

Help!

I'm
Teaching
Middle School
Science

By C. Jill Swango
and Sally Boles Steward



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NATIONAL SCIENCE TEACHERS ASSOCIATION

Arlington, Virginia



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Help! I'm Teaching Middle School Science

NSTA Stock Number: PB170X
Printed in the USA by Victor Graphics. Printed on recycled paper.

05 04 03 4 3 2 1

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Library of Congress Cataloging-in-Publication Data

Swango, C. Jill, 1956-

Help! I'm teaching middle school science / by C. Jill Swango and Sally Boles Steward.
p. cm.

Includes bibliographical references.

ISBN 0-87355-225-3

1. Science—Study and teaching (Middle School)—United States—Handbooks, manuals, etc. I. Steward, Sally Boles, 1973- II. Title.

LB1585.3 .S93 2002

507'.1'2—dc21

2002153474

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 APPENDIX
B

CORNSTARCH AND WATER MIXTURE

sometimes referred to as oobleck, from *Bartholomew and the Oobleck* by Dr. Seuss (Random House, 1976)

- 1 ½ c cornstarch
- 1 c water

Mix the ingredients by hand starting with all the cornstarch and about ¾ c of water until this gooey material will drip from your hand, but, when struck a glancing blow, will not splatter. If too watery, add additional cornstarch.

NOTE: Make a big serving bowl of oobleck in class with students and then ask for someone to help test it. Put the bowl in front of the seated volunteer and grab some of the oobleck and let it flow through your fingers. Inform class and participant that the test to see if oobleck is ready is to hit it hard with a fist: If it splatters, it is not ready. Then smash your fist into the mixture. Practice this several times without a “victim” so that splashes are not truly made. It is fun to watch the reaction of the participant, and, of course, all the students want to try.

SALT CRYSTALS

(kosher salt works best, but table salt can be used)

- | | |
|---|---|
| <ul style="list-style-type: none"> • salt • hot water • measuring spoons • string • scissors • toothpick • baby food or like jar | <ol style="list-style-type: none"> 1. Attach string to toothpick. Trim string so that it will hang into jar without touching the bottom or sides. Put this apparatus to one side until ready for use. 2. Put about two tsp salt into jar. 3. Add hot water to jar until about ¾ full. 4. Stir until the salt (or most of it) dissolves. 5. Put toothpick/string apparatus into jar. 6. Let stand undisturbed for two to three days. The longer time the jar is left alone, the larger the crystals will grow. |
|---|---|

MAGNESIUM SULFATE

(Epsom salt)

- | | |
|--|---|
| <ul style="list-style-type: none"> • 250 mL beaker • measuring spoons • scissors • petri dish or jar lid • magnesium sulfate • dark colored paper • tap water | <ol style="list-style-type: none"> 1. Cut a circle from the dark colored paper that will fit inside the petri dish or lid. 2. Fill the beaker with water, add 4 T (60 mL) of magnesium sulfate (Epsom salt) and stir. 3. Put the dark colored paper into petri dish or lid. 4. Pour a thin layer of solution into petri dish or lid over dark colored paper. 5. Let stand undisturbed for two to three days. |
|--|---|

SUGAR CRYSTALS

- tap water
 - container for cooking
 - toothpick
 - sugar (save some to rub on string)
 - drinking glass or the like
 - string, Popsicle stick
 - food coloring (optional)
 - artificial flavoring (optional)
1. Boil 1 c water in a container, turn off heat, add 1 ½ c sugar, and stir. Add more sugar, if necessary, to make a saturated solution.
 2. When solution cools, add color or flavoring and pour into glass.
 3. Tie string to toothpick, rub sugar on string, and drop string into the solution. Allow toothpick to rest on the glass rim. If using a Popsicle stick, make a hole in one end to slide on toothpick. Leave undisturbed for several days.

CRYSTAL GARDENS

- laundry bluing
 - salt (kosher works best)
 - 250 mL beaker or old mixing bowl
 - water
 - ammonia
 - porous material for crystals to grow on (sponge, bricks, lava rocks, art paper, etc.)
 - food coloring (optional)
1. Add ingredients in this amount and order: 10 mL bluing (found in laundry section), 10 mL water, and 10 mL ammonia in mixing container. (If using bowl, it will probably get stained.)
 2. Stir solution until salt is mostly dissolved.
 3. Pour over item(s) on which crystals will grow.
 4. Let stand undisturbed (may only take one day to see results).
 5. If coloring, there are a couple of ways to try: add about 1/8 of small coloring bottle to solution or dab a liberal amount of coloring on growing surfaces where crystal solution was poured.

CULTURE MEDIUM

Unflavored gelatin can be used in place of agar or other culture-growing media, just follow the directions on the box and use.


 APPENDIX
B

FUN PUTTY

- white glue
- water
- borax (found in the laundry section of a grocery store).

Mix equal parts of white glue and water and add a borax solution (try 16 g of borax dissolved in 400 mL of warm water). Food coloring may be added (might stain your hands, though). Measure 50 mL of the glue mixture into a cup, then stir in 10 mL of borax solution. Store in a plastic bag and when it dries up, throw it away.

HYDROCHLORIC ACID

When using concentrated acid (12 M) in any of the following recipes, wear splash goggles, apron, and chemical resistant gloves. ***Do not inhale the vapors!*** Use a fume hood or well-ventilated area for preparation. ***Immediately clean up any spillage.***

To make 1 liter of mixture:

Always add acid to water.

<u>MOL WANTED</u>	<u>AMT WATER</u>	<u>AMT ACID</u>
1 M	916.7 mL	83.3 mL
2 M	833.3 mL	166.7 mL
3 M	750.0 mL	250.0 mL
6 M	500.0 mL	500.0 mL

IODINE

(Tincture of Iodine)

- iodine
- methyl alcohol (burner alcohol)

Dissolve 2 g of iodine in 120 mL of alcohol. *Iodine crystals are irritating to the skin, so handle with care.*

NITRIC ACID

When using concentrated acid (15.9 M) in any of the following recipes, wear splash goggles, apron, and chemical resistant gloves. **Do not inhale the vapors!** Use a fume hood or well-ventilated area for preparation. **Immediately clean up any spillage.**

To make 1 liter of mixture:

Always add acid to water.

<u>MOL WANTED</u>	<u>AMT WATER</u>	<u>AMT ACID</u>
1 M	937.1 mL	62.9 mL
3 M	811.3 mL	188.7 mL
6 M	622.6 mL	377.4 mL

PHENOL RED

- phenol red
- distilled water

Dissolve 1 g of phenol red in 200 mL of water. This will make a stock solution to prepare indicator solutions as needed. To use, add 4 drops of NaOH (sodium hydroxide) to 20 mL of phenol red stock solution. Add enough distilled water to make 2000 mL of phenol red indicator solution.

RED CABBAGE JUICE

(for acid/base indicator)

- red cabbage
- cooking pot
- grater
- colander (strainer)
- water

Grate the cabbage into small pieces and place them in the pot. Add water to cover cabbage. Boil until the liquid turns a dark purple color—about 20–30 minutes. Pour the liquid through a strainer to remove the cabbage, which will be a bluish/dark purple color. Test with white vinegar (an acid) and soapy water (a base). Juice should turn pink in acids and green in bases.

CAUTION: Juice will spoil in a few days even if refrigerated. Try making test paper by soaking coffee filters or filter paper with the juice and allowing it to dry.