

## LESSON FOUR: MINERALIZATION

### FOCUS:

Enamel is the hardest substance in the human body. This enamel cap covers and protects the dentin and keeps the teeth strong and healthy. During the course of our lives our teeth are perpetually undergoing the processes of demineralization and remineralization. Food intake and oral habits contribute to these processes. It is important for students to understand the chemical interactions taking place as well as what they can do to decrease demineralization and increase remineralization.

### OBJECTIVES: Students will:

- ▶ illustrate the cycle of demineralization/remineralization (*see diagram*)
- ▶ analyze the acidity of common foods that promote demineralization
- ▶ establish a relationship between pH and acidity
- ▶ compare the effects of demineralization on fluoride-treated and non-treated substances
- ▶ examine the variations of fluoride in water supply across the state (*or country, or world*)

### **ACTIVITY 4A: MINERALIZATION CYCLE—INTRODUCTION**

Read paragraph one of “Teeth Through Time” found in the front of this unit to explain the process of mineralization.

This is an excellent time for a study on prefixes, de- and re- in particular, and the composition of words and word meanings. Mineralization is a cyclical process. Students have probably studied and modeled other cycles such as the water cycle. Mineralization of the teeth is an excellent concept for a cycle illustration. In groups have students create a poster which illustrates this cycle.

### **ACTIVITY 4B: LAB-pH OF COMMON FOODS**

In activity 4B students will determine the pH of common foods and food ingredients. Students will relate their results to the process of demineralization. Students will decide how their eating habits and dental hygiene habits can reduce demineralization.

Acidic foods and food ingredients encourage demineralization. By using pH paper, the pH of common foods and food ingredients can be determined. By interpreting the pH, one can determine which substances increase the risk for tooth demineralization.

The pH scale was developed by a bottling plant scientist who wanted to insure that the correct acidity was maintained for carbonated drinks produced by his plant. Now, this scale is used worldwide by scientists. The “p” stands for the mathematical value “power of ten.” The “H” represents the number of hydrogen ions or hydroxyl ions in a solution. The strength of an acid or base depends upon this number of ions. A neutral solution has a pH of 7, while acids are below 7 (0–6), and bases are above 7 (8–14). The official definition of pH is “the negative of the logarithm of the hydrogen ion concentration.” Listed below are some common solutions and their pH values:

pH	Solution
1	Hydrochloric Acid
2	Stomach Acid
3	Soft Drinks
4	Tomato Juice
6.5	Milk
7	Water, corn oil
11	Ammonia
13	Bleach
14	Sodium Hydroxide

















