

a WOW Lab

**BLUEPRINT**

Saponification

## Achievements and Competencies

### Learning Outcomes

<b>Grades 10-12</b>
Chemical Reactions
Acids and Bases

Achievements and Competencies are based on the Common Framework of Science Learning Outcomes (K-12) set by the Canadian Council of Ministers of Education (1997).

### Specific Expectations

#### **Grade 10**

##### PHYSICAL SCIENCE

##### Chemical Reactions

116-3 Identify examples where technologies were developed based on scientific understanding .

Soap was developed based on the understanding of chemical reactions between strong bases and fats. In this activity students gain an understanding of this reaction through the production of soap.

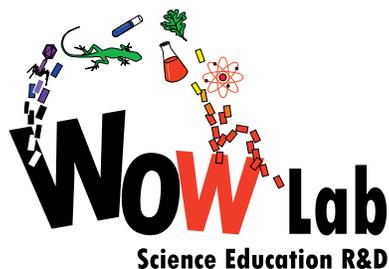
#### **Grade 11 & 12**

##### CHEMISTRY

##### Acids and Bases

116-2 Analyse and describe examples where scientific understanding was enhanced or revised as a result of the invention of a technology (e.g., describe examples such as how the use of various indicators to determine pH enhanced the comprehension of acids and bases).

In this activity students determine that soap is important in human hygiene. Proper hand washing with soap can prevent the spread of disease. They also observe that for soap to be effective at cleaning it must be very basic since it is used to clean off grease and oils, which are acidic because they contain fatty acids.



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## Saponification - Achievements and Competencies

117-2 Analyse society's influence on scientific and technological endeavours (e.g., analyse society's demand for products of a certain pH, such as shampoos and antacids).

Soap has been created to clean especially well and society requires soap to be mild enough to avoid irritation of the skin. When the soap is made too basic to be used, the pH is monitored until it reaches a desirable level. Once this pH level is reached, soap cleans by forming micelles around grease particles, allowing the grease to be washed away. Soap brings otherwise immiscible substances, such as oil and water, together by forming an emulsion.

320-2 Predict products of acid-base reactions.

The definition of an acid-base reaction is a chemical reaction between an acid and a base. In the saponification activity, a chemical reaction occurs between a fatty acid and a base to form a salt of the fatty acid and glycerol. Vegetable shortening is used as the acid and sodium hydroxide as the base. However, a variety of acids and bases can be used. For example, olive oil and potassium hydroxide can also be used.