



Lesson Plan 090106

The Case Against Chlorine (Target: Grades 1-4)

Time Requirements:

1. 50-minutes during science or art time

Objectives:

1. Create awareness for the ways the paper industry uses chlorine compounds to bleach pulp and paper
2. Create awareness for volume of fresh water being polluted through the paper-making process
3. Create awareness for other ways in which chlorine compounds are used by industry to create pollution
4. Create awareness for alternative papers, not made with chlorine compounds

Materials:

1. "The Case Against Chlorine" lesson and activity handout (included with this lesson)
2. Crayons and/or nontoxic, washable markers.
3. Enough blank sheets of copy paper or drawing paper for each person in the class (chlorine-free or at least recycled paper would be best!)

Methods:

1. (10-20 minutes) Distribute "The Case Against Chlorine" lesson handout to students. Read aloud the information in the lesson handout.
2. (30 minutes) Ask the students to create their very own poster about why chlorine-bleached paper should be replaced by chlorine-free paper.
3. (After class) Put the students' creations up on the walls.

Lesson Information: The Case Against Chlorine

Chlorine-Bleached Paper Creates a Toxic Tide

Some of the world's most toxic substances—dioxins and other organochlorines—are produced as by-products of chlorine bleaching. They are released in wastewater from pulp and paper mills using chlorine chemistry. Like ripples in a pond, these harmful chemicals have spread everywhere—in our water supply, food chain and bodies. Everyday, an average size pulp mill using chlorine based bleaching chemistry will release around 50 million gallons of water contaminated with bioaccumulative toxic organochlorine compounds (dioxins, furans, PCB's, chlordane, etc.) into our lakes, rivers, streams and our groundwater. That's just one day, one mill. In 1995 the paper industry released over 1,551,000,000,000 (trillion) gallons of contaminated water

Chlorine-Bleached Paper Affects Human Health

Exposure to dioxins, the #1 deadliest toxin produced by man, and other organochlorines, such as DDT and PCB, are known to cause cancer. They also are linked to disorders of our nervous, reproductive and immune systems.

Children are the Most At Risk

Children ingest significantly more food and water per pound of body weight than adults. Therefore, they are more susceptible to toxins from chlorine bleaching processes. Fresh water is the key to life. Let's not needlessly destroy such a valuable resource.

The Contaminants Created by Chlorine Bleaching Last for Decades

Organochlorines created and released from chlorine bleaching processes persist a long time and travel throughout the global environment. They build up in the fatty tissues of fish and other animals, as well as in water, soils, sediments and organic matter of lakes and rivers. Biologists believe organochlorines may be responsible for mutations, sterility, immune system failures and local extinctions in many wildlife populations.

Chlorine-Bleached Paper Uses more Water and Energy

A certified chlorine-free producer will use 1/20th the amount of fresh water and with no releases of chlorinated poisons. When all pathways are considered, the bleaching of pulp and paper with chlorine has been and continues to be one of the world's largest sources of toxic persistent organochlorines into the environment. Every species on earth, including humans, is now exposed to organochlorines that can reduce sperm counts, disrupt female reproductive cycles, cause endometriosis, induce spontaneous abortion, alter sexual behavior, cause birth defects, impair the development and function of the brain, reduce cognitive ability, interfere with the controlled development and growth of body tissues, cause soft tissue cancers (breast, colon, testicular, etc.,) and compromise immunity.

Joe Thornton, Pandora's Poison: Chlorine, Health, and a New Environmental Strategy; op cite, UNDEP Chemicals Division, Dioxin & Furans Inventories, Geneva May 1999

Be Cost Effective

Pulp mills that do not use corrosive chlorine chemistry experience significantly lower maintenance costs. Paper mills that use certified chlorine-free pulp gain loyal followings—with customer retention rates as high as 90%.

Don't Be Misled by 'ECF' Labels

ECF (Elemental Chlorine Free) papers are bleached with chlorine dioxide, a 1950's technology, which does not eliminate organochlorines. Also, bleaching pulp with chlorine dioxide uses 20 times more water and energy than chlorine-free processes.

Contact the Chlorine-Free Products Association (CFPA)

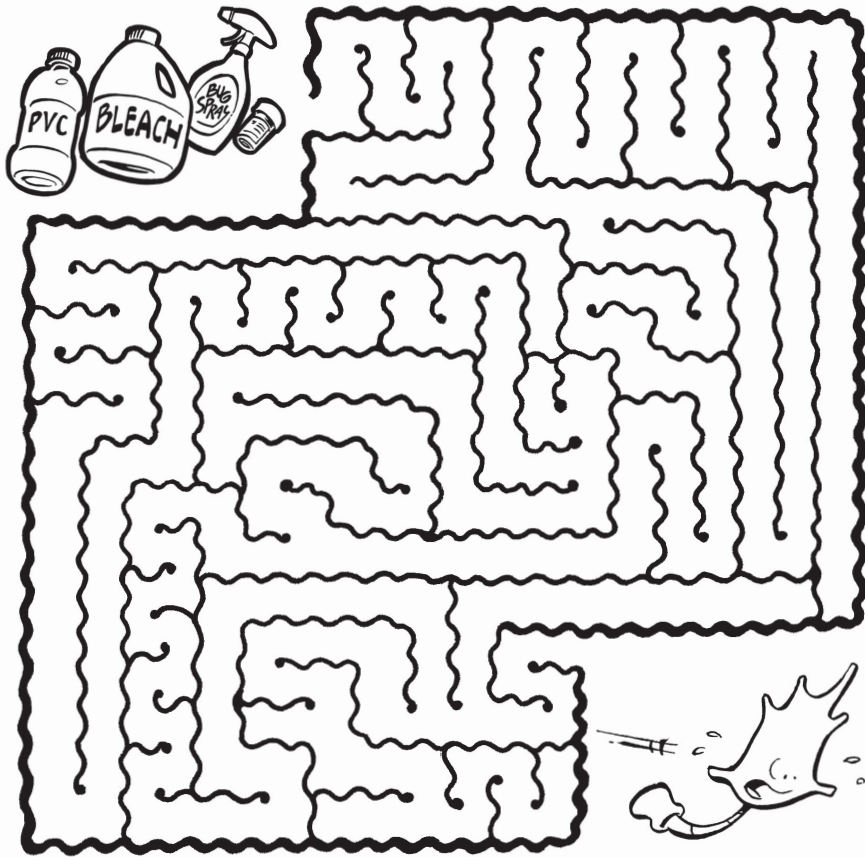
CFPA can help you track down chlorine-free papers and suppliers for nearly any printing need. Call 847.658.6104 or visit their website to learn more about other TCF/PCF product information.

Take a Stand

As a consumer, your preferences and buying power help determine which chemicals and technologies are used for making paper. When you switch to TCF & PCF certified products, you protect children and stand up for a healthier, cleaner, chlorine-free environment.

For more information, visit: <http://www.chlorinefreeproducts.org>.

HELP RUSTLE ESCAPE FROM CHLORINE-TAINTED PRODUCTS



FIND OUT MORE ABOUT HOW CHLORINE AFFECTS OUR LIVES :

<http://www.chlorinefreeproducts.org>

<http://www.rfu.org/PulpPrimer.htm>

<http://www.internethealthlibrary.com/Environmental-Health/Chlorine-and-cancer.htm>

<http://www.mcspotlight.org/media/reports/wenchlorine.html>

<http://archive.greenpeace.org/toxics/reports/gopher-reports/chlora2.txt>

http://www.greenbiz.com/toolbox/howto_third.cfm?LinkAdvID=4197

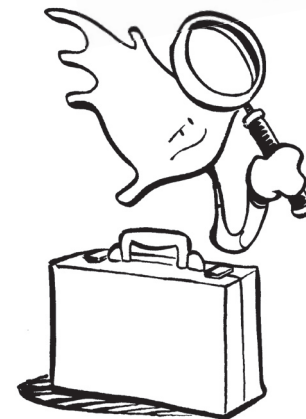
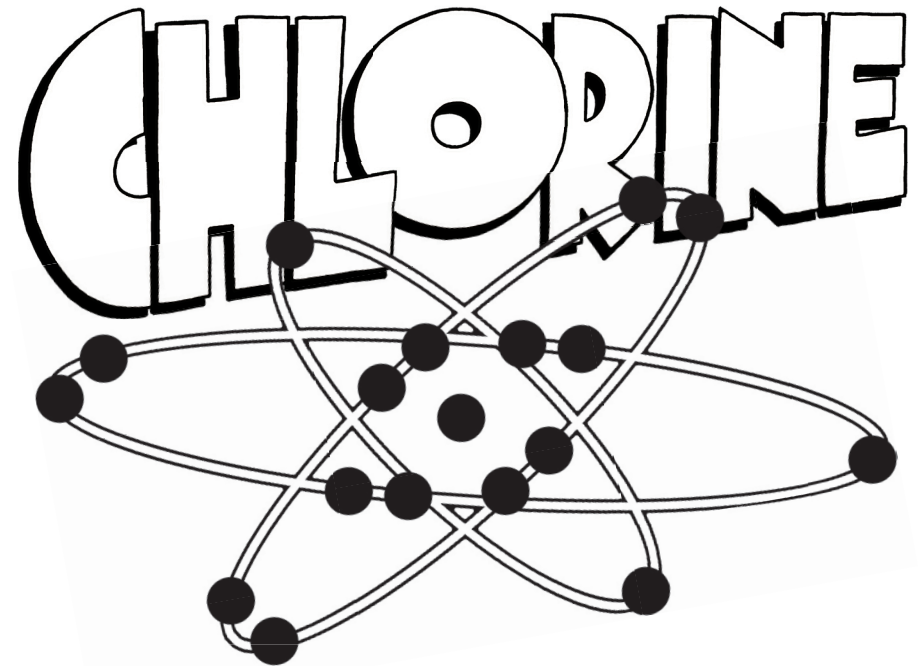
<http://www.referenceforbusiness.com/industries/Chemicals-Allied/Alkalies-Chlorine.html>

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PRESENTS

THE CASE AGAINST



Since Herbert Henry Dow discovered how to inexpensively separate chlorine from salt a century ago, chlorine has become a building block in tens of thousands of consumer and industrial products. Today, chlorine touches virtually every part of our lives. But it's not quite the "miracle" element that some would lead us to believe...

CHLORINE: THE GOOD, THE BAD & THE DEADLY

Since the discovery of how to extract chlorine from salt back in the 1800s, chlorine has become a building block in tens of thousands of chemical compounds used in consumer and industrial applications. Because of this, chlorine—one of the most toxic chemicals on the planet—touches every part of our lives.



THE BAD NEWS: Although chlorine is beneficial for purifying drinking water, less than 5% of the world's chlorine is used to make drinking water safe. The rest is used to make bleaches, plastics, pesticides, pharmaceuticals and other products.

The manufacture, use and disposal of these products results in

incalculable amounts of toxins, including dioxin, which are released into the air, soil, water supply and eventually our own body tissues—even into the umbilical cords of expectant mothers.

The scientific community and various cancer prevention organizations agree that chlorine-based compounds interfere with neurotransmitters and hormones in humans, and may be responsible for higher incidences of cancers and other serious health disorders, which have increased dramatically over the last century.

European nations have already passed laws against the use of chlorine in pulp and paper manufacturing. In the U.S., Congress and industry maintain

that such laws would devastate our paper industry (although it didn't happen to the paper industry in Europe).



Sadly, the U.S. paper industry has confused the issue further by introducing what they call "Elemental Chlorine Free" paper—a

term that means the purest form of chlorine was not used in the pulp bleaching process—even though, in many cases, toxic chlorine compounds like chlorine dioxide are still used. It's a misleading term that reinforces the need for consumer education and government-level intervention.



THE GOOD NEWS: Some North American paper companies have taken the initiative to produce **Processed Chlorine Free** (PCF) and **Totally Chlorine Free** (TCF) papers! They're available today, both in the U.S. and in Canada.

We need to reward these forward-thinking companies by asking school board members, local businesses and elected officials to specify TCF and PCF papers. Write your Congress person, Senators, or even the President.

It's our health and our future. To find out more, visit chlorinefreeproducts.org. By working together, we can reduce the toxic waste being dumped into our environment.

