

Project Guide

Composting

Waste Reduction & Recycling





Generation Earth Program

Generation Earth is a Los Angeles County Public Works environmental education program presented by TreePeople. 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 in Los Angeles

Waste is a vital issue in Los Angeles County. Each person 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.¹ 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.

Food Waste

In the United States, food waste is estimated at between 30-40 percent of the food supply.² In 2018 alone, the Environmental Protection Agency estimates that about 63 million tons of wasted food was generated. More food reaches landfills and incinerators than any other single material in our everyday trash, constituting 24 percent of the amount landfilled.³ Instead, it could be composted for fuel or soil amendments to grow more food.

Composting Project Guide

To help recover food waste on campus, this guide provides the guidelines for creating a plan, establishing relationships with key stakeholders, installing compost bins and implementing a composting program.

The Steps

1. Check This Out

Explore the subject of food and green waste by working in teams to learn a specific topic related to food waste reduction and share what is learned through the creation of infographics.

2. Create a Plan and Get More Information

Students work through a variety of questions to create a draft plan for an onsite compost program. Students also gather more information by conducting interviews with key stakeholders.

3. Get Permission

Using the information gathered, students update the draft plan for consideration. Permission may be from the school principal or another entity responsible for the site.

4. Compost Bin Installation and Maintenance

Once permission is given, students install the compost bin(s) and set up the program.

5. Evaluation

Complete the project by answering questions that serve to evaluate the process and offer next steps for potentially taking on additional waste reducing projects.

6. Resources

Resources are provided for materials and support.

CHECK THIS OUT

To get started, students explore the subject of food and green 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 four 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 food and green waste reduction, at home and in the community.

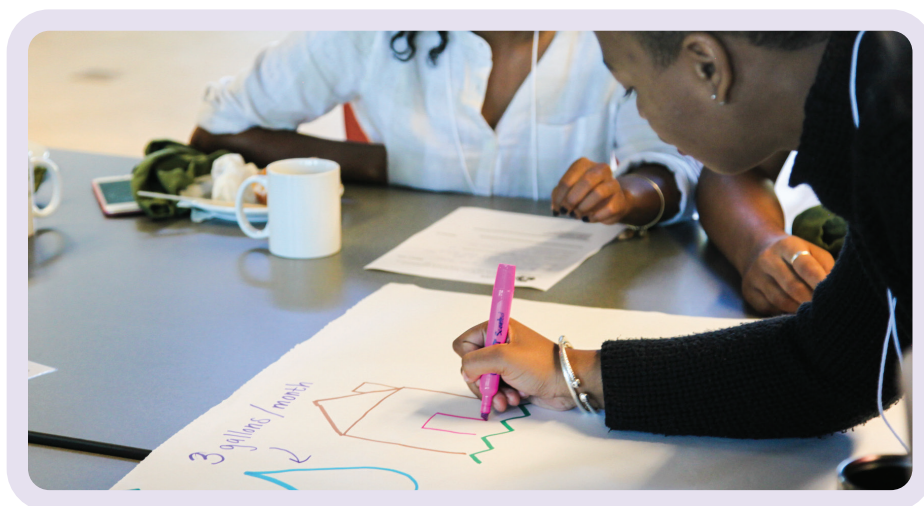
Materials

- Topic Sheets (pages 3 - 6)
- 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.



Food Waste In The Environment

START HERE!

Organic waste, such as fruit and vegetable scraps, is 48% of what California throws in landfills.⁴ In fact, up to 40% of all the food produced in the United States goes uneaten. That is on average 400 pounds of food per person every year!⁵

Create an infographic that answers the following questions:

- How does wasting food affect the environment?
- What is an example of food waste?
- What is something that can be done to reduce food waste?



- When food is thrown in the trash, we dispose of much more than food. When food is wasted, it also wastes the resources – such as the land, water, energy, and labor – that go into growing, storing, processing, distributing, and preparing that food.⁶
- When you waste food, you waste tons of water. Agriculture is the biggest user of freshwater and accounts for 70 percent of all use around the world.⁷ Twenty four percent of our freshwater use goes to grow food that will end up wasted.
- Food waste includes perishables that get discarded because they are inexpensive and quickly spoil. Pound per pound, fruits and vegetables are among the least expensive and fastest spoiling foods, constituting over 40% of total food waste.⁸
- Composting is one of the EPA's recommended actions, but preventing food being waste and recycling are the most preferred methods.⁹ Composting these wastes creates a product that can be used to help improve soils, grow the next generation of crops and improve water quality.

Green Waste

START HERE!

Organic waste, such as fruit and vegetable scraps, is 48% of what California throws in landfills.⁴ In fact, up to 40% of all the food produced in the United States goes uneaten. That is on average 400 pounds of food per person every year!⁵

Create an infographic that answers the following questions:

- What is green waste?
- What are issues related to green waste?
- What is something that can be done to reduce green waste sent to the landfill?



- Green waste is anything that grows from the soil. This includes grass, vegetables, flowers, trees, shrubs, and other plants. Items that are made from organic materials, such as paper (from a tree) or clothing (from cotton) are also green waste.
- Much of this green waste is sent to landfills. Collectively, residents and businesses in Los Angeles County sent 661,000 tons of green waste to landfills for recovery in 2023.
- Methane is another issue. When tiny bacteria break down green waste, gasses are produced and escape into the air. Most of this gas is methane. Methane is a potent greenhouse gas—about 28 times more powerful than carbon dioxide at warming the Earth, on a 100-year timescale, and more than 80 times more powerful over 20 years.¹⁰
- Landfills are the third-largest source of human-related methane emissions in the United States, accounting for approximately 14.4 percent of these emissions in 2022.¹¹
- Green waste is used to make compost, a decomposed organic matter that is part of a natural process of recycling organic material into a rich soil amendment. It helps create healthy soil for growing food and supports overall garden health.

Food Waste at School

START HERE!

Organic waste, such as fruit and vegetable scraps, is 48% of what California throws in landfills.⁴ In fact, up to 40% of all the food produced in the United States goes uneaten. That is on average 400 pounds of food per person every year!⁵

Create an infographic that answers the following questions:

- How many pounds of food is wasted every year?
- How do schools play a role in food waste?
- What is something that can be done to reduce food waste at school?



- Each year 92 billion pounds of food is wasted in the United States. Food goes to waste at every stage of food production and distribution - from farmers to packers and shippers, from manufacturers to retailers to our homes.¹²
- Most of this food waste comes from the consumer level. Reasons for this waste include spoilage, uncertainty of expiration dates, food packaged in bulk, oversized portions served and undervalued foods due to cheap prices.
- An estimated \$1.2 billion dollars' worth of school lunch food is wasted nationally every year.¹³
- The USDA Secretary announced in September of 2015 nationwide food waste reduction goals aiming to reduce food waste by 50% by the year 2030.¹⁴ Schools can play a vital role in meeting this goal.
- School food waste, such as fruit and vegetable scraps, can be used to make compost. Composting helps create healthy soil for growing food and supports overall garden health.

Degraded Soils

START HERE!

Soil degradation, a decline in soil quality caused by human activities, has been a major global issue during the 20th century. The importance of land degradation among global issues is enhanced because of its impact on world food security and quality of the environment.¹⁵

Create an infographic that answers the following questions:

- What are the components and benefits of healthy soil?
- What happens when soil is degraded?
- What is something that can be done to improve degraded soil?



- Healthy soil supplies clean air and water, bountiful crops and forests, productive grazing lands, diverse wildlife and beautiful landscapes. It does this by regulating water, filtering pollutants, cycling nutrients, sustaining plant and animal life and providing the medium for plant roots.¹⁶
- When soil is fed by organic matter (such as fallen leaves, branches and rotting plants), it creates a food source for bacteria and fungi. Spiders, millipedes and worms eat the bacteria and fungi. Each of these consumers releases nutrients back into the soil that are utilized by plants. This complex system, known as the soil food web, is what creates healthy soil.
- Many soils in the U.S. and around the world have become degraded. Degradation most commonly occurs when erosion and decreased soil organic matter levels initiate a downward spiral resulting in poor crop production. Soils become compact, making it hard for water to infiltrate and roots to develop properly. Erosion continues, and nutrients decline to levels too low for good crop growth.¹⁷
- School food waste, such as fruit and vegetable scraps, can be used to make compost. Adding compost to degraded soil in and around the site introduces beneficial organisms and nutrients to help rebuild the soil.

MAKE A PROGRAM PLAN

Students answer specific questions and make decisions that build a plan to share with key stakeholders.

Procedure

1. Answer the questions to help build a plan.
2. Once complete, go to page 13 to get more information through interviews with key stakeholders to help create the final plan.

Materials

- Site Map
- Resource list (page 16)

Questions

Where will the compost bin be set up?

Using a map of the site look for:

- **Open space area**
 - At least 10' by 10' space for each bin
 - Semi- to full-sun exposure
 - At least 10 feet away from any window or door (for potential odors)
- **Source of water**
 - This is a spigot or other source that supplies water using buckets or close enough to use a hose.

Mulch

Some school districts have mulch available and can have it delivered to the site.

What materials do you have? What materials do you need to source?

The following materials are needed to ensure a successful composting program:

- **Compost bin**
 - See the Resources section on page 16 for more information on the different types of bins that are available
 - The proposed location determines the type of bin needed
- **Nitrogen-rich materials**
 - Fruit and vegetable scraps (orange peels, carrot tops, apple cores, etc.)
 - Moldy fruits and vegetables
 - Coffee grounds and loose tea leaves
 - Grass and garden clippings
- **Carbon-rich materials**
 - Mulch (dead leaves, twigs, branches)
 - Sawdust (only from untreated wood)
 - Paper, such as newspaper, brown paper bags, etc.

What tools and supplies do you have? What tools and supplies do you need to source?

The following tools and supplies are needed:

- Pitch fork or shovel
- Gloves
- Sifting screen
- Compost thermometer (optional)
- Hose
- Water buckets
- 5-gallon food scrap collection buckets
- Instructional signs

How will you use the completed compost?

Some ideas include:

- **Onsite**
 - Adding compost to vegetable and/or flower gardens.
 - Adding compost to other garden areas.
 - Breaking up and adding compost to hard, compacted soil or areas where soil is eroding.
- **Off-site**
 - Student distribution for home use.

Facilities and Maintenance

Check to see if tools and supplies are available for use through the Facilities and Maintenance staff.



What is the plan for gathering materials and feeding the bin? Who will turn the compost when needed?

Consider the following for a daily/weekly plan:

- **Number of bins**
 - Will there be one compost bin or more? This will help determine the daily or weekly plan and how much material will be needed.
 - If there is only one bin, gathering materials once a week is enough.
 - If there are multiple bins, gathering materials every day is needed.
- **Gathering vegetable/fruit scraps**
 - Gather small amounts of food scraps directly from cafeteria staff.
 - Gather large amounts of food scraps during lunch from students.
 - How will this be done? Who will make it happen?
- **Tending the compost bin**
 - Who will be in charge of turning and tending to the compost bin?
 - Who will tend to the finished compost?

Club or Class

Consider collection and tending to the compost bin as part of class time or during a club meeting.

What is Needed to Take Care of a Compost Bin?

Go to page 13 to review the guidelines on how to tend to a compost bin to get an understanding of what is involved.

How will you promote composting?

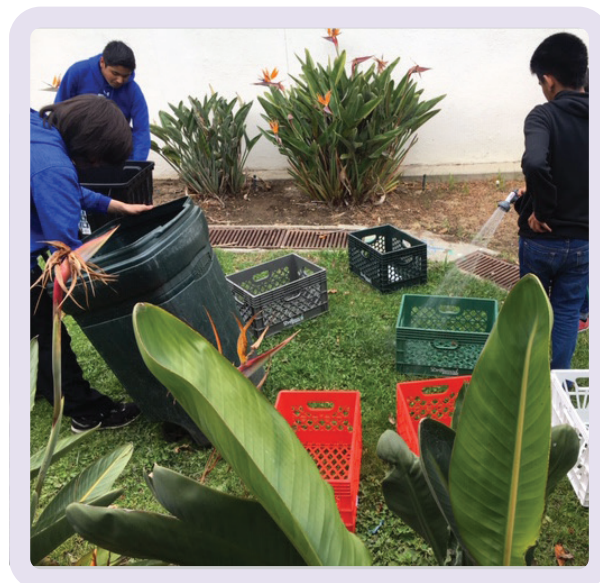
The size of your program and how you get your materials will determine how you promote the program.

- **If you are collecting food scraps from students**
 - Make signs to inform students about composting and the campus system.
 - Include instruction for what can and cannot be put into the compost bucket.

What is your plan to ensure the continuation of the program?

Consider the following as part of the plan:

- **Teacher/class support**
 - One way to ensure a successful on-going program is to include it as part of a class.
- **Student club**
 - One way to ensure a successful on-going program is to make it part of a student club or gardening program.



GET MORE INFORMATION

It is important to find out more by interviewing key site stakeholders. Stakeholders are people who may affect and provide the necessary materials for a composting program.

Procedure

1. Depending on your campus, determine which stakeholders to interview:
 - Principal
 - Onsite Maintenance/Plant Manager
 - Cafeteria Manager/Food Service Manager
 - Teachers
2. Create an information sheet about the value of composting. See the Resource section on page 16 for a variety of resources.
3. Bring a copy of the draft plan, compost information sheet and a school map showing the proposed location to the interviews.
4. Have groups share what they learned.
5. Adjust the plan as needed.

Materials

- Draft plan
- Suggested interview questions for each group (page 11)
- Pencil/pen

Helpful Hints

Know your facts so you can answer questions.

For example:

Will the compost smell?

The compost pile will be turned regularly and a balanced mix of greens (nitrogen) and browns (carbons) will be maintained to avoid a smelly bin.

What about pests?

No meat, oil, sugars or dairy products will be added to eliminate potential odor and pests.

Sample Interview Questions

PRINCIPAL

- Are there any school policies and/or procedures related to composting on school campuses?
- Do you have any ideas for how the compost program can become part of the curriculum?
- Once we have conducted the interviews and updated the plan, would you be willing to review it and give permission for the project to move forward?

CAFETERIA MANAGER/FOOD SERVICES MANAGER

- Are there any wasted fruits and vegetables from breakfast and/or lunch?
- Which meal generates the most fruit and vegetable food waste?
- What happens to fruit/vegetables that are returned at breakfast or that don't get served at lunch?
- Are there any leftover fruits and vegetable scraps or egg shells that get thrown away?
- Would you be willing to place scraps into a bucket for our use?
- What would be the best time/day for a food scrap pickup and who should pickups be arranged with?
- Are there any additional comments or concerns we can address for you?

ONSITE MAINTENANCE/PLANT MANAGER

- Are there grass clippings, other plant material and used paper or newspaper available to use?
- Is it possible to get a load of mulch from the school district?
- Are there any regulations or safety concerns we need to be aware of?
- Are there tools that we could have access to, such as gloves, hose, 5-gallon buckets, or shovel?
- Are there any concerns about the location we identified? Is there a better location?
- Are there any concerns about the source or use of water periodically to rinse out buckets or moisten the compost?
- Are there any additional comments or concerns we can address for you?

TEACHER

- Would you be willing to help manage and sustain a compost program?
- How can the compost program become part of the curriculum for specific classes?
- Would you be willing to manage a compost collection bin in your classroom?
- Would you allow students to be part of the compost program as part of the class or to provide extra credit?
- Are there any additional comments or concerns we can address for you?

GET PERMISSION

Getting permission is the last step necessary before setting up the space and installing the compost bin.

Procedure

1. Using information from the stakeholder interviews, update the composting project plan.
2. Set up a meeting with the principal or other stakeholder responsible for the site.
3. Provide the composting information sheet, compost program plan and a school map showing the proposed location.
4. Once permission is given, begin planning the compost bin installation.

Support Needed?

A Generation Earth Coordinator is available to assist your group through this process and to help avoid any roadblocks.

Helpful Hint

Before the presentation, have students:

- Practice!
- Be prepared to answer questions
- Know what the roles are of all stakeholders



INSTALLATION AND MAINTENANCE

Setting Up The Bin

- Go to the Resource section on page 16, for more information on sources and types of bins.
- Set up the compost bin in an outdoor area with semi- to full-sun exposure at least 10 feet away from any window or door (for potential odors).
- Place a 1" layer of mulch (or other carbon-rich material) at the bottom of the compost bin.
- Fill the compost bin lasagna style (see box).
- End with a top layer of brown, carbon-rich material to help maintain moisture.

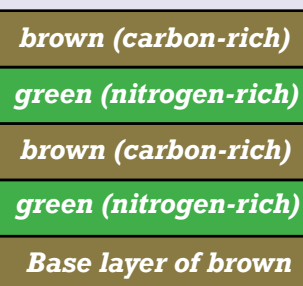


Maintenance

- **Phase 1: Fill the compost bin**
 - Follow the instructions above to fill the compost bin.
 - The duration of this phase depends on how much material is added. Fill it up in 1 day or in 2 months, either works.
- **Phase 2: Active decomposition**
 - Once full, to prevent too much heat harming the microbes, give the material oxygen by removing the material, spreading it out and placing it back in the bin.
 - Do this at least once a week.
 - This phase lasts about 4 - 6 weeks.

Lasagna Style

- Start with a base layer of mulch or other carbon-rich material.
- Add one layer of green, nitrogen-rich material (up to 3" thick).
- Cover with an equal amount of brown, carbon-rich material.
- Repeat these layers until the bin fills up, ending with a brown layer.



- **Phase 3: Curing**
 - Allow the compost to return to ambient soil temperature (80°F) before sifting.
 - This phase lasts about 3-4 weeks.
- **Phase 4: Sifting and application**
 - Sift the cured compost to remove chunky carbon.
 - Apply compost to your soil!
- **Go back to phase 1**

Troubleshooting

- Use your thermometer to assess how well your compost is decomposing. A standard compost pile won't reach optimal temperatures (120°F or higher) until the bin is near/at capacity.
- Too much of the browns can cause the pile to dry out and the bin won't reach high temperatures. Too much of the greens can cause the pile to become sludgy and excessively hot.
- If your compost is too dry, add water or more greens. If your compost is too wet, add more carbon.



EVALUATION

Once the Composting program is set up, have students answer the following questions to evaluate their project and introduce some possible next steps.

Questions

1. What was the most successful part of the project?
2. What was the least successful?
3. What would you do differently next time?

What's Next?

Are you interested in another project?

Consider using another Project Guide:

- Community Swap Event
- E-Waste Collection Event
- Campus Curbside Recycling
- Textile Recycling Event
- Food Rescue



RESOURCES

Compost Bins

There are a variety of options for compost bins. The site, space and resources will determine what system you decide on.

- **Where to find compost bins**

- On-line
- Home improvement store
- New/used through an online marketplace
- Donations

- **Types**

- **Round uprights**

- Open bottom so that organisms can easily make their way into the bin to help break down material
- Side vents allow air to get into the bin.
- Sliding panel at the bottom to access finished compost and keep fresh material at the top.

- **Square uprights**

- Open bottom so that organisms can easily make their way into the bin to help break down material
- Side vents allow air to get into the bin.
- Locking self-watering lid offers air ventilation.
- Two sliding panels at the bottom to access finished compost and keep fresh material at the top.



— **Tumbling composter with two chambers**

- Two chambers — one chamber for fresh scraps and one chamber for making/cooking compost.
- Allows for storage of fresh scraps while making compost.
- Raised off the ground, to help prevent rodents and other pests.



— **Do-it-yourself bins**

- Build from scratch using basic materials.
- Costs less.
- Adaptable to the site
- For ideas go to: diyncrafts.com



Food Waste at School

The following are a variety of resource materials related to food waste at school, including some sample project plans.

- **Guide to Conducting Student Food Waste Audits - A Resource for Schools**
epa.gov/sites/production/files/2017-12/documents/guide_to_conducting_student_food_waste_audit_-_nov_20_2017.pdf
- **Reducing School Food Waste Infographic**
usda.gov/sites/default/files/documents/reducing-food-waste-infographic.pdf
- **Education and School Waste Reduction Programs**
calrecycle.ca.gov/education/
- **Food Waste Best Practices**
nrdc.org/sites/default/files/k-12-food-waste-best-practices-ib.pdf

- **How to Comply with Organic Waste Policies in California**
calrecycle.ca.gov/recycle/commercial/organics/faq#Jurisdiction
- **Food Reduction Made Easy**
wastedfood.cetonline.org/wp-content/uploads/2019/08/FoodReductionMadeEasy.pdf
- **Food Separation Made Easy**
wastedfood.cetonline.org/wp-content/uploads/2019/08/FoodSeparationMadeEasy.pdf
- **Project Plan for Reducing Cafeteria Waste**
thegreenteam.org/wp-content/uploads/2016/01/Lunch-Against-Landfill-Us-vs.-Waste-Campaign-.pdf
- **Food Waste Diversion Guide for Schools**
[thegreenteam.org/wp-content/uploads/2015/08/Food_Waste_Diversion_Guide_for_Schools_\(1\).pdf](http://thegreenteam.org/wp-content/uploads/2015/08/Food_Waste_Diversion_Guide_for_Schools_(1).pdf)

How-to / Infographics

- **How to Layer Compost**
thegreenteam.org/wp-content/uploads/2012/08/Composting-is-Easy.pdf
- **Compost Food Web**
thegreenteam.org/wp-content/uploads/2012/08/Compost-Food-Web-Poster.pdf
- **Composting Video Demonstrations**
portal.ct.gov/DEEP/Waste-Management-and-Disposal/Organics-Recycling/Compost-Video-Downloads

Policies / Laws On Organic Waste In California

Policies and laws to support teacher and student advocacy efforts.

- **SB-1383 Short-lived climate pollutants: methane emissions: dairy and livestock: organic waste landfills (2015-2016)**
leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201520160SB1383
- **AB-1826 Solid waste: organic waste**
leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201320140AB1826
- **AB-827 Solid waste: commercial and organic waste: recycling bins**
leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201920200AB827

REFERENCES

1. dpw.lacounty.gov/epd/rethinkla/recycle/recycle-what-is.aspx
2. usda.gov/foodwaste/faqs
3. epa.gov/sustainable-management-food/wasted-food-programs-and-resources-across-united-states
4. calrecycle.ca.gov/organics
5. nrdc.org/resources/wasted-how-america-losing-40-percent-its-food-farm-fork-landfill
6. www.epa.gov/sustainable-management-food/sustainable-management-food-basics#Food%20Waste
7. npr.org/sections/thesalt/2013/06/06/189192870/when-you-waste-food-youre-wasting-tons-of-water-too
8. refed.org/downloads/ReFED_Report_2016.pdf
9. www.epa.gov/sustainable-management-food/composting#scale
10. energy.ec.europa.eu/topics/oil-gas-and-coal/methane-emissions_en#:~:text=On%20a%20100%2Dyear%20timescale,on%20a%2020%2Dyear%20timescale.
11. [www.epa.gov/lmop/basic-information-about-landfill-gas#methane.](http://www.epa.gov/lmop/basic-information-about-landfill-gas#methane)
12. www.feedingamerica.org/our-work/reduce-food-waste
13. foodtank.com/news/2016/11/schooling-food-waste-how-schools-can-teach-kids-to-value-food
14. epa.gov/sustainable-management-food/united-states-2030-food-loss-and-waste-reduction-goal
15. agrivi.com/blog/soil-degradation/
16. www.nrcs.usda.gov/conservation-basics/natural-resource-concerns/soils/soil-health
17. sare.org/publications/building-soils-for-better-crops/healthy-soils/how-do-soils-become-degraded



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