Lesson Plan 010105

Chlorine-Bleached Paper (Target: Grades 5-8)

Objectives:

1. Create awareness of the pollution and related ecosystem devastation caused by using chlorine compounds to bleach wood pulp and paper products.
2. Introduce students to alternative technologies that enable the production and bleaching of paper without the use of chlorine compounds.
3. Develop action steps for student communication with local officials, state and federal representatives, manufacturers, retailers and others.
4. Create awareness for "Saving Water for Our Future" poster contest, developed by The Chlorine Free Products Association (nonprofit org. providing information and certification for paper products that are either "Totally Chlorine Free" or "Processed Chlorine Free")

Materials:

1. Colorable Poster: Copies of the poster "5 Things that Everyone Should Know About Chlorine-Bleached Paper"
2. Companion Worksheet: "Chlorine-Bleached Paper Worksheet"

Methods:

1. **Read Aloud:** Text from poster: "5 Things that Everyone Should Know About Chlorine-Bleached Paper". (5 minutes)
2. **Group Participation:** After reading the information, fill in the blanks of the activity page paragraph aloud in class. Ask the students to raise their hands and provide answers to the fill-in blanks. (5 minutes).

   Next, have a student (or students) go to the board. Ask students to list paper products that are commonly used in everyday life. Once they're listed on the board, ask students if there is any other category of products that has as many contact points with normal life. (The goal is to reinforce how basic paper is in our lives. This exercise should take about 10 minutes).
3. **Individual Work:** Ask the students to complete the crossword puzzle on the Activity Page. (10 minutes)
4. (Option) **Individual Work, Color Classroom Comic and/or Poster:** Give students time to color Classroom Comic and/or the Poster (15 minutes to 1 hour). Students can send finished work to GO NATUR'L STUDIOS, LLC., 11057 Allisonville Road, Suite 122, Fishers, IN 46038. Student submissions will be entered in a monthly drawing for a Rustle the Leaf prize.

Lesson Information: "5 Things Everyone Should Know About Chlorine-Bleached Paper"

1. Virtually all commonly-available paper products—even most recycled papers—are processed and bleached with toxic, ecosystem-killing, chlorine-based chemical compounds.
2. The amount of natural resources it takes to process wood pulp into chlorine-bleached papers is—for lack of a better word—shocking.

   For example, one single sheet of copy paper uses up to 13 ounces of water in chlorine-based processing. To put it another way, the average chlorine-based pulp mill releases 50 million gallons of toxic water every single day. That's roughly the amount of water it would take to fill a hole the size of a football field to a depth of 140 feet (the height of a 13-story building). That's just at one mill—for one day. In North America there are over 80 of these mills.
3. The poisons used in chlorine-based pulp mills are released into the environment and are responsible for the devastation of all types of life, spanning virtually all ecosystems. And they are beginning to exact a horrible toll on human health.

   Chlorine by-products known as organochlorines are linked to a frightening number of human diseases. These include disrupted reproductive cycles, endometriosis, spontaneous abortion, birth defects, impairment of brain development and function, and more. Sadly, children are at the greatest risk. Children ingest considerably more food and water per pound of body weight than adults, making them more susceptible to these toxins.
4. There is a proven, MUCH more efficient way to produce bleached paper. It is by using oxygen-based bleaching compounds that require far less water, and produce virtually no pollution.
5. Claims that oxygen-bleaching is more expensive are misleading. While chlorine-compound-bleaching is less expensive as a process, its hidden, long term costs defy calculation.

   Think about it: what is the cost of cleaning up all the polluted coastlines, waterways and ecosystems that have been devastated by chlorine-related pollution? What is the cost to society for treating all the diseases resulting from chlorine-related toxins? When the REAL costs are considered, oxygen-based bleaching is the best deal on the planet!

(Additional Lesson Information Provided on Following Page)

10 Ways to Impact...

From the brochure of the same name, developed by the Chlorine Free Products Association. Used by Permission.

Stem the 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 50,000,000 (million) gallons of water contaminated with bioaccumlative toxic organochlorine compounds (dioxins, furans, PCB's, chlordane, etc.) into our lakes, rivers, streams and our groundwater. In 1995 the paper industry released over 1,551,000,000,000 (trillion) gallons of contaminated water. Six years later, this totals up to 9,306,000,000,000 (trillion) gallons.

Promote 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.

Protect Future Generations

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.

Preserve the Environment

Organochlorines that are 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.

Save Fresh Water

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.

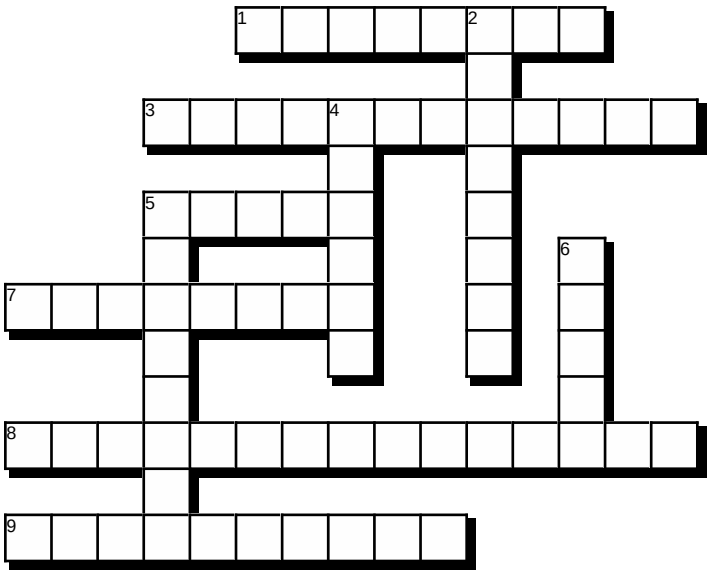
For a color brochure version of the information provided here, visit: http://www.chlorinefreeproducts.org.

Chlorine-Bleached Paper Activity Page

Read the "5 Things Everyone Should Know About Chlorine-Bleached Paper" poster and then fill in the blanks below:

Most of our paper products are bleached with a chemical compound that includes the toxic chemical _____. When this chemical is used to bleach wood pulp and paper, it requires an incredible amount of _____. Just one sheet of copy paper that is bleached with a chlorine compound may use up to ____ ounces. One of the most dangerous byproducts of this type of paper bleaching is a group of toxins known as _____. These toxins are linked to a wide range of human diseases and conditions such as _____ and _____. Sadly, the people most vulnerable to these poisons are _____.

Chlorine Bleached Paper Crossword



ACROSS

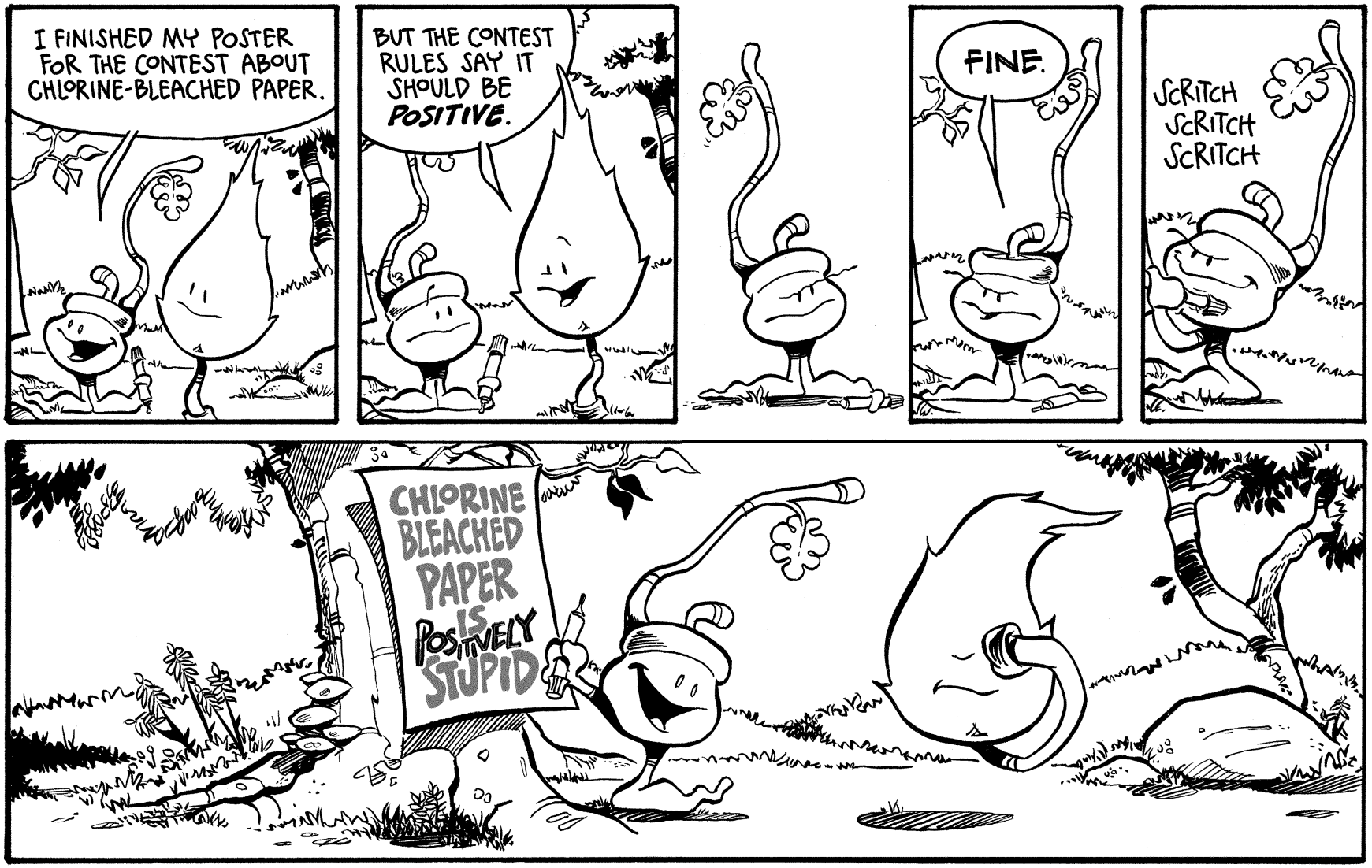
1. Group most vulnerable to diseases caused by toxins in the water and food supplies.
3. These types of human cycles are interrupted by toxins related to chlorine.
5. Number of millions of gallons of toxin-laced water that is dumped every day by chlorine-based pulp mills.
7. Toxic chemical that is most commonly used in bleaching pulp and paper.
8. Family of toxins that are created from industrial processes involving chlorine and other chemicals.
9. These types of paper products are brown in color. Paper grocery bags are a good example.

DOWN

2. Even these types of paper products are usually rebleached before being processed.
4. Active ingredient used in the alternative method to chlorine paper bleaching.
5. The polluted water dumped daily by the average chlorine-based pulp mill would fill a hole the size of this type of athletic field, to a depth of 140 feet.
6. The development and function of this organ is impaired by toxins related to chlorine.

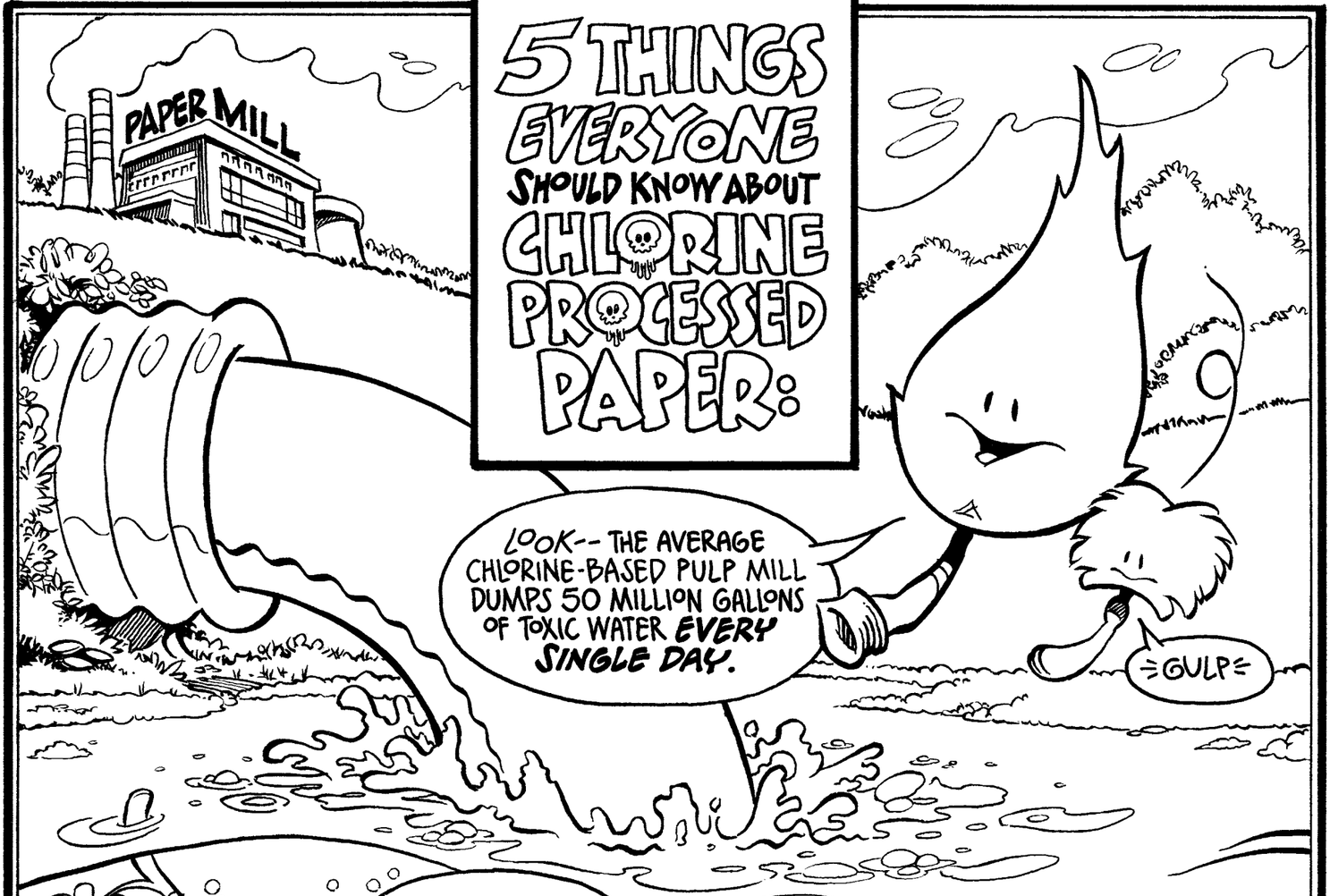
RUSTLE THE LEAF™

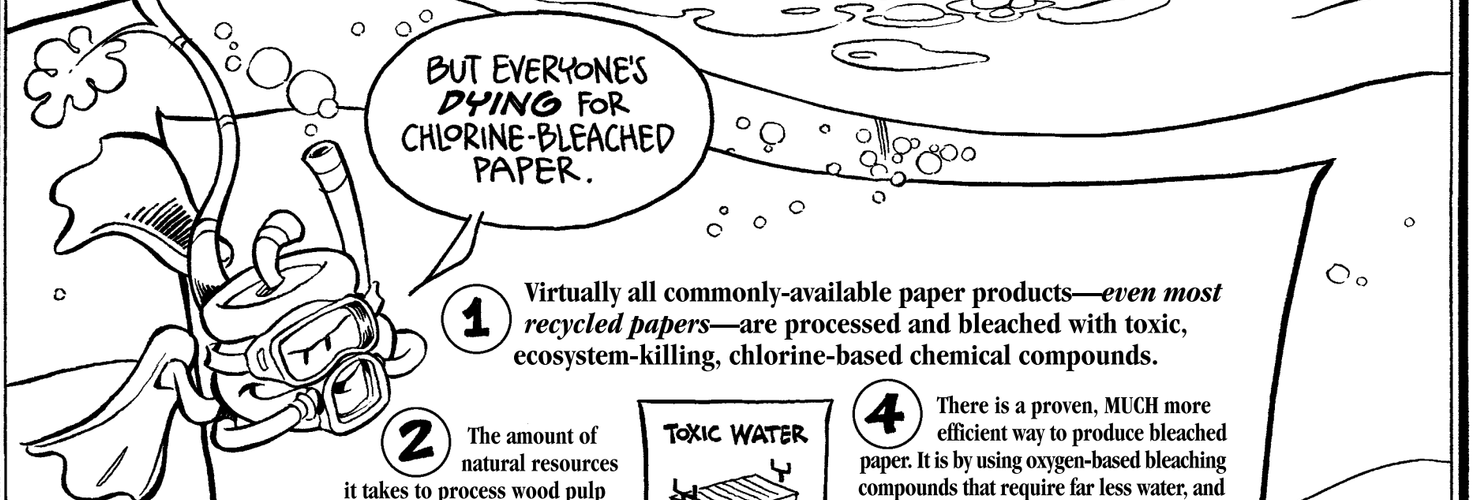
CLASSROOM COMIC



Every year, the Chlorine Free Products Association and the State of Vermont conduct a "Saving Water for Our Future" poster design contest. Students in grades 6-8 are challenged to design a poster that creatively, compellingly makes the case for alternatives to paper that is bleached with chlorine compounds. You can learn more about the dangers of chlorine-bleached papers—and about having a similar contest at your school—at http://www.chlorinefreeproducts.org/contest.html.

5 THINGS EVERYONE SHOULD KNOW ABOUT CHLORINE PROCESSED PAPER:





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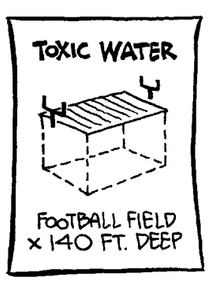

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SO NOW WHAT? **Knowledge is power, and you've just been provided with the knowledge to start changing things. Ask parents and teachers for help. Write to elected officials. Ask for the chance to speak to the media, to the school board, the mayor, the store clerk, your buyer of your books, the retail paper supplier. Speak up. Make a difference. It's your future: start protecting it now! To get more information, visit the web site listed below.**

YOU CAN HELP CHANGE THINGS ***RIGHT NOW***: VISIT WWW.CHLORINEFREEPRODUCTS.ORG