

The Science Behind Personal Care Products: A Hands-On Approach to Engage K-12 Students

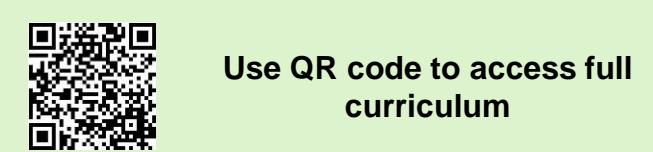
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Science - Relevant & Hands-On!

Making science relevant and hands-on is critical to engaging middle and high school students. The Northwest Association for Biomedical Research (NWABR) developed a four lesson curriculum, "Consumer Awareness: Personal Care Products Safety and Labeling" that investigates the science, labeling and safety testing behind personal care products. The lessons, which include a lotion-making lab, have been presented by teachers and toxicologists to diverse student audiences in classrooms and informal, after-school programs.

Lessons and workshops can be tailored in length and depth to the target audience. Critical evaluation skills and a basic understanding of science and regulations are encouraged. The curriculum addresses national Next Generation Science Standards and provides a context for introducing topics such as toxicology, the process of drug development and careers in science.



Use QR code to access full curriculum

Curriculum Overview

Lesson 1: Beyond First Impressions

- Labels – Claims – Regulations

Lesson 2: What's In It?

- Emulsion chemistry – Lotion preparation – Inquiry labs

Lesson 3: Is It Safe?

- Basic toxicology, Safety testing: MSDSs & animal studies – Designing a human study

Lesson 4: The Informed Consumer

- Are my cosmetics dangerous? Risk management
- What, and who, should you believe? Evaluating advertisements & information sources
- Speak up! Consumer advocacy
- Difficult decisions and ethical dilemmas

Curriculum & Workshop Training

Teacher professional development workshops were developed to introduce middle and high school teachers to background concepts, lesson activities and inquiry options associated with the curriculum.



Teacher feedback helped to optimize the lessons and integrate them with state science education standards. After training, teachers had access to a lotion-making loaner kit with supplies and equipment.



Lessons 1 and 2 (cosmetic regulations, labeling, and lotion making) were the basis for independent workshops for informal, out-of-classroom presentations.

Scientists used the kit and curriculum to support their presentations emphasizing research methods, use of animals, ethics and career options.

The kit enabled the engaging lotion-making lab to take place in non-lab facilities.

Impact and Dissemination

Teacher Professional Development and Informal Outreach Workshops

	Time Period	Students	Teachers	Schools	Adults
Teacher Professional Development					
8 hr Workshops	8 wkshps – 4 yrs		164	148	
2 hr Workshops	5 wkshps – 4 yrs		110		
Kit loan program	7 years	11,456	129	112	
Girl Scouts	4 years	482			138
Informal outreach programs	6 years	833			189
TOTALS		12,771	403	260	327

Teacher evaluations of curriculum and its use:

"Really liked the lessons, very well done, with so many ways to extend the lesson into other areas, sub-topics."

"This is a very well thought out curriculum! Very user friendly!"

"The students were most interested in the animal testing claims...Most of them had no idea what "animal research" was..."

"The kids loved making the lotion and trouble shooting when it didn't go as planned."

Workshop & Lab for Multiple Audiences *The science, safety & careers behind lotions*

Workshop Variations:

Laws, Labels and Safety Testing

What's a mouse got to do with my hand lotion?

Lotions and Potions - Science or Magic?

Ooh-La-La! Lotions, Labels and Lab

Lotions and Landfills!

The Science Behind Cosmetics: Safety Testing & Animals

Cosmetic Lessons from Ancient Egypt

Scientists speaking to lay audiences about their career and education paths can adapt this curriculum to introduce multiple aspects of science, research and ethics.

Investigating cosmetic product labels and regulations can lead into discussion about the process and application of science, public policy, social responsibility and career options.

Workshop Audiences:

Girl Scouts
AWIS GEMS program
Expanding Your Horizons
UW Summer Camp
NWABR CURE Fellows & teachers

The kit-based lotion-making lab can be used in non-lab facilities and reinforces fun while learning about emulsion science.

Lotion-Making Kit *Supplies for lab & discussion*

Lab Equipment

- 8 Hot plates
- 8 Glass beakers, 400 ml
- 8 Plastic beakers, 250 ml
- 8 Measuring spoon sets: 1 T, 1 tsp., ¼ tsp.
- 8 ½-cup Measuring cups
- 8 1-cup Measuring cups
- 8 Wooden stirrers
- 8 Spatulas
- 16 Pot holders
- 32 Plastic spoons
- 8 Felt pens
- 64 Lotion containers w/lids
- 8 Lotion recipes & flow charts

Kit = Lab equipment & supplies for 32 students (8 lab stations, 4 students/station)

The kit was available at no charge for trained teachers. There was a participant fee for afterschool programs.

Supplies (per lab station)

- Mineral oil (1/2 c.)
- Beeswax (3 T.)
- Coconut Oil (1 tsp.)
- Borax (1/8 tsp.)
- Water, in bottle (1)

For Discussion

- ~32 Product containers (shampoo, soap, hand lotion, etc) for label examination
- 8 each, MSDS information for Mineral oil
- Borax
- Propylene glycol
- Methyl paraben

Supplies (per kit)

- Dish detergent
- Sponge



Reading Labels



Making Lotion



Adding Fragrances

Program Highlights

- Freely available curriculum focusing on the science and regulations behind personal care products
- Workshop ideas & support for presentations to audiences of multiple ages and education backgrounds
- Lotion-making lab useable in non-lab venues
- Background and resources:
 - Cosmetic vs. drug regulations
 - Labeling requirements
 - Safety testing and toxicology
 - Emulsion chemistry and skin biology
 - The use of animals in research
 - Science careers
- Worksheets and activities:
 - Designing labels
 - Evaluating advertisements
 - Dose response and risk assessment
 - Inquiry lab around lotion formulation
 - Exploring consumer advocacy

Resources

Curriculum available online:
<http://www.nwabr.org/teacher-center/consumer-awareness#overview>

SOT Education resources:
<http://www.toxicology.org/teachers/teachers.asp>

Acknowledgements

Original idea and activity developed by Angelika Grossmann at ZymoGenetics.

The Chiron Foundation provided initial funding for NWABR to develop the curriculum and conduct professional development workshops for teachers.

The American Chemical Society, Puget Sound Section provided a grant for workshop supplies.

Some teacher and student workshops were supported by "Collaborations to Understand Research and Ethics (CURE), funded by National Center for Research Resources and the Division of Program Coordination, Planning, and Strategic Initiatives of the National Institutes of Health (Grant #R25OD011138).