

## Winter/Christmas – Candy Cane Science

As Christmas is rapidly approaching we'll do some kitchen chemistry.



### Materials:

- 750 mL ingredient 1 (3 cups granulated sugar)
- 5 ml ingredient 2 (1 teaspoon peppermint flavouring)
- 125 ml H<sub>2</sub>O (½ cup water)
- 190 mL ingredient 3 (¾ cup corn syrup)
- 4 ml ingredient 4 (¼ teaspoon red food colouring)
- 2 ml ingredient 5 (¼ teaspoon Cream of tartar)
- 2 sauce pans
- Measuring cups and spoons
- Cooking oil or wax paper
- Cookie sheets
- Candy thermometer
- 2 trivets
- Mixing bowl

**Procedure:** (Remember to have your parent's permission and have them watch and help you.)

- Combine Ingredients 1, 3, 5 and the H<sub>2</sub>O. Heat until all ingredients are dissolved.
- Divide into two saucepans, boil, but don't stir until it is 138<sup>o</sup>C (280<sup>o</sup>F).
- Add ingredient 2 to each pan and stir.
- Add ingredient 4 to just one of the pans and stir.
- Place pans on trivets to cool.
- After the contents have cooled enough to handle (like warm taffy) stretch, pull and form it into ropes of red and white and twist them around each other. Roll the twined cane (optional).
- Cut and form the rope pieces into the shape of a shepherd's crook.
- Place the canes on an oiled surface and allow it to harden.

### What's Happening:

Candy canes are primarily sugar. The unique physical and chemical characteristics of sugar makes cane formation possible. When sugar is heated, it melts and becomes a workable syrup. The syrup can be rolled and fashioned. As it cools, the syrup becomes thicker and begins to hold its shape. When the candy is completely cooled, the sugar crystals remain together and form the solid candy cane.

Corn syrup, also used in candy canes, is a modified form of starch, and provides a sweet flavour. When mixed with sugar, it inhibits the natural tendency of sugar to crystallize. Crystallization would result in a grainy appearance and a brittle structure. Corn syrup has the added effect of making the confection more opaque. The corn syrup also helps control moisture retention and limits microbial spoilage. More info: <http://www.madehow.com/Volume-7/Candy-Cane.html#ixzz2Dd78TtjZ>

### Extension:

Use different food colourings and flavourings for interesting results.

This activity is based on our Winter/Christmas kit. The source for this lab was: <http://www.easyfunschool.com/article1838.html>. Our teaching kits (described on our website) are loaned out FREE to provide classroom teachers and parents of home schooled children an opportunity to explore Science in interesting ways. Please consider volunteering as a classroom guest speaker or allow your business as a field trip location.

Lorne Cooper, Regional Executive Director

PRAXIS, "Making Science Fun". Contact Praxis at [praxis@praxismh.ca](mailto:praxis@praxismh.ca), [www.praxismh.ca](http://www.praxismh.ca), Tweet or follow us @PraxisMedHat, or friend us on Facebook. Address: c/o 200 7th Street S.W., Medicine Hat, AB, T1A 4K1 Phone: 403-527-5365, Fax: 403-527-6570.