For Students

Which cleaning agent do we choose ?

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Institute: Learning Lund
Country: Sweden

Subject: Science

Grade level: 8-9

Objectives/competencies: Students are expected to be able to**:**

- Seek and select appropriate information related to the study of cleaning agents, from the books, computers networks and web pages.
- Explain the advantages and disadvantages of different types of cleaning agents.
- Explain pH, surface tension and the various conditions of bacterial growth.
- Put forward a plan of how the pH, surface tension and bacterial growth can be determined.
- To cooperate with partners in the group in undertaking an experimental investigation.
- To design and carry out experimental determinations in the domestic science room [in a bathroom] and in the laboratory.
- Decide, with reasons, which cleaning agents Mr. Clean should buy for his kitchen and his bathroom.

Curriculum content: pH, surface tension and the various conditions of bacterial growth.

Kind of activity: Library search, work in the domestic science room [in a bathroom], laboratory investigation, group discussion to make a justified socio-scientific decision

Anticipated time: 5 lessons

Student Guide

Scenario

Mr. Cecil Clean wants to do something about his kitchen and his bathroom. His friends criticise him and threaten to rename him Mr. Fred Filth. He goes to a supermarket – but he does not know what to choose to assist in cleaning because he hardly has any knowledge about cleaning agents, cleaning etc.

Mr. Clean is acquainted to a school-teacher, so he inquired whether her students can carry out a scientific study of cleaning agents so that he can be better able to determine which ones to buy.

Student Tasks

1. Seek from different sources (as books, computers networks, web pages, etc.) information about the properties of cleaning agents and methods to investigate these properties.
2. Seek from different sources (as books, computers networks, web pages, etc.) information about the conditions of bacterial growth and methods to investigate them.
3. Analyse the information obtained so as to (a) become familiar with the different types of cleaning agents and (b) how to test these cleaning agents, and (c) with conditions of bacterial growth and (d) methods to investigate them.
4. Plan techniques and procedures for sampling bacteria and for testing the impact of the different cleaning agents on their growth. Plan the material and equipment which is needed. Become familiar with security measures in connection with growing bacteria in the laboratory.
5. Work in groups to collect bacteria in different sites (each group visits three comparable sites) prior and after cleaning with the different cleaning agents.
6. Visit the domestic science room (or school kitchen [and some of the school's bathrooms]
   - Collect samples of bacteria in Petri dishes prior and after cleaning with a cleaning agent. Secure the Petri dish with tape so it does not open by itself.
   - Describe the place where the samples are taken.
7. In the laboratory and in groups, test the cleaning agents for:
   - pH
   - how the cleaning agent affects surface tension.
   - Content of water.
8. Let the Petri dishes rest in a heating cabinet and draw or photograph the outcome.

   CAUTION: bacteria, which are otherwise harmless, may be harmful when present in the amounts obtained in this procedure.

   DO NOT IN ANY CASE OPEN THE PETRI DISHES! They must be taken care of by the teacher after the enquiry.
9. Put forward your findings in the form of tables and comparative graphs. Write a report classifying the cleaning agents analysed.
10. Discuss the results obtained with other groups and arrive at a general conclusion as to which cleaning agents Mr Clean should buy.
11. Determine how best to communicate the results to Mr Clean.