

THE AMERICAN CHEMICAL SOCIETY
CLEVELAND SECTION &
NASA LEWIS RESEARCH CENTER

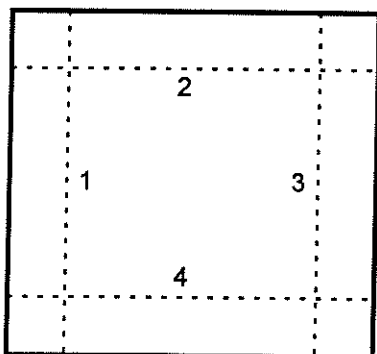
As part of the National Chemistry Week celebration
(November 3-9, 1996)

Ask students in the eighth grade or below

"HOW DO BOATS FLOAT?"

Throughout Cleveland's 200 year history, boats have been very important. But exactly how do so many tons of metal float on water?

Follow the instructions below and answer the questions. Materials: Aluminum foil, scissors, a ruler, a sink half filled with water, and a box of paperclips.



- 1) Cut the aluminum foil into three squares, each 3 inches by 3 inches.
- 2) Label the squares A, B, and C
- 3) Using the picture as a guide, draw lines 1-4 on square A, 1/4 inch from the edges. Be careful not to tear the foil.
- 4) Fold the aluminum flat along edges 1-4.
- 5) Open all the folds and make a boat.
- 6) Float the aluminum boat on the water.
- 7) Carefully add paperclips to the boat until it sinks.
- 8) Record how many paperclips it took to sink the boat.
- 9) Repeat steps 3-8 with square B using 1/2 inch edges.
- 10) Repeat steps 3-8 with square C using 3/4 inch edges.

Questions:

- *What can you say about the number of paperclips it takes to sink each of the boats?*
- *Why do some boats hold more paperclips than others?*

Include your name, phone number, school, and teacher's name on your answer. Send it and a self-addressed stamped envelope to:

Grade/Middle School Chemistry Contest
c/o John Carroll University
Department of Chemistry
Cleveland, OH 44118-4581

All entries must be received by November 1.

All answers are rewarded with a prize (so be sure to send your self-addressed stamped envelope)! All the correct answers are entered in a random drawing. Winners, their parents, and their teachers will be invited to be our guests at the November American Chemical Society meeting. At this time, the students will be recognized and presented with savings bonds.

This contest is supported by area industries that help make our lives better through chemistry.

Eveready Battery Company
P.O. Box 450777
Westlake, OH 44145

Dear Educator:

The Cleveland Section of the American Chemical Society and NASA Lewis Research Center are again sponsoring a contest for students in grades 8 and below as a part of their National Chemistry Week celebration. There are several other activities in addition to the contest this year. We have enclosed a calendar of events that you can share with your students. We hope both you and they will enjoy the activities we have planned.

Please encourage your students to enter the contest. We encourage you to perform the experiments in your classroom and send entries in as a class. The questions were selected so that common items are used for the experiments; no special chemicals or equipment are needed. You can send one self-addressed stamped envelope for your entire class. If you do, please use an envelope approximately 9 inches by 12 inches with 3 or 4 stamps so that we can fit the prizes for all the students in your class that entered the contest into it. Each individual entry must include the student's name and phone number, teacher's name, grade, and school.

Every student who enters will receive a prize. Correct answers will be entered into a random drawing and the winners of that drawing will receive savings bonds.

This year's contests is a practical demonstration of densities and water displacement. It is designed to provide students with a real world example of chemistry as a study of matter. The contest requires the students to perform a simple task, record their observations, and organize their thoughts to answer the questions.

Feel free to help your students with the following:

- A) Boats float by being less dense than water. They do not float by weighing less than water. They weigh the same as the volume of water that they displace. The metal of a boat is more dense than water. However, the boat itself is less dense. Much of the volume of the boat is air.
- B) The maximum volume of water that can be displaced by the aluminum boats is easily determined. Multiply together the lengths of the two sides of the base of each boat and the edge of each boat. An alternate method is to use a teaspoon and count the number of teaspoons that fit inside each boat.
- C) The greater the volume displaced by the boat, the more paperclips it can carry.

We hope you and your students enjoy the contest. We hope that this helps your students to experience the excitement of discovery and to see the relevance of science to their daily lives.

Sincerely,

Michael P. Setter and Irene Cesa
National Chemistry Week Co-Chairs

THE AMERICAN CHEMICAL SOCIETY
CLEVELAND SECTION &
NASA LEWIS RESEARCH CENTER

As part of the celebration of National Chemistry Week
(November 3-9, 1996)

Ask students in grades 9 through 12

"HOW DO YOU MAKE A POLYMER?"

Several Northeastern Ohio companies make polymers. Some are called plastics, others rubber. Others have different names. Let's investigate this important industry.

Follow the instructions below and answer the question. Materials: Measuring cup, measuring spoons, 5 clear 8 oz. glasses, tap water, borax laundry booster, white school glue, 5 stirrers.

- 1) Label one of the clear glasses "Borax" and the remaining glasses A-D
- 2) Use the measuring spoon to place 1 tablespoon of borax into the "Borax" glass.
- 3) Use the measuring cup to add 1 cup of hot tap water into the "Borax" glass.
- 4) Stir until the borax is dissolved.
- 5) Add the amount of tap water indicated in the table to each of the four glasses, A-D.
- 6) Add 1 tablespoon of the white glue to each of the glasses, stirring until well mixed.
- 7) Add the indicated amount of the "Borax" solution to each of the four glasses, stirring well.
- 8) Record your observations, now and after 5 minutes.
- 9) Organize your results in a table.

	A	B	C	D
Water	1 tablespoon	2 tablespoons	None	1 tablespoon
"Borax"	2 teaspoons	2 teaspoons	2 teaspoons	4 teaspoons

- Question:**
- *What is the difference between the contents of the different glasses?*
 - *What can you say about the importance of proportions of ingredients in making a polymer?*

Include your name, phone number, school, and teacher's name on your answer. Send it and a self-addressed stamped envelope to:

High School Chemistry Contest
c/o John Carroll University
Department of Chemistry
Cleveland, OH 44118-4581

All entries must be received by November 1.

All answers are rewarded with a prize (so be sure to send your self-addressed stamped envelope)! All the correct answers are entered into a random drawing. Winners, their parents, and their teachers will be invited to be our guests at the November American Chemical Society meeting. At this time, the students will be recognized and presented with savings bonds.

This contest is supported by area industries that help to make our lives better through chemistry.

Eveready Battery Company
P.O. Box 450777
Westlake, OH 44145

Dear Educator:

The Cleveland Section of the American Chemical Society and NASA Lewis Research Center are again sponsoring a contest for students in grades 9 - 12 as a part of their National Chemistry Week celebration. National Chemistry Week will be celebrated November 3-9 this year. There will be several other activities in addition to the contest this year. We have enclosed a calendar of events. Please share this information with your students. We hope both you and they will enjoy the activities we have planned.

Please encourage your students to enter the contest. We also encourage you to perform the experiments in your classroom and send entries in as a class. The questions were selected so that common items are used for the experiments; no special chemicals or equipment are needed. You can send one self-addressed stamped envelope for your entire class. If you do, please use an envelope approximately 9 inches by 12 inches with 4 stamps so that we can fit into it the prizes for all the students in your class that entered the contest. Each individual entry must include the student's name and phone number, teacher's name, grade, and school.

Every student who enters will receive a prize. Correct answers will be entered into a random drawing and the winners of that drawing will receive savings bonds.

This year's contest involves a National Chemistry Week favorite throughout the nation. This is a simple introduction to polymer science, one of the most active areas of industrial chemistry. The contest requires the students to attempt four different preparations to the same polymer. In addition to following the instructions, the students need to make and record their observations and then draw some conclusions.

Please encourage your students to research these and related topics, such as what area industries are involved in polymer production, and the types of polymers that are produced as a result. The product in glass A is variously referred to as "Slime", "Glop", "Gluep", and "Funny Putty". The polymer in the white glue is crosslinked by the borax. This crosslinking forms a new polymer. This is the same process as the "vulcanization" used in the tire industry to make natural rubber less sticky.

We hope you and your students enjoy the contest. We hope that this helps your students to experience the excitement of discovery and to see the relevance of science to their daily lives.

Sincerely,

Michael P. Setter and Irene Cesa
National Chemistry Week Co-Chairs

The AMERICAN CHEMICAL SOCIETY (ACS) - CLEVELAND SECTION -

Celebrates CLEVELAND'S BICENTENNIAL/CENTENNIAL 1796 - 1896 - 1996

During NATIONAL CHEMISTRY WEEK - November 3rd to 9th, 1996

In our library program, we opened "time capsules" and analyzed the materials inside. Some were "authentic", i.e., could really be 100 years old; for example, cotton and paper. Some were more recent inventions; for example, the sodium polyacrylate in disposable diapers, or the high-density polyethylene in Tyvek® "paper" envelopes.

Read and discover more about new and old materials. Learn about the old problems that new materials attempted to solve. As new problems arise, scientists strive to solve these to make the world a better place.

Children's Books

- The Secret Life of School Supplies by V. Cobb J 670 C634s
Spotlight on Plastics by M. Lambert J 668.4 L174s
My Backyard History Book by D. Weitzman J 973.07 W439b
A+ Projects in Chemistry by J. VanCleave J 540.78 V278jv

Advanced Reading (For adults, too)

- Superstuff! Materials That Have Changed Our Lives by F. Bortz 621.3 B648s
One Thousand Years of Explosives by W. S. Dutton 662.209 D95
The Art of Soap Making by M. Mohr 668.12 M726a

Here are two views on a new sweetener:

- Sweet Success - How Nutrasweet® Created a Billion Dollar Business
by J. E. McCann 338.476645 M126s
Aspartame (NutraSweet®) Is It Safe? by H. J. Roberts, M.D.
363.1929 R542a

- The New Alchemists by R. Hazen 620.11 H338n
Great Discoveries by Young Chemists by J. Kendall 925.4 K33
A Hundred Years of Chemistry by T. Williams 540.9 F493h3
From Caveman to Chemist: Circumstances and Achievements (an ACS publication)
by H. Salzberg 540.9 Sa39f
From Design to Discovery (ACS) by P. Cram 540.92 C847f
Chemistry and Crime: from Sherlock Holmes to Today's Courtroom (ACS)
S. Gerber, editor 363.256 C42
Milestones of Modern Chemistry; Original Reports of the Discoveries
by E. Farber 540.09 F221m
Creations of Fire: Chemistry's Lively History from Alchemy to the Atomic Age
by C. Cobb and H. Goldwhite 540.9 C633c

