About this book

This book is one of a series of three created by the project *Strengthening Secondary Education in Practice: Language Supportive Teaching and Textbooks in Tanzania* (LSTT). The books are intended an example of the design of language supportive learning materials specifically for use in Tanzanian secondary schools. We hope that the ideas in this book will be taken up, adapted and developed further by educators, authors and publishers.

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Strengthening Secondary Education Practice
Language Supportive Teaching and Textbooks

Books in the series

Biology for Secondary School - Form 1: A language supportive textbook, Specimen Chapters

English for Secondary School - Form 1: A language supportive textbook, Specimen Chapters

Mathematics for Secondary School - Form 1: A language supportive textbook, Specimen Chapters
Learning Biology and English together

This Biology text is intended to support Tanzanian students in Form I, who are beginning to learn subjects in English. When Form I students start learning subjects in English, they often find that they cannot use the language well enough to learn effectively. Learning in English is also difficult because everything they know already from primary school was learnt in Kiswahili.

Students may find it hard to read texts, to talk in English to a partner or in a group about a topic, to listen to the teacher explaining a new subject concept or to write about a topic. Students may not have the oral and written fluency that is needed. They may also not have the academic vocabulary in order to understand and express knowledge about Biology subject. For this reason, materials for learning Biology in English need to be:

- **Language accessible:** This means it is written in a simple way, with diagrams that allow all students in Form I to read it.

- **Language supportive:** This means that the textbook helps students to develop their English as they learn Biology.

- **Relevant to learners’ context:** Biology is about the living world around us. Learning Biology is easier and more interesting when it is contextualized. So this book is filled with examples from learners’ context.

This textbook achieves the above criteria. It is prepared by Biology and Language specialists working together. It has evolved through the cooperation of TIE, UDOM, and Bristol University, UK. It has also been developed through the hard work and advice of wonderful teachers in Dodoma, Morogoro, and Lindi regions, who trialled this textbook and gave valuable feedback.

The result, we think, is a great book that will be easy for teachers to use, and for students to learn from. Above all it will show students that learning Biology is a wonderful, relevant and exciting journey. We hope you enjoy using it with your students as much as we enjoyed writing it.
Using Kiswahili for Learning

Students who are still developing their ability to learn Biology in English will find it useful to use Kiswahili. Using Kiswahili will help students to remember and build on what they learned in primary school. Thus, Kiswahili can be used in particular ways to help both, learning of both English and grasp new concepts in Biology. Here are some examples:

- If students talk briefly in Kiswahili about a topic before they read an English text, it prepares them to understand it in English.

- After reading a text in English, it is helpful to talk about it in pairs using Kiswahili. This helps to make sure they have understood it well.

- When students need to write about a new biology concept in English, it can help them if they first talk in pairs in Kiswahili about how to compose sentences in English: *two heads are better than one*.

- If students can talk in Kiswahili about the details of a text they have to write in English, they are then more likely to write sentences that are grammatically accurate and use vocabulary correctly.

- Talking in Kiswahili helps students to talk in English. For example, when they have to talk about a new concept in English, they can talk about it first in a group in Kiswahili. This helps them understand the concept better and they are then better able to express the new concept in English.

This textbook guides teachers on how to use Kiswahili as a resource to learn English and strategically support students to learn Biology.
The textbook helps students to learn in many different ways. It has:

**Accessible text**

The textbook is written in simple sentences in English to make it easy to understand.

**Glossary**

There are lots of new words to learn in Biology. New words are highlighted in the text. Each page has a glossary of all such words with Kiswahili translations. The glossary will help students understand Biology. At the back of the book, there is also a complete glossary of all the new words.

**Illustrations and Diagrams**

These help students to understand the meaning of words, and concepts.

**Biology Activities**

The book takes an activity based learning approach to learn Biology. These structured activities will keep students actively engaged in the learning process.

**Reading, Talking and Writing Activities**

Students need help with reading, talking and writing about Biology. There are lots of activities to support their development in both Biology and English, including pair and group work.

**Help Boxes**

‘Help boxes’ give students extra help to complete the activities. This might be helpful with English or Biology. Using the help box will assist students to do the activities.
Investigations

In the course, students will learn the practical skills of being a biologist. The activities can all be done with little equipment.

Homework

After the lesson, students will be provided with some activities to do in their own time.

Extension Activities

The extension activities have the work at a higher level of thinking to challenge students. If students are really interested in Biology, this is for them.

Did you know?

This book is written to reflect Tanzanian context. The ‘did you know’ boxes tell lots of interesting and useful things about Biology relevant to Tanzanian students. Learning Biology is easier and funny when learners’ environment can be seen in the Biology concepts.

Summary and Review Questions

Each unit ends with a summary of what you have learnt, and some review questions. This prepares learners for tests.

Some Useful Teaching Strategies

Here are some useful strategies that will help a teacher when teaching Biology using this textbook.

Teaching from the Front:

☐ If students have already studied the topic in primary school, they can only express their knowledge in Kiswahili. Therefore, use Kiswahili to ask them questions about their previous learning.

☐ Use diagrams and pictures to illustrate concepts. Use the pictures in the book, or draw them on the board.

☐ Write key concepts on the board. Repeat them and get students to say them.

☐ Translate new concepts into Kiswahili. Draw attention to those words in the text.

☐ Refer to the glossary in the book. Encourage students to use the glossaries.
Use what students know already. Some of this knowledge will be in Kiswahili or a mother tongue. Get students to access their prior learning by asking them to talk in a vernacular language.

Check regularly whether students understand. Ask questions to check this. Short answers (e.g. yes/no questions) are easy to answer. If you ask questions that require a longer answer and the learners cannot give it in English, accept their answers in Kiswahili. You can then translate them into English.

Use Kiswahili strategically to help learning. For instance to get the meaning of key concepts.

Remember that Form I students have to concentrate very hard to listen to English. If you talk for a long time in English, it will be difficult for them to keep focused on what you are saying.

**When students talk:**

- Demonstrate to students how an activity should be done, and then ask them to do it.

- If students cannot talk in pairs or groups in English about a concept, ask them to do it first in Kiswahili. As they finish, ask one or two pairs or groups to report in English what they have said. Give them a few minutes to decide what they will say in English. Help them with the useful vocabulary.

- When students work in pairs or groups, go round and listen. Help them where necessary.

- When students talk in English, try not to correct their English while they are speaking. Correct after they have finished, but without discouraging them.

- Never humiliate a student because he or she cannot talk English and do not allow students to humiliate or laugh at another student’s English. Mutual respect should be part of the classroom culture. This will give the students confidence to try out English.

**When Students read the textbook**

- Ask students to work briefly in pairs or small groups and say what they know about the topic. Put a question on the board for them to answer. It doesn’t matter if what they say is incorrect. A three minutes discussion will be enough. Then ask them to read the text.

- If there is a picture or diagram to accompany the text, get them to look at this picture or diagram before they read. Students can talk about it in English or Kiswahili. This will help them to understand the text in English.

- At first, ask students to look at the glossary before reading the text. As they get better at reading, students can refer to the glossary as they read.
Ask text-based questions before students read the text to give them focus and extra motivation.

Fill-in-the-blanks activities make students think about what they are reading and help them to understand the meaning.

When students have read the text, ask them to talk briefly (e.g. 3 minutes) in pairs in Kiswahili to check whether they agree about what they understood.

Get a few students to report to the whole class about what they understood. If a learner has understood the text but can’t explain it in English, accept an answer in Kiswahili, and translate for the class.

When students write:

Demonstrate to students how an activity should be done, and then ask the students to do it.

It is useful for students to sometimes work in pairs when they write in English. They can discuss how to construct sentences, which words to use, how to spell, etc. It is good if they discuss this in English, but it is just as good if they discuss in Kiswahili.

When students write, go round and read. Help them where necessary.

When they have finished writing, it is sometimes useful to get one or two students to loudly read out their sentences to the whole class, or even to dictate a sentence to be put on the board. However, this kind of activity can take time, so keep it short.
KWA MWANAFUNZI


Kitabu hiki kina mazoezi mengi yanayovutia na kufurahisha. Mazoezi haya yatazasaidia kujiifunza Baolojia na Kiingereza kwa pamoja. Ukiwa na uwezo mzuri wa Kiingereza utaweza kujiifunza Baolojia vizuri.

Kitabu hiki kina sifa zifuatazo zitakazo kusaidia kujiifunza Baolojia:

Kiingereza Rahisi

Kiingereza katika kitabu hiki ni rahisi na cha kueleweka. Hii inatokana na ukweli kwamba kitabu hiki kimeandikwa kwa kutumia sentensi fupi na rahisi.

Faharasa (Tafasiri)

Kitabu hiki kina faharasa za Kiswahili katika kilakura. Tumia faharasa hizi kurahisisha ulewawa na unachojifunza kwa kukuza umahiri wako wa Baolojia na Kiingereza.

Kujadili kwa Kiswahili

Kuna wakatiutatakiwakujadiliana kwa Kiswahili. Hii itakusaidia kueleweka na kuzungumza (kufanana) dhana mbalimbali za Baolojia.

Kazi zamakundi

Kuna methali isemayo “kidole kimoja hakivunji chawa.” Kujifunza kwa ushirikiano katika makundi ni njia sahihi ya kujiifunza kutoka kwa wengine.
Kufanya majaribio ya kisayansi  
Baolojia ni somo linalosomwa kwa kutumia majaribio ya kisayansi. Majaribio ya kisayansi yanasaidia kuelewa vizuri somo la Baolojia.

Kusoma na Kuandika kwa kutumia michoro na picha  
Kitabu hiki kina picha na michoro iliyopangiliwa vizuri ambayo itakusaidia kuelewa dhanambalimbali za Baolojia na kuandika juu ya dhana hizo. Kwa ufanisi, ni vizuri kufanya shughuli hizi pamoja na wenzako.

Kuwasilisha darasani  
VIDOKEZO MUHIMU VYA KUJIFUNZIA


- Baada ya kusoma kitabu mshirikishe mwenyao kuhusu dhana ulizojifunza kwa Kiswahili. Hii itakusaidia kuzifahamu dhana hizi.


- Ikiwa hauna nakala ya kitabu hiki, unaweza kuandaa misamiati. Chukua daftari kisha andika maneno mapya ya Kiingereza pamoja na maana zake dhana dhana Kwa Kiswahili.

- Zungumza na kaka, dada, au mzazi kuhusu kile ulizojifunza darasani. Pia ni muhimu kuzungumza dhana dhana dhana dhana kwa mchoro kutoka kitabu.

- Uliza maswali kwa watu wa familia yake kuhusu mada ulizojifunza. Fanya hivi kwa Kiingereza au Kiswahili.
Introduction

Most human activities in schools, homes, and elsewhere result in the production of waste. What we buy, eat, use and harvest ends up making a lot of waste. Waste management is important if we are all to live in a clean and safe environment. In this chapter, waste and waste management will be discussed.

LEARNING OBJECTIVES

You should be able to:

- Explain the terms waste and waste management
- Identify types of waste
- Outline basic principles of waste management
- Demonstrate ways of disposing of waste
- Explain the effects of poor waste disposal
- Suggest proper ways of disposing of waste in the surrounding community
Chapter Four

Unit 4.1 Waste

In everyday life at home or at school there are materials you do not need. For instance, banana or potatoes peels, used papers, plastic bags, empty cans and bottles, used batteries, worn out clothes, broken utensils, dirty water, spoiled milk, etc. All these things are called waste. They are also called rubbish, trash, junk, or garbage. They are unwanted or undesired materials or substances. They can be a source of accidents or diseases in our environment.

Waste may also consist of the unwanted materials left over from a manufacturing process such as industrial, commercial, mining or agricultural operations.

Activity 4.1 Whose waste?

Different places make different types of waste.
1. In groups, record a list in english of all the waste you can think of.
2. Share your ideas as a class and write your ideas on the blackboard.
3. Different places make different types of rubbish. Copy the table below in your notebook. Write down the varieties of waste and identify the places where they can be produced. Indicate by putting a tick (√) in appropriate place.

<table>
<thead>
<tr>
<th>Waste</th>
<th>At home</th>
<th>At school</th>
<th>In farm</th>
<th>In factory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banana peels</td>
<td>√</td>
<td>√</td>
<td>√</td>
<td></td>
</tr>
</tbody>
</table>

Key ideas

Waste
Biodegradable
Non-biodegradable

Glossary

<table>
<thead>
<tr>
<th>English</th>
<th>Swahili</th>
</tr>
</thead>
<tbody>
<tr>
<td>waste</td>
<td>taka</td>
</tr>
<tr>
<td>rubbish</td>
<td>takataka</td>
</tr>
<tr>
<td>undesired</td>
<td>isiyohitajika</td>
</tr>
<tr>
<td>substances</td>
<td>vitu vinavyounda au vinavyojenga kitu fulani (viunzi)</td>
</tr>
<tr>
<td>consist of</td>
<td>imeundwa na</td>
</tr>
<tr>
<td>industrial</td>
<td>za viwanda</td>
</tr>
<tr>
<td>commercial</td>
<td>za kibiashara</td>
</tr>
<tr>
<td>mining</td>
<td>uchimbaji wa madini</td>
</tr>
<tr>
<td>production</td>
<td>uzalishaji</td>
</tr>
</tbody>
</table>

Mwongozo

non- ni kiambishi awali chenyema maana “sio/isiyo”. Hivyoo basi, neno “non biodegradable” linamaana “isiyo haribika kibao”. Kuwa makini kutoaufisha kiambishi “non” na neno “none” linalomaanisha hakuna.

Fig 4.1 Waste materials in one of the streets in Tanzania
Where does your waste go

Waste materials may be collected, stored, or treated before being discarded or recycled. This process of collecting, storing, discarding, and recycling wastes is known as waste management. This process is very important in our schools and at home because we need to control accidents and diseases in our communities.

Types of waste

Waste materials can be classified using different criteria. For example, by using the physical state of waste, we find three kinds of waste: solid, liquid, and gaseous wastes. Solid wastes include plastics, containers, bottles, cans, papers, or scrap iron. Liquid wastes include domestic waste water, chemicals, oils, waste water from ponds, manufacturing industries and other sources. Gaseous wastes include smokes and smog from burning substances mainly from industries, cars, or in kitchens.

Wastes can also be classified based on how they rot or decompose. By using this criterion we find two kinds of waste: Biodegradable and non biodegradable.

Glossary

<table>
<thead>
<tr>
<th>English</th>
<th>Swahili</th>
</tr>
</thead>
<tbody>
<tr>
<td>waste</td>
<td>taka</td>
</tr>
<tr>
<td>collected</td>
<td>iliyokusanywa</td>
</tr>
<tr>
<td>stored</td>
<td>iliyohifadhiwa</td>
</tr>
<tr>
<td>treated</td>
<td>tibiwa/wekwa</td>
</tr>
<tr>
<td>dawa</td>
<td></td>
</tr>
<tr>
<td>discarded</td>
<td>iliyotupwa</td>
</tr>
<tr>
<td>recycled</td>
<td>kutumika tena</td>
</tr>
<tr>
<td>management</td>
<td>dhibiti</td>
</tr>
<tr>
<td>communities</td>
<td>jamii</td>
</tr>
<tr>
<td>classify</td>
<td>weka kwenye</td>
</tr>
<tr>
<td>criteria</td>
<td>vigezo</td>
</tr>
<tr>
<td>biodegradable</td>
<td>haribika</td>
</tr>
<tr>
<td>gaseous</td>
<td>enye asili ya gesi</td>
</tr>
<tr>
<td>criterion</td>
<td>kigezo</td>
</tr>
<tr>
<td>manufacturing</td>
<td>kutengeneza</td>
</tr>
<tr>
<td>ponds</td>
<td>mabwawa</td>
</tr>
<tr>
<td>manufacturing</td>
<td>bidhaa</td>
</tr>
</tbody>
</table>

State of waste

- Solid
- Liquid
- Gas

How waste rots away

- Biodegradable
- Non biodegradable
Biodegradable waste is also known as organic waste. It refers to waste that will rot away. Examples of biodegradable waste are paper, wood, and fruits. Biodegradable waste is decomposed by bacteria in the environment.

Non-biodegradable waste is also known as non-organic waste. Non-degradable waste is waste that is not decomposed by bacteria, for example plastics, bottles, old machines, and cans.

**Activity 4.2 Types of waste**

1. Take turns to reading the passage above called ‘types of waste’.
2. As you read the passage, write down any new and unfamiliar words in your notebook.
3. Listen carefully for how to pronounce any new words.
4. Talk with your neighbour about the meanings of any unfamiliar words. First, read the sentence where the word was found. Think about the meaning of the whole sentence and then think about the meaning of the unfamiliar word. If you are still not certain about the meaning of the word, check the glossary or ask your teacher to help you.
5. For each of the new words you have learned, write a sentence using the words.
6. Share your sentences with the rest of the class.

**Activities 4.3 A study tour in the school compound**

<table>
<thead>
<tr>
<th>PLACES</th>
<th>TYPES OF WASTE</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Visit places around the school compound. In each place, identify the waste found.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Classify the waste you find into solid, gaseous or liquid and estimate the quantity for each category.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Then, classify the wastes into biodegradable and non-degradable wastes.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Suggest how each type of wastes identified in the school compound could be managed.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Draw a bar chart to show the types and quantities of waste found in each place.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Activity 4.4 Summarizing waste

Compose as many correct sentences as you can from this table.

<table>
<thead>
<tr>
<th>Plastic bags</th>
<th>Glass</th>
<th>A decayed fruit</th>
<th>Smoke from a burning fire</th>
<th>Water used while washing clothes</th>
<th>A discarded chair</th>
<th>Cans</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>is an example</td>
<td></td>
<td></td>
<td>is an example</td>
<td>is an example</td>
</tr>
</tbody>
</table>

of liquid gaseous solid waste

Summary

The waste we produce in our environment can be liquid, solid, or gaseous. Waste can also be in biodegradable or non-biodegradable form. Biodegradable forms of waste can be decomposed by organisms such as bacteria, termites and other microorganisms. Non-biodegradable waste cannot be decomposed by organisms, and therefore leads to a dirty environment if not properly managed. Waste in our environment causes pollution and damages our environment.

Extension Activity

Carry out a study tour around your community. Record the type and estimate the quantity of waste you find in different places. In each place, write who is producing the waste that you can see. Is it a farmer? A shop owner? A small business woman? A piki piki driver?

Glossary

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>estimate</td>
</tr>
<tr>
<td>kadiria</td>
</tr>
</tbody>
</table>
Chapter Four

Unit 4.2 Waste Management

Activity 4.5 Reading about waste

Read the text below and identify two examples of waste mismanagement and four examples of waste management. Write those examples in English in your book.

Modern life produces more and more non-biodegradable waste. Waste cans, plastic bags and bottles are all non-biodegradable materials. All these waste products can make our surroundings untidy if not well managed. Therefore, we need to manage these waste materials safely and properly at our homes and schools. We can do this by collecting and sorting them out before keeping them in special containers, bins or bags.

We often mismanage waste. For example, at school, it is common to see some careless students litter papers in classrooms or school surroundings. In towns and cities, some people dump domestic waste by the roadside and in open spaces. It is also common to see people walking in the street carelessly throwing plastic bags and papers by the roadside and in open spaces.

Waste from industries and sewage can contaminate the soil and clean water if not managed properly. Wastes from industries contain chemicals that can go into the land and
cause soil pollution. If they contaminate clean water, they can cause health problems. Therefore, we need to manage waste effectively by using any of the following ways:

- Re-using
- Recycling
- Composting
- Burning
- Putting in landfills

**Activity 4.6 Data on waste in Tanzania**

The following table shows some of data for waste in Tanzania.

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Amount produced (tons/ per day)</th>
<th>Amount collected (tons/ per day)</th>
<th>% collected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ilala</td>
<td>1100</td>
<td>430</td>
<td>39</td>
</tr>
<tr>
<td>Temeke</td>
<td>1,035</td>
<td>280</td>
<td>27</td>
</tr>
<tr>
<td>Kinondoni</td>
<td>2,026</td>
<td>823</td>
<td>41</td>
</tr>
<tr>
<td>Total</td>
<td>4,161</td>
<td>1,533</td>
<td>37</td>
</tr>
</tbody>
</table>

Source: Dar es Salaam City Council (2010)

1. Look at the table with your neighbour. Your teacher will explain how to ‘read’ this table.

2. Write correct sentences in English that explain the information in the table. For instance,

   ‘In Kinondoni municipality, 823 tons of waste are taken to landfill everyday’.

3. Calculate the amount of waste not collected in each manucipality.

4. With your neighbour, discuss why all waste produced are not collected? Present your view to the class.

5. What does this data suggest?
**Management of waste**

There are various methods of proper waste management that will help you to keep your environment clean. Here are some of the main ways that you can manage waste.

**Activity 4.7 Re-using waste**

Make a list of all the things in your home or school that can be reused. Describe how you can reuse these materials. Present this list to the class in English or Kiswahili.

---

**Did you know**

The Maasai society in Tanzania have been very creative in re-using car tires. They take used tires and made sandals out of them. These car tire sandals are now fashionable for the youth of Tanzania. It is now becoming a source of income and employment opportunity for many families in Tanzania, not just the Maasai.

**Glossary**

| Re-use | tumia tena/ kwa matumizi mengine |

Fig 4.3 Sorting is a proper way of managing wastes

**Fig 4.4 A Maasai man selling sandals made from car tires**

This is the easiest and best way to dispose of waste – use it again. Things like plastic bottles and plastic bags can be used again and again. Sometimes, waste can be reused to make new things. Have you seen people wearing sandals made of old car tyres?
Recycling is one of the best methods of managing waste, and you can do it. Recycling means that you turn the material back into what it was made from. Plastic bottles can be melted and made into new plastic objects. Glass bottles can be melted and made into new glass bottles. Many things can be recycled – paper, cardboard, cans, batteries, clothes, tyres, and metals. If you recycle these things, they don’t have to be thrown away. It is very common to see people, especially in towns, collecting plastic bottles and taking them to a recycling centre. If you recycle, you will save a lot of energy and resources and reduce pollution.

**Activity 4.8 Why don’t people recycle?**

Some people do not recycle. Why do you think this is?

1. Talk in Kiswahili. Why do you think many people do not do recycling?
2. In a small group, discuss what could be done to get more people to recycle.
3. Create an action plan to get more people to recycle. Everyone in the community will need to do something. You could make a table to help you fill in using words: E.g.

<table>
<thead>
<tr>
<th>Who?</th>
<th>What will they do?</th>
<th>When will they do it?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children</td>
<td>Not drop sweets</td>
<td>All the time</td>
</tr>
</tbody>
</table>

2. Present your action plan to the class in English.
Composting

Activity 4.9 Managing waste by composting

1. With your partner, look at the picture in fig. 4.6 and say what is happening.
2. Read the text below and write the meaning of composting in your notebook in Kiswahili and in English.
3. What kinds of waste can be composted?

Composting is another method of waste management. Composting is when we take biodegradable organic waste and let it turn into manure. You can carry out composting in your own backyard. You can use leaves, grass, twigs, and add vegetable, fruit peels, or potato peels. To do composting, dig a hole and throw in all organic waste. After a few days or weeks, it will decompose into manure you can use in your garden or shamba. Do not throw bottles, plastic cans in the compost hole. This is a natural process that is completely free of any hazardous by-products or meats.

Activity 4.10 A class compost

Make a class composting site somewhere in the school compound. Ask your friends and teachers to throw in their organic waste. Observe the compost each week, and make notes about what happens to it. You can make notes in Kiswahili or English. When the organic waste has composted, use it as manure to prepare a school garden.
Activity 4.11 Using landfills to manage waste

1. With your partner, look at the picture in fig. 4.7 and say what is happening.
2. Find out the kind of waste that can be put in a landfill.

Landfill is another method for proper waste management. Waste management through the use of landfills involves the use of open area. This area is dug open and filled with waste that cannot be recycled. When the hole is full, the area is then covered up again with soil. Landfills are not safe to visit because they give off gases like methane, which are highly hazardous. The landfill should be properly lined and the waste should not come in contact with other areas nearby. What types of wastes do you think should be put in a landfill?

Activity 4.12 Describing a landfill site

Look carefully at the picture of a landfill site above. Write some short sentences in English to describe what you could see and smell if you were there. Use adjectives (describing words) in your sentences. Here are some words to help you. Rubbish, waste, pile, smelly, rotting, food, bottles, horrible, ugly, slimy, messy.

Did you know

The average time for plastic bottles to decompose in a landfill is close to 700 years! Plastic bottles should not be put in landfills. Plastic bottles should be recycled or reused.

Glossary

<table>
<thead>
<tr>
<th>English</th>
<th>Swahili</th>
</tr>
</thead>
<tbody>
<tr>
<td>hazardous</td>
<td>ya hatari</td>
</tr>
<tr>
<td>horrible</td>
<td>ya kutisha</td>
</tr>
<tr>
<td>slimly</td>
<td>ya kuteleza</td>
</tr>
<tr>
<td>messy</td>
<td>chafu au</td>
</tr>
<tr>
<td>ugly</td>
<td>enye sura</td>
</tr>
<tr>
<td>messy</td>
<td>hali ya kuchanganya</td>
</tr>
<tr>
<td>ugly</td>
<td>mbaya</td>
</tr>
</tbody>
</table>
Activity 4.13 Finding waste which cannot burn

1. Talk with a partner in Kiswahili. Look at the picture and say what is happening.
2. Read the text and find out what happens when you burn waste.
3. Read the text and find out what waste you cannot burn.

Burning of wastes is a common method for waste management. If you cannot recycle, and there are no open areas for setting up a landfill, you can burn the waste matter generated in your household. Burning reduces the volume of waste to be disposed. Some waste such as plastic should not be burned because it releases dangerous gases and a bad smell. Plastic waste should be re-used or recycled.

Activity 4.14 Summarizing waste management

Re-read the texts above and fill in the following table:

<table>
<thead>
<tr>
<th>Recycling</th>
<th>Composting</th>
<th>Landfill</th>
<th>Burning</th>
</tr>
</thead>
<tbody>
<tr>
<td>What waste material is appropriate?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What waste material is not appropriate?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Activity 4.15 Classifying waste
You will do this activity in groups outside. Your teacher will give each group a pile of waste, and gloves or plastic bags to cover your hands. Go through the waste. Divide the waste into following groups:

- Waste that can be re-used
- Waste that can be recycled
- Waste that can be composted
- Waste that should be burnt
- Waste that should go to landfill

A world without waste management

Waste management is important if we are all to live in a clean and safe environment. Imagine we all just throw garbage, junk, and rubbish away. Imagine we all send our rubbish to the landfill, or dump them in a nearby river or by the roadside. What do you think would happen?

The poem on page 74 will help you imagine what a world without waste management would be like. After you have read the poem, turn to this activity.

Activity 4.16 What would happen?
Each group will look at one of the verses in the poem
1. Read the paragraph together. Look up any difficult words in the glossary on the page or at the end of the textbook. Make sure you understand the meaning of the paragraph.
2. Draw a picture showing what would happen if what the paragraph says happens. Label your picture in both English and Kiswahili.
3. Translate your paragraph into Kiswahili. Discuss how best to write the translation.
4. Present your work to the class. One person reads out the verse in English and another shows and explains your picture in Kiswahili.

Glossary

<table>
<thead>
<tr>
<th>English</th>
<th>Swahili</th>
</tr>
</thead>
<tbody>
<tr>
<td>gloves</td>
<td>mipira ya</td>
</tr>
<tr>
<td>garbage</td>
<td>takataka</td>
</tr>
<tr>
<td>junk</td>
<td>vitu</td>
</tr>
<tr>
<td>nearby</td>
<td>karibu/jirani na</td>
</tr>
<tr>
<td>poem</td>
<td>shairi</td>
</tr>
</tbody>
</table>
Activity 4.17 Complete the sentences

Work in a group. Read the text and complete the sentences.

1. If we all just throw garbage, junk, and rubbish away __

2. If we all send our rubbish to the landfill, or dumped it in a nearby river __

3. If waste contaminates the water and diseases such as dysentery, diarrhoea, cholera and typhoid are spread __

4. If chemicals get into the soil and humans eat plants and animals that have been in contact with polluted soils __

5. If wastes block the sewage and cause flooding __

6. If we leave untreated sewage flowing in our streets __

7. If rubbish is a breeding ground for flies and cockroaches __

8. If dirty rainwater becomes a breeding ground for mosquitoes __
Activity 4.18 The importance of waste management

Write a short explanation of paragraph explaining why waste management is important in Tanzania. Use the following writing frame.

Paragraph 1: say what kinds of waste there are
Paragraph 2: say what kinds of waste management there are
Paragraph 3: define recycling and say what can be recycled
Paragraph 4: define composting and say what can be composted
Paragraph 5: define landfill and say what can be put in a landfill
Paragraph 6: define burning and say what can be burned

Activity 4.19 Drawing waste disposal

1. Discuss with your neighbour what you think the most important 5 ideas of waste disposal are. There is no right or wrong answer.
2. Write the 5 ideas in your notebook.
3. Draw a picture that illustrates these main ideas. Drawing will help you to remember what you have learned in this chapter.

Summary

We generate a lot of wastes. Waste management may be costly, especially in urban areas where there are many people. We can use different ways to reduce the amount of wastes. First, reduce the waste you produce at home. For example, use fabric towels and ceramic plates at home instead of paper towels and paper plates. Fabric towels and ceramic plates will last for many years but paper lasts only a few days before it becomes waste.

Second, reuse plastic bags or use a fabric bag when you go to the market. Use old boxes to send parcels instead of buying...
new boxes. There are materials that can be used over and over again, such as package boxes, gift wrappers, clothing, furniture, and even playing toys. Do not be too quick to throw them away. You can also consider sorting out the waste for recycling and composting. Recycling and composting are good methods for reducing pollution.
5.1 Health
5.2 Immunity
5.3 Personal and Community Hygiene

**Introduction**

In chapter three you learned about safety in the environment. You learned about safety at home and at school, you learned how to prevent accidents, you learned about first aid, and how to apply first aid in specific situations. The emphasis in chapter three was to prepare you to maintain a healthy environment.

In this chapter you will learn about health. You will learn about the different ways our bodies resist diseases. And lastly, you will learn about the meaning of hygiene and the different ways to keep yourself and your community hygienic.

**LEARNING OBJECTIVES**

You should be able to:

- Explain the concepts of health and immunity
- Mention types of body immunity and their importance
- State factors which affect body immunity
- Explain concepts of personal hygiene and good manners
- Outline principles of personal hygiene and good manners
- Mention requirements of personal hygiene and good manners
- Outline ways of maintaining personal hygiene during puberty
- Explain the importance of personal hygiene and good manners
UNIT 5.1 Health

Activity 5.1: Being in the hospital

Have you ever been admitted in the hospital? Do you know anyone who has been admitted to hospital? Discuss the following questions with your neighbour in Kiswahili.
1. What happened before you were admitted?
2. How did you feel before you were admitted?
3. What happened after the treatment by the doctor?

Meaning of Health

Every time we meet a friend, we ask “how are you” or “habari yako” in Kiswahili. We do this to know how our friend feels and about his or her health. Health is the general condition of body and mind. But what does it mean when someone says he or she is feeling well or healthy?

Activity 5.2

1. Discuss with your neighbour in Kiswahili what it means to be healthy.
2. Make a word web with your neighbour. You can make your word web in Kiswahili or English. A word web helps you to understand the word ‘healthy’ and all the words related to the word healthy. For help, look at the HELP box (mwongozo).

What does ‘healthy’ mean? If you are healthy, you are well. You are not sick. You are well in several ways. Firstly you are physically well: your body is working properly. Secondly, you are mentally well: you are well in your mind. Thirdly you are socially well: you have friendships and good relationships with your family.

Activity 5.3

Discuss with a partner in Kiswahili:
1. Describe the meaning of the following words:
   (i) physical
   (ii) mental
   (iii) social
2. Think about people you know who are physically, mentally, and socially healthy. How do you know that these people are healthy?
3. Write the characteristics of people who are physically,
mentally and socially well. For example, a physically well person may be strong. A socially well person may have many friends.

4. Draw and label two pictures. Draw one picture of a person who is physically, mentally, and socially well. Draw a picture of a person who is physically, mentally, and socially unwell. Label your pictures in English and Kiswahili.

**Activity 5.4** Forming meaningful sentences

Write correct sentences using these phrases

<table>
<thead>
<tr>
<th>If you are</th>
<th>mentally well</th>
<th>socially well</th>
<th>it means</th>
<th>you have friends.</th>
<th>your mind is working properly.</th>
<th>you are healthy in your body.</th>
</tr>
</thead>
</table>

**Activity 5.5** Healthy condition

1. Discuss the two pictures you see with your neighbour in English.
2. Who do you think is in a healthy condition? Who is in an unhealthy condition? Why?

**Glossary**

- mentally: kwa akili
- socially: kijamii
- strong: enye nguvu
- unwell: isiyo vizuri
- colourful: enye kuvutia

**Mwongozo**

Un- ni kiambishi awali chenye maana “sio”. Hivyo basi, neno “unhealthy” linamaana “isiyo na afya nzuri” na neno “unwell” linamaana “isiyo nzuri”

**Extension Activity**

Make a poster promoting a broad view of healthy living. Put it up around the school for other children to read. Make your poster colourful and easy to understand.
Strategies for physical, mental, and social wellbeing

Normally, you are not **aware** of your state of health unless you are unwell. Therefore, you need to make an effort to **maintain** good health. One strategy to maintain good health is to eat many different types of food. If you eat a variety of food that meets all your bodily requirements, you are maintaining a balanced diet. A balanced diet must contain protein, carbohydrate, fat and vitamins in proper proportion. You will learn more about a balanced diet in form 2.

Other general rules for maintaining good health include:

- **Exercising regularly** helps you to maintain physical wellbeing
- Having a **positive attitude** helps you to maintain mental and social wellbeing
- **Avoiding** drugs, alcohol and cigarettes helps you to maintain physical, mental, and social wellbeing
- Cleaning your environment, as we learned about in chapter three, helps you maintain physical wellbeing
- Loving your family and friends helps you maintain social wellbeing
Activity 5.6 Functions of activities
1. Look at the picture in fig 5.3. Write all the activities you can see people doing in English.
2. With your neighbour, discuss which activities you think help to maintain wellbeing.
3. For each activity, tick the table, to say what the activity helps in

<table>
<thead>
<tr>
<th>Activity</th>
<th>physical wellbeing</th>
<th>mental wellbeing</th>
<th>social wellbeing</th>
<th>No wellbeing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Activity 5.7 Health in the news
1. Read the news article on page 80 to yourself. Write at least 5 unfamiliar words in your notebook.
2. Review all the unfamiliar words with your neighbour. Work together to guess the meaning of the words. Write the definition in Kiswahili or in English in your notebook.
3. Read the article again with your neighbour. This time, discuss and answer the following questions. Record your answers in your notebook in English or Kiswahili.
   A. How many children under the age of 5 are malnourished.
   B. What are the underlying causes of malnutrition?
   C. How much money is the Government spending on Malnutrition related illnesses in children under 5 years old.

Glossary
- news: habari
- news article: makala ya habari
- review: soma kwa udadisi
- guess: buni majibu
- malnourished: isiyopewa lishe bora
- underlying: za msingi/kuu
- malnutrition: utapia mlo
- illnesses: magonjwa
Chapter Five

Mwongozo
Ili kujua maana ya maneno usiyoyajua, soma sentensi yote halafu jaribu kufikiria maana ya sentensi hiyo. Buni maana za maneno usiyoyajua. Kama bado hujaweza kujua maana za maneno hayo, angalia maana zake kwenye faharasi au muulize mwalimu wako
UNIT 5.2 IMMUNITY
Meaning and Importance of Immunity

Activity 5.8 healing ourselves
Read the following questions and discuss them with your neighbour. Record your ideas in your notebook in Kiswahili.
1. Have you ever felt unhealthy because of the flu, a cold or a cough?
2. How did you become healthy again? Did you drink tea? Did you take medication? Did you rest?
3. Have you injured yourself and then healed with no medication?
4. Why do you think your injury healed itself?

There are a lot of microscopic organisms in the environment. ‘Microscopic’ means that they are very small. You cannot see them with your eyes. Some of these microscopic organisms cause diseases. We call these microscopic organisms pathogens. They enter the body and can make us sick.

How do we stay healthy despite exposure to pathogens? The answer is simple: Our bodies have the ability to resist infection. The ability of the body to resist pathogens is called immunity.

Immunity is the ability of the body to protect or defend itself from diseases. The immune system is the body’s defence against diseases.

The body defends against these microscopic organisms by special cells in our blood, called white blood cells. There are two types of white blood cells, phagocytes and lymphocytes. When pathogens enter into the body, phagocytes and lymphocytes try to destroy the pathogens.

Phagocytes and lymphocytes
Phagocytes move around the body. When they find the pathogens, they destroy them by engulfing them.

Key ideas
Body’s ability to resist infection

Glossary
flu mafua
cold homa
cough kikohozzi
medication dawa
rest pumzika kwa muda
injured jeruhiwa
healed pona
microscopic viumbwe vidogo
pathogens vijidudu sababishi
sick uguu
infections maambukizi
immunity kinga ya mwili
defend linda
immune system mfumo wa kinga ya mwili
defence ulinzi
special maalumu
while blood cells chembe hai
engulf kumeza

Fig 5.4 A Phagocytes engulfing a pathogen
**Extension Activity**

*Fig 5.5 An antigen on a pathogen*

Lymphocytes make antibodies to destroy pathogens. An antibody is made that exactly fits the shape of molecules on the surface of the pathogen. When an antibody finds the pathogen with the right shaped antigen, it locks onto pathogen and kills it.

**Activity 5.9 How white bloods cells work**

Work with a partner:

1. Discuss in Kiswahili how lymphocytes and phagocytes protect the body

<table>
<thead>
<tr>
<th>Phagocytes</th>
<th>Lymphocytes</th>
<th>Antibodies</th>
</tr>
</thead>
<tbody>
<tr>
<td>make antibodies</td>
<td>engulf pathogens</td>
<td>move around the body</td>
</tr>
</tbody>
</table>

2. Write correct sentences using the words in the table:

Lymphocytes attack pathogens differently. They produce chemicals called antibodies. The antibodies are carried in the blood and move around in almost every part of the body, destroying the pathogen.
Activity 5.10 Importance of vaccines

Look at the illustration. Discuss with your neighbour in Kiswahili: what is happening and why?

You can get immunity either naturally or artificially.

Have you ever received a vaccination at a clinic or hospital? A vaccination is an injection into your arm. You can also get a vaccination if you take a tablet. The vaccination gives you immunity: it protects you from diseases such as cholera, typhoid, and polio. We call this artificial immunity.

You can also get natural immunity without a vaccination. You can get this through your mother's milk when you were a baby. You also get natural immunity when you have a disease and your body produces its own antibodies to fight against pathogens.

Glossary

active hali ya uchangamfu
inject dunga sindano
anti rabies dawa ya kuzuia, kutibu kichaa cha mbwa
remains mabaki
passive hali ya upole (au dhaifu)
There are also two types of immunity: Active and passive immunity.

In active immunity, our body produce its own antibodies to fight against pathogens. In passive immunity, antibodies are given to the person – either by injection or through mothers’ milk as babies.

**Activity 5.11 Matching definitions of immunity**
Match the term with the correct definition

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural active immunity</td>
<td>Immunity acquired when the body produces antibodies after a vaccination</td>
</tr>
<tr>
<td>Artificial passive immunity</td>
<td>Immunity acquired from having a disease</td>
</tr>
<tr>
<td>Artificial active immunity</td>
<td>Immunity acquired when antibodies are given in a vaccination</td>
</tr>
</tbody>
</table>

**Activity 5.12 Types of immunity**
The following table tells you more about each of the types of immunity. In the table, the types of immunity, pictures, captions and paragraphs have been mixed up.
1. Discuss in Kiswahili. Match the correct example and description with the type of immunity.
2. Copy the correct table into your notebooks

<table>
<thead>
<tr>
<th>Type of immunity</th>
<th>Example</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural active</td>
<td>breastfeeding</td>
<td>If you are bitten by a dog, your doctor will give you an injection called anti rabies. This injection protects you from Rabies. The anti rabies injections contain antibodies that will fight the disease.</td>
</tr>
<tr>
<td>Passive immunity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active immunity</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Natural passive immunity

| Vaccination against rabies gives antibodies | In Tanzania, vaccination is common. Babies receive the DPT vaccine against diphtheria, tetanus, and pertussis (whooping cough) and measles. The vaccine contains a live part of the pathogen that causes the disease. The body responds to the presence of the pathogen by producing antibodies. |

### Artificial active immunity

| Suffering from a disease will give you immunity for your life | A new born baby has not yet developed an immune system. The baby needs ready made antibodies to protect her body against diseases. A new born baby can get antibodies from breast milk. This is one reason why breast milk is very important for babies’ health. |

### Artificial passive immunity

| Born baby receiving vaccine against DPT | After you have a disease like measles, you will never suffer from that disease again in your life. Your body produces its own antibodies against the disease. This type of immunity is very effective and functions for a long time, sometimes even your entire life. |
Factors that affect body immunity

Sometimes, we recover very quickly from a disease. And sometimes it takes a long time to recover. There are many reasons for this difference. One reason for a long time recovery time might be weak body immunity. What make our body immunity to be weak? There are many factors that affect the strength of our immune system. They include:

<table>
<thead>
<tr>
<th>Glossary</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV</td>
<td>virusi vya ukimwi (VVU)</td>
</tr>
<tr>
<td>stressed</td>
<td>iliyofadhaishwa/iliyopata msongo wa mawazo</td>
</tr>
<tr>
<td>bitten</td>
<td>iliyong’atwa iliyotulia/tuama hisia</td>
</tr>
<tr>
<td>settled</td>
<td>usingizi</td>
</tr>
<tr>
<td>long time</td>
<td>muda mrefu</td>
</tr>
<tr>
<td>lack of sleep</td>
<td>ukosefu wa</td>
</tr>
<tr>
<td>dehydration</td>
<td>upungufu wa maji mwilini</td>
</tr>
</tbody>
</table>

- **Emotional stress:** When your mind is not settled, you become stressed. Some people become stressed when there is too much work to be done. Other people become stressed when a family member is ill. If you remain stressed for a long time, your body immunity weakens. So it becomes easy to be attacked by diseases.

- **Lack of sleep:** Did you ever stay without sleep? Lack of sleep weakens body immunity.

- **Ultra violet radiation:** Ultra violet radiation from the sun weakens body immunity. Don’t stay too long in the sun.

- **Poor waste disposal:** Do you remember the effects of poor waste disposal? It can lead to water and soil pollution. If we use polluted water and eat polluted food, pollution enters our body. As a result, our bodies’ immunity become weak.

- **Infection by virus and bacteria:** HIV infection is an example. It weakens the body immunity system and the patient eventually develops AIDS.

- **Poor diet:** Eating too much fat, alcohol, or refined sugar, protein, calories, vitamins, minerals, or water weakens our immune system. Also, if we do not eat the right food, our body does not get enough nutrients such as minerals and vitamins.

- **Age:** Our body immunity naturally weakens after the age of 40.

- **Dehydration:** If you do not drink water you become dehydrated. Dehydration causes pain, asthma and allergies. Dehydration stops the body from removing waste, and lowers body immunity.
Activity 5.13  Drawing diagrams of immunity

1. Discuss each of the factors that affect body immunity with your neighbour in Kiswahili.
2. Draw a picture for each factor that affects body immunity in your notebook. Write a caption in English that describes each picture.

Activity 5.14  Writing about immunity

Use the information in the table to write a letter to your friend in English. In the letter, describe how your friend can maintain high body immunity. You may want to mention the types of food that your friend should eat, or the types of exercise your friend should do. Use these phrases in your letter:

- You should ...
- Make sure you...
- Avoid...
- Don’t try to...

Activity 5.15 The importance of vaccination

1. Discuss with your neighbour the importance of vaccinations in Kiswahili and in English.
2. Write down reasons for the importance of vaccinations in your notebook.
3. Imagine your small brother or sister feels afraid of vaccinations. With your neighbour, role-play how you will convince your small brother or sister to go to the clinic to get a vaccination. One of you should be the big brother or sister. The other should be the small brother or sister.
4. Share your role-play with the class.
5. If your fellows have shared any reasons for the importance of vaccinations in the role-play, add them to your notebook.
Activity 5.16 Word meaning

Match the words given in the right column with a suitable explanation in the left column.

<table>
<thead>
<tr>
<th>Explanation</th>
<th>Word</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. An organism that causes disease</td>
<td>1. Antibody</td>
</tr>
<tr>
<td>B. Immunity cells that attack by engulfing</td>
<td>2. Vaccination</td>
</tr>
<tr>
<td>C. Immunity cells that produce antibodies</td>
<td>3. Phagocytes</td>
</tr>
<tr>
<td>D. Chemicals that attack pathogens</td>
<td>4. Lymphocytes</td>
</tr>
<tr>
<td>E. Foreign molecules in the body that stimulate the immune system</td>
<td>5. Antigen</td>
</tr>
<tr>
<td>F. Defence system of the body</td>
<td>6. Immunity</td>
</tr>
<tr>
<td>G. Ability of the body to resist disease</td>
<td>7. Immune system</td>
</tr>
<tr>
<td>H. Injection of antigens into the body to stimulate body immune</td>
<td>8. Pathogen</td>
</tr>
</tbody>
</table>

Summary

In this unit, we have learned about health and immunity. We learned that we can be physically healthy, mentally healthy and socially healthy.

In addition to the concept of health, we learned that our bodies have an ability to resist infection. The ability to resist infection is called immunity. We learned that body immunity can be natural - meaning that the immunity happens naturally, without vaccination; or artificial, meaning that the immunity happens artificially, with an injection. We also learned that immunity can happen passively, when antibodies that fight infection are given to us; or actively, when the body makes the antibodies.

Body immunity contributes much to keeping us healthy. However, in order to have sustainable health, we need to do much more to support the body immunity. This is what we are going to learn in the next unit.
UNIT 5.3 Personal and Community Hygiene

Personal hygiene

This unit is about keeping our body clean and healthy.

You know that many individual families, like your family, make a community. If each family in the community keeps their environment clean, the whole more community will be clean and its members will be healthy.

Activity 5.17 Why is cleanliness important?

Work in a small group, discuss the following questions in Kiswahili.
1. Why do you take baths and wash your uniforms?
2. What do you think would happen if you did not take baths or wash your uniform?
3. Report to the class, using sentences like these:
   We take baths and wash our uniforms because...
   If we didn’t take baths we might....
   If we didn’t wash our uniforms we might...

What do you think of when you hear the words personal hygiene? Personal hygiene means cleaning, grooming, and caring for our bodies and environment. If we want to remain healthy, we have to keep our bodies and our environment clean.

Activity 5.18 Cleanliness activities

1. Look at the picture. Say what the people are doing.
2. Report to the class in English, like this:
   In picture 1 the person is washing...
Washing our bodies

We live in a hot and dusty environment. We always sweat. Therefore, we need to wash our bodies with warm water and soap to remove sweat and dust.

If we do not wash our body, we will produce a bad odour and suffer from skin diseases.
Keeping our nails short and clean

We use our hands for so many activities. During cooking, cleaning, farming, and other activities, dirt gets under nails. Long nails will pass the dirt to food when we eat. Therefore, we cut our nails to keep them short and clean.

If we do not keep our nails short and clean, our nails will pass dirt to food when we eat it.

Washing and combing our hair daily

We normally put oil in our hair to keep our scull moist. The oil attracts dust. Therefore, we should wash our hair every time we take a bath. We should also dry our hair after washing, and comb our hair. It is better to keep short hair to make it easy to comb.

If we do not wash and comb our hair, our hair will be dusty and unclean.

Cleaning our teeth

We clean our teeth after eating. We clean our teeth to prevent a bad odour in our mouths. We do not feel good if we talk with someone with bad mouth smell. Therefore, we should brush our teeth at least twice per day, in the morning when we wake up and in the evening before going to bed. If we brush our teeth regularly, we will avoid tooth decay and gum infection.

If we do not brush our teeth regularly, our teeth will decay and be prone to infection, and our breath will have a bad odour.

Activity 5.19 Cleaning your teeth

Discuss the following questions in english with your neighbour.

1. How many times do you brush your teeth per day? Why do you brush your teeth?
2. What time of day do you brush your teeth? Why?
3. Where do you get water for brushing your teeth?
4. How many times per day do you take a bath?
5. What other activities do you do to keep your body clean and healthy?
**Hand-washing after toilet use and before eating**

We use our hands to prepare and eat food. We also use our hands to hold various things. When we use the toilet, we use our hands to clean ourselves. Sometimes we use our hands to clean our young siblings. Therefore, we must wash our hands with soap and water. It is particularly important to wash our hands with soap before we prepare or eat food.

If we do not clean our hands, we can infect ourselves with pathogens.

**Washing and ironing our clothes regularly**

We should wash our clothes with soap and clean water when they are dirty. Washing clothes with soap kills the germs that can cause skin diseases. Ironing makes us appear smart and kills the eggs of the Tumbu fly.

If we do not wash and iron our cloths, we may get sick, have a bad appearance, or attract the Tumbu fly.

**Wash and change our bedding regularly**

Our bedding needs to be washed with soap regularly. This is because when we sleep we might sweat and make our bedding dirty. Therefore, we must wash and change our bedding regularly.

If we sleep on dirty bed sheets, we may become ill.

**Keep our environment clean**

Our immediate environment consists of our house, our compound, and the surrounding area near our home. A clean environment is important if we want to stay healthy. Sometimes people keep their environment very dirty. A dirty environment can make you unhealthy. Therefore, if we keep the environment of our homes clean, we can keep the whole community clean.

If we do not keep our environment clean, we can become unhealthy.
Activity 5.20 Heads and Tails

Match the heads and tails of these sentences:

A. Empty refuse containers when 1. which grows around your home
B. Burn refuse 2. so that sewage does not spill out
C. Do not pour dirty water 3. drains
D. Do not throw solid refuse into 4. they are full
E. Cut the grass 5. in a safe fireplace
F. Maintain your sewage pipes 6. on public roads

Activity 5.21 Completing sentences

Fill in the gaps below using the words in the box.

illness food infect germs healthy twice ironing environment dust

1. It is important to wash regularly in order to keep ....
2. We need to keep our nails short so that dirt doesn’t get into our ...
3. Our hair gets dusty, so washing is necessary to get the ... out of it.
4. If we brush our teeth ... a day we can avoid tooth decay.
5. Before we eat food we should wash our hands so that we don’t ... ourselves.
6. We have to wash our clothes to kill ....
7. ... clothes can kill the eggs of the Tsumbu fly.
8. Washing bedding can help us avoid ...
9. We should keep our ... clean if we want to stay healthy.

Activity 5.22 Personal hygiene

1. In a group, prepare a short role-play about the importance of personal hygiene. Choose one aspect of personal hygiene you have learned about. You might show what happens if you do not keep clean. Or show the benefits of personal hygiene.
2. Present your role-play to the rest of the class.
Personal hygiene during puberty

Puberty is a normal process. Your mother and father, grandmother and grandfather, neighbours, teachers, and older brothers and sisters have all gone through puberty. You are growing older, and your body is changing. Do not feel ashamed of your body or the changes. All people go through puberty.

Puberty is the time in life when a boy or girl becomes sexually mature. It is a process that happens between the ages of 10 and 14 for girls and 12 and 16 for boys. It causes physical changes, and affects boys and girls differently.

Fig 5.13 Changes during puberty
Activity 5.23 Changes during puberty

1. Look at the pictures in fig 5.13. Discuss in groups of boys and girls in Kiswahili and describe the changes that happen in puberty.
2. Copy the pictures into your exercise book. Label your pictures with these sentences.

<table>
<thead>
<tr>
<th>Girls</th>
<th>Boys</th>
</tr>
</thead>
<tbody>
<tr>
<td>The breasts develop</td>
<td>The testicles and penis get bigger</td>
</tr>
<tr>
<td>Hair grows in the pubic area and armpits</td>
<td>Hair grows in the pubic area and armpits</td>
</tr>
<tr>
<td>Menstruation (or a period) occurs</td>
<td>Muscles grow</td>
</tr>
<tr>
<td>Sweat glands develop</td>
<td>The voice deepens</td>
</tr>
<tr>
<td>Mucus is produced through the vagina</td>
<td>Facial hair develops</td>
</tr>
<tr>
<td></td>
<td>Increased sweating and body odour</td>
</tr>
</tbody>
</table>

Good manners

In the previous section, we learned about personal hygiene. We learned personal hygiene during puberty. In this section, we are going to learn about good manners.

Glossary

- pubic area: kinena
- armpits: kwapa
- Menstruation: hedhi
- Sweat glands: matezi ya jasho
- mucus: ute
- testicles: korodani/pumbu
- voice: sauti
- deepens: nzito
- Facial hair: ndevu/sharubu
- vagina: uke
- good manner: tabia njema
- sneezing: kupiga chafya
Chapter Five

Activity 5.24 Good manners

1. Look at the pictures in fig 5.14 and fig 5.15. Which person is showing good manners? Why?
2. What do you understand by the term good manners?
3. Make a word web in English, like you did in unit 5.1, to show the meaning of the term good manners.

Good manners means acting in a way that shows respect, care, and consideration for others. If you have good manners you can get on with people better.

Good table manners

There are rules or manners to be followed while eating. The following are some of table manners:

- Chew with your mouth closed
- Say “excuse me” if you need to leave the table.
- Never reach across a dish or someone else’s plate to reach something; instead, politely ask the person sitting next to you “please pass the salt or sugar.”
- Don’t put your elbows on the table when you are eating

Good manners in conversation

- Listen to other people when they speak
- Take your turn. Do not dominate the conversation, give other people chances to talk
- Think before you talk
- Do not interrupt, just wait until the other has stopped talking before you start
- Do not talk to only one person when you are talking to a group of people
- Do not pick your nose and ears in the public
- Cover your mouth and nose with handkerchief when sneezing or coughing

Activity 5.25 Good manners

1. Work with a small group to prepare a role-play in English showing good manners.
2. Present your role-play to the class
3. Watch your fellows role-play and write the good manners they are role playing in your notebook.

Extension Activity

Some good manners are the same for all people. Some good manners are specific to your community, culture or religion. Write any good manners that are specific to your own community.
Importance of personal hygiene and good manners

**Activity 5.26 Benefits of personal hygiene and good manners**

1. Copy this table into your notebook.
2. Look at the sentences. Copy the sentences into the correct part of the table.

<table>
<thead>
<tr>
<th></th>
<th>Health benefits</th>
<th>Social benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal hygiene</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good manners</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Good personal hygiene improves your own **self-image**.
- Washing your hands can prevent the spread of **germs**.
- Brushing teeth prevents tooth decay and gum infections.
- You set standards for others’ behaviour and encourage them to treat you with similar respect.
- Good personal hygiene will make us accepted by our community.
- Good manners make a good **impression** on others.
- A clean body will keep bacteria, **viruses** and **fungus** away.
- Being **polite** and considerate means considering how others are feeling.
- Brushing your teeth can reduce the likelihood of **oral** diseases.

**Summary**

In this unit we have learned the meaning of personal hygiene and community health.

We learned that in order to maintain our personal and community health, each individual must observe the principles of good health. These principles are many and diverse. They include washing our hands before and after eating or using toilets, cleaning and ironing our clothing, and keeping our environments clean. If everyone in our families and communities become responsible, it is possible to have healthier individuals in the community.

We also learned about good manners. You should recall that while good manners apply to all people, some good manners are specific to certain communities, **tribes**, **religions**, or age groups.
6 INFECTIONS AND DISEASES

6.1 Causes of Infections
6.2 Common Infections Diseases
6.3 Classification of Diseases
6.4 Non-Infections Diseases

Introduction
In this chapter you will learn about some common diseases in Tanzania. If a pathogen invades your body, you may start to feel unwell. You start to show symptoms. Common symptoms are tiredness, nausea, diarrhoea, lack of appetite etc. Each disease shows different symptoms.

Different microorganisms can cause diseases – Bacteria, Virus, Fungus and Protozoa. In this chapter you will learn about the symptoms of common diseases, and how these diseases are transmitted.

LEARNING OBJECTIVES
You should be able to:
- Explain the meaning of the terms infection and disease
- Mention common infections and diseases
- Explain the causes, symptoms, modes of transmission, and effects of common infections and diseases
Key ideas
Infections
Diseases
Infectious diseases
Non-infectious diseases

Mwongozo

Glossary
Infectious inayoambukiza
Non-infectious isiyoambukiza

UNIT 6.1 Infections and diseases

Activity 6.1 Symptoms of diseases
1. Look at the pictures in fig 6.1.
2. Discuss in Kiswahili. What do the pictures tell you about infections and diseases? What are the signs of disease you can see in the pictures? An infection is different from a disease.
An infection is when dangerous microorganisms enter the body. Normally, an infected person does not show any sign of being unwell.

When a person has a disease, he or she is ill. This means all or part of the body is not working properly. Diseases are caused by infections, environmental factors, or genetic factors.

When an infection causes a disease, we call this an infectious disease. Therefore, an infected person is at risk of getting an infectious disease. The disease starts when the person notices that something is wrong with his or her body.

People with diseases usually have symptoms. Symptoms help doctors to determine what the disease is.

Usually diseases have symptoms that tell us what the disease is. Look at figure 6.2. What symptoms can you see? What disease do you think the person has?

**Activity 6.2 Symptoms of diseases**

Do you know the symptoms of some common diseases?

1. Common infectious diseases and their symptoms are listed in table 6.1.1. Column A shows common infections diseases and column B shows the symptoms of the diseases. Discuss each infectious disease with your neighbour. Mention anything you know about the disease. Do you know anybody who has had the disease? Discuss in Kiswahili.

2. Review the symptoms listed in Column B. Discuss the meaning of each symptom in Kiswahili with your neighbour.

3. Match the symptoms in column B with the infectious disease in column A. You may use the symptoms in column B more than once. For example, high temperature is a symptom of both Malaria and flu.
Many microorganisms live in and on our bodies. They are normally harmless or even helpful. But some microorganisms are harmful for humans, and cause infectious diseases. There are different types of unsafe microorganisms that cause disease. These are:

- bacteria
- viruses
- fungi
- protozoa

These organisms are found everywhere. They can be found in air, soil, and water. You can get infected by:

- touching
- eating
- drinking
- breathing
- through animals and insect bites
- Kissing
- Sexual contact

<table>
<thead>
<tr>
<th>Column A - DISEASE</th>
<th>Column B - SYMPTOMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaria</td>
<td>High temperature</td>
</tr>
<tr>
<td>flu</td>
<td>headache</td>
</tr>
<tr>
<td>yellow fever</td>
<td>sweats</td>
</tr>
<tr>
<td>rabies</td>
<td>chills</td>
</tr>
<tr>
<td>dengue fever</td>
<td>vomiting</td>
</tr>
<tr>
<td>typhoid</td>
<td>aching muscles</td>
</tr>
<tr>
<td></td>
<td>joint pain</td>
</tr>
<tr>
<td></td>
<td>diarrhoea</td>
</tr>
<tr>
<td></td>
<td>sore throat</td>
</tr>
<tr>
<td></td>
<td>sneezing</td>
</tr>
<tr>
<td></td>
<td>anxiety</td>
</tr>
<tr>
<td></td>
<td>odd behaviour</td>
</tr>
<tr>
<td></td>
<td>fear of water</td>
</tr>
<tr>
<td></td>
<td>stomach pain</td>
</tr>
<tr>
<td></td>
<td>rash</td>
</tr>
</tbody>
</table>

- Malaria
- flu
- yellow fever
- rabies
- dengue fever
- typhoid
- High temperature
- headache
- sweats
- chills
- vomiting
- aching muscles
- joint pain
- diarrhoea
- sore throat
- sneezing
- anxiety
- odd behaviour
- fear of water
- stomach pain
- rash
Biology for Secondary School
Chapter 6: Infections and Diseases

Glossary

- **virus**  
  - **virusi**

- **fungus**  
  - **ukungu**
  - **unaotanda**
  - **kwenye majani ya mimea au kwenye ngozi**

- **protozoa**  
  - **mdudu**
  - **mdogo asiyi na uti wa mgongo**

- **algae**  
  - **miti isiyi maua isiyi na chakuniwiti wala majani wala kigogo**

- **bacteria**  
  - **mdudu mdogo aliye na ukuta na husababisha maradhi**

*Fig 6.3 Diseases causing microorganisms*
Activity 6.3 Diseases causing microorganisms

Look at the microorganisms in figure 6.3 and read their names aloud.

1. Find the names of each of the microorganisms in the glossary.
2. Using Kiswahili, discuss with your neighbour the diseases caused by each organism.
3. What do you know about each disease?
4. Which infectious diseases affect people in your community?

There are many infectious diseases. In this unit you will learn about some common diseases.
UNIT 6.2 Common Infectious Diseases

Diseases caused by Bacteria

Activity 6.4 Writing about diseases
Copy this table into your exercise books. Read about the following diseases and fill in the table.

<table>
<thead>
<tr>
<th>Disease</th>
<th>Transmitted by</th>
<th>Symptoms</th>
<th>Can lead to</th>
<th>Prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td>TB</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cholera</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dysentry</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Tuberculosis (TB)

Fig 6.4 A person with TB coughing

Fig 6.5 A child being vaccinated against TB with the BCG

Tuberculosis is an infectious disease caused by bacteria called mycobacterium. It is transmitted through air. The bacteria are spread in droplets when coughing or sneezing. A person with tuberculosis may show some or all of the...
The following symptoms:
- Loss of weight
- Fever
- **Prolonged** cough
- Blood-stained *sputum*
- Lack of *appetite*
- Loss of energy

A person with this disease needs immediate medical treatment. If not well treated, the disease may lead to:
- Damage of *lungs*
- *Bone* infections
- Damage of the kidney

To prevent tuberculosis, we need to give children a vaccine called Bacillus Calmette-Guerin [BCG]. This vaccination gives artificial active immunity.

**Cholera**

Cholera is an infectious disease caused by bacteria called *vibrio cholerae*. It is transmitted through eating *contaminated* food or drinking contaminated water. A person with cholera may show some or all of the following symptoms:
- Severe *diarrhoea*
- Vomiting
- Loss of weight
- And dehydration of the body

A person with this disease needs immediate medical *treatment*. 50% of people with severe cholera would die if left untreated.

To prevent cholera, we need to do the following actions:
- Dispose of faeces properly
- Cook food properly
- Wash hands after visiting toilet
- Boil or treat drinking water
- **Thoroughly** wash fruits and vegetables.

---

**Glossary**

<table>
<thead>
<tr>
<th>English</th>
<th>Swahili</th>
</tr>
</thead>
<tbody>
<tr>
<td>prolonged</td>
<td>cha muda mrefu</td>
</tr>
<tr>
<td>sputum</td>
<td>makohozi</td>
</tr>
<tr>
<td>appetite</td>
<td>hamu ya kula</td>
</tr>
<tr>
<td>damage</td>
<td>harbu</td>
</tr>
<tr>
<td>lungs</td>
<td>mapafu</td>
</tr>
<tr>
<td>bone</td>
<td>mtiwa</td>
</tr>
<tr>
<td>contaminated</td>
<td>kisicho/yasio safi na salama</td>
</tr>
<tr>
<td>diarrhoea</td>
<td>kuharisha</td>
</tr>
<tr>
<td>vomiting</td>
<td>kutapika</td>
</tr>
<tr>
<td>treatment</td>
<td>matibabu</td>
</tr>
<tr>
<td>thoroughly</td>
<td>vizuri</td>
</tr>
</tbody>
</table>

**Did you know**

*Babies fed on breast milk are less likely to get an infectious disease than babies fed on bottled milk. Can you think why?*

---

*Fig. 6.6 A woman breastfeeding baby*

Families fed on breast milk are less likely to get an infectious disease than families fed on bottled milk. Can you think why?
**Dysentery**

**Dysentery** is an infectious disease caused by bacteria called *Entamoeba histolitica*. It is transmitted through eating uncooked food or poorly prepared food. A person with dysentery shows some or all of the following symptoms:

- **Diarrhoea** with blood in **faeces**
- **Fever**
- **Nausea**
- **Vomiting**

A person with this disease needs immediate medical treatment. Infected people need to be treated using the recommended **drugs**. If not well treated, the disease may lead to:

- **Anaemia (insufficient red blood cells)**
- **Dehydration**

To prevent dysentery, we need to do the following actions:

- **Avoid uncooked food**
- **Prepare** and keep food in hygienic conditions.

---

**Glossary**

- **Dysentery** (ugonjwa wa kuhara)
- **Bacteria** (enea)
- **TB** (mboga la mungu)
- **Cholera** (ugonjwa wa kuhara)
- **Dysentery** (ugonjwa wa kuhara)
- **Diarrhoea** (harisha)
- **Fever** (homa)
- **Nausea** (kichefuchefu)
- **Vomiting** (kutapika)
- **Prepare** (anda)
- **Anaemia** (upungufu wa damu)
- **Insufficient** (isiyotosheleza)
- **Blood** (damu)

---

**Activity 6.5 Preventing Diseases**

In groups, discuss and prepare a role-play showing how to avoid catching one of the diseases caused by Bacteria - TB, Cholera or Dysentery. In the role-play you should show the class the activities you should do to prevent the disease. Use English language in your role-play. You can use Kiswahili to prepare the role-play.
**Diseases caused by protozoa**

**Malaria**

Malaria is an infectious disease caused by protozoa called *plasmodium*. It is very common to people living in tropical areas like Tanzania. It is transmitted through mosquito bites by mosquitos that carry the malaria parasite. A person with malaria may show some or all of the following symptoms:

- Irregular fever
- Pain in joints
- Head ache
- Abdominal pain
- Nausea
- Vomiting

A person with this disease needs immediate medical treatment. If not treated early, this disease may lead to:

- Anaemia
- Failure of the kidney
- Damage of the brain
- Damage of the spleen

To prevent the spread of Malaria, infected people need to be treated using recommended anti-malaria drugs. Also, mosquito larvae need to be destroyed by using oil spray or insecticides and mosquitoes breeding sites need to be drained.

To prevent Malaria in tropical areas, we need to wear long sleeves shirts, trousers, and socks, sleep under a treated mosquito net at night, and use mosquito repellent.

---

**Glossary**

- Tropical areas: *maeneo yenye joto kali*
- Mosquito: *mbu*
- Abdominal: *tumbo*
- Brain: *ubongo*
- Spleen: *bandama*
- Destroy: *teketeza, angamiza*
- Drain: *toa maji kwa mifereji/bomba, kausha*

**Did you know**

- Fig. 6.9 Close up of anopheles mosquito on skin

There are many different types of Mosquito. However, only the female anopheles mosquito can transmit Malaria.

- Fig. 6.10 A child sleeping under bed net
Activity 6.6 Preventing Malaria
Prepare a poster written in Kiswahili and English. Show:
(i) Symptoms of Malaria
(ii) Ways to prevent Malaria

Diseases caused by Viruses

Flu/common cold
Flu is an infectious disease caused by large variety of viruses. It is transmitted through the air. The viruses spread by droplets when coughing or sneezing. A person with the flu or common cold shows some or all of the following symptoms:

- **Nasal** and bronchial irritation resulting in sneezing and coughing,
- **Fever** or chills
- Feeling very tired

If not treated quickly, the disease may lead to difficulty in breathing.

To prevent the flu or common cold, we need to do the following actions:

- Sneeze and cough into tissues and dispose of them properly
- Don’t stand or sit too close to someone with a cold
- Wash your hands often
- Do not share food, drinks, or clothing with anyone with a cold

Did you know
Garlic can help children to recover fast from flu/common cold.

![Fig 6.11 Sneezing towards someone spreads the disease](image)
Activity 6.7 Recovering from a cold

1. In groups of five discuss in Kiswahili how you feel when you have the flu or a common cold. Discuss the following questions:
   (i) What do you do to become healthy again?
   (ii) What do you like to eat or drink when you have the flu?
   (iii) What do you do to prevent the spread of the cold to others in your home?

2. Present your ideas to the class using English.

Diseases caused by fungi

Candidiasis

Candidiasis is a sexually transmitted infection (STI) caused by fungus. It is spread from one person to another through sexual contact. Sharing personal belongings such as underwear and towels also spreads the infection. If not treated, candidiasis can infect the blood of an individual. A person with candidiasis shows some or all of the following symptoms:

- White discharge from the female sexual organs
- Itching vagina
- Swollen penis
- Skin rashes
- And thick white patches in the mouth

To prevent candidiasis, we need to do the following actions:

- Abstain from sex at a young age and before marriage
- Avoid risky sexual activities
- Ensure proper medical treatment
- Avoid sharing of personal belongings such as towels, underwear, and pyjamas.
Activity 6.8 What disease do I have?

In this activity you are going to role-play a visit to a doctor. One person is going to be the patient. The other people in the group are the doctors. Use English.

1. Each patient should study the symptoms of one infectious disease.
2. The patient should then describe their symptoms to the group of doctors.
3. The doctors should discuss what the illness is.

Then, switch roles so that all members of the group have the opportunity to be a patient.
UNIT 6.3 Classification of diseases

Classification of infectious diseases

We classify infectious diseases based on how they occur:

<table>
<thead>
<tr>
<th>Disease</th>
<th>Epidemic disease</th>
<th>Endemic disease</th>
<th>Pandemic disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaria</td>
<td>An epidemic disease affects a large number of people in a specific region in a short period of time. For example, Cholera spread through West Africa in 2012.</td>
<td>An endemic disease is a disease that is consistently in one area. For example, Malaria and Bilharzia are always present in tropical areas where there is stagnant water.</td>
<td>A pandemic disease is one that spreads widely to affect a large geographical area such as a continent or the whole world. For example, example HIV-AIDS has spread around the whole world.</td>
</tr>
<tr>
<td>Ebola</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bilhazia/ \schistosomiasis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cholera</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Activity 6.9 Classify the diseases

Fill the table below by putting a tick in the appropriate cell

<table>
<thead>
<tr>
<th>Disease</th>
<th>Epidemic</th>
<th>Endemic</th>
<th>Pandemic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaria</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ebola</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bilhazia/\schistosomiasis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cholera</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Activity 6.10 Writing what we know

Construct correct sentences by using the phrases from the table below

<table>
<thead>
<tr>
<th>Disease</th>
<th>Cause/Trans.</th>
<th>Cause/Trans.</th>
<th>Cause/Trans.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaria</td>
<td>Is caused by</td>
<td>Female anopheles mosquito</td>
<td></td>
</tr>
<tr>
<td></td>
<td>by contam. food</td>
<td>Contaminated food and water</td>
<td></td>
</tr>
<tr>
<td></td>
<td>and water</td>
<td>Plasmodium species</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Viruses</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mycobacterium</td>
<td></td>
</tr>
<tr>
<td>Cholera</td>
<td>Is caused by</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>by contam. food</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>and water</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>Is transmitted by</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>by Plasmodium species</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flu</td>
<td></td>
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</table>
Infections and diseases

Non Infectious Diseases

All the diseases we have discussed in this chapter are called infectious diseases. We call them infectious diseases because they are diseases that are caused by infections. Infectious diseases can be passed from one person to another.

There are also diseases that cannot be passed from one person to another. These are called non-infectious diseases. Examples of non-infectious diseases are:

- Cancer
- Mental illness
- Diabetes
- Kwashiorkor

Non-infectious diseases may be caused by:

- Environmental factors such as smoke production
- Poor nutrition
- Genetic disorders
- Human behaviour such as over feeding.
- Stress
- Old age

Summary

There are many diseases. Some are caused by infections while others are caused by environmental factors, or genetic factors. Infections occur when harmful microorganisms invade a body. Infection is usually not accompanied by symptoms and signs. A disease develops when a person starts to notice that the body is not well.

A disease has signs and symptoms. Examples of diseases caused by infections are cholera, colds and Tuberculosis. Diseases causes by infections can be spread from one person to another. Diseases caused by factors other than infection are known as non-infectious diseases.

Non-infectious diseases can be caused by factors such as old age, stress, environmental factors, poor nutrition, human behaviour and genetic disorders. Non-infectious diseases cannot be easily transmitted from one person to another. Examples of non-infectious diseases are cancer, Diabetes and Heart diseases.

Extension Activity

Conduct a research on one non-infectious disease. In your research find out the following:

- what causes the disease
- what the symptoms are
- how it is treated

Present your finding to the rest of the class.

Glossary

- cancer: saratani
- mental illness: ugonjwawa
- diabetes: kisukari
- kwashiorkor: unyafuzi
- nutrition: lishe
- genetic disorders: magonjwa
- ya kinasaba
This book is one of a series of three created by the project Strengthening Secondary Education in Practice: Language Supportive Teaching and Textbooks in Tanzania (LSTT).

The books are intended an example of the design of language supportive learning materials specifically for use in Tanzanian secondary schools. We hope that the ideas in this book will be taken up, adapted and developed further by educators, authors and publishers.