Reading 11.1 – Do People Really Make Soap from Fat?

Getting Ready

You have learned a lot about substances and mixtures. Do you think that the soap you buy in the grocery store is usually a substance or a mixture? Give reasons for your response.

In this reading, you will learn more about making soap. As you read, decide whether your answer to the Getting Ready question is right, or whether you should revise it.

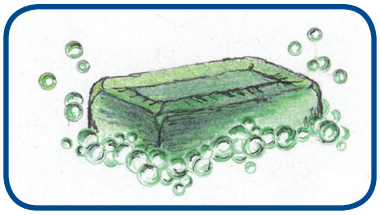
Making Soap: Today and Long Ago

Today most people buy soap at the store, but there was a time when people made their own soap. Most people who made soap in the past did not really understand what happened in the process. They made soap by trial and error. That means they tried different ways of mixing and cooking until they got soap that was just right. Over time, they developed a procedure for making soap that they could repeat every time they needed to make more. Today scientists understand the chemical reaction involved in making soap. They know which substances to start with so that they end with good soap every time.

Three Steps to Making Soap

In the 17th and 18th centuries, people followed three steps to make soap:

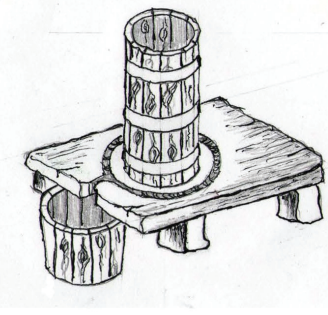
1. Make a lye solution from wood ash and water.
2. Prepare the fats.
3. Combine the fat and lye and heat them.



As you read the following steps in the process, think about how these steps compare with what you do in class.

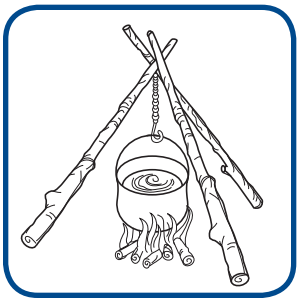
1. Make the lye.

During colonial times, the first ingredient required to make soap was a liquid solution of lye. Lye is similar to the sodium hydroxide you used to make soap in class. The American colonists made a lye solution by placing ashes from burned wood into a barrel. The barrel had no bottom. It sat on a stone slab with a groove carved in it. The slab rested on a pile of rocks. The colonists poured water slowly over the ashes until a brownish liquid oozed out the bottom of the barrel. This liquid was a lye solution. The process was called leaching.



Lye Leaching Apparatus

2. Prepare the fats.
The next step was preparing the fats to be used in making soap. The colonists used fat from animals they had killed for food. They had to remove all of the parts that they did not want in their soap. For example, when animal fat was removed from dead animals, it still had pieces of muscle attached to it. The muscle tissue had to be removed. This was the smelliest part of making soap.



3. Heat the ingredients.
Colonists poured the fat and the lye solution into a large pot. Then they put the pot over a fire outdoors. The ingredients were boiled. The colonists boiled the fat and lye until a chemical reaction occurred that formed soap. This procedure is very similar to what you did in class. You slowly heated the solution of sodium hydroxide and fat to make soap.

Comparing the Colonists' Soap to My Soap

Compare the reactants and products in the two chemical reactions. How do the reactants and products in the colonists' soap compare to the reactants and products in the soap you made in class? Remember that to compare you should tell what is alike and what is different about the reactants and products.

Soft and Hard Soap

Some chemical reactions occur in minutes or hours. Other chemical reactions, like making soap, can take days or weeks. The reaction that made the Statue of Liberty appear green took years. This is why you will wait a week or two before testing the properties of your soap. The chemical reaction needs to be completely finished first.

The same thing was true when the colonists made soap. Even after they put out the fire, the fat and lye continued to react to make soap. The next day the soap was a brown jelly-like substance. The colonists poured this soft soap into a wooden barrel.

Whenever they needed soap, they dipped some out with a wooden ladle. The soap made with lye was very soft. If they wanted hard soap, the colonists put salt in the pot at the end of boiling. If they did this, a hard cake of soap formed in a layer at the top of the pot. That is why you poured your hot soap into a solution of sodium chloride.

In the process, the colonists made a new substance. The atoms in the substances that they started with interacted to form new substances. Their soap had the same type of molecules all the way through. If the colonists had added other substances to their soap, then it would have been a mixture. Remember that a mixture is a combination of two or more substances. If the colonists had added flower petals to their soap to improve the odor, the soap would have been a mixture.

ACTIVITY 11.2 – TESTING THE PROPERTIES OF SOAP