to remove substances that might cause illnesses.

#### Directions

Duplicate picture below for each pupil. Read the following directions to the class:

**NUMBER ONE** Draw a picture of the animal who lives here.

The picture drawn should be of an aquatic animal. These creatures extract oxygen from water. They cannot live outside of water because their bodies are made in a special way.

**NUMBER TWO** Draw a picture of a plant or flower receiving the water it needs to live.

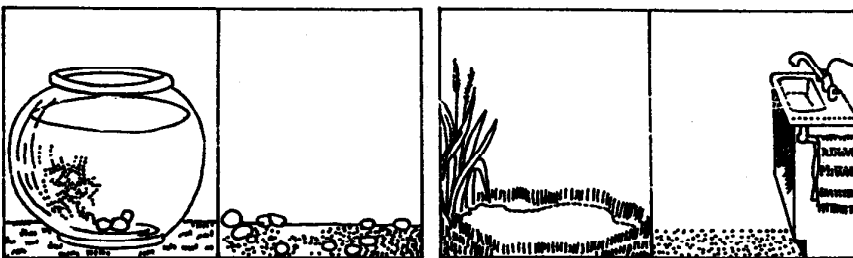
This picture should be of a plant that lives on rainwater or irrigation of some sort; or someone watering the plant.

**NUMBER THREE** Draw a picture of an animal taking a drink from a pond.

This could be a drawing of any animal(s) drinking from a natural source.

**NUMBER FOUR** Draw a picture of yourself drinking a glass of water.

A self-portrait of the student drinking water from a glass helps to demonstrate that humans should drink water from sources that have been treated and are clean.



## 11.2. SOURCES OF WATER IN THE COMMUNITY

Water goes round in a cycle: it falls as rain, and some soaks into the ground while some runs off as streams; gradually much of it collects into rivers and runs into the sea. From the sea, and also from inland lakes and any wet areas such as forests, water evaporates into the air; there it forms into clouds and travels with the wind finally it falls again as rain. As water goes round this cycle it picks up a number of substances some of which are helpful and some harmful to man.

Every community is concerned about how much rain it will get to meet its water needs. They should also be concerned about what happens to the rain after it has fallen. How much just runs off down to the sea and how much is caught and stays in the area? Water that runs off quickly does the community little good. What is held in the soil, particularly the root systems of forests, will benefit the community over a long time. Water stored underground lasts longer than water in surface dams. So trees (forests) are very important to the community and we should try to see that trees are not thoughtlessly cut down for fuel and that more trees are planted than are being cut down.

Forests are a community's best water store

Some of the advantages and disadvantages of different types of water as it goes round the cycle are briefly described below.

### 1. Rain water

If collected from iron sheets or tile roofs into gutters and led by pipes into clean and closed tanks; this is normally the purest natural water available.

#### DISADVANTAGES

- (a) It is very difficult to collect from thatched roofs.
- (b) Gutters and large tanks are required to store sufficient rain water to last into the dry seasons.
- (c) The water is 'soft' and does not contain any of the essential mineral salts. It may not taste very good.

### 2. Water that falls on high hills (upland surface water)

The water that collects into streams above where people live is often plentiful and clean and makes very good drinking water. If it can be piped to people living lower down the hills, the water comes by gravity and no pumping is required.

## **DISADVANTAGES**

The source must be protected. If animal grazing or human settlement occurs in the catchment area the water will be polluted. In some places the increasing population has led to shortage of land on the lower slopes of hills and people have moved up into the catchment area, polluting the supply to those living below them.

### **3. Water in all other areas (such as plains and on coastal belts).**

Most villages and towns are not on or near high hills where they can get clean water from above the level where people live. Water in these areas, which cover a large part, sometimes most, of the country, is of two main kinds: surface water and underground water.

## **SURFACE WATER**

Surface water, whether in ponds, lakes, shallow springs, streams, or rivers or in water holes, shallow wells, or dams, is the most common source of water for most people. Unfortunately it is also the most frequently polluted. Its advantages are that it is easily accessible; it can be obtained by hand by simple pumps; and the larger lakes and rivers are permanent sources all year round. Hand pumps are inexpensive and many suitable designs are now available; but the communities must work together to have them lubricated and maintained.

## **DISADVANTAGES**

This water is easily and frequently polluted as it runs over the ground where humans and animals urinate and defaecate. Also people wash and bathe in it. It may also be polluted by chemicals used in agriculture or industry. Attempts must be made to prevent pollution and also to purify this water, as described below (see 13.3. and 13.4.).

## **UNDERGROUND WATER**

As the water soaks through the ground and travels underground it is filtered, as soil is a good filter. Underground water is therefore usually clean and often plentiful and permanent. It may come from a long way away and is not so dependent on local rain. Many rural areas and small towns use this type of water.

## **DISADVANTAGES**

- (a) Water from deep wells and deep springs usually contains a lot of salts and other minerals and so it becomes salty, sometimes too salty for any use unless the salts are removed, which is an expensive operation.

- (b) This water generally needs pumping from great depths, often to tanks and reservoirs before reaching the user.
- (c) Underground water can become contaminated from a latrine built too close or from bucketfuls of dirty water tossed by people into the well.

#### **4. Sea water**

By the time that water reaches the sea it always contains some salts. These become further concentrated by evaporation and thus over millions of years sea water has become too salty to drink unless subjected to a very expensive purification process to remove the salt.

**Source:** Community Health op. cit.

### **11.3. CONTAMINATION OF WATER SOURCES AND HOW TO PROTECT THEM**

#### **A. Contamination of water sources**

It is easier to prevent water getting dirty than it is to clean it. It is important therefore to consider again all the possible sources of contamination between the time that water falls as rain and the time it is used.

1. Surfaces where rainwater collects may have leaves, insects, or bird and animal faeces on them.
2. When water runs over the earth it may become contaminated with human or animal excreta, refuse, fertilizers, or industrial waste. This contamination is less high up on mountains and greater nearer towns.
3. Shallow wells may be contaminated by excreta and refuse washed into them, especially if there are latrines nearby.
4. Wells may also be contaminated by the use of dirty containers for drawing water, or by oil from a pump.
5. Rivers, lakes, or dams may be contaminated by bathing, or urinating or defaecating in the water.
6. Even piped water may become contaminated from leaks in the pipes, especially when these pass near foul water or dirty drains.
7. Water may go bad if it is stored for too long in a pot or cistern.
8. Water from any source may become contaminated if it is drunk from dirty or communal drinking vessels.

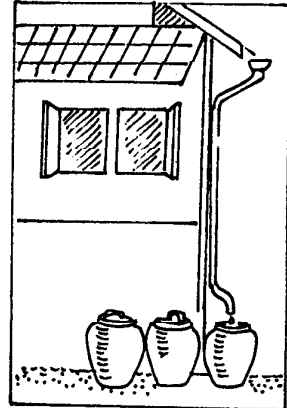
It is easier to protect water sources than to cleanse  
dirty water afterwards

## B. Protection of water sources

Protection of water means keeping germs out. For this we have to make sure that humans and animals have no contact with the ground above the water or with the water itself.

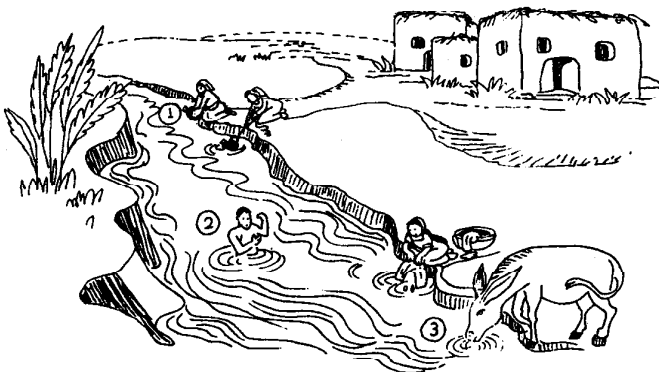
### 1. RAIN WATER COLLECTION

- Collect rain water from a clean roof and drain it into a clean receptacle with a tight lid so that the water can be used throughout the year. The receptacle might be, for example, an earthenware jug, a metal or concrete tank.



### 2. WATER FROM A RIVER

- Draw water from the river before it reaches your village (see drawing below, identify spot 1). Tell the pupils to boil the water before they drink it.
- Let people bathe in the river only where it leaves the village; let the animals drink the water only further down the river (see drawing and identify spots 2 and 3).
- Note that water which runs over rocks or in sunshine is not necessarily safe.



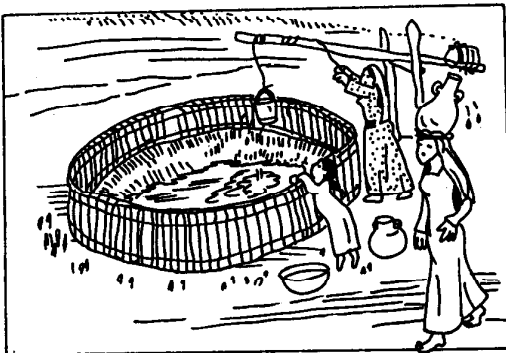


### 3. WATER FROM A WELL

- Get the well cleaned and disinfected. If possible, get the well covered and install a pump for drawing the water.
- If the well is not covered, see that no dirt or rubbish is thrown into it.
- See that there is no pit latrine or cesspit within 25 feet of the well.
- Drain away the water spilt near the well and do not allow surface water to flow into it.
- Keep the buckets on a clean surface. Do not place buckets used for drawing water from the well, on ground on which people walk.
- Keep clean the vessels and rope used to take water out of the well.
- Do not wash clothes or bathe near the well; otherwise, impure water will get into it.
- Advise the people not to use water from the pond where cattle get their water.

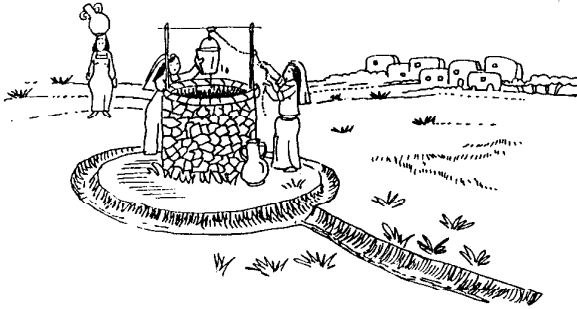


Women using an infected pond as a water source.



Women using improved water hole.

Avoid wasteful use of water

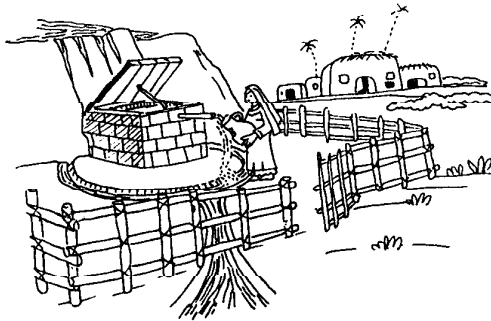


Women using a protected well

#### 4. WATER FROM A SPRING

The spring is properly protected if: (see drawing)

- There is a fence all the way round it about 20 metres away from the spring, and the gate is kept closed.
- There is a ditch around the spring to let the rainwater drain away.
- There is a 50 cm high cemented stone wall round the spring.
- There is a pipe coming out of this wall and the water is taken from this pipe.



If there is no other place to get safe water,  
tell the people to boil the water before they drink it

- Sources:**
1. The Primary Health Worker. WHO, Geneva, 1980.
  2. Community Health op. cit.

## 11.4. SAFE DRINKING WATER

### Water purification

#### SIMPLE METHODS

It should be said again that it is generally easier to prevent water getting dirty than it is to make it clean afterwards. However, there are many occasions when relatively dirty water has to be used, so it is important to know the simple ways of cleansing it.

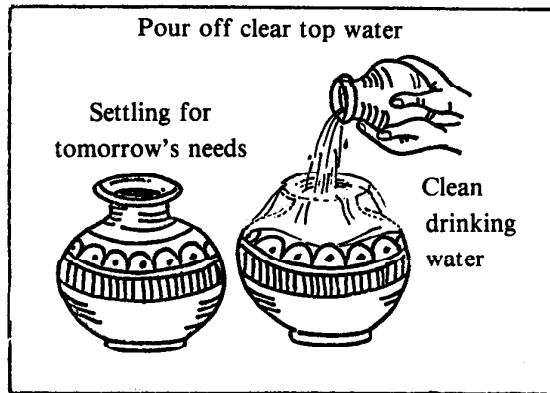
The main methods used for cleansing water are:

- storage
- filtration
- sterilization

### Storage

#### THE THREE-POT SYSTEM

If water is allowed to stand, many of the harmful organisms which may have got into it die because they cannot survive in water for a long time. Also a lot of the suspended matter settles to the bottom. If the water was cloudy or turbid to start with, the difference can easily be seen; if it was clear, standing will still reduce the number of living organisms although the improvement cannot be seen with the naked eye. Water improvement by storage can be simply done in the home by using three pots for water. Two big pots are used for fetching water on alternate days. The first pot is allowed to stand for 24 hours. Then the clear top water is carefully poured into another smaller pot for drinking and the remaining water used for washing. When the first pot is empty it is cleaned and refilled and allowed to stand for 24 hours again while the second big pot is used in the same way as the first. In this way each day's water has been standing for 24 hours before it is used.

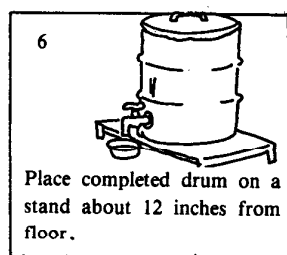
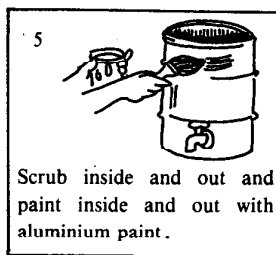
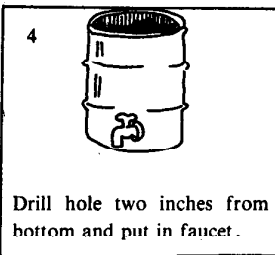
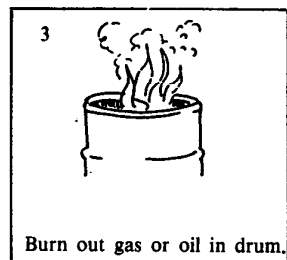
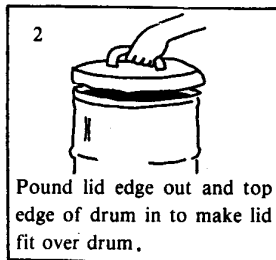
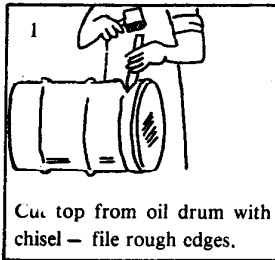


THE THREE - POT SYSTEM OF WATER STORAGE

This method of storage may be done on a larger scale in tanks or on a very large scale in reservoirs. In these cases the water should stand for three to seven days before use.

#### ANOTHER METHOD OF STORING WATER IS USING A DRUM

These steps may be followed:



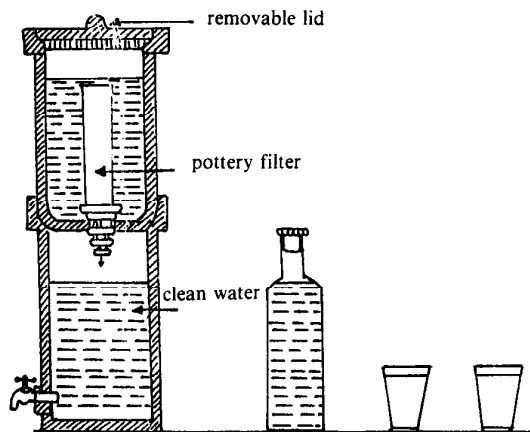
Keep cover on drum except when filling

#### Filtration

Filtration is the next stage of purifying water. This too can be done on a small scale for a household or on a large scale for a village or town.

The best simple household filter is a candle filter. It is, however, rather expensive. The filter is made of pottery in the shape of a big candle. It also needs two containers (diagram is on next page). Water is put into the top one, filters through the pottery candle, and is stored in the bottom one. From time to time the candle is brushed to clean it.

The commonest filter for use on a larger scale is one made of sand. This is made in layers with stones at the bottom, then coarse sand and fine sand (sand with small



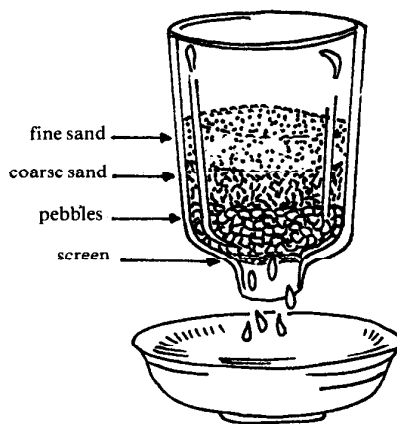
A candle filter

grains) on top. Sand filters for a public water supply are usually built in concrete containers. For a few houses smaller sand filters in special metal containers may be used.

#### TO BUILD AND USE A SIMPLE WATER FILTER

##### Teacher notes:

As a demonstration or an extra assignment this project shows how filters work to cleanse water of large particulate matter. However, caution your students not to drink this water. Although it will appear clean, it is not clean enough to drink. There are still impurities that must be removed by other means.



**DIRECTIONS:** You will need a one quart (one litre) plastic bottle, a piece of wire screen, pebbles, coarse sand and fine sand. Collect rain water, puddle water or some other “dirty” water from a natural source. If necessary, you can mix some dirt into tap water yourself. Cut the bottom out of the bottle, invert the bottle and place the piece of screen in the neck. First place a layer of pebbles, then a layer of coarse sand, then the fine sand. Pour some tap water through to remove any dust. Then slowly pour the dirty water through the filter. Water that goes through the filter should be cleaner than what was poured in.

## **Sterilization**

Sterilization is the final stage of water purification necessary for wholesome drinking water. On a large scale, for big towns, this is done in the waterworks by adding chlorine automatically to water that has been filtered. On a small scale, water may be sterilized either by boiling or by adding disinfectants such as chlorine or iodine.

- (a) Boiling water is the simplest and safest method of sterilization but very few people are prepared to do this regularly. They can, however, sometimes be persuaded to do it, if there is an outbreak of water-borne disease. (Because tea is made with boiling water, weak tea is an excellent safe drink for small children.) Water can also be sterilized by filling up transparent glass bottles and exposing them to sunshine for two hours.
- (b) Chlorination: A 1% solution of chlorine can be purchased for household use. Two drops to a litre of water will provide reasonable sterilization. Chlorine tablets may be used as directed by the manufacturer. For more complicated treatment of larger quantities of water, you should check with your district health officer for advice.
- (c) Iodine is an excellent disinfecting agent which may be purchased as 2% tincture of iodine. Two drops are sufficient to disinfect one litre of water and iodine tablets are also used in the sterilization of small amounts of water as directed by the manufacturers.

## **Summary**

The provision of adequate quantities of safe water near people's homes is one of the most important aspects of primary prevention. It is not enough just to tell people to boil their water – because very few will do so. Instead, encourage the simple ways of protecting water sources and of cleansing water.

## **Testing water**

When new supplies of water are being developed on a large scale it is very desirable to test the quality of the water. The two principal methods of testing are:

- bacteriological analysis
- chemical analysis

## **Bacteriological analysis**

It is very difficult to find the actual organisms that cause diseases, e.g. typhoid bacilli or poliomyelitis viruses. Instead the most important test is for an organism

**E. coli (Escherichia coli); this is a normal inhabitant of human and animal intestines and it cannot live elsewhere for very long. If there are many E. coli in a sample of water (ideally there should not be more than 10 per 100 ml) this shows the water is being contaminated by excreta. This is a clear danger signal.**

**E. Coli – Faeces – Danger**

### **Chemical analysis**

This involves testing for a number of different substances. Some, such as ammonia, are also indicative of contamination with organic matter, often excreta. Other tests can be done for hardness or softness, or for other salts or minerals, which may affect the taste, or suitability of water for drinking.

**Sources:** (1) Community Health op. cit.

(2) Alaska, Dept. of Health 1965. Health and First Aid Guide for Home and Village.

## **11.5. THE ROLE OF WATER IN PREVENTING COMMON SICKNESS**

### **Water**

Water is essential to life. It is a part of every cell and is necessary for most basic functions like respiration and digestion. Water is also a good solvent and many substances, some useful and some harmful to life, may be dissolved in it.

Water can affect health in a number of different ways. Lack of water for personal hygiene may result in the increased transmission of some diseases, called water-washed diseases. Water may carry the micro-organisms of specific diseases, called water-borne diseases. Or it may be necessary in the life cycle of a disease vector – such diseases are called water-related diseases. The important diseases affected by water in these ways are:

#### **Water-washed diseases**

- diarrhoea and dysentery
- skin diseases (including scabies)
- eye diseases (including trachoma)

- Water-borne diseases**
- typhoid
  - cholera
  - poliomyelitis
  - amoebiasis
  - hepatitis A

- Water-related diseases**
- malaria
  - schistosomiasis
  - onchocerciasis

When trying to control these diseases we should consider carefully the role that water plays. The water-washed diseases are transmitted by (1) the faecal-oral route because people do not wash their hands, eating utensils or vegetables and by (2) lack of personal hygiene – washing face, eyes and body. The main cause of this is lack of water; either there is very little water available or because it has to be carried a long way, requiring time and energy. The water-borne diseases, in contrast, are due to dirty water containing the disease organisms themselves. Water-related diseases involve water with vectors, which transmit the diseases (see Unit 20).

In preventing the increase of water-washed diseases, the quantity of water is important. To prevent water-borne diseases it is necessary to improve the quality. As the water-washed diseases are generally more common than the water-borne diseases, we can do a lot to improve health if we can make more water easily available. Of course, the cleaner and purer the water the better, but we should not delay increasing the quantity of water just because we cannot obtain water of the best quality.

Everyone requires about two litres of water a day for basic physiological needs. However, if water has to be fetched from a source half a mile away people can manage with a total of about six litres a day; if they can get water from a tap in the compound, they will use up to 25 litres; and where a house is provided with many taps and there are flushing latrines they will use 100 litres or more a day.

It is the long-term aim of most governments to provide piped water for all, but before this happens there are many simple improvements that can be made in village supplies to ensure that both a larger quantity and a better quality of water are increasingly available.

Get enough water first; then improve the quality



## Healing with water

Most of us could live without medicines. But no one can live without water. In fact, over half (57%) of the human body is water. If everyone living in farms and villages made the best use of water, the amount of sickness and death – especially of children – could probably be cut in half.

For example, correct use of water is basic both in the prevention and treatment of diarrhoea. In many areas diarrhoea is the most common cause of sickness and death in small children. Contaminated water is often part of the cause.

Giving lots of liquids to a child with diarrhoea is more important than any medicine. In fact, if enough liquid is given, no medicine is usually needed in the treatment of diarrhoea (see Unit 18).

In the next section are a number of other situations in which it is often more important to use water correctly than to use medicines.

### WHEN THE RIGHT USE OF WATER MAY DO MORE GOOD THAN MEDICINES

#### PREVENTION

To prevent:

1. Diarrhoea, worms, gut infections
2. Skin infections
3. Wounds becoming infected; tetanus

Use water:

1. Boil drinking water, wash hands, etc.
2. Bathe often
3. Wash wounds well with soap and water



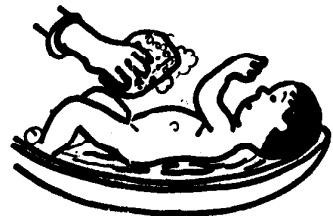
#### TREATMENT








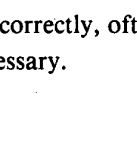


To treat:

1. Diarrhoea, dehydration
2. Illnesses with fever
3. High fever

Use water:

1. Drink plenty of liquids
2. Drink plenty of liquids
3. Soak body with cool water



To treat:	Use water:	
4. Minor urinary infections (common in women)	Drink plenty of water	
5. Cough, asthma, bronchitis, pneumonia, whooping cough	Drink a lot of water and breathe hot water (to loosen mucus)	
6. Sores, impetigo, ringworm of skin or scalp, cradle cap, pimples	Scrub with soap and water	
7. Infected wounds, abscesses, boils	Hot soaks or compresses	
8. Stiff, sore muscles and joints	Hot compresses	
9. Itching, burning, or weeping irritations of the skin	Cold compresses	
10. Minor burns	Hold in cold water	
11. Sore throat or tonsillitis	Gargle hot salt water	
12. Acid, lye, dirt, or irritating substance in eye	Flood eye with cool water at once	
13. Stuffed up nose	sniff salt water	
14. Constipation, hard stools	Drink lots of water (also enemas are safer than laxatives, but do not overuse)	

In each of the above cases (except pneumonia) when water is used correctly, often medicines are not needed. Use medicines only when absolutely necessary.

**Sources:** (1) Helping Health Workers Learn op. cit.  
(2) Community Health op. cit.



**UNIT 12. OUR LIVING ENVIRONMENT**

12.1. CLEAN AIR

12.2. NOISE POLLUTION



UNIT 12 : OUR LIVING ENVIRONMENT

TOPIC	LEARNING ACTIVITIES AND REFERENCE TO RESOURCE MATERIAL	SUBJECT	GRADE
<p><b>12.1. Clean air</b>  <b>Learning activities:</b></p> <p><b>Resource material:</b>            Clean air (12.1.)</p>	<ul style="list-style-type: none"> <li>- List the kinds of air pollution (harmful impurities in air) that you have noticed in your town (or village).</li> <li>- State next to each kind the source of it.</li> <li>- Describe each kind.</li> <li>- Indicate in which way it can be harmful to               <ul style="list-style-type: none"> <li>people</li> <li>animals</li> <li>plants</li> </ul> </li> <li>- Draw a sketch map of your village (or neighbourhood) and mark on it the sources of air pollution.</li> <li>- List a) ways in which air pollution in your community can be prevented;               <ul style="list-style-type: none"> <li>b) ways in which its harmful effects can be minimized;</li> <li>c) ways in which pupils can help in a) and b) above.</li> </ul> </li> <li>- Design a poster with appropriate messages on air pollution directed to the public.</li> </ul>	Science Geography Art	3 - 5

UNIT 12. (Cont.): OUR LIVING ENVIRONMENT

TOPIC	LEARNING ACTIVITIES AND REFERENCE TO RESOURCE MATERIAL	SUBJECT	GRADE
<p><b>12.2. Noise pollution</b>  <b>Learning activities:</b></p> <ul style="list-style-type: none"> <li>- Give reasons               <ul style="list-style-type: none"> <li>a) why airports are placed some distance from urban areas,</li> <li>b) why many people find country life more attractive than city life.</li> </ul> </li> <li>- List five major sources of 'noise pollution' in your town or village.</li> <li>- Design a poster urging people to prevent 'noise pollution'.</li> </ul> <p><b>Resource material:</b></p> <p>Noise pollution (12.2.)</p>			

## 12.1. CLEAN AIR

On a spring day after a shower of rain in the countryside, the air is so clean it is a pleasure to breathe. On the other hand, when travelling to a big, crowded city by bus or train, as one approaches the city, thick black smoke seems to envelope it or cover it with a cloud of unpleasant, smelly impurities, which are tiny, invisible particles issuing from factories, trucks, buses, and cars. The whole atmosphere in and around the city is grey, heavy, dusty and oppressive.

When there is smoke and dust in the air, we say the air is polluted. Pollution means destroying the purity of the atmosphere, making it foul and filthy, and contaminating the environment with all sorts of impurities. Colourless gases issuing from factories and vehicles fill the air, causing untold damage to both people and plants. One of these gases, which smells like rotten eggs, is called "hydrogen sulphide"; another which smells like a matchstick when it bursts into flame is called "sulphur dioxide". These two gases, along with "carbon monoxide" are the major health hazards posed by air pollution. Sand storms and dust are another cause of pollution. Power plants, large factories, petrochemical plants and cars are the major sources of impurities in the air.

Because pollution is harmful to human health and to plants, people in many countries try to prevent it. They move large factories away from cities, and compel them to clean the smoke before it is emitted or discharged into the air. In some cities, they do not permit private cars to reach the city centre at certain times in an attempt to reduce the amount of pollution. These and similar steps are called "air pollution control measures".

One of the best ways to control air pollution is to grow trees on roads and streets as well as around factories; having the streets paved and keeping them clean also helps prevent pollution. But, above all, people themselves can best help limit air pollution by taking public transport, instead of driving to work or to go shopping and by keeping streets free of exposed garbage and rubbish.

There are two types of air pollution, outdoor and indoor; the latter is caused by smoke and fumes from kerosene heaters and cookers, cigarette smoking and other sources. But both types can be prevented if all were determined to make a collective effort to safeguard their health from the deadly hazards of this modern curse.



## 12.2. NOISE POLLUTION

We have often heard a car horn suddenly go out of control and start blowing continuously, and how both driver and other people immediately rush to stop the noise. When noise levels go beyond certain limits, they become unpleasant and irritate people. Police car and ambulance sirens, loud noise at construction sites, railway stations and near airports, are examples of uncomfortable noises. When noise generates a nervous reaction in people and makes them irritable, we say there is noise pollution. It is usually encountered in and around certain factories, in crowded city centres, where vehicles, trains, and traffic in general create discomfort. Workshops and garages involved in metal repair work also cause noise pollution.

Noise pollution can cause harm to the physical and mental well-being of people. For example, workers whose job is to loosen parts from asphalt road surfaces with electric drills can go deaf because of the noise made by such machines. Factory workers dealing with machinery which makes excessively loud noise face the same danger. Constant lower-level noises may not cause immediate physical harm, but they create discomfort which is called "stress". Urban populations are more exposed to stress than rural people; they are more nervous, aggressive, impatient and irritable than country folk. All this is due to the fact that city dwellers have to rush most of the time, move amidst crowds, bear the noise of traffic, and the polluted city air that is not relieved by large open spaces or green areas.

In some countries there are rules and regulations to prevent noise pollution in factories, streets and other public places. For example, drivers are prohibited from blowing car horns at certain times in the city, railway lines run underground, heavy-duty lorries are not allowed within city limits, etc. Similarly, factories and metal workshops are confined to "industrial zones" outside cities.

In these countries workers who have to deal with noisy machinery are obliged to wear ear plugs as a protection against noise, and there are many other steps and measures taken to keep down the level of noise and noise pollution.



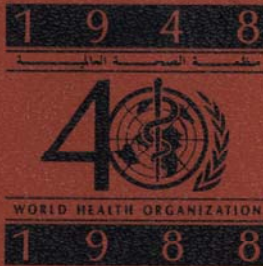




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