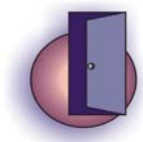




Can Lake Water Be Made Safe?



Teacher Guide

This unit relates to

- a) identifying chlorine as an oxidising agent
- b) purification of water
- c) identifying microorganisms, especially bacteria.

Suggested Teaching Strategy

1. The lesson starts with an interactive exercise where students give ideas on possible causes of water pollution, diseases especially those affecting the villagers. The teacher accepts all answers but guide the students to be specific as much as possible and think beyond water pollution towards facts such as purification methods.
2. The students record possible causes of unclean water in the form of a chart. The causes can be directly observable such as objects in the water, or factors that are unseen (pesticides dissolved in the water, bacteria, etc)
3. The teacher guides the students to ways in which the problem can be tackled and towards the use of purification products found on the market. They also have to say the principal element found in these products such as chlorine.
4. How chlorine is prepared in the lab and the industry and its different uses.
5. Students are further allow to investigate the purity of samples of water by using the micro-kit with the teacher's assistance.

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Learning Outcomes for the Breakdown by lesson

Lesson 1

At the end of this lesson, students are expected to be able to:

- Discuss the problem of lack of purify of lake water and record these on a chart
- Suggest how the problems can be tackled.

Lesson 2

At the end of this lesson, students are expected to be able to:

- Examine a sample of lake water under a microscope
- Determine the effects of adding chlorine water to the sample of lake water
- Compare the effects of adding chlorine water with the adding of bleach.
- Determine the effect of boiling lake water

Lesson 3

At the end of this lesson, students are expected to be able to:

- Deduce the reasons for the effects of chlorine on lake water
- Explain microorganisms and how they can be killed
- Draw microorganisms as seen through a microscope
- Distinguish between bacteria and viruses.

Lesson 4

At the end of this lesson, students are expected to be able to:

- Decide with justification whether the lake water can be made safe
- Identify any action that could be undertaken by students and how this could be mobilized.
- Explain the meaning of 'safe water'.



Achieving the Objectives

Objective	This is achieved by
Decide, with justification, whether the lake can be made safe	Carrying out a discussion within the group
Carry out experiments to determine the usefulness of chlorine as a purification agent	Making chlorine water in groups and testing this in various ways based on a worksheet.
Communicate in both oral and written forms	Taking part in the discussion and in recording the results of the experimentation
Cooperate with members of a group in carry out experiments and in making discussions	Working with the member so the group
Explain the formation of chlorine	Recording the results of the experiments and giving explanations in the notebook
Explain with the help of chemical equations how chlorine can oxidise	Recording explanations individually in the notebook