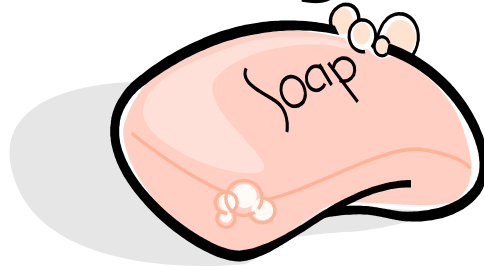


Toxic Free Tips

The Beauty of Soap



Do natural cleaners – soap, vinegar, baking soda, etc. – work as well as detergents and other commercial cleaners?

Yes!

Soap vs. anti-bacterials

- Most biological processes are water-based chemistry. Soap is good at interfering with these basic chemical processes.
- Because soap works at this basic level, germs can't build up a resistance to soap.
- Most anti-bacterial products kill 95% of germs, but the strongest 5% survive. The survivors reproduce, creating even stronger germs.
- In the long run, soap beats anti-bacterial products for safer cleaning.
- When you can't use soap and water, the CDC recommends using an anti-microbial (more than 60% alcohol) hand sanitizer.

Soap is stronger than oil

- Oil is what holds dirt to a surface. If you break that hold, you can rinse away the oil and the dirt.
- Soap works because of its structure and the way it interacts with oil.
- Soap is attracted to oil. It surrounds oil molecules and breaks their hold to a surface. This makes the oil and the dirt easier to rinse off.

Getting to the nitty-gritty

- Changing the pH (level of acid or base) of water gets at particulates.
- Weak acids, like vinegar and lemon juice, change water's pH. They are also good at killing things and act as mild disinfectants.
- It's best to wash windows with a weak acid such as vinegar – it doesn't need rinsing off like soap.
- Bases, such as baking soda, also change water's pH.



Toxic Free Tips

Website:

www.ecy.wa.gov/toxicfreetips

Toll free:

(866) 939-9991

Write to us:

ToxicFreeTips@ecy.wa.gov

Ecology Publication Number 09-04-011

Borax, soft and sweet

- Hard water (water with minerals in it) can cause soap to leave a scummy deposit and not work as well. (The old “ring around the tub.”)
- Borax acts as a buffering agent in hard water by tying up some of the minerals.
- Borax provides some bleaching for laundry.
- Borax helps keep down odors in diaper pails.
- Always rinse well after using borax, especially surfaces used to prepare food.
- Use small amounts. Borax breaks down to boron in the environment, so it can be toxic in large amounts.

Stay away from

- Products with halogenated ingredients – keywords are:
 - Chloro-
 - Bromo-
 - Fluoro-
 - Halide-
 - Halogen-
- Products with heavy scents. These may use synthetic musk, a persistent, bioaccumulative toxic chemical.

Use with caution

- Products with large amounts of citrus extracts. The extracts may be in a high enough concentration to be toxic.

GREENER Cleaners – Better for Your Budget!

“Green” cleaning doesn’t mean you have to buy high-priced commercial products. You can clean green and save your budget, too. Baking soda, soap, and vinegar are cheap and plentiful. So use the “recipes” from **ToxicFree Tips** and protect both your budget and our natural world.

Household Cleaners: Cost Survey of Safer Alternatives and Commercial Cleaners Feb. 2009

Category	Product	Average cost per ounce
Safer Alternatives	Baking Soda	\$0.06
	White Vinegar	\$0.05
	Table Salt	\$0.03
	Borax	\$0.06
	Castile Soap	\$0.56
Commercial Cleaners	All Purpose Cleaner	\$0.12
	Glass Cleaner	\$0.13
	Toilet Bowl Cleaner	\$0.14
	Surface Scrub	\$0.08
	Oven Cleaner	\$0.29
	Drain Cleaner	\$0.15



Sources:

- Dickey, Phillip. Laundry Detergents, Washington Toxics Coalition, 8/1991
- Helmenstine, Anne Marie. How Does Soap Clean?, About.com Chemistry, 3/9/ 2009
- Stone, Alex. Personal Communication, Chemist, WA Dept. of Ecology, 1/13/2009
- Centers for Disease Control and Prevention. Global Water, Sanitation, & Hygiene, cdc.com, 4/10/2009

All purpose cleaner – 16 oz

1 tsp soap, 1 tsp borax, 2 tblsp vinegar in 16 oz water - \$0.15
Commercial all purpose cleaner - \$1.92

Window and Mirror Cleaner – 16 oz

¼ cup vinegar in 14 oz water - \$0.10
Commercial glass cleaner - \$2.08

Drain Cleaner – 8 oz

½ cup vinegar, ½ cup baking soda, and boiling water - \$0.44
Commercial drain cleaner - \$1.20

Oven Cleaner – 8 oz

1 cup baking soda, water - \$0.48
Commercial oven cleaner - \$2.32

Toilet Bowl Cleaner – 4 oz

½ cup baking soda, 1 tsp soap - \$0.33
Commercial toilet bowl cleaner - \$0.56