

2.1 Lesson 1: Water and health

Teacher's information – Lesson 1: Water and health

The first lesson is dedicated to the topics of water and health. It starts with a walk through the school and the community to raise awareness on the current local situation. Back in school, three activities give a deeper insight into water, water origin and water use. An exercise on the causes of disease in households is followed by a more general overview of disease transmission. At the end of the lesson, an exercise on disease prevention outlines the future lessons and shall motivate the children to endorse the principles of the Safe Water School.

Preparation

- Identify the key areas associated with water and hygiene in school and in the community

Objectives – Knowledge

- Know the water and hygiene-related problems in school and in the community
- Know the most prevalent local diseases
- Know five good behaviours to prevent diseases

Objectives – Attitudes

- Consider water as a precious resource
- View open faeces as a problem
- Be interested in learning how to prevent diseases

Objectives – Skills

- Be able to distinguish a “clean” from a “dirty” household
- Be able to identify the problems related to water and hygiene in the community

Time

- 120 minutes

Materials – School

- 5 grams of salt
- 0.5 litre of raw water
- Drawing material

Materials – Toolkit

- 2 PET bottles
- 1 syringe
- Images: Lesson 1

Key messages of the lesson

- **Water is the base of all life.**
- **Unsafe water and bad hygiene make you sick.**
- **Learn to prevent diseases and become a Safe Water Promoter.**

Water & hygiene walk

Materials: Drawing material

1. Walk around in the school and show the children what the school has already undertaken to create a hygienic environment, for example hand washing station, latrines. Show them how to use these improvements. Also point out the current problems in school, like open defecation or an unsafe water supply.
2. Extend the water walk to the community. Show and tell the children about local water-related features (e.g. nearby river, frequent rainfall or cultural events with reference to the water). Point out the main local water and hygiene problems, for example contaminated water sources, open defecation or garbage dumps. Show them exemplary “clean” and “dirty” households.
3. Make the children draw a situation related to water or hygiene they experienced during their walk.
4. Discuss the drawings with the children and hang them on the wall.

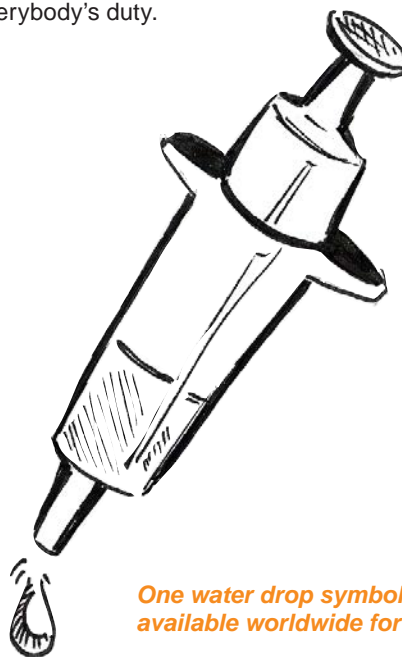


Possible situation during the water & hygiene walk

Water is the base of all life

Materials: 2 PET bottles, 0.5 litre raw water, 5 grams of salt, 1 syringe

1. Illustrate how precious water is by showing the relationship between all the water on earth and the water available for human use. The example is calculated for a 0.5-litre bottle. Adjust the figures when using other bottle sizes.
2. Fill the first bottle with water. It symbolises all the earth's water.
3. Pour about 3% of the water (approximately one soup spoon), symbolising the earth's freshwater, into the second bottle.
4. Add salt to the first bottle to illustrate the undrinkable seawater.
5. Extract one drop with the syringe from the second bottle. The remaining water symbolises the frozen freshwater, most of it found at the earth's poles.
6. Let the single drop fall to the floor. The drop symbolises the water available worldwide for human use, of which about 95% is used in agricultural and industrial activities.
7. Initiate and guide a discussion based on the following inputs:
 - Water is a scarce and precious resource.
 - Water plays a central role in all large cultures and religions.
 - People can survive only a few days without water.
 - Preserving and protecting water is everybody's duty.



One water drop symbolises the water available worldwide for human use

The origin of water

Image: Water cycle

1. Divide the class into four groups and distribute the same image of the water cycle to all the groups. Let the children discuss the water cycle in the group and create a story about a water drop.

Alternative for young children: Explain the water cycle by telling the story of a raindrop: "Once upon a time there was a raindrop floating on the sea. The sun warmed the water and the drop evaporated. It rose as water vapour. With many other drops, it formed a cloud ..."

2. Ask one child of each group to present his/her story in front of the class.



Water cycle

Personal water use

Images: Personal water use

1. Distribute the images "Personal water use" to the children and let them look at the images.



Drinking water



Playing with water



Cleaning face



Washing clothes

2. Ask them to describe the water use on their images before hanging them on the wall.
3. Inform the children about the links between water and hygiene.
 - Water is used for many hygiene behaviours, such as hand washing or brushing teeth.
 - Water is the base of all life, but it can also cause illness and death.

Disease causes in a household

Images: *Dirty household, Clean household*

1. Inform the children about the most prevalent local diseases. Include information about diarrhoea.
 - Diarrhoea causes people to lose liquid from their bodies and can result in death.
 - Many diseases can be prevented efficiently by drinking safe water, washing hands properly and disposing faeces safely.
2. Divide the class into two groups. Hand out the images “Dirty household” to one group and the image “Clean household” to the other group. Let them discuss the images and prepare a presentation in front of the class about the good and bad behaviour as illustrated by the images.



Dirty household



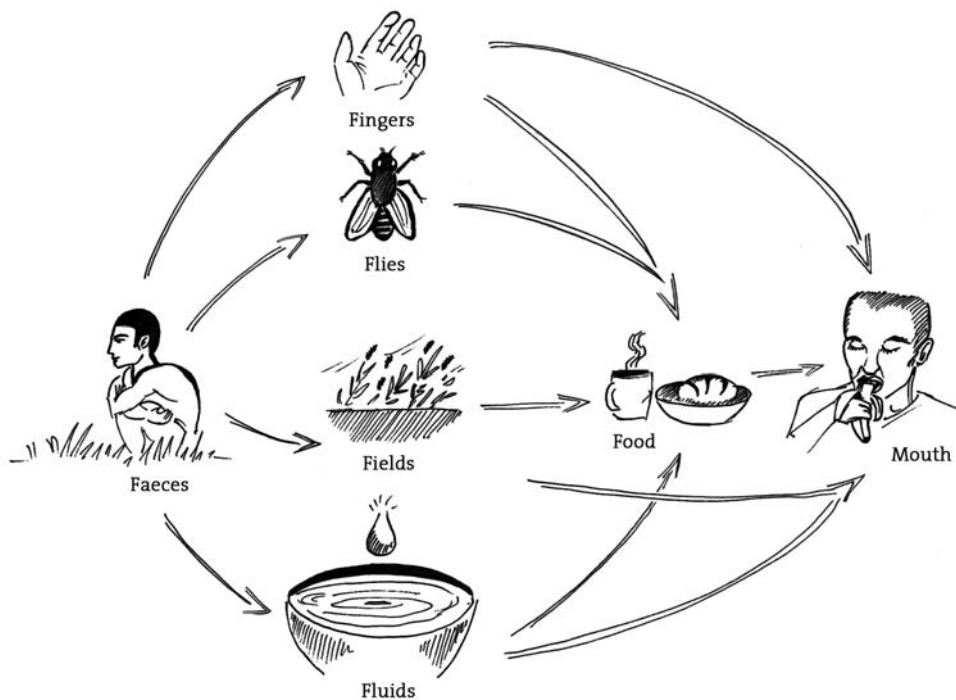
Clean household

3. Tell the group with the image “Dirty household” to present its image. Help the children name all the bad behaviours shown on the image.
 - Flies in the house, chicken on water storage container, open defecation from child and animals, open waste disposal, faecal contamination of the water source, untied animals near the house, unhygienic food storage.
4. Tell the group with the image “Clean household” to present its image. Help the children name all the good behaviours shown on the image
 - Protected water source, latrine, tied animals, distance between house and animals, water storage container with lid, clean house, container for waste disposal.
5. Explain the key message of the two images.
 - The family in the “Dirty household” has a greater risk of becoming ill due to bad handling of water and poor hygiene practice.
 - The family in the “Clean household” has a reduced risk of becoming ill as it applies easy and efficient improvements and practices.

Disease transmission routes

Images: Disease transmission routes

1. Inform the children about the dangerous organisms in faeces and their dissemination via the faecal-oral route.
 - The diseases are mostly spread by organisms found in human excreta.
 - One gram of human faeces can contain 10 000 000 viruses, 1 000 000 bacteria, 1 000 parasite cysts, and 100 parasite eggs.
 - The diseases are normally transmitted by faecal-oral routes via fingers, flies (insects), fields and fluids, food or directly to the mouth.
2. Divide the class into four groups and distribute the images “Disease transmission routes” to all the groups.



Disease transmission routes (F-Diagram)

3. Let the children arrange the images of the disease transmission routes. Give them an example of one disease transmission route, such as faeces – fingers – mouth.
 - What are the different routes on which pathogens are transmitted from the faeces to the mouth?
4. Let the groups show and explain their diagrams to the other groups. Ask them for local examples of disease transmission.

Disease transmission barriers

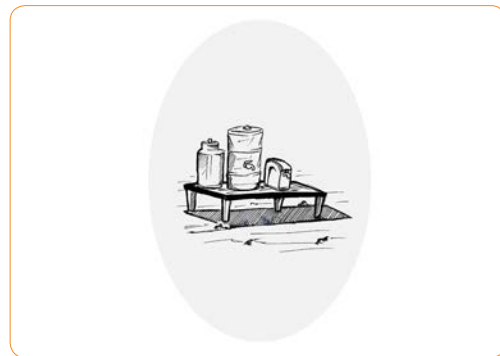
Materials: Drawing materials

Images: Disease transmission routes, Disease transmission barriers

1. Ask each group to identify local practices that can break the transmission routes.
2. Distribute the images “Disease transmission barriers” to each group. Let the children place the received images on the diagram.



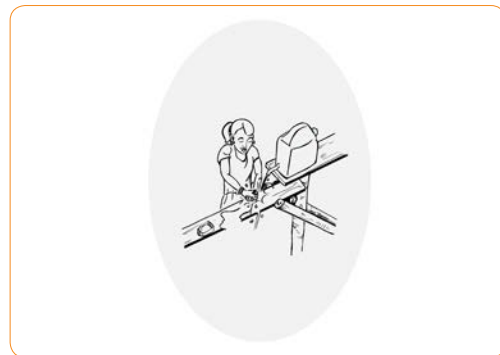
Latrine



Safe water storage



Boiling



Washing hands

3. The distributed images do not cover all situations. The groups can draw additional transmission barriers, such as covering food or cooking food.
4. Let the groups show and explain their completed diagrams to the other groups.
5. Ensure understanding of the disease transmission routes and repeat that there are easy and efficient ways to create disease transmission barriers.
 - Water quality improvements (e.g. water disinfection)
 - Hygiene improvements (e.g. hand washing, food storage)
 - Sanitation improvements (e.g. proper use of toilet)

Realise your dreams

Images: Realise your dreams

1. Explain to the children that they will learn about the improvements that lead to a healthier life, to realise their dreams and to help their families and friends.
2. Show them therefore the image “Realise your dreams”. Ask the children about their own dreams and inform them about the role of a Safe Water Promoter.



Realise your dreams

3. Sing a song related to the topic of the lesson. For example about water, preventing diseases or realising dreams. Choose therefore an existing song or create a new song with the children.

What did we learn today?

- What are the water and hygiene-related problems in the community?
- What are the causes for the most prevalent local diseases?
- What distinguishes a “clean” from a “dirty” household?
- Can organisms come from faeces into your mouth? How?

Home-bringing message

- Faeces can contain millions of dangerous small organisms.
- Open faeces are a threat to health.
- I will be a Safe Water Promoter to help prevent diseases.

2.1.1 Background information – Water and health

Water is the base of all life

Water is a chemical substance with the chemical formula H₂O. Its state can be liquid (water), solid (ice) or gaseous (steam). Water is vital for human health and a central element in cultures and religions all over the world. Without water people can survive only 3 – 4 days.

At any one time, about half of the population in developing countries suffers from one or more of the six main diseases associated with inadequate water supply and sanitation: diarrhoea, ascariasis, dracunculiasis, hookworm infection, schistosomiasis, and trachoma.

Water-related diseases are especially dangerous for children. They kill and make sick thousands of children every day worldwide.

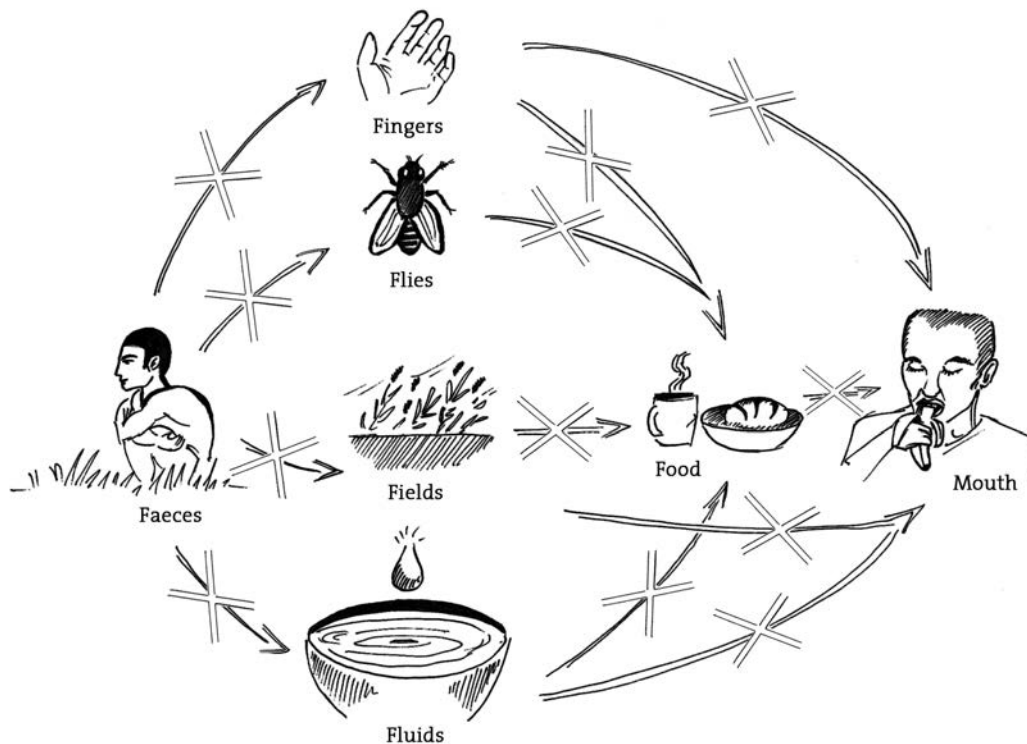
- 4 billion cases of diarrhoea occur annually, of which 88 % is attributable to unsafe water as well as inadequate sanitation and hygiene.
- 1.8 million people die every year from diarrhoeal diseases, the vast majority are children under five.
- 443 million school days are lost annually because of water- and sanitation-related diseases.
- Almost one-tenth of the global disease burden could be prevented by improving water supply, hygiene and sanitation.⁵

⁵ WHO: Combating diseases at the household level. 2007.

The faecal-oral mechanism

The faecal-oral mechanism, in which traces of faeces of an infected individual are transmitted to the mouth of a new host, is by far the most significant transmission mechanism. This mechanism works through a variety of routes – via fingers, flies (insects), fields, fluids, food, or directly to the mouth. Because of the use of so many “F-words” in English, it is often called the F-Diagram.

By interrupting these transmission routes, diarrhoea and other water-borne diseases can be prevented efficiently. The disease transmission routes get interrupted with improved water quality, hygiene and sanitation.



Disease transmission routes are interrupted by improving water quality, hygiene and sanitation

Diarrhoea

Diarrhoea is the most important public health problem directly related to water and sanitation. It causes people to lose liquid from their bodies and can result in death. Repeated episodes of diarrhoeal diseases make children more vulnerable to other diseases and malnutrition. It is transmitted via the faecal-oral mechanism.⁶



Faeces

Diarrhoea can be prevented efficiently by drinking safe water, washing hands properly and disposing faeces safely. If the measures are practised individually, the risk of contracting diarrhoea will be reduced as follows:

- Drink safe water: 39 %
- Wash hands properly with soap: 44 %
- Dispose faeces safely: 32 %⁷

Practised together, these behavioural measures will reduce the risk of contracting diarrhoea even further.

The stool of people with diarrhoea contains more water than normal and may also contain blood. Three or more watery stools in 24 hours are evidence of diarrhoea. People with diarrhoea should consume a lot of liquid (e.g. safe water, tea, breast milk) and food (e.g. soup, cooked cereals). Medical assistance is necessary if the diarrhoea is serious.

The Oral Rehydration Therapy (ORT) is a simple, cheap and effective treatment against dehydration caused by diarrhoea. ORT should begin at home with the use of available “home fluids” or a home-made “sugar and salt” solution given early during the diarrhoea episode to prevent dehydration. Once a child becomes dehydrated, however, ORT should be provided in the form of a balanced and complete standard mixture of glucose and salts.

A basic oral rehydration therapy solution is composed of:

- 30 ml of sugar
- 2.5 ml of salt; dissolved into
- 1 litre of disinfected water⁸

⁷ Fewtrell et al.: Water, sanitation, and hygiene interventions to reduce diarrhea in less developed countries. 2005.

⁸ WHO: Oral rehydration salts. 2006.