

**Subject of Focus:** Chemistry, Health

Have students complete a comprehensive research paper examining the relationship between allergies or skin irritants and chemicals associated with personal care products.

**Student reports should address the following:**

- Chemicals in personal care products that frequently cause allergies or irritation. These should include (but are not limited to) descriptions on the properties, uses, and other potential health outcomes for:
  - Alpha hydroxyl acids
  - Formaldehyde
  - Parabens
  - Imidazolidinyl
  - Quaternium 15
  - Methylchloroisothiazolinone (MCI)
  - Methylisothiazolinone (MI)
  
- Research on the types of products that are most likely to contain chemical allergens or irritants (ie: perfumes, sunscreen, etc).
  
- Challenges with label reading as a strategy to avoid known allergens.

**Student reports should define and explain the following concepts:**

- Irritant contact dermatitis
- Allergic contact dermatitis

**Subject of Focus:** Chemistry

**Have students choose one of the following chemicals commonly used in personal care products to report on:**

- Butylbenzyl Phthalate (BBzP)
- Dibutyl Phthalate (DBP)
- Diethyl Phthalate (DEP)
- Diethylhexyl Phthalate (DEHP)
- Dimethyl Phthalate (DMP)
- Formaldehyde
- Galaxolide
- Lead

**Student reports should address the following:**

- Description of chemical properties and molecular structure
- Common uses of the chemical (with an emphasis on personal care products)
- The purpose of the chemical (what does it do?)
- Health implications for the chemical and known safety data
- Environmental toxicity for the chemical
- How the chemical is broken down

**Subject of Focus:** Chemistry, Health

Students should review the following article:

Title: Beautifully Toxic: The Effects of a Burmese Cosmetic Practice

Author: Esther Munene, PhD

Affiliation: Utah Department of Health

*Article is only available online by subscription, however, it can be located in the January, 2013 American Journal of Public Health (Volume 103, Number 1) or in the Resource section of your Toxic Beauty Instructor Support Materials notebook.*

In a research paper, students should further explore and discuss the following:

- Lead as a human health hazard
- Lead as an environmental toxin
- The cultural significance of Thanakha and aw tway for Burmese children in both native and refugee environments
- Another cultural beauty practice that has health and/or environmental toxicity consequences



**Subject of Focus:** Chemistry, Health

Have students complete a comprehensive research paper examining the relationship between the endocrine system and chemicals associated with personal care products.

**Student reports should address the following:**

- The anatomy and function of the endocrine system
- Major hormones released by the endocrine system and their functions
- The relationship between the endocrine and the immune system
- Chemicals in personal care products that effect the endocrine system (and potential health outcomes)

**Student reports should define and explain the following concepts:**

- Endocrine disruption
- Hormone mimicker

**Subject of Focus:** Chemistry

Students should create a PowerPoint (or visual media) presentation following the path of formaldehyde found in personal care products through the body and environment. This presentation should address the complete ecological cycle from the point of use, including:

- How formaldehyde enters the body
- Means by which it may be introduced to the environment
- Potential contamination pathways through soil, water, and air
- Eco and food systems effected
- The chemical break down of formaldehyde

Presentations should include detailed instructor notes or referenced support materials.

**Subject of Focus:** Consumer Science

Personal care product labeling is unregulated and often inaccurate or incomplete. Students should explore labeling by completing the following three pieces:

**Natural Product Association (NPA) Research:**

Students should create an informational brochure on the NPA which includes information on:

- The organization structure, purpose, origins, and activities
- What NPA certification signifies

**Label “Scavenger Hunt”:**

Create a chart graph or visual display illustrating products on which students were able to find the following ingredients on their labels. Student displays should include a legend or key that explains what ingredients are.

- Parabens (ingredients with the prefix ethyl, methyl, butyl or propyl)
- Phthalate (often listed as DEHP, DHP, DBP, or dibutyl phthalate)
- Petroleum products (propylene glycol, polyoxyethylene, petrolatum, isobutene)
- Hydroquinone
- Nano Zinc
- Color additives
- Bonus: Placenta (yes, placenta!)

**Design a Label:**

Taking in to consideration label elements that are helpful, deceitful, or confusing (including statements, ingredient lists, visual elements, and slogan claims), students should choose a product and create an ideal label that would better inform consumers about the product’s benefits, uses, and potential risks.

**Subject of Focus:** Chemistry, Consumer Science, Health

Have students research the two concepts below. They should address:

- Common chemicals found in sunscreen in their implications on health and environment.
- Research on the health effects of UV exposure from sun.
- Research on the effectiveness of sunscreen in providing protection from UV exposure.
- Differences in the safety and effectiveness of sunscreens available and how we use them.
- What experts from respective industries recommend (Examples: Environmental Working Group, American Cancer Society, Environmental Protection Agency, American Medical Association, Food & Drug Administration, Centers for Disease Control, etc).
- Ways to protect health from toxins and/or UV exposure.

Have students choose a point of view related to the use of sunscreen and defend it in an opinion/research paper. Stress that there is no right or wrong point of view and the strength of the paper lies with student's ability to use credible research and logic to support their conclusion.

**Concept 1:** Sunscreen contains many chemicals, often including retynol (potential link to tumor development) and oxybenzone (potential hormone disruptor). They also often contain nanoparticles which are used to help the product penetrate the skin more deeply. Many sunscreens have been found to be minimally effective in blocking harmful UV rays.

**Concept 2:** UV rays from sun and tanning beds are classified as carcinogenic. Unprotected exposure to UV rays is the number one preventable cause of skin cancer and other conditions such as actinic keratoses and premature aging.

**Subject of Focus:** Chemistry, Consumer Science

50% of the costs of personal care products are attributed to the packing. Have students explore the effects of personal care packaging on environment and health by reporting on the following issues:

- The purpose of package (address the marketing, efficiency, educational, and economic role of packaging)
- Examples of materials that are often used to package personal care products and associated chemical content
- The environmental impact of manufacturing these products
- Means by which toxins move through the environment as a result of packaging
- The environmental impact of the breakdown of these products

Student projects should include a quantifiable demonstration of the volume of waste generated by packaging (such as collecting all personal care packaging or containers for a set amount of time to display, weigh, etc).

Student projects should also include a sample, drawing, or written explanation of an alternative packaging method that is less toxic, but still meets the requirements and functions that packaging serves.



**Subject of Focus:** Chemistry, Consumer Science, Health

**Part One:**

Have students choose FIVE personal care products that they use daily (lotion, deodorant, lip balm, shampoo, make-up, perfume/cologne, etc). Use the Environmental Working Group's "Skin Deep" web database (and/or a comparable app) as a guide to help students report the following for all five products:

- Chemical content highlighting the most toxic component
- Potential impact on human health
- Potential impact on the environment
- Products uses and effectiveness

**Part Two:**

Have students take the product that received the highest risk rating on EWG Skin Deep site or a comparable app, and choose a less toxic product to replace it with. This may be a store-bought or homemade alternative. Students should examine/explain why it is a better choice, taking in to consideration the same four points listed above. Have students try the newer, less toxic product for a period of time and report on the results.

**Subject of Focus:** Consumer Science

Have students create their own personal care products with ingredients that are less toxic, require less packaging (or reusable packaging), cheaper, and do not rely on shipping. Multiple recipes for a variety of personal care products can be found on the website for the Campaign for Safe Cosmetics at <http://www.safecosmetics.org/article.php?id=233with> (two samples listed below).

Students should sample products and report on the results.

**Chamomile Shampoo**

- 4 bags of Chamomile tea (or 1 handful of fresh Chamomile flowers)
- 4 tablespoons pure soap flakes
- 1 1/2 tablespoons glycerin\*

Let the tea bags steep in 1 1/2 cups of boiled water for 10 minutes. Remove the tea bags and with the remaining liquid add the soap flakes. Let stand until the soap softens. Stir in glycerin until mixture is well blended. Pour into a bottle. Keep in a dark, cool place.

**Lip Balm**

- 1/4 cup of beeswax
- 1 1/4 cups of oil (coconut oil, jojoba oil, olive oil, vegetable glycerin, shea butter, cocoa butter)
- Several drops vitamin E oil to preserve
- Few drops of flavoring (vanilla, peppermint)

Makes 15 containers

**Subject of Focus:** Chemistry

Students should review the following article:

McDougall, Andrew (Feb 2013). Sustainable Technology Developed to Produce Sperm Whale extract for Perfumes. Retrieve from:  
<http://www.cosmeticsdesign.com/content/view/print/739312>

- Students should summarize the article.
- Students should choose a toxic chemical common in personal care products (briefly discuss the chemical characteristics and why it is used)
- Use a molecular structure library such as the one at <http://www.nyu.edu/pages/mathmol/library/> from New York University to find a substitute with a similar structure, that may serve the same purpose as a product ingredient, but with less toxicity



**Subject of Focus:** Consumer Science

Part 1:

Students should create a 3-5 question survey about how their peers make decisions about personal care products (ie: price, look, recommendation, product claims, etc). Questions can address either a belief/attitude or a behavior. Students may choose to focus on one product (such as deodorant, or lotion). Surveys should be designed so the answers are scaled.

**Examples:**

1. How concerned are you about personal care products may be impacting your health?

Very concerned (1)

A little concerned (2)

Not concerned at all (3)

2. If you knew of a less toxic shampoo, how likely are you to change products:

Very likely to change (1)

I may change (2)

Not likely to change (3)

Students should administer the survey they design to peers in one of their classes, social, or athletic groups. Try to administer at least 25 surveys.

Part 2:

Students should create an educational campaign containing THREE key messages that relate to their survey questions. They may use fliers, student publications, public announcements, social media, classroom presentations etc. to share their key messages throughout the term or year so that students who took your survey will be exposed to the messages.

Part 3:

Students should re-administer the SAME survey to the SAME group of peers and create a display or report illustrating:

- The three key messages (and why they were chosen)
- Methods for sharing messages (and which seemed most/least effective)
- A comparison of pre/post surveys showing any changes in attitude or behavior

**Subject of Focus:** Consumer Science

**Part One:**

Have students choose one of the following products to research. Use the Environmental Working Group's "Skin Deep" web database as a guide. Students should address:

- Chemical content highlighting the most toxic component
- Potential impact on human health
- Potential impact on the environment
- Products uses and effectiveness

**Choose a Product:**

- Garnier Fructis Anti-Humidity Hairspray
- Revlon Moondrops Lipstick
- Covergirl Lip Perfection Lipstick
- Stetson Original Aftershave
- Clearasil Ultra Rapid Action Pads
- Right Guard Deodorant

**Part Two:**

Have students choose a less toxic comparable product and examine/explain why it is a better choice. Students should take in to consideration the same four points listed above in their argument and research.