

Household Toxic Waste

Question: How do household chemicals affect our environment?

Kentucky Core Content:

SC-H-3.5.5 Human beings live within the world's ecosystems. Human activities can deliberately or inadvertently alter the dynamics in ecosystems. These activities can threaten current and future global stability and, if not addressed, ecosystems can be irreversibly affected.

Objectives:

Students will be able to:

1. List the dangers of household waste products.
2. Determine how many household toxic waste products are in their town.
3. Properly dispose of household toxic waste products
4. Explain appropriate use of these products

Materials:

Students work in groups of four:

- 200 ml Flask
- 200 ml Beaker
- “Ocean” water (???% salt water)
- 10 cm ½” Flexible aquarium tubing
- Ammonia
- Indicator solution
- Water Funnel
- Coffee filter
- Cotton
- Aquarium charcoal
- List of common household wastes (obtained from Internet)

Procedure/time:

This activity should take about 40 minutes. Follow up discussion to assignment may take 20 minutes. See sheets below for exact procedure.

Assessment:

- Follow-up discussion a few days after the lab is completed.
- The students must do the homework assignment.
- You can deduce (knowing the population of your town and guessing about 4 people to each household) how many household waste products are in your town. Then, you can give an additional homework assignment where the students had to find out what they could do about it. They were assigned:
 - 1) To find out where the recycling center was and when they picked up at their house
 - 2) To find out where to recycle used motor oil, and
 - 3) To design a very basic filter system that a city could use to clean its waste water that may contain toxic products. You can hang up the best ones.



Household Toxic Waste

Each year our rivers and ocean become more and more polluted with our household toxic waste. Many people don't realize that all curbs lead to the ocean. In other words, any toxic chemicals dumped out on your street will end up in a river or the ocean. Often this is your drinking supply!! Here are some examples of household toxic waste; oven cleaners, glue, batteries, oil, bug spray, etc. Complete this experiment to learn about these toxic wastes.

Flask = your street

Beaker = the ocean

Tubing = the path from your street to the ocean

Experiment 1

- 1) Test a small sample of the ocean water with indicator solution. What do you observe?
- 2) Fill your beaker 1/3 full with clean ocean water given to you.
- 3) Fill your flask 1/3 full with water and the "toxic waste" given to you.
- 4) Pour the toxic waste from your street, down the tubing and into the ocean
- 5) Use the indicator solution to determine if you polluted the ocean.

On a scale of 1-10 (10 = the most polluted, 0 = no pollution) rate the ocean after this experiment a 10. Ocean pollution after first experiment = **10**

Questions

1. Would there be less pollution if you let the toxic waste dry on your street before it washed to the ocean?
2. What are some ways that you can stop pollution from household toxic waste?
3. Some household toxic waste products are necessary. How can we prevent them from polluting our rivers and oceans?

Experiment 2

Many cities have built elaborate filtration systems in order to prevent water pollution by household toxins. Due to these systems, it would be better to put many toxins down the sink then to dump them on the street. However, some toxins such as oil and antifreeze have special disposal methods and some can even be recycled!

Why do you think it would be better to put bleach down the sink then to pour it on the road?

Let's try filtering our street water and see if it helps. For this experiment you will try to filter your water using three different methods; coffee filter, cotton and charcoal.

- 1) Set up the experiment like Experiment #1
- 2) Put coffee filter over beaker (or into the funnel if you have one)
- 3) Run "toxic waste" into the ocean – make sure you don't spill "toxic waste" on the floor!
- 4) Rate the amount of pollution in the ocean between 1 and 10 (you get to guess on this one. Remember 1 = no pollution and 10 = most pollution & was your rating for the first experiment.)

Amount of pollution with coffee filter _____

- 5) Repeat the experiment again using a coffee filter and cotton
- 6) Rate the ocean pollution each time

Amount of pollution with coffee filter and cotton _____

- 7) Repeat the experiment again using a coffee filter and charcoal
- 8) Rate the ocean pollution

Amount of pollution with coffee filter and charcoal _____

Questions:

1. Which filter material worked the best?

2. What other filter materials might be used to filter polluted water? List at least two.

Homework

- 1) Use the list of common Household Waste given to you.
- 2) Check each one on the list that you have in your house.