

Activity 2b Assessing Proposals

Group Number: _____ ()

Date: _____

Tasks (20 minutes):

Design, process and report are the three areas where assessment criteria are needed. The final reporting session allows teachers to assess various groups. The process assessment should be carried out in a laboratory where the actual manipulation of apparatus, data recording and bench arrangement can be observed and marked by the teacher. However, at the design stage, it is difficult for a teacher to be present at the discussion of every group. The design assessment relies on a written proposal plan from each group and the Log Sheet from individual members.

Criteria	Remarks	Mark (max. 5 marks)
Feasibility of the plan	Workable, authentic, STSE connection	
Use of appropriate method and reference	easily found standard method, method rarely mentioned but appropriate, a new method suggested by the group	
Procedure	workable, easy to follow, correct sequence, with all necessary steps	
Choice of apparatus and chemicals	apparatus chosen are appropriate and are of the expected accuracy required. Available chemicals -- dangerous nature, compatibility	
Risk assessment	safety concerns regarding certain chemicals, apparatus, procedures and the whole plan	
Group Mark =		(max. 25 marks)

With individual Log Sheets as references, individual marks should be given.

Member No.	Mark adjustment (+4 to -4)	Comment (if any)
1		
2		
3		
4		
5		
6		
7		
8		

Salt Content of Snack Foods

Student Handout

Introduction


Somehow you may eat snacks especially when you are enjoying sports, movies or TV programmes. Salt is often added to snacks as flavouring. Snacks usually contain high levels of salts and fat. Excessive intake of salt and fat has been linked to high blood pressure.




Do you read the food label before you buy a snack? Nutrition information of snacks is generally provided in the food labels. Consumers rely on the labels to make wise nutritional choices. However, it is still not a must to display the nutrition information on the food packages in Hong Kong. You are a scientist in the consumer council. In the coming issue of “Choice magazine”, the editorial board would like to report on the “healthiness” of different brands of deep fried snacks such as potato chips and biscuits. You are required to compare the salt contents in different snacks, especially those labeled as low salt content ones.


Tasks


You have about 20 hours of lesson time to work with your group members to solve the above problem (see the work schedule given). Discuss how to share the tasks among your group members and take note of the following. In addition to face-to-face meetings, you may discuss your ideas with your members and teacher using email and discussion forum.

1. Read a food label of a snack. What nutritional information does it give? Search for information on the methods of determining salt content in foodstuffs. You may use search engines (e.g. Yahoo or Google), textbooks or reference books. Keep proper record of your information search (log sheet )
 - ◆ What is the chemical nature of salt?
 - ◆ What is the recommended maximum daily intake of salt?
 - ◆ What is the chemical principle underlying various methods of salt content determination?
 - ◆ Select one method which involves reaction with chloride ions.

2. With the possible methods in mind, choose the one which you think is the best and design step-by-step procedures to determine salt content in 2-3 snack samples of your choice. Alternatively, you could compare the salt content in one snack sample determined from two different methods. Illustrate your ideas using a diagram or a flow chart. It is advisable to divide your investigation into several experiments. You may consider the following when designing your experiments.
- ◆ How do you separate the salt from the rest of the food? What solvent could be used to dissolve the salt? The separation process may be very slow, how will you speed up the process? Apart from laboratory apparatus, what household items could be used?
 - ◆ What are the chemical reactions involved in your method?
 - ◆ What assumptions have you made in your method?
 - ◆ Are there any other substances present in the food that may interfere with your method of determination? How do you remove the interference if it seriously affects your experimental results?
 - ◆ How much sample will you use for analysis?
 - ◆ How do you check whether your method is reliable? What is your criterion?
 - ◆ How will you report your results of analysis so that you can compare the salt contents in different brands of snacks?
 - ◆ What chemicals and apparatus would you use? What safety precautions should be taken? How do you dispose of the waste that you produce?
 - ◆ Outline the calculation steps based on chemical stoichiometry. What unit would you use to report the salt content? What assumptions have you made?

Before carrying out your investigation, prepare a proposal using the proposal form  and seek advice from your teacher on the details of your proposed experiment.

3. Carry out your investigation safely and record all observations (complete observations and measurements record form .

4. Organise and analysis your data (complete data analysis record form ). Please address the following aspects in your reporting:
- ◆ the underlying chemical principle of your method,
 - ◆ procedures and safety precautions,
 - ◆ any modifications of steps and difficulties involved,
 - ◆ tables summarizing your results,
 - ◆ treatment of data involving calculations,
 - ◆ comments on the results obtained,
 - ◆ sources of errors and suggestions for improvement,
 - ◆ recommendations to the general public,
 - ◆ a conclusion of the investigation,
 - ◆ further investigations that could be conducted,
 - ◆ references
 - ◆ distribution of work among your group members
 - ◆ reflections of what have you learned in this investigation

Does your result agree with the figures displayed on the label of the snacks? What may be the reasons for the discrepancy? Is there any difference in salt contents between normal and 'low salt' foods? Try to design further experiments to find it out.

5. Give an oral presentation of your investigation.

Safety

No eating and drinking is allowed in the laboratory. Never ingest any snacks used in the experiments. Do not touch any hot objects with your bare hands. Avoid direct contact with chemicals. Wash you hands immediately with plenty of tap water if chemicals spill on your skin.



You should carefully assess the risk involved in your experiments and look up the relevant safety precautions. Safety information about the chemicals used or produced in your investigation is available from relevant Material Safety Data Sheets (MSDSs). Dispose of chemical wastes and excess materials properly.

Materials and Apparatus

0.1 M silver nitrate solution



5% potassium chromate indicator



Distilled water, filter paper, common titration apparatus and laboratory glassware