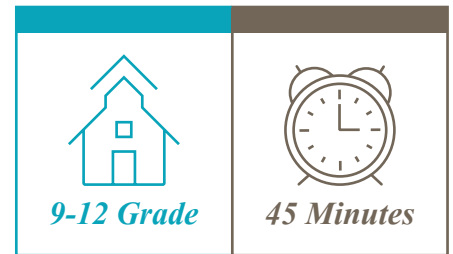


Lesson 1:

What are PPCPs and How Do They Affect Me?

**Subjects:**

Consumer science, Life science, Mathematics

**Setting:**

Home and Classroom

**Pre-Homework:**

Pharmaceutical and Personal Care Product Worksheet

Materials:

- Internet Access (for research or instruction)
- Worksheet (Pharmaceutical and Personal Care Products) **[Included]**
- Worksheet (Personal Care Plan of Action) **[Included]**

DSRP Vocabulary:

- ▶ Nonpoint-source pollution
- ▶ Personal care products (PCPs)
- ▶ Point source pollution
- ▶ Pharmaceuticals

INTRODUCTION

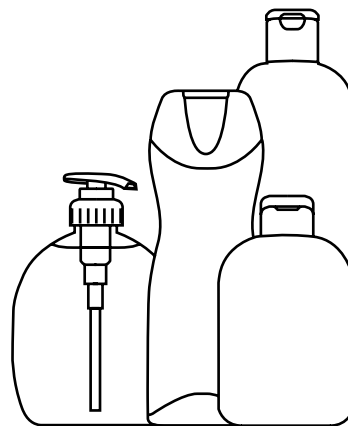
Every day you use a variety of products to improve your health or your quality of life. For example, perhaps you have to take a daily medication. That's a pharmaceutical (P). When you take a shower, you use shampoo, conditioner, soap, and maybe other products. Before you leave, you use toothpaste to brush your teeth. All of those items are considered personal care products (PCPs). The question is where do all of these substances, considered by most to be necessary to every-day life, go when they leave your body or go down the drain? What can *you* do to be an agent of change when it comes to how pharmaceuticals and personal care products (PPCPs) enter our environment?

STUDENT OBJECTIVES

1. Explain, based on research, the different sources of pollution specific to pharmaceuticals and personal care products.
2. Summarize possible effects of PPCPs to the environment.
3. Design a personal (or family) action plan to reduce PPCP pollution.
4. Critically discuss the issues and challenges surrounding the issue.

DAILY ASSESSMENT

Students should have a clear understanding of the issues outlined in the PPCP worksheet as well as a feasible action plan to reduce improper disposal of PPCPs in their home.



STATE AND NATIONAL STANDARDS

COMMON CORE

Literacy: RST.9-10.8
RST.11-12.7
RST.11-12.8

Math: MP.2
HSN.Q.A.1
HSN.Q.A.2
HSN.Q.A.3

NAAEE GUIDELINES

3.1
3.1.B
3.1.C

NGSS

HS-LS2-7
HS-ETS1-4

The Take-Away

Students and their families have the power to reduce PPCP pollution by changing habits, which will ultimately help aquatic ecosystems.

*(All instructions that begin with an * are found on the Illinois-Indiana Sea Grant Resource or YouTube Page)*

Conventional Classroom Procedure:

The **night before class**, hand out the Pharmaceutical and Personal Care Product Worksheet and have students fill out the first two columns.

1. In class, have students search online the words “chemicals in personal care products” and review the information they gather from reputable links. Students should write down which sites they visited and take notes on important facts they learned. If conflicting information is given, that could be a point of discussion.
2. *Watch video *How Drugs Pollute Our Drinking Water* (3:00).
3. Split up students into research groups (2-4 students).
4. Have students investigate the ingredients they found in the homework page (Helpful research links posted below).
5. Based on the information provided in the video and the material and evidence gathered from the internet on PCP ingredients, student groups should summarize the issue in 1-4 sentences.
6. Each student should come up with a personal action plan to reduce improper PPCP disposal in their household (sheet provided).

Flipped Classroom Procedure:

1. The **night before class**, students should:
 - a. Fill in the Pharmaceutical and Personal Care Product Worksheet
 - b. Google “chemicals in personal care products” and read and watch information gathered from reputable links.
 - c. *Read *How Drugs Pollute Our Drinking Water*
 - d. *Review *How to Dispose of Unwanted Medicine and Personal Care Products Research and Resources*
 - e. *Read the Pennsylvania Sea Grant Article
 - f. Fill in the Personal Care Plan of Action worksheet
2. In class:
 - a. Discuss the “surprises” of what students learned while filling out the Pharmaceutical and Personal Care Product Worksheet.
 - b. Discuss potential fears, realities, and challenges of what they learned.
 - c. Break students into groups to reflect on the Personal care Plan of Action worksheets and what extensions (stewardship projects) could be created from what they have learned. Share those discussions.

Resources:

- *How to Dispose of Unwanted Medicine and Personal Care Products Research and Resources
- *Pennsylvania Sea Grant
- *Environmental Working Group: Skin Deep (NGO)

- *Household Products Database
- *Learn About Chemicals in Your House – EPA

Extensions or Possible Student Projects:

- Have students make their own alternative personal care products like shampoo, conditioner, or face cleanser, and use only those products for one week. There are a number of websites that can be researched by Googling “homemade personal care products.” They can journal about their experience on how easy (or not) and effective the natural products were compared to their store-bought counterparts. Have them consider cost, availability of ingredients, storage issues (lifespan), and time required to make and use.
- Calculate the number of PPCPs that your class(es) is/are diverting and keep an ongoing total that can turn into a “green promotion” for your school’s efforts to restore the environment.
- Communicate with local authorities for a Drug Take Back event. See (Illinois-Indiana Sea Grant *Resource Page*) for a tool kit on how to hold a successful event.

Name _____ Block/Period _____

Pharmaceutical and Personal Care Product Worksheet

Look at personal care products in your house (shampoos, conditioners, lotions, etc.). Write down any ingredients that you can't pronounce or know the purpose of. In class, research the uses for the ingredients.

| Ingredient (at home) | Found in | Purpose (in class) |
|----------------------|------------------|--------------------|
| e.g. triclosan | toothpaste, soap | antibacterial |
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Summary of issue:

Name _____ Block/Period _____

Personal Care Plan of Action



Target: Reduce PPCP release in my home.

I, _____ plan to reduce the improper disposal of PPCPs in my home by *educating my family* and *following these steps*.

- 1.
- 2.
- 3.
- 4.
- 5.

Add more on the back as needed

- As my family and I make these changes in our household, we will be diverting _____ PPCPs (specific chemicals) from being improperly discarded into the environment. (Show your math.)

- These changes by my family are important because... (Discuss the cost, safety, reliability, and aesthetics as well as social, cultural, and environmental impacts of this habit change.)