

Purpose: To work cooperatively as a group to produce candy canes with proper physical characteristics in a specified time frame. You will also observe the effect of temperature on the visible physical characteristics of a mixture and then relate those observed properties to molecular bond structure.

Candy Cane Recipe

Materials:

2/3 cups Sucrose (Table sugar)-(C₆H₁₂O₆)

2 teaspoons Corn Starch-(C₆H₁₀O₆)

2 Tablespoons (H₂O)

1/4 teaspoon Potassium hydrogentartrate (Cream of Tartar)

Plant extract (Flavorings – do not mix flavorings)

3 drops of food coloring (your choice, you may mix colors if you like).

PROCEDURE:

1. Measure and combine all ingredients into a medium pan. Cook over medium setting.
2. When mixture starts to boil, turn down to low and continue to heat gently. **DO NOT STIR.** (This process takes 15-20 minutes)
3. The quantity of heat is directly related to the viscosity of your product. This is an important factor in determining the physical characteristics of your product. When the thermometer reaches 132° C, a sufficient quantity of heat has been added to break the appropriate number of molecular bonds. Remove from heat.
4. Let solution cool for 3 minutes, then add 2ml flavoring and gently stir. Your product will be **VERY HOT**, but it will cool rapidly. As the product cools, lightly coat a cookie sheet with vegetable oil. When the product has become viscous, but still fluid enough to pour, pour half of the mixture on to each opposite side of the sheet. You need to have a knife with a buttered blade ready to “cut” the viscous substance into 2 separate sections. Add different food colors to each section as you desire and begin to fold the color into the mixture with a buttered utensil.
5. As soon as the substance is cool enough to handle, roll each “blob” of candy into 2 separate coils about the length of the cookie sheet. Place them side by side on the cookie sheet and cut both cords into 4 equal sections. Each member then takes their 2 equal sections of different colored candy and twists them together forming a rope-like single coil. Shape the candy into a cane and place it on lightly wax paper to cool and harden.
6. Clean up all candy and sticky surfaces. Note the water temperature which works best for clean up.
7. When the station is clean, gather group members together, each member must hold his own product to have a photograph taken.
8. Homework – Write a 1 page minimum summary of the candy making process including important terms, concepts and observations. The report is due the next class period.

Assessment

Score-Students will be given a score of 4-0 for the class activity and their HW assignment. The two scores will be added to produce a total activity score.

(Total possible point- 4+4 =8 pt.)

4-Excellent- Completion of product production with in time allotment- Candy Cane is of proper consistency and work area clean. Member observed cooperating and contributing to the completion of project.

HW assignment turned in on time and complete. It is evident the student put thought and effort into his assignment.

3- Candy has imperfection of some type, but students can suggests reasons for the imperfection of their product and changes they would make if they were to repeat the activity. Students are observed working in a cooperative, timely manner and clean up is complete.

HW assignment turned in on time, but lacking in content to some extent. Moderate effort is visible.

2- Students are working in a somewhat disorganized, uncooperative manner: student is observed to be wasting time: incorrectly following written procedure; clearly not focused on the activity: observed leaving work area for inappropriate reasons.

HW lacking in content to greater extent than Assessment #3 or late. Effort is lacking.

1- Students clearly disorganized and not cooperatively participating in the completion of the activity. For example, a student is observed by teacher not to be following written procedure and leaves unclean workstation. The student is clearly not participating in activity or consistently disrupting the progress of the group.

HW severely lacking in content, or late, not submitted. Very little effort is visible.

Extra Credit: Research, and turn in an article or web site related to this lab and briefly explain why you chose it. Extra credit on identical sources will be given to the first student only. (Unless circumstances indicate otherwise.)