



Waste Reduction & Recycling

Toolkit



Generation Earth Program

Generation Earth is a Los Angeles County Public Works environmental education program. Our goal is to educate and encourage youth in Los Angeles County to be an active part of the solution to environmental concerns in their community. We offer do-it-yourself environmental projects that help youth make a positive difference in their schools, at home and in the world. Our programs are built to support the needs of teachers, students and schools.

Waste Reduction & Recycling Toolkit

This toolkit is designed to assist teachers and students in exploring waste in Los Angeles County, including the waste on their school campus – from what can be found in the trash cans after each meal is served, to classrooms and school offices. This exploration will help your students determine what area of waste reduction they are interested in and then choose from a variety of Project Guides to help reduce waste on campus.

Waste Reduction

There is no such thing as throwing an item “away.” It all must go somewhere. Being disposed into landfills with our massive amounts of trash are compostable, reusable and recyclable materials. The U.S. Environmental Protection Agency reported a 32.1 percent composting and recycling rate (mostly paper and metal) in 2018.¹ That figure could be higher if instead of landfilling “trash” we could compost and utilize these reusable resources. Waste reduction is more than recycling. It involves minimizing the use of packaging or products that are not reusable or biodegradable. This results in resources conserved and money saved.



History of Waste in California

In 1989, Assembly Bill 939 (AB 939) was passed. It made all California cities, counties, and approved regional solid waste management agencies responsible for enacting plans and implementing programs to divert 25% of their solid waste by 1995 and 50% by year 2000. Later legislation mandates the 50% diversion requirement be achieved every year.² In 2012, California adopted AB 341 and Senate Bill 1018 (SB 1018) which required that any business or public entity that generates over four cubic yards of waste per week must implement a recycling system.³ Additionally, AB 341 set a new goal of a state-wide diversion rate of 75% by 2020.⁴ AB 1826 was signed in 2014, requiring businesses, including local jurisdictions, to recycle their organic waste. In 2016, SB 1383 established targets to achieve a 75 percent reduction levels of disposal of organic waste by 2025.⁵

Waste in Los Angeles

Waste is a vital issue in Los Angeles County. Each of us generates an average of five pounds of waste per day. This may not sound like much, but when multiplied over a period of a year, the amount of waste each person creates is staggering.⁶ Waste is generally transported to one of ten solid waste landfills around Los Angeles County. It costs money to dispose of it and valuable open space is used to create landfills to store waste.

Waste at School

California school districts dispose large amounts of waste. This waste represents a significant loss of natural resources and school district funds, as well as a potential threat to student/staff health and the environment. The cafeteria is one of the largest areas on campus where waste is produced. Food, trays, cups, cans and straws are just a few of the items that are wasted. Classrooms and offices use a lot of paper products each year. These materials are expensive and costly. In planning a campus waste reduction program, it is important to create goals that are realistic and progressive. It is vital to establish a good working relationship among students, staff, facilities managers and waste haulers to ensure opportunities for program expansion through purchasing power, new ideas and information.

The Toolkit Steps!

1. Check This Out

To get started, students explore the subject of waste by working in teams to learn a specific topic related to waste reduction and share what they have learned through the creation of an infographic that they share with the class.

2. Site Assessment and Waste Audit

The next step is to explore waste on campus. Using a map of the site, students indicate where there are specific waste-collection elements on campus. They continue the process by conducting a Waste Audit to identify the different types of waste found.

3. Get More Information (High School option)

The site assessment and waste audit are just part of the waste picture at a site. Students explore further by conducting interviews with key site stakeholders, including the Principal, local Recycling Coordinator, Waste Hauler Contract Manager and more, depending on the site.

4. Choose a Project Guide

Using the site assessment, waste audit and more, students answer questions to determine which waste reduction project is most appropriate and interests them the most. A variety of Generation Earth Project Guides are suggested.

5. Let's Get Started

Once students have determined what Project Guides interest them, follow the guidelines to get started, including how to set up a classroom visit and more!

6. Resources

References and Next Generation Science Standard Skills are included.

Check this Out

To get started, students explore the subject of waste by working in teams to learn a specific topic related to waste reduction and share what they have learned through the creation of an infographic that they share with the class.

Procedure

1. Divide students into six working groups. Groups should be as close to equal in size as possible.
2. Pass out a different topic sheet to each group.
3. Each group has 15 minutes to:
 - Learn and discuss the topic.
 - Use poster paper and markers to create an infographic answering the questions listed on the topic sheet.
4. Each group shares and explains their infographic with the larger group.
5. As a class, discuss the need for waste reduction, at home and in the community.

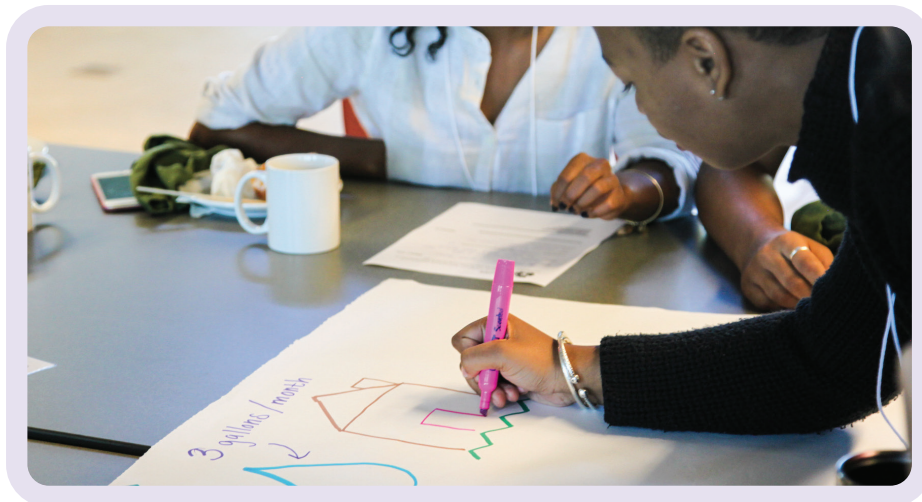
Materials

- Topic Sheets (pages 4 - 9)
- Poster paper or dry erase board—one per group
- Markers—one set per group

High School Option

Guiding questions are provided for each Topic Sheet. These can be optional for use in creating the infographic.

Invite teams to explore their subject further by answering questions they may still have or that came up while sharing the infographics.



Piles of Paper

START HERE!

You're doing your homework and make a mistake in the first paragraph. So, you crumple the piece of paper and toss it in the trash. Did you think about the tree that the paper came from?

Create an infographic that answers the following questions:

- How are paper products created?
- Why is it an issue?
- How much of this paper is wasted in Los Angeles County?
- What is something that can be done on campus to reduce paper waste?



- Trees are harvested and sent to mills to be processed into lumber. The wood waste is sent on to paper mills where it is manufactured into lunch bags, notebooks, paper, magazines, napkins, towels, etc.
- Making paper from raw materials (trees) requires large amounts of water and energy. The pulp and paper industry is among the top five most energy-intensive industries globally and is the fourth largest industrial energy user.⁷
- The average American uses seven trees and 680 pounds of paper per year.⁸ Paper and paperboard make up 23.05 percent of waste generated.⁹
- Paper made from waste paper is called “post-consumer” recycled paper because it has been used and recycled instead of being landfilled. New paper made from recycled paper instead of trees creates 35% less water pollution, 74% less air pollution and 75% less energy is used.¹⁰
- To reduce the amount of paper going to landfills, find sustainable alternatives such as using a reusable canvas bag, cloth napkins, purchasing post-consumer products, buying items in bulk to reduce packaging waste or collect paper products for recycling.

The Problem with Plastic

START HERE!

When your grandparents were growing up, plastics weren't a big part of their lives. Today, plastics are used for everything from milk jugs and soda bottles to bicycle helmets and auto parts.

Create an infographic that answers the following questions:

- How are plastic products created?
- Why is it an issue?
- What is the problem with plastic waste?
- What is something that can be done to reduce plastic waste?



- Plastics are made from oil, a non-renewable natural resource limited in supply.
- Manufacturing plastic requires large quantities of water and energy resources. Plastic manufacturing also produces harmful chemicals that if not properly treated may pollute our water and air systems.
- Ninety-one percent of all plastic is not recycled.¹¹ In Los Angeles alone, ten metric tons of plastic fragments (bags, straws and soda bottles) are carried into the Pacific Ocean every day.¹²
- Plastics don't really break down; they just break up. Wear and tear and washing, as well as sun and heat, can slowly turn plastics into smaller and smaller pieces until they eventually become what are known as microplastics.¹³
- Purchasing products with less packaging minimizes plastic from becoming litter on the streets and in the ocean. Marine animals sometimes mistake six-pack rings, plastic bags and other plastic items floating in the ocean as food.
- By recycling plastic, it can be used to make other plastic products such as water bottles and food containers into t-shirts. We fully participate in the recycling process when we collect these products for recycling and then buy new products made from recycled goods.

Pollution Down the Drain

START HERE!

Street gutters are more important than you may realize. They drain water off the streets through catch basins and into storm drains. These openings lead to flood control channels that, in turn, carry the water directly to the waterbodies, such as creeks, rivers, lakes and ultimately the ocean. Water picks up debris as it travels through streets and into the waterbodies.

Create an infographic that answers the following questions:

- What is stormwater?
- Why is it an issue?
- How is motor oil part of the issue?
- What is something that can be done to reduce the effect of urban runoff?



- Rain falls on solid surfaces, such as streets and parking lots, flows across pavements, runs along gutters and enters storm drains through catch basins. This stormwater is called urban runoff. We also create urban runoff when cars are washed on streets, yards are over watered or driveways and sidewalks are hosed down.
- Storm drains help prevent flooding by moving large volumes of stormwater and urban runoff through flood channels directly to the waterbodies without treatment.
- Stormwater and urban runoff is a significant source of pollution. Litter, dog waste, cigarette butts, fast food packaging, plastic shopping bags, pesticides, leaking motor oil – anything on the ground – can end up in the waterbodies.
- Used oil is a major source of oil contamination of waterways and can result in pollution of drinking water sources. In fact, one gallon of used motor oil can pollute one million gallons of drinking water.¹⁴
- Eliminating the use of harmful pesticides and fertilizers on plants, recycling motor oil and picking up trash are ways to prevent polluted stormwater and urban runoff from reaching the waterbodies.

There is No “Away”

START HERE!

When we throw things “away,” they don’t vanish into thin air. When items are tossed into the garbage, they are sent to a landfill. A landfill is a carefully engineered structure, designed to be the final option for disposing waste.

Create an infographic that answers the following questions:

- What is leachate?
- Why is it an issue?
- Why is methane an issue?
- What can be done to reduce the items that are landfilled?



- Landfills are lined on the bottom and sides with thick layers of plastic and clay. As garbage is dumped, it is covered with layers of soil, foam, plastic or crushed glass to prevent litter and water, soil and air pollution. This also prevents trash from breaking down by minimizing oxygen and moisture levels inside.
- Leachate is formed when rain water filters through wastes placed in a landfill. When this liquid comes in contact with buried wastes, it leaches, or draws out, chemicals or constituents from those wastes.¹⁵ This contaminated liquid trickles down to the bottom. If the plastic liner should fail or be punctured, the leachate could leak into the soil and underground water system, creating a health risk.
- When tiny bacteria break down food, paper, clothing, wood, yard waste or pet waste, gasses are produced and escape into the air. Most of this gas is methane. Methane is a potent greenhouse gas that has more than 80 times the warming power of carbon dioxide.¹⁶ Landfills are the third largest source of man-made greenhouse gas emissions.
- Reduce the amount of waste going to the landfill by reducing the amount of waste produced, reusing items more than once, recycling and to rethink by finding environmentally friendly alternatives. Also, bringing items to household hazardous waste or electronic waste collection events can help reduce waste going into landfills.

Do Not Trash the Neighborhood

START HERE!

Have you ever taken a walk in your neighborhood and saw abandoned furniture, tires, appliances or other unwanted items dumped in alleys, vacant lots and other open spaces? Dumping these items is unsafe and illegal! People caught illegally dumping trash or unwanted items may be subject to a \$10,000 fine and six months in jail.¹⁷

Create an infographic that answers the following questions:

- What is illegal dumping?
- Why is it an issue?
- Why is E-Waste an issue?
- What is something that can be done to prevent illegal dumping?



- Properly disposing of large items requires disposal fees to a recycling facility or landfill. It is illegal for residents, contractors and waste haulers to leave their large items wherever they want.
- Los Angeles County and local cities spend millions of tax dollars to clean up trash and unwanted items illegally dumped.
- Illegally dumped trash attract insects and rodents creating health and safety concerns. Rodents spread diseases, chew through wiring and harm the environment and human health.
- Televisions, computers and other electronic waste (E-Waste) have cathode ray tubes, which contain lead. E-Waste items are hazardous to the environment and should be properly recycled or disposed of by a certified hazardous waste hauler.
- People caught dumping illegally can be fined up to \$10,000 and/or jailed for six months. However, it is often difficult for local law enforcement agents to catch these criminals. Report illegal dumping by calling local law enforcement agencies.
- Periodic neighborhood cleanup projects may discourage illegal dumping. It is believed that illegal dumping is less likely to happen in clean, watched neighborhoods than in areas that continuously have large volumes of trash in streets, sidewalks and alleys.

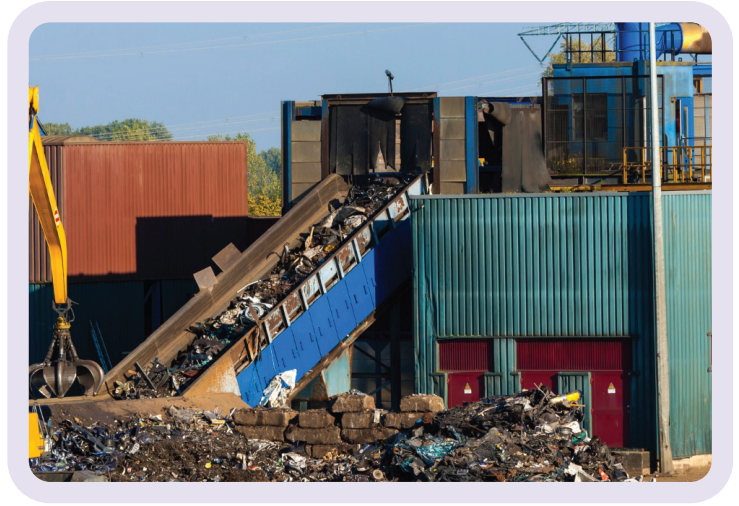
Recycling Business

START HERE!

Most of the trash generated every day are disposable items made from materials that can be pulped, melted, or mixed again into a new item. Facilities were made to process these types of waste into new items.

Create an infographic that answers the following questions:

- What is a MRF?
- What happens to our recycled materials?
- What is the issue now?
- What is something that can be done to keep products no longer recyclable out of the landfill or burned?



- Materials Recovery Facilities (MRF) are the collection factories items go to when picked up curbside for a recycling program. High-tech machinery is used to identify and sort out materials. The extra is bundled into a “bale” of high-quality material that is sold to manufacturers to create new materials such as shoes, bags and new plastic products.
- These large compressed bales are loaded into shipping containers and sent to other countries around the world. In 2016, the United States was exporting almost 700,000 tons a year to China alone. Overall, China imported 7 million tons from around the world.¹⁸
- In January of 2018, China put a ban on almost all imports — banning shipments of recyclables that have a contamination level of .05 percent or higher. Since recycling bins are almost always contaminated, this means that 99 percent of the recyclable materials we used to sell to China is no longer being recycled. If no alternative is found, these materials will be sent to the landfill and/or incinerators.
- It is critical that we decrease our dependence on single-use plastics and other products no longer recyclable. Reducing the use of single-use plastics such as straws, plastic bottles and other disposable goods, reduces the risk of products no longer recyclable ending up in landfills.

SITE ASSESSMENT AND WASTE AUDIT

Once students have explored the subject of waste in Los Angeles County, it is time to assess what is happening on their campus. Conducting an assessment and audit of their site will help determine the most appropriate waste reduction project.

Using a map of the site, students indicate where there are specific waste-collection elements on campus. They continue the process by conducting a Waste Audit to identify the different types of waste found.

Procedure

1. Plan to work in groups when mapping and auditing the site.
2. Create a map using one of the following:
 - An existing map and remove any unnecessary information.
 - Online map of the site.
 - Hand-made map using a large sheet of paper.
3. Make sure each group has a map, Site Assessment Guidelines, Waste Audit Tally Sheet, gloves and pencils.
4. Have students locate specific waste-collection elements and mark them on the map.
5. Have students conduct the audit to identify and tally the type of waste collected.
6. Familiarize students with the areas they are observing and demonstrate how to gather the data.
7. Have groups report their findings.
8. Create a combined tally representing the site as a whole.

Materials

- Site Assessment Guidelines (page 11)
- Waste Audit Tally Sheet (page 12)
- Pencil
- Gloves
- Map of site

Helpful Hint

Break the site maps into different parts of the campus for each group.

Site Assessment Guidelines

Look for and add the following letter symbols to your site map:

OUTSIDE

- **Trash can** **X**
- **Recycle bin** **R**
Indicate whether it is for paper, plastic and/or glass bottles, aluminum cans or all types of recyclables
- **Compost bin** **C**
- **Food waste bin** **F**
- **Trash dumpster** **TD**
Indicate if there is cardboard and other recyclables inside and how full it is
- **Recycling dumpster** **RD**
Indicate if there is only cardboard inside or other recyclables as well

INSIDE

If possible, indicate on your map which classrooms/offices have the following:

- **Trash can** **X**
- **Recycle bin** **R**
Indicate which items can be recycled inside
- **Ink Cartridge bin** **IC**
- **Battery bin** **B**
- **Food waste bin** **F**

ALSO INDICATE:

- If any other collection/waste reduction is happening on campus and where.
- If there are any signs or instructions written on or around the bins.
- If any recycling bins are stand-alone or next to a garbage can.

Waste Audit Tally Sheet

Name(s)

Date

Location

1. Put on gloves before checking trash cans.
2. Under each column, keep a tally of each item that is found. Place additional items under "other."
 - Items marked with * indicate that these items may or may not be recycled with your waste hauler.
3. Take note:
 - Are garbage cans contaminated with recyclables?
 - Are recycling bins/dumpsters contaminated with garbage?
 - Is any paper contaminated with liquid or food?

Trash	Items	Quantity	Notes
	Plastic Wrappers/ Foil Wrappers		
	Chip/Snack Bags		
	Straws		
	Napkins		
	Plastic bags*		
	Other		
Curbside Recyclables			
	Glass bottles/jars		
	Metal/alum. cans		
	Plastic bottles		
	Clean paper/ cardboard products		
	Styrofoam Products*		
	Beverage cartons/ Juice boxes		
	Hard plastic food containers		
	Food soiled paper trays/boxes*		

E-Waste	Items	Quantity	Notes
	Cell Phones		
	Electronic toys		
	TV/Computers		
	Other		
	Batteries		
	Cleaning Products		
	Nail polish/Beauty products		
	Paint		
	Ink Cartridges		
	Other		
	Food Scraps		
	Grass clippings/ Landscape waste		
	Other		
Food to Donate			
	Unopened packaged food		
	Whole produce		
	Other		
Other			
	Reuseable books / items		
	Textiles, clothes and shoes		
	Other		

GET MORE INFORMATION: High School Option

The waste audits and site assessments are the first steps to gathering information. It is important to find out more by interviewing key site stakeholders. Stakeholders are people who may affect or be affected by a recycling program.

Procedure

1. Depending on your campus, determine which stakeholders to interview:
 - Principal
 - Local/City Recycling Coordinator
 - Waste Hauler Contract Manager
 - On-site Maintenance/Plant Manager
 - Office Manager
 - Cafeteria Manager/Food Service Manager
 - Teachers
2. Create questions to ask each stakeholder. See page 15 for samples.
3. Divide students into groups to set up and conduct interviews.
4. Have groups share what they learned.

Materials

- Suggested interview questions for each group (pages 15-18)
- Pencil/pen

Helpful Hints

- Check with the Principal for the names and contact information for the Waste Hauler Contract Manager and others.
- In some cases, plant personnel have been separating, collecting and redeeming California Redemption Value (CRV) containers. This may be a good way to promote recycling, but it doesn't provide the schools with an accurate measure of what is being recycled on their campuses. Also, it provides no incentives to students and misses an opportunity for education and behavior change.

Sample Questions

PRINCIPAL

- Has there previously been a recycling program on campus? If so, what were the successes and failures?
- Which company or companies currently haul campus waste?
- Do they offer recycling services?
- If no, are there community partners who can help establish a recycling program?
- What recycling program would you like to see on campus?
- Would you consider launching or improving a campus recycling program?

LOCAL/CITY RECYCLING COORDINATOR

- Are there currently any programs in place or local partners to support or increase school recycling?
- Are there any available resources like incentives, speakers, partners, free bins or signs to help schools increase recycling?

WASTE HAULER CONTRACT MANAGER

- Are the waste and recycling materials you collect separated at your facility?
- Do recyclables need to be in a separate dumpster/bin for collection?
- What materials can be recycled?
 - Beverage cartons
 - Styrofoam
 - Paper trays with food residue
 - Plastic bags
 - Plastic forks
 - Napkins
 - Juice boxes
 - Plastic bags
 - Ziplocs
- What percentage contamination rate of non-recyclable materials in the recycling bin is too high to accept for recycling?

- Can you offer any small bins, dumpsters or resources to the school to help increase the waste diversion rate?
 - If yes, are there any associated costs?
- If we increased the recycling rate on campus, what savings could be extended to the school?
- What is the difference between the service/hauling cost for landfill material vs. recycling?
- What services do you provide for food waste/yard waste?
- What contaminates your recycling waste stream the most?
- Where does our waste go after it is hauled away?
 - If it goes to a landfill, is it mixed with waste from other schools or other businesses first?
- How many pounds of waste/recycling material are collected every year?

ON-SITE MAINTENANCE/PLANT MANAGER

- What recycling programs do you manage or engaged with on campus?
- Are bottles and cans collected from the waste stream?
 - If yes, would bins specifically for recycling or just bottles and cans placed around the campus be helpful?
- Do you have a special collection for any hazardous waste such as paint, light bulbs, chemicals and cleaners?
 - If yes,
 - Where are they collected?
 - Where do they go when disposed?
 - Who is in charge of their disposal?
 - If no,
 - Could we help you create a hazardous waste collection program?
- What is done with green waste such as grass clippings?
 - Would you consider using a compost program for green waste and/or food scraps?
- What size and color bags do we currently use on campus for waste bins? Recycling bins?
- What is the waste and recycling collection schedule on campus? Weekly? Daily? Time?
- If our group were to start or expand on the campus recycling program, would the maintenance team be able to help with the collection of the recyclables from bin and disposal into the right dumpster?
- What help would you need from students, teachers and parents to maintain the recycling program?
- Are there any garbage cans on campus that can be removed to focus the garbage output to fewer areas?

- If our group were to start or expand on the campus recycling program, would the maintenance team be able to help with the collection of the recyclables from bin and disposal into the right dumpster?
 - What help would you need from students, teachers and parents to maintain the recycling program?
- Are there any garbage cans on campus that can be removed to focus the garbage output to fewer areas?
 - If so, can any of these be turned into recycling bins and placed next to another garbage can?

CAFETERIA MANAGER / FOOD SERVICE MANAGER

- What is the current disposal system for boxes, food cans, plastic containers and food waste for recycling?
 - If none, would you consider starting a cafeteria kitchen waste recycling program?
- Is food prepared on site or delivered pre-made to the campus?
- Is there a compost program for cafeteria food preparation scraps?
 - If no, would you consider letting us start one?
- Is there leftover food that could be donated to a charity from any food preparation in the kitchen or any unserved food?
- What kind of unserved food from the cafeteria could be shared or donated?
- Where can the food be donated? What kind of permission is needed?
- What resources and assistance would you need from us to start or improve a food share or donation program?

OFFICE MANAGER

- Does the office currently collect recyclables such as ink cartridges, batteries and paper?
 - If yes,
 - What items?
 - Where are they collected?
 - Where do they go when disposed?
 - Who is in charge of their disposal?
- If no, would you consider a special recycling program in the office?
- Does staff currently print on one or both sides of paper?

TEACHERS

- Are you currently working on any recycling projects with your class?
 - If yes, please share what you are doing.
- Would you be willing to have a recycling bin in your classroom?
- Would your class like to help in a multi-classroom or cafeteria recycling program?
 - Promotion?
 - Auditing/tracking?
 - Contests?
 - Collection?
- Is there a lot of food waste from your classroom that could be used to feed others in need?
 - If yes, would you be willing to participate in a classroom food share table and donation project.



CHOOSE A PROJECT

Using the site assessment, waste audits and any additional information about waste on campus, determine with the group what they would like to achieve at their site by asking specific questions that lead to project suggestions.

Procedure

1. Lead a discussion about what was learned about waste on campus.
2. Inform the class that they can choose from a variety of waste reduction project guides. They are:
 - Campus Curbside Recycling Project Guide
 - Composting Project Guide
 - E-Waste Project Guide
 - Food Rescue Project Guide
 - Community Swap Project Guide
 - Textile Recycling Project Guide
 - Waste Education Awareness Project Guide
3. Use the Project Selection sheets to answer specific questions.
4. Once complete, work with the students to go through all the answers and options to determine which Project Guide to use or learn more about.

Materials

- Project Selection sheets (pages 20-22)

Helpful Hint

Review the different Project Guides ahead of time.



Project Selection

Campus-wide recycling of a glass, metal and/or paper:

- Is there a curbside recycling program on campus?

YES

Is it successful? If not, consider the Campus Curbside Recycling Project Guide for ideas on how to improve recycling on campus

NO

Consider the Campus Curbside Recycling Project Guide to set up a campus recycling program

When doing the trash audit:

- Was there recyclable waste in the trash?

YES

Consider the Waste Education Awareness Project Guide to raise awareness about waste reduction on campus or the Campus Curbside Recycling Project Guide to set up recycling on campus

NO

- Was there E-Waste and/or hazardous waste?

YES

Consider the E-Waste Collection Project Guide to create an E-Waste event

NO

- Was there food scraps or other plant material such as grass clippings?
 - YES**
Consider the Compost Project Guide to start a composting program
 - NO**
- Was there whole or unopened packaged food?
 - YES**
Consider the Food Rescue Project Guide to start a food rescue program
 - NO**
- Was there textiles or other reusable items?
 - YES**
Consider the Textile Recycling Project Guide to create a textile recycling event
 - NO**

Community Involvement:

- Are you interested in a project that involves the community?
 - YES**
Consider the E-Waste Collection Project Guide, Community Swap Project Guide or Textile Recycling Project Guide to create an event for the community
 - NO**

When interviewing any stakeholders:

- Was there interest in curbside recycling from campus stakeholders?
 - YES**
Consider the Campus Curbside Recycling Project Guide
 - NO**
Consider the Campus Curbside Recycling Project Guide to explore a plan and reapproach stakeholders

- Was there interest in a campus food waste reduction?
 - YES**
Consider the Food Rescue Project Guide
 - NO**
Consider the Food Rescue Project Guide to explore a plan and reapproach stakeholders

- Was there interest in campus composting?
 - YES**
Consider the Compost Project Guide
 - NO**
Consider the Compost Project Guide to explore a plan and reapproach stakeholders

LET'S GET STARTED

A variety of Project Guides are available to help reduce waste. Once the group has chosen a specific Project Guide it is time to get started on a service learning project.

Steps

- 1. Get assigned a Generation Earth Program Coordinator.** Reach out to Generation Earth at info@generationearth.com expressing your interest in one of the project guides. The Generation Earth Outreach Coordinator will connect you to a Program Coordinator.
- 2. Set up a classroom visit.** If interested, work with your Generation Earth Program Coordinator to set up a classroom visit. Classroom visits can be with the teacher and/or students.
- 3. Download a Project Guide.** Project Guides can be downloaded directly from generationearth.com

Eco Clubs

- Have your teacher advisor follow the guidelines provided to register your Eco Club.
- Once you have completed a project, your Eco Club will receive an official certification and join a network of clubs with access to resources and continued support from Generation Earth.



RESOURCES

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Next Generation Science Standards

SCIENCE AND ENGINEERING PRACTICES

ASKING QUESTIONS AND DEFINING PROBLEMS

Check This Out (Pg. 3)

Check This Out activity allows students to identify problems in their community and use valuable information to begin to design solutions.

Get More Information (Pg. 14)

By conducting interviews with key site stakeholders, including principals, local recycling coordinators, waste hauler contract managers and more, students are able to ask and refine questions that will help them define their goals.

Choose a Project (Pg. 19)

Students work as a group to ask specific questions intended to determine what they need to achieve success.

DEVELOPING AND USING MODELS

Check This Out (Pg. 3)

Check This Out activity allows students to develop infographics as tools for representing waste issues and their solutions.

Site Assessment and Waste Audit (Pg. 10)

A map creation of the site helps students to construct and use models as tools for presenting their ideas and explanations, which will serve as diagrams in planning their investigations.

PLANNING AND CARRYING OUT INVESTIGATIONS

Site Assessment and Waste Audit (Pg. 10)

Students can investigate the layout of their landscape, systematically collecting data about the elements that impact their current situation and could affect the feasibility of their project by identifying the parameters they have to work within.

Get More Information (Pg. 14)

By conducting interviews with key site stakeholders, including principals, local recycling coordinators, waste hauler contract managers and more. Students are able to investigate and clarify what counts as data.

ANALYZING AND INTERPRETING DATA

Choose a Project (Pg. 19)

By using the site assessment, waste audits, interview information and dichotomous project tree deductive reasoning model, students are able to analyze their data to determine which waste project is most appropriate

USING MATHEMATICS AND COMPUTATIONAL THINKING

Site Assessment and Waste Audit (Pg. 10)

Students can quantify and categorize items collected on their site.

CONSTRUCTING EXPLANATIONS AND DESIGNING SOLUTIONS

Choose A Project (Pg. 19)

Based on the phenomena observed and the data collected and analyzed, students form explanations and conclusions about what project they should carry out and how, and design a plan on how to engineer and implement the solutions to the problems that informed their project choice.

ENGAGING IN ARGUMENT FROM EVIDENCE

Toolkit Process (all pages)

tudents are able to critically argue why they have designed their specific plan and defend its validity based on the evidence they have produced.

Cross Cutting Concepts

- Patterns
- Cause and Effect
- Scale, proportion and quantity
- Systems and system models
- Energy and matter
- Structure and function
- Stability and change



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