TOOTHPASTE WITH A TWIST

INTRODUCTION

Products people use daily are manufactured from minerals directly or use materials that were made from minerals. In this activity, students investigate one such product.

PURPOSE

Students will produce a "marketable" product used by most people every day that is made from minerals. The abrasive and cleansing compounds found in toothpaste, calcium carbonate and sodium bicarbonate, respectively, are both minerals.

MATERIALS NEEDED

- Calcium carbonate ($CaCO_3$) (mineral limestone), food grade
- Sodium bicarbonate ($NaHCO_3$) (baking soda, mineral nahcolite)
- Water
- Small plastic cups
- Plastic Spoons
- Sticks for stirring
- Assorted food colors and flavorings
- Eye droppers
- Optional items:
  - Hydrogen peroxide, (H_2O_2) (3%)
  - Fluoride
  - Sugar, or other sweetener
  - Diatomite, food grade
- Have some commercial toothpaste samples available.

PROCEDURE

1) Basic recipe for toothpaste is:
   a) 1/2 teaspoon calcium carbonate,
   b) 1/4 teaspoon sodium bicarbonate in
   c) Mix together in a small plastic cup,
   d) Add just enough water (with eye dropper) to make a paste.
2) Have the students taste the basic recipe and discuss possible improvements.
   a) Divide the class into groups of 4 and let them come up with some solutions to make the basic recipe more appealing to others.
      i) Remember, the purpose is to produce the most "marketable" toothpaste.
   b) Each group is responsible for one recipe.
      i) (As the samples are quite small, only small amounts of color and flavoring are needed.)
   c) Each group will keep a record of their recipe and submit it with the sample for judging.
      i) The judges who will determine the winner can be another class, parents, etc.
      ii) Have a prize for the winning sample.

EVALUATION

1) How did the homemade toothpaste compare to commercial products?
2) What mineral is added to toothpaste to fight cavities?
3) How many of the commercial toothpastes had minerals in them? (Have students research chemicals listed in the ingredients list to see if they are also minerals.)
4) Have the students compare the prices of commercial toothpaste in relation to the number and types of mineral ingredients.
   a) Which were more expensive?
5) Have the class develop an advertising campaign for the winning toothpaste.
   a) This can be a slogan; jingle, rap, or song that will help sell their toothpaste.
   b) Have a prize for the winning ad campaign.

TOOTHPASTE WORKSHEET

Group No. _____ Product Name _____

Basic Recipe: 1/2 tsp. calcium carbonate, 1/4 tsp. sodium bicarbonate, water to form paste.

Added:

_____ _____
ingredient amount

_____ _____
ingredient amount

_____ _____
ingredient amount

Flavoring: _____ Color(s) _____

AD CAMPAIGN:

Slogan (if any) _____

15 second ad:

_____

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