Environmental Lesson Plan



5E Learning Sequence: Grades 3-5

Developed by K-12 Science Education Specialists in L.A. County and Aligned With: California Common Core Standards,
Next Generation Science Standards (NGSS), and
California Environmental Principles and Concepts (CA EP&C)

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LESSON PLAN

Objectives

At the end of the lesson/learning sequence, students are expected to identify the types of substances/items that make up household hazardous waste (HHW) and electronic waste (E-Waste) along with identifying other hazardous waste; interpret the meaning of various safety symbols associated with HHW and the dangers HHW; explain how to properly dispose of HHW, E-Waste and other hazardous items; and create an alternative household cleaning product using ingredients found in most homes.

Standards

Next Generation Science Standards (NGSS)

- 5-ESS3-1 Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.
- 5-PS1-3 Make observations and measurements to identify materials based on their properties.
- 3-5-ETS1-2 Generate and compare multiple solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

California Environmental Principles and Concepts (CA EP&C)

Principle II: People Influence Natural Systems

Concept A. Direct and indirect changes to natural systems due to the growth of human populations and their consumption rates influence the geographic extent, composition, biological diversity, and viability of natural systems.

Principle IV: There are no Permanent or Impermeable Boundaries that Prevent Matter from Flowing Between Systems. The exchange of matter between natural systems and human societies affects the long term functioning of both.

Concept B. The byproducts of human activity are not readily prevented from entering natural systems and may be beneficial, neutral, or detrimental in their effect.

<u>Common Core State Standards - Language Arts</u>

Reading Informational Text

Key Ideas and Details

• CCSS.ELA-LITERACY.RI.5.1Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.

Integration of Knowledge and Ideas

- CCSS.ELA-LITERACY.RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.
- CCSS.ELA-LITERACY.RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.

Writing

Text Types and Purposes

- CCSS.ELA-LITERACY.W.5.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
- CCSS.ELA-LITERACY.W.5.8 Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources.

Research to Build and Present Knowledge

• CCSS.ELA-LITERACY.W.5.9 Draw evidence from literary or informational text to support analysis, reflection, and research.

Speaking and Listening Comprehension and Collaboration

- CCSS.ELA-LITERACY.SL.5.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-lead) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.
- CCSS.ELA-LITERACY.SL.5.2 Summarize a written text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

Presentation of Knowledge and Ideas

• CCSS.ELA-LITERACY.SL.5.4 Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.

Teacher Background

When household hazardous waste, E-Waste, old paint, used motor oil, batteries, sharps and pharmaceuticals are stored or disposed of improperly it threatens the safety of families, the community and the environment. In fact, it is illegal to dispose of these harmful substances/objects in the household garbage, sinks, storm drains or down the toilet. It is important for students to know that there are designated Permanent Centers and ongoing Temporary Events where these harmful substances/objects are collected to be properly disposed of. Before the lesson, explore the various links in slide 16 (S16) in the Household Hazardous Waste/E-Waste Lesson PowerPoint to help students identify a collection center near them, as they will record the address and operation hours in their Student Guide. Also, student safety is of the utmost importance and thus parents/guardians should be notified about the lesson before it is taught. Be sure to send home the parent letter (Appendix A) before you begin the lesson.

Vocabulary

<u>Electronic Waste (E-Waste)</u>: Consumer electronic equipment that is no longer wanted. E-Waste can include computers, printers, televisions, VCRs, cell phones, fax machines, stereos, and electronic games. Electronics may contain lead, copper, and other heavy metals or potentially toxic substances.

<u>Household Hazardous Waste (HHW)</u>: Any leftover product labeled toxic, poison, corrosive, flammable, combustible, or irritant, that you want to discard.

Household Hazardous Waste Permanent Centers: Permanent collection centers that offer a convenient, free method for Los Angeles County residents to properly dispose of household hazardous and electronic waste (HHW/E-Waste). Residents can drop off items such as paint, solvents, chemicals, computers, batteries, cell phones, fluorescent lights, etc. Permanent Center locations can be found here.

<u>Sharps</u>: Sharps is a medical term for devices with sharp points or edges that can puncture or cut skin. They may be used at home, at work, and while traveling to manage the medical conditions of people or their pets, including allergies, arthritis, cancer, diabetes, hepatitis, HIV/AIDS, infertility, migraines, multiple sclerosis, osteoporosis, blood clotting disorders, and psoriasis. Information from the U.S. Federal Drug Administration

<u>Temporary Events</u>: These free one-day, drive-through collection events are where residents can drop off their HHW and E-Waste and other hazardous items. No appointment is needed. More information regarding these temporary events can be found here.

Time Needed

- 1.5 2 hours collectively, as it can be broken down into three smaller sections as needed:
 - 1. Introduction: Engage and Explore
 - 2. Procedure: Teacher and Student Explain
 - 3. Conclusion: Extend and Elaborate

Materials Needed

- Parent Informational Letter (Appendix A)
- Student Guide Sheet (one per student, can be found at the end of this lesson)
- Projector or monitor for Household Hazardous Waste/E-Waste Lesson PowerPoint
- Internet connection
- A sample of household cleaners from your home or classroom (optional)
- One lemon for each pair of students
- Water or Club Soda (2 cups for each pair of students)
- Cornstarch (1 teaspoon for each pair of students)
- One Mixing bowl and spoon (for each pair of students)
- Small funnel (for each pair of students)
- Small spray bottles (one for each student- can be found at the dollar store)
- Newspaper
- Poster Paper or Tagboard
- Markers / Writing Materials

Resources & Additional Informational

- Appendix A - Customizable Parent Informational Letter

- Appendix B- Too Toxic to Trash (Optional informational sheet for slide 16 (\$16) and slide 18 (\$18)
- Alternative Recipes for Common Household Products
- Environmental Links
- YouTube: What is Household Hazardous Waste? (optional)

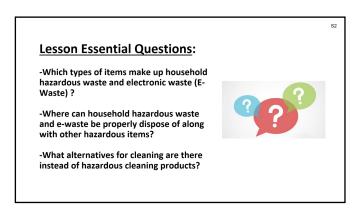
Directions

(S1) Lesson Title - Household Hazardous Waste and E-Waste

- Explain to students that in this lesson they will learn which items make up household hazardous waste (HHW) and electronic waste (E-Waste). They will be able to identify these items in their homes and explain how to dispose of them properly. In addition, they will learn how to properly dispose of other hazardous items. They will make their own alternative household cleaning product using ingredients found in most homes. Lastly, they will make an informational poster to share with their family regarding what they have learned.

Essential Questions: Which types of items make up household hazardous waste and electronic waste (E-Waste)? Where can household hazardous waste and E-Waste be properly disposed of along with other hazardous items? What alternatives for cleaning are there instead of hazardous cleaning products?

- 1. (S2) Show students the slide with the Essential Questions that will be addressed in this lesson. Ask students to volunteer and read the questions aloud to the class.
 - Have students discuss the Essential Questions at their tables or with a partner. Ask students to share their responses with the class. Have them write down the essential question they are most curious about on the student guide.



Introduction (Engage / Explore)

2. (S3) Tell students that they are going to explore the different types of HHW and E-Waste along with other hazardous items they might find in their home.

3. (S4) Ask Students: Which types of chores do you and your family do to help keep your room/home clean? Allow students to discuss at their tables or with a partner. Have them record what they discussed on the student guide before taking turns sharing with the class.

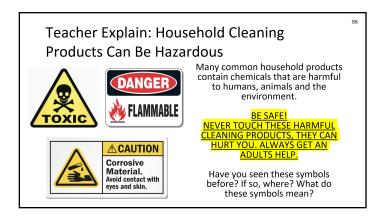


- 4. (S5) Ask Students: Are any cleaning products used to clean your home/room? If so, which ones? Allow students time to reflect and take turns answering the question. Students may share (vocalize) the types sprays or other cleaning materials they use.
 - Ask Students: Where are these types of products kept in your home? Students may state that they kept under the kitchen sink, in the garage or in a laundry room. Have students record their responses on the student guide.



5. (S6) Explain to students that household cleaning products can be hazardous. Many of them contain chemicals that can be harmful to humans, animals and the environment. These items can be toxic, poison, corrosive, flammable, combustible, or irritate the skin. Emphasize that students should never touch these harmful cleaning products without an adult's help. In addition, explain that when individuals use these products, they should be wearing protection such as gloves/masks and/or other safety materials if needed.

- Ask students: Have you seen these symbols before? If so, where? What do these symbols mean? Allow time for students to share and record their answers. Review the safety symbols with them and explain what they mean. At this time you can pass around samples of household cleaners from your home or classroom (optional). Preferably, these containers would be empty to prevent any student from accidentally spraying or spilling its contents. Have students identify the safety symbols and warnings written on the labels.



6. (S7) Ask Students: What do you or your family do with these items when they are no longer needed? Mention that as they clean their homes/rooms they may find items that they no longer need or want. What do they do with these items? Go down the list and ask students to share their responses and have them record them on the student guide. Students may not be familiar with some of the items such as used motor oil, sharps or pharmaceuticals. Let them know they will learn more about these items in the next few slides.



Procedure

(Teacher Explain / Student Explain)

7. (S8) Teacher Explain: What is Household Hazardous Waste (HHW)? Explain to students that any leftover products that are labeled toxic, poison, corrosive,

flammable, combustible or irritant that they want to discard is considered HHW. Ask students how they would know if the items in their home fall into those categories. Refer back to slide 6 (S6), let students know that these products come with warning symbols such as those and remind them not to touch them without the help of an adult, and also safety gear should be used when handling these substances. In addition, emphasize that it is both dangerous and illegal to dispose of HHW in the garbage, down any drain, or on the ground. Penalties for doing so include fines or possible jail time. Have them complete the sentences in the student guide.



8. (S9) Teacher Explain: Other Items that should not be thrown in the garbage, down any drain, or on the ground include old paint and used motor oil. Ask students if they have any old paint cans at home. If so, where are they kept? Explain that paint cans come in different sizes and if possible bring in some examples to show students. Explain that engines from cars, trucks, motorcycles, boats and lawn mowers use motor oil to help with moving parts. This motor oil needs to be replaced from time to time. Some people take their cars to a shop where the oil is changed and disposed of properly. Other people choose to change their car's motor oil themselves. The picture in the slide shows the dark color of used motor oil and the types of containers that new motor oil comes in. Ask students if their parents/ guardians take their cars to shops to change the motor oil or if their parents choose to do it themselves. If so, do they know what happens to the used motor oil? Have students complete the sentence in their student guide with these two item.



9. (\$10) Teacher Explain: Other Items that should not be thrown in the garbage, down any drain, or on the ground include pharmaceuticals and sharps. Pharmaceuticals are medicines that can prevent, treat or cure diseases. They include pills and even cough syrup. Again, emphasize safety around pharmaceuticals, students should never touch or take any pharmaceuticals without the direct supervision of a parent/ guardian. In the past it was common for people to discard pharmaceuticals in the toilet, however doing so pollutes our ground and water supply, hurting our environment and endangering public health. Pharmaceuticals should never be flushed down the toilet. Sharps are devices with sharp points that can puncture or cut the skin. They help people manage medical conditions such as diabetes. All sharps should be placed in a sharps container. When the container is full they need to be disposed of properly. Ask students if they have ever seen a sharps container. They may have seen one in a doctor's office or in the nurse's office at school. Ask students if they know of anyone who has a medical condition that requires them to use sharps. Have students complete the sentence in their student guide with these two items.



10. (S11) Review that batteries should not be placed in the recycling bin or thrown in the trash can. Students should know that old batteries can explode, leak, release harmful gases or catch fire. In addition batteries can leak acid that can irritate and burn the skin. Also, when storing batteries the negative and positive ends should not touch as they can short circuit, which potentially can lead to a fire. It's always a good idea to store batteries in their original packaging. Have students complete the sentence in the student guide with the information from the slide.



11. (S12) Electronic Waste or E-Waste is made up of consumer electronic equipment that is no longer wanted. E-Waste can include computers, printers, televisions, printers, VCR's, cell phones, fax machines, stereos, electronic games, etc. Ask students if they have any E-Waste at their home, if so, what is it? Allow students to discuss at their table or with a partner. Ask students if those items are usable for others, and if so, would consider donating it to charity so that someone else can get use from it. Electronics should be recycled when they are no longer usable. Have students record their responses on the student guide.



12. (\$13) Electronic Waste or E-Waste should not be thrown in the trash. They may contain lead, copper, and other heavy metals or potentially toxic substances that are bad for the environment. Have students complete the sentence in the guide.



13. (S14) Collection Centers and Special Events. Waste disposal is easy with collection centers and special events! Ask students if they have ever been to a HHW or E-Waste collection event or collection center. If so, who did they go with and what did they dispose of? Students should know that there are permanent centers and temporary events where people can safely dispose of HHW, E-Waste, leftover paint, used motor oil, electronics, batteries, sharps and pharmaceuticals for free. Click on the image to play the Youtube video describing a temporary event. In the student

guide have students list the types of items they saw residents drop off at the event. Also, have them note the phone number at the end of the video that they can call for more information about collection events (888-CLEANLA).



14. (\$15) Student Explain: What have you learned? Have students reflect on what they learned in this lesson. Have them go through the list of items again and share how each item should be properly disposed of. Have them write down where the items should be taken and why in the student guide.



15. (S16) Student Explain: What do the collection centers or events below do? Can you find one near you? Click on the links within the slides so that students can explore the various collection centers and events near them. Students will learn that many of the waste items reviewed today can be taken to permanent centers or temporary events. Help students find a permanent center or temporary event near where they live. Have students record the address and day(s) and hours of operation. Optional - show students the flyer Too Toxic to Trash (Appendix B). Discuss which additional items can be taken to collection centers. Where else can they dispose of used motor oil, sharps, batteries and paint?

Student Explain: What do the Collection Centers or Events below do? Can You Find One Near You?

Permanent Centers

Temporary Events

Household Hazardous Waste (HHW) Disposal

Electronic Waste (E-Waste) Disposal

Household Battery Disposal

Paint Recycling

Pharmaceutical Disposal

Sharps Disposal

Used Motor Oil Collection Centers



Conclusion (Extend / Elaborate)

16. (S17) Student Extend: Let's make an alternative household cleaning product for windows! Refer to the 'materials needed' list on page 2 for this hands-on activity. Students will work in pairs to mix the juice of one lemon, 2 cups of water or club soda and one teaspoon of cornstarch. They will then use a funnel to pour the cleaning product into two plastic spray bottles. You can conduct an experiment on classroom windows to see if the solution cleans the windows just as well as store bought window cleaner by placing tape down the center of the window and cleaning each side with a different solution. Be sure to have students use gloves when handling the solutions and wash their hands afterwards.

Student Extend: Let's make an alternative household cleaning product for Windows!

To make this alternative window cleaner, you and your partner will need:

- Juice from one lemon
- 2 cups water or club soda
- 1 teaspoon cornstarch



Mix all ingredients and pour evenly into two plastic spray bottles for each of you. Shake well. Spray solution onto window. Scrub and wipe with a newspaper.

<u>Disclaimer: Results may vary. Test recipe effectiveness by applying a small amount of product to an area before using.</u>

17. (\$18) Student Elaborate: Come up with a poster to educate your family about household hazardous waste and E-Waste. Include the other items you learned about today. Provide students with poster paper, tagboard or construction paper and writing materials. They will create an informational poster to share with their families. Students should answer the Who, What, When, Where and How questions on their poster with factual

S17

information text and drawings. You can also share the flyer Too Toxic to Trash (Appendix B) with the students so that they can write down additional information. In addition, the posters can serve as Public Service Announcements (PSA's) as they can be presented to students in other classrooms as well, reinforcing their public speaking skills.

Student Elaborate: Come up with a poster to educate your family about household hazardous waste and E-Waste. Include the other items you learned about today.

• Who: Who will be your audience? Who can help you dispose of HHW, E-Waste and other hazardous items?

• What: What types of substances/objects can be collect to be disposed of properly?

• When: When can these items be disposed of?

• Where: Where should you take these items be collected?

• How: How can your family ensure that these types of waste do not end up in the garbage, down any drain, or in the ground?

Name	Date
Household Hazardous Waste (H	HW) & Electronic Waste (E-Waste) Lesson Student Guide
(S2) Write down the essential qu	uestion you are most curious about for this lesson:
(S3) Let's Explore Different Type Directions: Answer the questions	es of Household Hazardous Waste and E-Waste below.
(S4) Keeping Your Room/Home C help keep your room/home clean	Clean: Which types of chores do you and your family do to?
(S5) Keeping Your Room/Home C your home/room? If so, which one	Clean, cont.: Are any cleaning products used to clean es?
Where are these types of product	ts kept in your home?
(S6) Household Cleaning Product before? If so, where?	ts Can Be Hazardous: Have you seen these symbols
What do these symbols mean?	
(S7) Getting Rid of Things You Noitems when they are no longer ne	o Longer Need: What do you or your family do with these eeded?
Leftover cleaning products:	
Old Paint:	
Used Motor Oil:	
Electronics:	
Batteries:	
Sharps:	
Pharmaceuticals(medicine):	

(S8) Household Hazardous Waste (HHW): Any leftover products that are labeled		
is considered Household		
Hazardous Waste (HHW).		
It is both DANGEROUS AND ILLEGAL to		
(S9) Other Items That Should Not Be Thrown In The Garbage, Down Any Drain, Or On The Ground: and		
(\$10) Other Items That Should Not Be Thrown In The Garbage, Down Any Drain, Or On The Ground, cont.: and		
(S11) Batteries Should Not Be Placed In The Recycling Bin Or Thrown In The Trash Car Because old batteries can		
(\$12) Electronic Waste or E-Waste: Do you have any E-Waste at your home? If so, what is it?		
Is it still usable for others? If so, would you consider donati it to charity?		
(S13) Electronic Waste or E-Waste Should Not Be Thrown In The Trash Because E-Waste may contain		
(S14) Collection Center and Special Events: Which types of items did residents drop off this event?		
What is the phone number to call for more information about collection events?		
(S15) What Have You Learned? Where should these items be taken to be properly disposed of? Why?		

(S16) What Do The Collection Centers or Events Do?	
Can You Find One Near You? What is the location of the Permanent Center or Te Event Near You? What are their days and hours of operation?	mporary

APPENDIX A (CUSTOMIZABLE PARENT LETTER)

Dear (3rd-5th Grade) Parents and Guardians,

I hope this letter finds you well. We are excited to inform you about an upcoming educational unit that will be implemented across our 3rd through 5th grade classes. Our focus will be on identifying household hazardous waste (HHW) and electronic waste (E-Waste), in addition to other hazardous items (old paint, used motor oil, batteries, sharps and pharmaceuticals) aiming to educate our young learners about safety precautions and the proper disposal methods for these potentially harmful items.

ABOUT THE UNIT

Student Safety: Our foremost priority is to ensure the safety and well-being of our students. Through age-appropriate lessons and activities, we will educate them about recognizing household hazardous materials and understanding the risks associated with them.

Environmental Awareness: By introducing students to the concept of proper disposal, we aim to foster a sense of environmental responsibility from a young age. This knowledge will empower them to make informed decisions in the future, benefiting both their immediate surroundings and the broader community.

Key Topics to be Covered:

- Identification of common HHW, E-Waste and other hazardous items and their possible home locations.
- Safe handling and storage practices.
- Introduction to recycling and disposal methods that are both safe and environmentally friendly.
- Critical thinking questioning to reinforce learning and encourage practical application of knowledge.

Classroom Activities:

We will be teaching and learning through a series of interactive and engaging activities tailored to each grade level. Simple illustrations and informational text will be used to introduce the concept of safe practices at home. Students will participate in a hands-on activity where they will make an alternative household cleaning product to clean windows with items that can be readily found in most homes.

Parental Involvement:

We encourage parents and guardians to reinforce these lessons at home by:

- Reviewing the materials sent home with your child.
- Discussing household safety practices as a family.
- Ensuring that hazardous items are stored securely and disposed of correctly.

Safety Measures:

Please be assured that all activities will be conducted in a controlled and supervised environment. We will ensure that content is age-appropriate and sensitive to individual needs. We believe that equipping our students with knowledge about household hazardous waste is crucial for their safety and the well-being of our community. Your support and cooperation in this educational endeavor are greatly appreciated.

Should you have any questions or concerns regarding this unit, please do not hesitate to contact me. Thank you for your continued partnership in your child's education.

Warm regards,

[Teacher's Name / School Principal's Name] [School Name] [Contact Information]

TOO TOXIC TO TRASH



Know Your HHW - HHW is any product labeled toxic, poisonous, corrosive, flammable, combustible or irritant. E-Waste is any outdated or unwanted electronic device such as a TV, stereo, electronic game, microwave, computer or a small household appliance.

What We Accept

Household Hazardous Waste

Abrasive cleaners Air fresheners Antifreeze **Asbestos**

Automotive products

Bug spray Car batteries Chlorine bleach Compact fluorescent light bulbs (CFLs) Disinfectants Drain cleaners

e-cigarettes/Vaping devices

Fertilizers

Floor, furniture and shoe polish Fluorescent light tubes

Fungicides, herbicides, weed killers Furniture and paint strippers Gasoline and diesel fuel Glass/window cleaners

Hair spray

Hair relaxers, dyes, permanents Household batteries,

NiCad batteries Insecticide

Medicine (Controlled substances not allowed)

Mercury thermostats

Nail polish and nail polish remover

Oven cleaners

Pet products (flea collars

and sprays) Pool chemicals Propane tanks (small)

Rat, mouse, snail, and slug poisons Sharps waste/medical needles Rug & upholstery cleaners solvents Spray Paints Stains and varnishes

Transmission and brake fluid Thinners and turpentine

Tub, tile, and toilet bowl cleaners Used motor oil and oil filters

Electronic Waste

Cell phones, Computers, Electronic games, Fax machines, Light switches, Printers, Televisions, Stereos, VCR's, DVD players and Microwaves etc.

We Don't Accept

HHW / E-waste from businesses, explosives, ammunition, radioactive materials, trash, tires and white goods (refrigerators, stoves, washing machines, etc.).

For alternative non-hazardous recipes visit: pw.lacounty.gov/epd/hhw/alternative_recipes.pdf

Additional Disposal Options For:

Used Motor Oil/Used Oil Filters

Utilize local certified centers (Autozone/Kragens/O'Reillys) or utilize one of County's permanent used oil centers. Visit CleanLA.com for a full list.

Generated Sharps Waste and Used Medications

For sharps waste disposal, utilize designated Sheriff's stations. For additional disposal options near you, visit www.nodrugsdownthedrain.org or check with your medical provider or city.

Household Batteries

Utilize designated LA County public libraries for household battery disposal.

Utilize local retail stores. For program details and locations, visit PaintCare.org or call 855-724-6809.

ADA and Title VI Accommodations: Individuals requiring reasonable accommodations, interpretation services, and materials in other languages or in an alternate format may contact the Public Works coordinator at (626) 458-7901. Reguests must be made one week in advance of the scheduled meeting date. Individuals with hearing or speech impairment may use California Relay Service 711.

Acomodamientos ADA y Titulo VI: Individuos que requieran acomodamiento razonable, servicios de interpretación, y materiales en otros idiomas o formatos alternativos pueden comunicarse con el coordinador del departamento al (626) 458-7901. Las solicitudes deben hacerse una semana antes de la reunión programada. Personas con impedimentos auditivos o del habla pueden usar el Servicio de Relevo de California al 7-1-1.