



# Livable Pierce County



## Livable Pierce County Patch

Learn about the Four Rs:  
Reduce • Reuse • Recycle • Respond

Activities for composting, water,  
and resource conservation and consumption

# Pierce County Patch Program

Pierce County is a wonderful place to live, work and play, thanks to the many natural wonders that surround our cities and towns. Everyone needs to do their part to help protect and preserve our natural environment for future generations.

Become a leader in your community by learning how to put the four R's (reduce, reuse, recycle and respond) into practice. This patch program is designed to help youth learn more about sustainable actions in Pierce County.

## Note:

This guide contains many links to websites and other resources and it is best to view and use it in its electronic format.

## How do I earn a patch?

1. Find an adult who can help supervise your activities
2. Complete the required number of **Activities** for each category according to your grade level:

	Compost	Water	Resource Conservation
K-Grade 3	1	1	1
Grades 4-8	2	2	2
Grades 9-12	3	3	3

3. Complete the required number of **Action Projects** according to your grade level. You may choose from any category:

K-Grade 3	1
Grades 4-8	2
Grades 9-12	3

4. Fill out and submit the [form](#) to receive your patch!



## Legend



Compost



Water



Resource Conservation



Activities



Activities



Activities



Action Projects



Action Projects



Action Projects

# Definitions

- Sustainable** **Meet current needs without limiting ability to meet needs in the future.**  
*Practice the 4 R's through composting, water, and resource conservation and consumption activities to help make Pierce County a place where people choose to live, learn, work and play.*
- Reduce** **Use less water and make less trash.**  
*The first step towards sustainability. When we consume or use less, there is not as much waste produced or water wasted.*
- Reuse** **Choose to use products and packages again.**  
*Reusing items reduces the amount of waste we produce.*
- Recycle** **Make something new out of materials from old items.**  
*We recycle lots of items in Pierce County and you can do your part by knowing what can go in recycle bins. These recyclable materials are collected and sorted, sold to manufacturers and made into new products.*
- Respond** **Take action to limit waste.**  
*Help make Pierce County a great place to live! Teach others how to reduce waste, buy things from companies that support the environment and practice the other Rs— Reduce, Reuse, Recycle.*



# Compost Activities

Complete Activities from this category:

**K-Grade 3** ..... choose 1

**Grades 4-8** ..... choose 2

**Grades 9-12** ..... choose 3



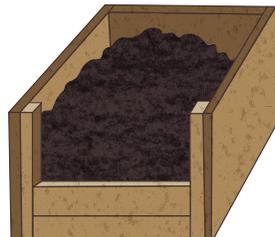
Compost is organic matter (like vegetable scraps or dead plants) that decays or breaks down to become a rich fertilizer.



## Compost demonstration garden

Do you want to see how community gardens are making compost?

Visit a Pierce County compost demonstration garden.



[Find a compost demonstration garden](#)

## Investigate a worm bin!

See worms up close and learn how they work alongside other animals to turn your food scraps into compost.

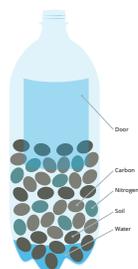


[Invite an educator to your group's meeting](#)

## Make your own compost

What happens when you put food scraps, a bit of soil, water, and old newspaper in an empty 2-liter bottle? You get compost!

Make compost in your kitchen and watch the process unfold right before your eyes!



[DIY Compost Instructions](#)

## Soil Experiment

Learn what environment is the best to help seeds grow!

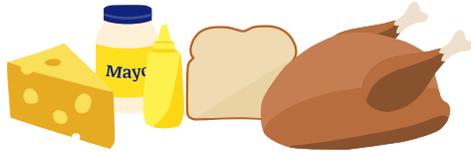


[Soil Experiment Instructions](#)

## Dining on dirt

What's for lunch? Dirt!

For this activity you will need your lunch, drawing paper, and crayons or markers. "Dining on Dirt" will help you trace everything in your lunch back to the earth.



[Dining on Dirt Instructions](#)

## Visit a worm farm

See worms up close and learn how they work alongside other animals to turn your food scraps into compost.

### Dinkelman Worm Farm

47402 228th Ave SE  
Enumclaw, WA 98022

(253) 632-6184

### Yelm Earthworm & Castings Farm

14741 Lawrence Lake Rd SE  
Yelm, WA 98597

(360) 894-0707



## Tour the Compost Factory

Do you know where your yard waste goes after the truck collects it from your home? It goes to The Compost Factory in Puyallup! Learn how your yard waste becomes valuable compost in just 32 days!

Contact an environmental educator to arrange a tour. *This activity is only for groups and is recommended for 9th grade and above.*



[Contact Pierce County to arrange a tour](#)

## What can you do?

In the future, we imagine a Pierce County where we all work together to reuse resources and waste little. Can you think of more examples?

### Safer Soil

Don't use chemical fertilizers on your grass and garden.

### Get Growing

Try growing your own vegetables! Plant seeds, watch them grow and enjoy the tasty results.

# Recommended Reading

## Find these books at your public library

*“Compost Stew: An A to Z Recipe for the Earth”* by Mary McKenna

*“Composting: Decomposition”* by Buffy Silverman

*“Compost: A Family Guide to Making Soil from Scraps”* by Ben Raskin

*“Compost By Gosh: An Adventure with Vermicomposting”* by Michelle Eva Portman

*“Composting Nature’s Recyclers”* by Robin Koontz

*“Garbage Helps Our Garden Grow: A Compost Story”* by Linda Glaser



# Websites

## Information for adult leaders and older youth

general information

[piercecounitywa.gov/compost](http://piercecounitywa.gov/compost)

children’s books about composting

[castlecompost.com](http://castlecompost.com)



# Water Activities

Complete Activities from this category:

**K-Grade 3** ..... choose 1

**Grades 4-8** ..... choose 2

**Grades 9-12** ..... choose 3



Water is all around us, but less than 1% of all the water on earth is available for the humans, plants and animals that live on land.

It's our responsibility to take care of earth's water and help keep it clean for future generations.

## Puget Sound Starts Here

Visit the Puget Sound Starts Here website. Click on "How to Help" and select an activity.



[Puget Sound Starts Here website](#)

## Learn about salmon

What are the five species of Pacific Salmon?

What stream conditions do salmon need to survive?

[Visit a local salmon stream](#) and look for signs of a healthy salmon environment.



[Meet the salmon in your neighborhood](#)

## Attend a Salmon Homecoming

*Fall Activity*

These events have fun activities for the whole family to learn about salmon.

[Donkey Creek Chum Festival](#)

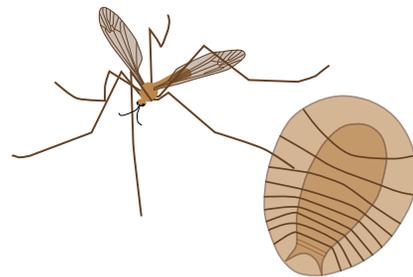
[Salmon Homecoming — Puyallup](#)



[Gig Harbor—Donkey Creek Chum Festival](#)

## Macroinvertebrates

Learn about water quality by investigating macroinvertebrates!



[Invite an educator to your group's meeting](#)

## Native Plants

Learn about the benefits and importance of native plants in connection to water.

Go visit the [Northwest Native Plant Garden](#) at Point Defiance Park in Tacoma



[Washington Native Plant Society](#)

## Rain Gardens

Research and visit a local rain garden.

- How do they work?
- How do they benefit the community and environment?



[Find local rain gardens](#)

## Visit the EnviroHouse

List the many ways the EnviroHouse at the Tacoma Recovery and Transfer Center is saving water and energy.

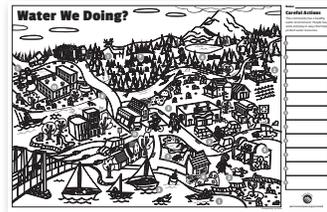


[EnviroHouse](#)

## Watersheds

What is a watershed? What watershed do you live in?

Complete the "Water We Doing?" activity poster to learn about watersheds.



["Water We Doing?" activity poster](#)

## 10 ways to save water

Research and list at least 10 ways to conserve or save water.



## Fruity Edible Aquifer

Make your own "edible aquifer" to learn about this natural feature and how human activities can harm it.



[Fruity Edible Aquifer Instructions](#)

## Visit a local stream

Visit a local stream and conduct a field investigation.

### To find a stream near you:

[Stream Map \(overview of local streams\)](#)

[List of Pierce County Streams](#)

[Salmon Viewing in Pierce County](#)



[Field Report Form](#)

## Home Water Inventory

Do you know how much water your family is using each day?

Start by making a list of all the ways you use water.

Use the form to track and find out how much water your family is using.



[Water Use Inventory](#)

## Hazards in your home?

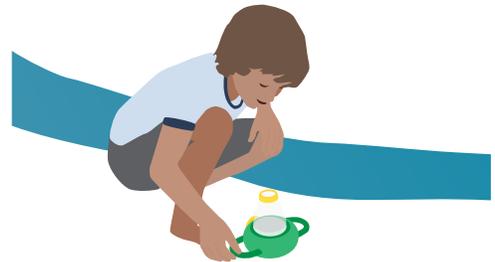
Many of the products we have at home under the sink and in cabinets are considered household hazardous waste (HHW).

These products contain chemicals that can cause serious harm to us, our pets and the environment.

Use the form to help find HHW in your home.



[HHW Inventory](#)



## What can you do?

In the future, we imagine a Pierce County where we all work together to reuse resources and waste little. Can you think of more examples?

### Skip bottled H2O

Drink tap water instead of bottled water.

### Clean & Green

Make your own non-toxic cleaners to reduce hazardous waste in your home and make it a safer place

# Recommended Reading

## Find these books at your public library

- “Chattanooga Sludge”* by Molly Bang
- “Did a Dinosaur Drink This Water?”* by Robert E. Wells
- “A Drop Around the World”* by Barbara Shaw McKinney
- “These Seas Count”* by Alison Formento
- “Water! Water! Water!”* by Nancy Elizabeth Wallace
- “Polluted Waters”* by Jennifer Stefanow
- “The Drop in My Drink: The Story of Water on Our Planet”* by Meredith Hooper
- “Let’s Save Water”* by Sara E. Nelson
- “Clean Water”* by Beth Geiger
- “How Big is Your Water Footprint?”* by Paul Mason
- “Save the Planet: Stop Water Waste”* by Claire Llewellyn
- “One Well: The Story of Water on Earth”* by Rochelle Strauss



# Websites

## Information for adult leaders and older youth

- home water audit [www.home-water-works.org](http://www.home-water-works.org)
- watersheds [cfpub.epa.gov/surf/locate/index.cfm](http://cfpub.epa.gov/surf/locate/index.cfm)
- water contamination [www.epa.gov/superfund/students/wastsite/index.htm](http://www.epa.gov/superfund/students/wastsite/index.htm)
- water consumption [water.usgs.gov/edu/qa-home-percapita.html](http://water.usgs.gov/edu/qa-home-percapita.html)
- drinking water [water.epa.gov/drink/local/](http://water.epa.gov/drink/local/)
- drinking water [water.epa.gov/learn/kids/drinkingwater/index.cfm](http://water.epa.gov/learn/kids/drinkingwater/index.cfm)
- watersheds [pugetsoundstartshere.org](http://pugetsoundstartshere.org)
- edible aquifer [www.groundwater.org/kids/](http://www.groundwater.org/kids/)
- salmon [www.co.pierce.wa.us/DocumentCenter/View/4024](http://www.co.pierce.wa.us/DocumentCenter/View/4024)



# Resource Conservation & Consumption Activities

Complete Activities from this category:

**K-Grade 3** ..... choose 1

**Grades 4-8** ..... choose 2

**Grades 9-12** ..... choose 3



Conservation is the sensible use of Earth's natural resources (like water, minerals and soil) so they will still be around in the future.

Consumption is the purchase and use of materials and products.



## Take a virtual tour

Learn how your recyclables are separated at a materials recovery facility, or MRF (pronounced "merf").

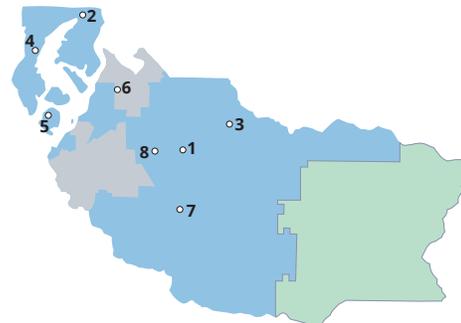
Then see the facility in Pierce County that processes your recycling.



- [Recycling sorting process](#)
- [Virtual tour of recycling facility](#)

## Recycling drop-off site visit

Visit a recycling center and a glass drop-off site. What items are accepted?



- [Recycling centers and glass drop-off sites](#)

## Tour Pierce County's landfill

Do you know where your non-recyclable garbage goes? Schedule a tour of the landfill in Pierce County.

Contact an environmental educator to arrange a tour. *This activity is only for groups and is recommended for 9th grade and above.*



- [Contact Pierce County to arrange a tour](#)

## Visit a community garden

There are over 70 community gardens, orchards and food forests in Pierce County. Find one near you and visit to learn more about what community gardens are and how they work.

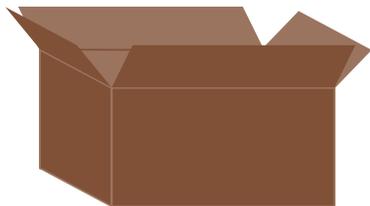


- [Harvest Pierce County](#)

## Find recycled content

Visit a local store and find 10 items that contain recycled content (either the product or packaging).

Are these items you use? Could these items replace an item you currently use?



## Pack a waste-free lunch

When you're done eating lunch do you have leftover wrappers, sandwich bags, juice boxes, and paper bags?

Say "goodbye" to all this garbage and learn how to pack a waste-free lunch.

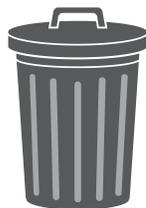


[Waste-Free Lunch Instructions](#)

## Home waste assessment

Are there recyclables in your trash? Is there trash in your recycling? Do you have lots of food waste?

Investigate and record your family's waste for one week.



[Waste Assessment Form](#)

## Life cycle assessment

A life cycle assessment looks at all the resources (materials, water, and energy) used to make a product, any pollutants or hazardous wastes produced, and the impact of the product's disposal at the end of its life.

Look at an example, then, select a product and do your own life cycle assessment.



[Assessment Form](#)

## Consumer survey

How much do you think about the things you buy and the companies that create them?

Complete the Consumer Survey and find out how your shopping habits rank with others.



[Consumer Survey Form](#)

## Packaging Profile

Select a recently purchased item (still in the packaging) from your home.

How is the item packaged? Is the packaging recyclable in Pierce County? ([see Reminders List](#)) Are there ways to reduce this packaging? Are there places where this item could be refilled?

Use the packaging profile form to complete this activity.



[Packaging Profile Form](#)

## "Your trash, my treasure!"

Learn to "upcycle" by making something fun and useable from items you might usually throw away.



[Upcycling Ideas and Instructions](#)

## What can you do?

In the future, we imagine a Pierce County where we all work together to reuse resources and waste little. Can you think of more examples?

### Repair

Fix items when they are broken, instead of buying new ones.

### Share

Share or borrow items that you don't need all the time.

### Reuse

Use reusable products: things that can be washed and used again (water bottles, lunch bags, napkins).

### Recycle

Look for products made with recycled content. And try to buy products with packaging that can be recycled or reused.

# Recommended Reading

## Find these books at your public library

*"Bag in the Wind"* by Ted Kooser

*"Awesome Things to Make with Recycled Stuff"* by Heather Smith with Joe Rhatigan

*"Garbage Monster"* by Joni Sensel

*"Garbage: Investigate What Happens When You Throw It Out (with 25 projects)"* by Donna Latham

*"Cool Odds and Ends Projects: Creative Ways to Upcycle Your Trash Into Treasure"* by Pam Scheunemann

*"Earth Friendly Waste Management"* by Charlotte Wilcox

*"Reduce, Reuse, Recycle: Garbage and Litter"* by Jen Green



# Websites

## Information for adult leaders and older youth

General recycling information	<a href="http://www.recycling-revolution.com/recycling-facts.html">www.recycling-revolution.com/recycling-facts.html</a>
General recycling information	<a href="https://napcor.com/">https://napcor.com/</a>
Reading Rainbow Recycling Tour <i>An overview of the basic process</i>	<a href="https://www.youtube.com/watch?v=w1l8HXa3HLk&amp;feature=youtu.be">https://www.youtube.com/watch?v=w1l8HXa3HLk&amp;feature=youtu.be</a>
General recycling information	<a href="http://greenschools.net">http://greenschools.net</a>
Product life-cycle assessment	<a href="http://www.epa.gov/osw/education/pdfs/life-cell.pdf">http://www.epa.gov/osw/education/pdfs/life-cell.pdf</a>
"The cost of being cool"	<a href="https://www.videoproject.com/environmental-issues.html">https://www.videoproject.com/environmental-issues.html</a>
SP Recycling Video	<a href="https://www.youtube.com/watch?v=rCpUBxpdzc">https://www.youtube.com/watch?v=rCpUBxpdzc</a>
Waste-free lunch	<a href="http://www.wastefreelunches.org/">http://www.wastefreelunches.org/</a> <a href="https://www.epa.gov/students/pack-waste-free-lunch">https://www.epa.gov/students/pack-waste-free-lunch</a>
Waste	<a href="http://www.epa.gov/epawaste/index.htm">http://www.epa.gov/epawaste/index.htm</a> <a href="https://ecology.wa.gov/Waste-Toxics/Reducing-recycling-waste">https://ecology.wa.gov/Waste-Toxics/Reducing-recycling-waste</a> <a href="http://www.naturebridge.org/garbology.php">http://www.naturebridge.org/garbology.php</a> <a href="http://www.plasticbagrecycling.org">www.plasticbagrecycling.org</a> <a href="http://www.storyofstuff.org">www.storyofstuff.org</a>
National Wildlife Federation- Student Activities	<a href="https://www.nwf.org/Educational-Resources">https://www.nwf.org/Educational-Resources</a>
Smart Shopping	<a href="http://www.epa.gov/epawaste/conservation/infographic/index.htm">http://www.epa.gov/epawaste/conservation/infographic/index.htm</a>



# Compost Action Projects

Action Projects may be chosen from *any* category: Compost, Water or Resource Conservation

**K-Grade 3 ..... choose 1**

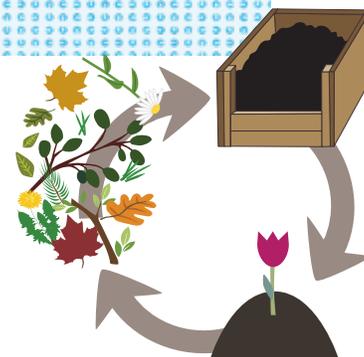
**Grades 4-8 ..... choose 2**

**Grades 9-12 ..... choose 3**



## Did you know?

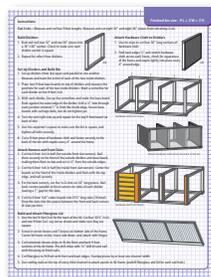
Composting plant material returns valuable nutrients back to the soil.



### Build a yard waste bin

Turn your yard waste into valuable compost by building a home yard waste bin.

There are several different styles. Choose the one that is right for your family.

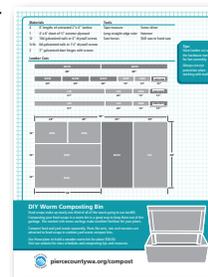


[Download instructions for building a bin](#)

### Build a worm bin

Vermicomposting! What is that?

Composting with worms! Learn how to build your own worm bin at home to recycle your food waste.



[Download instructions for building a bin](#)

### Worm composting "how-to"

Share what you know! Use this guide to educate friends, family, neighbors, community groups or other youth organizations. Your guide should include the following:

- Benefits of food waste composting
- What worms can and can't eat
- What worms need in a healthy home
- How to use finished compost



[What goes in your worm bin?](#)

### Container Gardening

Growing plants in containers is an easy way to grow a garden anywhere!

Use a potting soil or compost from [Cascade Compost](#) (made from yard waste debris in Pierce County) to plant seeds.

Follow the directions on your seed packets and choose a container that meets the depth requirements for your plants roots. (i.e. 5 gallon bucket for potatoes, 6-12in pot for lettuce).



# Water Action Projects

Action Projects may be chosen from *any* category: Compost, Water or Resource Conservation



**K-Grade 3** ..... choose 1

**Grades 4-8** ..... choose 2

**Grades 9-12** ..... choose 3

## Did you know?

Household hazardous waste should never be thrown in the garbage at your house.

Visit [piercecounitywa.org/hhw](http://piercecounitywa.org/hhw) to find a collection site near you.

### Organize a beach clean-up

Contact a local organization or select a favorite beach and bring bags to collect trash.



### Join the Stream Team

Contact the Pierce Conservation District and become part of the Stream Team.

#### Contact

Pierce Conservation District

Isabel Ragland

 (253) 845-9770 x. 103



 [Pierce Conservation District](#)

### Only Rain Down the Drain

Storm drains in Pierce County flow directly, untreated into a local stream, river, or Puget Sound. Help educate your community by marking storm drains with the message "Only Rain Down the Drain."

#### Contact

Pierce Conservation District

Belinda Paterno

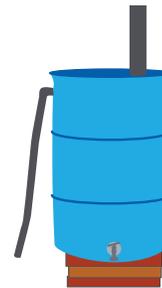
 (253) 847-9770 x. 109



 [Storm drain marker program](#)

### Rain Barrel

Install a rain barrel at your home or in your community.



 [Rain barrels](#)

## Make a Watershed Poster

Everyone who lives in Pierce County is part of the Puget Sound watershed, but each community is also part of a smaller watershed.

Find out what watershed you live in, and create a poster to educate your neighbors about it.

[Pierce County's Water Quality Report](#) will help you learn more about your watershed before creating your poster.



[Find your watershed](#)

## Green Cleaner Recipes

Cleaning can be fun when you make your own safe, non-toxic household cleaners!



[Green Cleaning Recipes](#)

## Scoop the Poop!

Pierce County is home to more than 206,000 dogs who produce more than 34 tons of waste every day. If left on the ground, the harmful bacteria can get into our soil and run into streams, lakes and Puget Sound.

Pet waste should always be picked up in a bag and thrown in the garbage.

Find out if your neighborhood is eligible for a free pet waste station.



[Pet waste information](#)

## TIP:

**Planning a fundraiser?**  
**Sell car wash coupons to help keep soap out of storm drains and your local water sources.**

[Puget Sound Car Wash Association](#)  
[Brown Bear Charity Car Wash Program](#)

# Resource Conservation & Consumption Action Projects

Action Projects may be chosen from *any* category: Compost, Water or Resource Conservation

**K-Grade 3 ..... choose 1**

**Grades 4-8 ..... choose 2**

**Grades 9-12 ..... choose 3**



## TIP:

When going out to eat, bring your own container to take home leftovers.



### Teach recycling tips

Teach another organization/group/troop/your school/classroom about proper recycling in Pierce County.

You can do this by hosting a workshop and using the many resources contained in this packet.



[Reminders for recycling, garbage, drop-off](#)

### Help set up a recycling program

Is there a business or organization you often visit that is not recycling?

Work with the manager or owner to help them set up a recycling program.

#### For existing recycling programs:

Are the recycling bins properly labeled?  
Are there pictures showing what's recyclable?



[Curbside recycling service providers](#)

### Environmental Club

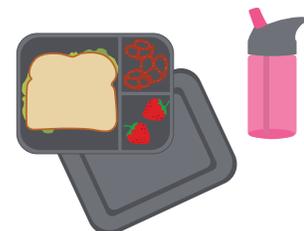
Volunteer for, or start, an environmental club or recycling project. Encourage everyone in your community to make waste reduction a part of their everyday lives.



[Washington Green Schools](#)

### Waste-free lunch poster

Make a poster for your school cafeteria or classroom that explains how to pack a waste-free lunch. Ask permission from your school or teacher first before putting up posters.



[Waste-Free Lunch Instructions](#)

## Organize a donation picnic

Your friends, family, and community members can have lunch, talk, and bring their old toys, clothes, books, furniture, and other items to be donated to charitable organizations.



## Teach a Patch activity

Teach another group or organization an activity from one of the three patch categories.



## Invasive species removal

Contact the Pierce Conservation District and participate in one of their volunteer opportunities.



[Pierce Conservation District](#)

## "Cache In, Trash Out"

Go geocaching and leave the places you visit better than you found them by packing out litter.



[Find popular Puget Sound geocaches](#)

## Adopt-a-Park or Trail

You and your organization can help keep a Pierce County park clean and enjoyable for many years to come.



[Pierce County Parks and Recreation](#)

## Adopt-a-Road

If you are at least 15 yrs old, you can help your neighborhood look better and be a safer, healthier environment by helping pick up litter.



[Pierce County Planning & Public Works](#)

## Vegetable gardening

Create a garden at home or get connected with a community garden. Visit the Harvest Pierce County website to [find a community garden near you](#).

\*Consider growing an extra row to donate to a local food bank.



[Harvest Pierce County](#)

## Help glean fruit

Volunteer with Harvest Pierce County's Gleaning Project to help glean, or pick, fruit.



[Pierce County Gleaning Project](#)

## Plant native plants

Seek out an opportunity to help plant native plants.



[Washington Native Plant Society](#)

## Create your own project

What do you want to accomplish?  
How will your project benefit your community?



[Contact an educator for help](#)

## Other volunteer opportunities



Pierce County Parks & Recreation  
Pitch in for Parks!



Metro Parks Tacoma  
Chip-in for Parks!



## Make your own compost

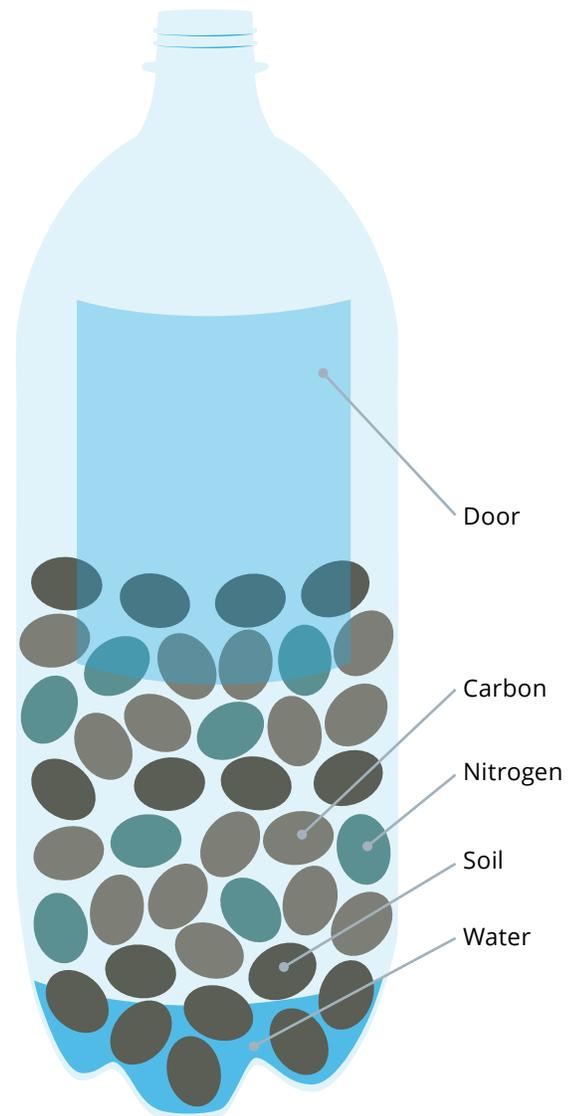
You need four things to make compost: air, water, carbon and nitrogen. These ingredients all work together, along with tiny microbes (bacteria), to break down organic matter. **Note: this project takes 1-3 months to complete.**

### Supplies:

- A clear plastic 2-liter bottle
- Scissors or box cutter
- Tape
- Journal
- Organic matter: **2 cups carbon** (shredded newspaper and/or dried leaves) and **1 cup nitrogen** (mix of fruit/vegetable peels cut into small pieces, coffee grounds, tea bags, grass)
- 2 cups of soil
- 1/8 cup water (to start)

### Activity Steps:

1. Ask an adult to cut a window (3 in. wide by 4 in. long) leaving one side attached, in the top half of the 2-liter bottle.
2. In your journal record everything you are putting into the bottle. (i.e. 1-apple core, 4- orange peels, 1-tea bags, shredded newspaper, 1/2 cup grass)
3. Mix your organic matter (carbon and nitrogen) together in a bowl.
4. Fill the bottom of the bottle with 1 cup of soil.
5. Add layers of your organic waste mixture in between layers of the remaining soil. Do not compact layers, arrange loosely so air can circulate.
6. Ask an adult to make small air holes in the sides of the bottle with a scissors or box cutter.
7. Pour water slowly onto your pile, but do not soak it. The pile should be as wet as a sponge that's been squeezed out.
8. Tape window closed.
9. "Stir" your compost by gently shaking the bottle up and down. If your pile looks dry, add more water in small amounts (1 tablespoon at a time) until it is wet enough.
10. Check your compost every 1-3 days and "stir" and add water as needed.
11. Compost will be finished in 1-3 months. Finished=No recognizable organic matter.
12. Record weekly observations in your journal and note each time you "stir" or add water. Water only needs to be added if the pile is too dry.





## Dining on dirt

Do you know where your food comes from, before it gets to the grocery store? In this activity, you'll discover that every edible item in your lunch came from the soil, or dirt. This means that we must have healthy soil to produce our food.

Composting is one way we help keep our soil healthy. Composting puts nutrients left over from plants and food waste back into the soil, which in turn helps grow new plants. Healthy soil means healthy plants. Healthy plants means healthy people and animals.

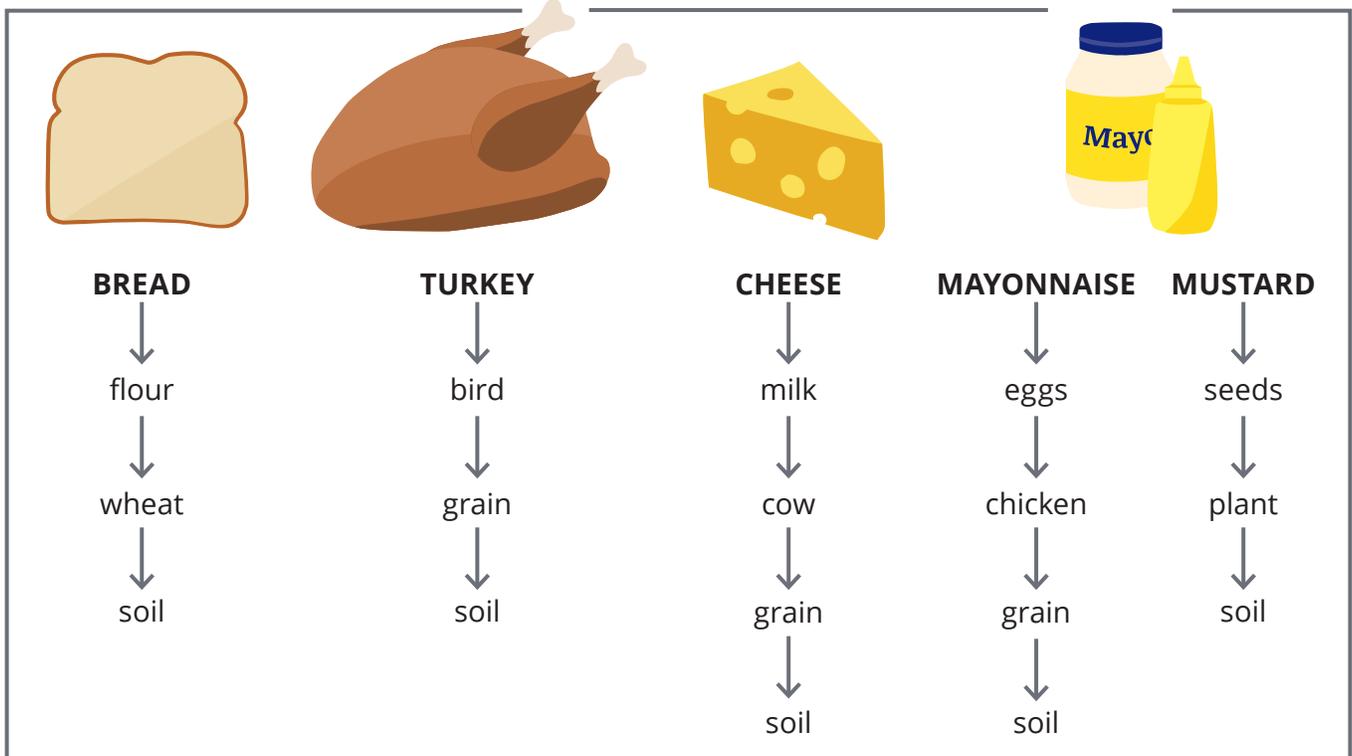
### Supplies:

- Lunch
- Drawing paper
- Crayons/markers

### Directions:

1. Across the top of your paper, draw pictures of each item in your lunch
2. Under each picture list all the steps it takes to get back to the soil

### Example: Turkey Sandwich



### Questions:

1. Which items in your lunch had the most steps back to the soil? Which items do you think used the most energy to get to your plate?
2. Which items in your lunch could be turned into compost? (refer to [What Goes in Your Worm Bin](#))
3. Share your lunch drawing with a friend and explain why we need healthy soil in order for us to eat lunch.



## Soil Experiment

Learn what environment is the best to help seeds grow!

### Supplies

- Measuring cup
- 3 pots of the same size (cut 1-liter bottles or milk cartons in half)
- 3 seeds of the same plant
- 3 different soil mixes, same total amount for each
  - Soil from your yard
  - Compost
  - Mix of 2/3 potting soil and 1/3 compost
- Ruler
- Journal

### Directions:

1. Label the pots A, B and C
2. Fill each pot with the same amount of "soil"
  - Pot A = soil
  - Pot B = compost
  - Pot C = mix of soil and compost
3. Plant a seed in each pot
4. Water each seed with the same amount of water (amount required depends on the size of pot)
5. Keep the pots together and make sure each gets the same amount of sun and water
6. Keep a journal recording what you see. Start by making a prediction:  
What pot will grow the healthiest plant? Tallest? Most leaves? Strongest stem?



### Questions:

1. After 4 weeks review your daily observations. What do you notice?
2. Are some plants bigger than others?
3. Are some plants a darker shade of green?
4. Is there anything else that is different between them?
5. How might you explain the differences between them? Write down your ideas.

## Soil Experiment (cont.):

### Example

	Date:	Date:	Date:	Date:
 <b>Pot A</b>	9/8	9/12	9/17	9/23
Water added	2 tablespoons (T)	1 T	4 T	2 T
Plant height	seed planted	not visible	not visible	1 cm
 <b>Pot B</b>				
Water added	2 T	1 T	4 T	2 T
Plant height	seed planted	not visible	1 cm	2 cm
 <b>Pot C</b>				
Water added	2 T	1 T	4 T	2 T
Plant height	seed planted	not visible	1.5 cm	2 cm

### Blank Form

	Date:	Date:	Date:	Date:
<b>Pot A</b>				
Water added				
Plant height				
<b>Pot B</b>				
Water added				
Plant height				
<b>Pot C</b>				
Water added				
Plant height				



## Fruity Edible Aquifer

Make your own “edible aquifer” to learn about this natural feature and how human activities can harm it.

### What is an aquifer?

An aquifer is a layer of porous rocks, sand, and gravel that can hold water. The water contained in an aquifer is called groundwater. The water in an aquifer gets recharged from surface water after it rains. Pollution swept up in rain water can contaminate an aquifer, causing groundwater (the water we drink and use to grow our food) to be polluted. In this activity you will learn how an aquifer is created, how pollution affects aquifers, and how the water cycle recharges aquifers.

#### Supplies:

- Clear drinking glass
- Spoon
- Drinking straw
- Food coloring
- A mix of chopped fruit (i.e. strawberries, blueberries, peaches, apples)
- Crushed ice or frozen bananas
- Clear soda pop or milk (dye a portion with food coloring and set aside)
- Plain or vanilla Greek yogurt or whipped cream topping
- Granola

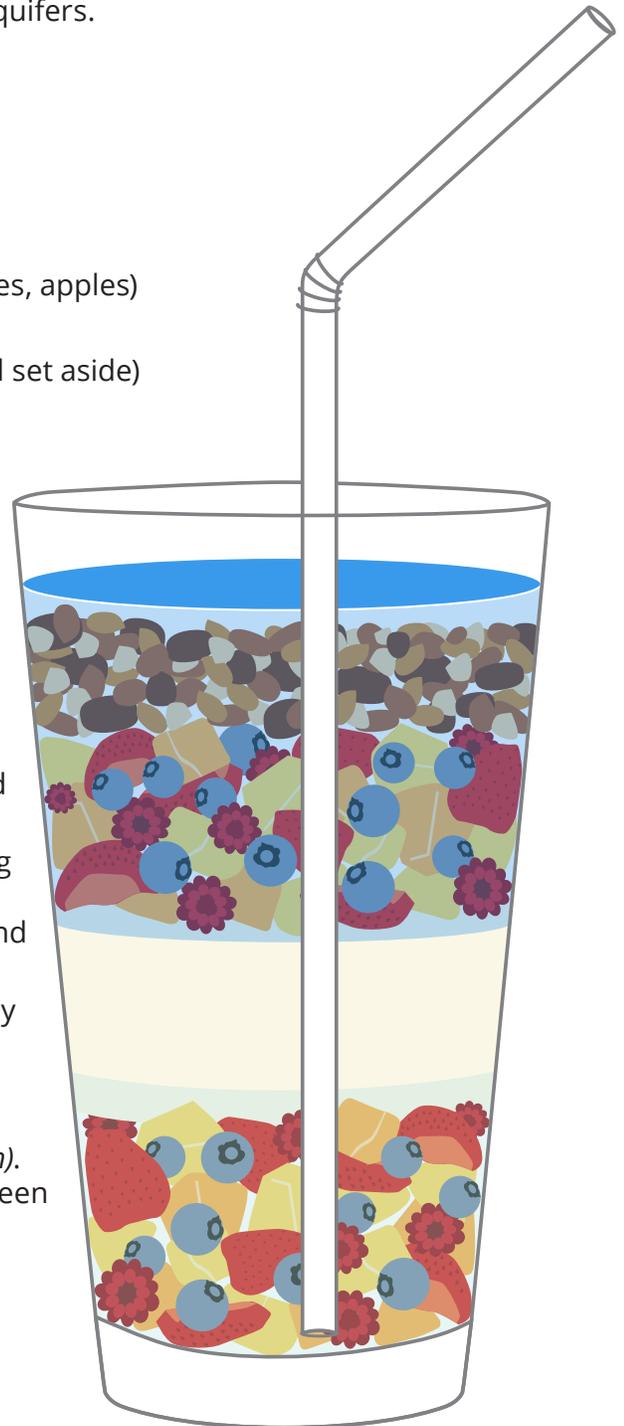
#### Directions:

1. Fill your glass 1/3 full with a mix of fruit and crushed ice or frozen bananas (*porous layer of rocks, sand and gravel*).
2. Pour enough soda or milk (*groundwater*) into your glass to just cover the fruit/ice.
3. Add a layer of yogurt (*confining layer of rock or clay*) over the fruit and soda.
4. Add another layer of *porous rocks, sand and gravel*, followed by a layer of granola (*soil*).
5. Now pour some of the soda or milk dyed with food coloring (*pollution and contaminants*) on top of your aquifer and watch what happens. This is what occurs when pollution and contaminants are spilled on earth’s surface.
6. Insert your drinking straw (*well*) into your aquifer and slowly begin to “pump” the well by sucking on the straw. What do you notice about the “groundwater”? What is happening to the pollution?
7. Recharge your aquifer by adding more clear soda/milk (*rain*). What do you observe happening? Make comparisons between your aquifer now and when it was first made.

(Adapted from The Groundwater Foundation)

### Do you drink from an aquifer?

Visit the [EPA’s Water Resources website](#) to find out where your drinking water comes from.





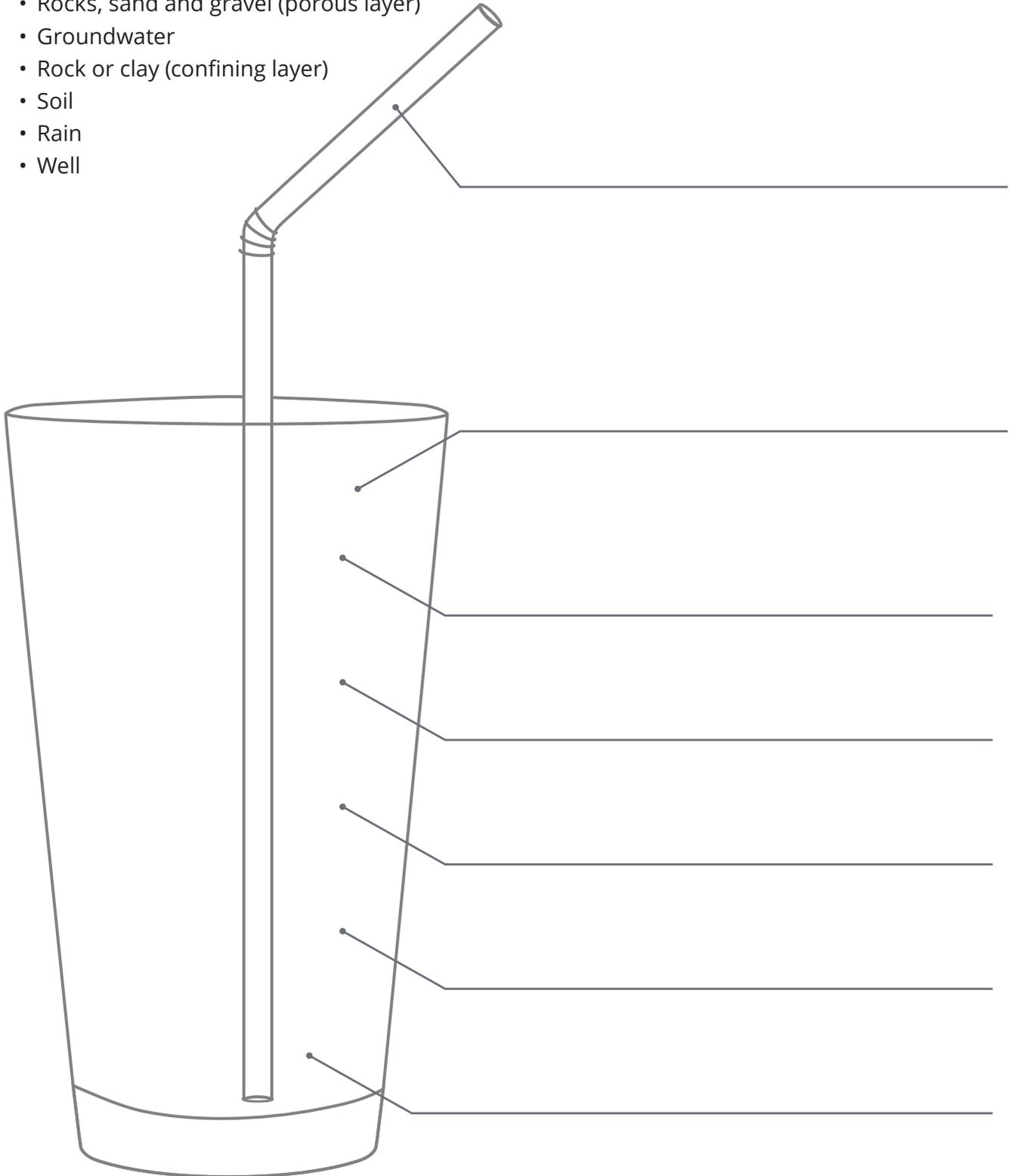
# Fruity Edible Aquifer Worksheet

Diagram your edible aquifer.

Label the layers using the list below.

## Layers

- Rocks, sand and gravel (porous layer)
- Groundwater
- Rock or clay (confining layer)
- Soil
- Rain
- Well





## Visit a local stream

Visit a local stream and conduct a field investigation.

### Stream etiquette:

Protect aquatic animals! Do not walk in the stream or move rocks and plants. Be careful to leave things as you found them. If you find litter and you can safely remove it, please pick it up.

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Stream name and location: \_\_\_\_\_

### Weather

Temperature: \_\_\_\_\_

Wind:                      Calm                      Breezy                      Gusty

Sky:                      Clear                      Partial Sun/Clouds                      Cloudy                      Raining

### Stream Conditions

*Use a tape measure or yard stick to measure depth and width.*

Depth: \_\_\_\_\_ Width: \_\_\_\_\_

Clarity:                      Clear                      Cloudy

Stream Bottom:                      Silt/Mud                      Sand                      Gravel                      Boulders

How much shade is on the creek?                      0%                      25%                      50%                      75%                      100%

How much woody debris, like logs, is in the stream?                      0%                      25%                      50%                      75%

### Streamside Vegetation

*Check the boxes to describe the types of plants present alongside the stream.*

Common                      Some                      None

Deciduous trees within 10 feet of creek 

--	--	--

Evergreen trees within 10 feet of creek 

--	--	--

Small trees and shrubs (less than 20 feet tall) 

--	--	--

Grasses 

--	--	--

Invasive Species (Ivy, Scotch Broom, Himalayan blackberry) 

--	--	--

Animal Habitats                      What signs of animals do you see?                      Common                      Some                      None

Animal tracks 

--	--	--

Fish 

--	--	--

Water insects 

--	--	--

*You may need to gently turn over rocks and look beneath, being careful to replace the rock exactly how you found it.*



## Home Water Inventory

Our planet has a limited amount of fresh water for all humans and animals to share, and human activities cause water pollution and shortages.

Do you know how much water your family uses each day? To find out, make a list of all the ways you use water.

	Cooking & Drinking	Hand Washing	Washing Dishes	Showers & Baths	Toilet Flushes	Teeth Brushing	Doing Laundry	Outdoor Water Use	TOTAL GALLONS
MON									
TUE									
WED									
THU									
FRI									
SAT									
SUN									

### Do the math

#### Doing Laundry

High efficiency models: Number of loads × 20 gallons  
Older models: Number of loads × 40 gallons

#### Showers and Baths

Showers: Number of minutes × 2.5 gallons (1.5 HE)  
Baths: 40 gallons per bath

#### Dishwashing

Dishwashers  
High efficiency models: Number of loads × 5.5 gallons  
Older models: Number of loads × 12 gallons

#### Washing by hand

Low-flow faucets: Number of minutes × 1.5 gallons  
Older faucets: Number of minutes × 2.2 gallons

#### Cooking and Drinking

Minutes × 1.5 gallons per person per day

#### Toilet Flushes

Low-flow toilets: Number of flushes × 1.6 gallons  
Older toilets: Number of flushes × 3.6 gallons

#### Teeth Brushing

Number of minutes with water running × 2.2 gallons (1.5 HE)

#### Hand Washing

Number of minutes × 2.2 gallons (1.5 HE)

#### Outdoor Water Use

½ inch hose: Number of minutes × 9 gallons/minute  
¾ inch hose: Number of minutes × 23 gallons/minute

To find your household's daily water use, per person, divide the total number of gallons by the number of people living in your home (i.e. 270 divided by 3 =90 gal/person each day)

- [Water Use Calculator](#)
- [Water Questions and Answers](#)

The average American uses 80-100 gallons of clean water a day. How does your family compare?

Can you and your family find three ways to reduce the amount of clean water you use each day?



## Hazards in your home?

Many of the products we have at home under the sink and in cabinets are considered household hazardous waste (HHW). These products contain chemicals that can cause serious harm to us, our pets and the environment. Use this form to help find HHW in your home.

### Remember:

1. Have an adult help you with this activity
2. Wear gloves and be careful with all the containers you touch
3. Try not to inhale any fumes or have any hazardous product touch your skin

Product Type	Do you have it?	Where did you find it?	How much is there?	Product Type	Do you have it?	Where did you find it?	How much is there?
<b>Cleaners</b>	<i>Y or N</i>	<i>under sink</i>	<i>16 oz bottle</i>	<b>Lawn Care</b>			
all purpose cleaner				fertilizers			
glass cleaner				weed killer			
dishwasher soap				bug sprays			
laundry soap				rodent killer			
fabric softener				slug bait			
stain remover				<b>Car Care &amp; Paint</b>			
bleach				gasoline			
floor cleaner				oil			
carpet cleaner				antifreeze			
furniture polish				batteries			
drain opener				kerosene			
oven cleaner				oil paint			
toilet bowl cleaner				paint thinner			
silver/metal polish				glue			
air freshener				window washer fluid			
<b>Cosmetics</b>				<b>Other</b>			
perfume				pool/spa chemicals			
cologne/aftershave							
nail polish							
nail polish remover							
jewelry cleaner							
shoe polish							

Adapted from "A Recipe for Clean Water" WET in the City Curriculum and Activity Guide

1. Take any products your family does not need or that can be replaced with a safer, non-toxic alternative to a [household hazardous waste drop-off location](#).
2. Make your own green cleaners by using the recipes provided in the Household Hazardous Waste Alternatives Action Project. There are natural alternatives to many of these chemical products and most of the ingredients are common items you probably already have at home (i.e. baking soda, lemon juice, vinegar) and are safe for you, animals and the environment.



## Green Cleaner Recipes

Cleaning your home can be safe and fun when you make your own safe, non-toxic household cleaners.

### Household Hazardous Waste Alternatives

Hazardous Commercial Products	Non-Toxic (safe) Homemade Alternatives
Toilet Cleaner	Baking soda, liquid castile soap, white vinegar, tea tree oil, water
Tub and Sink Cleaner	Baking soda, liquid castile soap, white vinegar, water
Window and Mirror Cleaner	Club soda
Floor Cleaner	White distilled vinegar, water, essential oil
Drain Cleaner	Baking soda, white distilled vinegar, hot water
All-Purpose Cleaner	Liquid castile soap, white distilled vinegar, borax, purified water, essential oil

Find more recipes on [Pierce County's website](#)



#### Window and Mirror Cleaner

1. Fill a spray bottle with club soda
2. Wipe with a lint-free cloth

#### Floor Cleaner

1. Fill a spray bottle with equal amounts of white vinegar and water
2. Add 15-20 drops of essential oil (optional)
3. Shake to mix
4. Spray directly onto floor (*safe for linoleum, tile and finished wood floors*)
5. Wipe with a clean rag or mop

#### Drain Cleaner

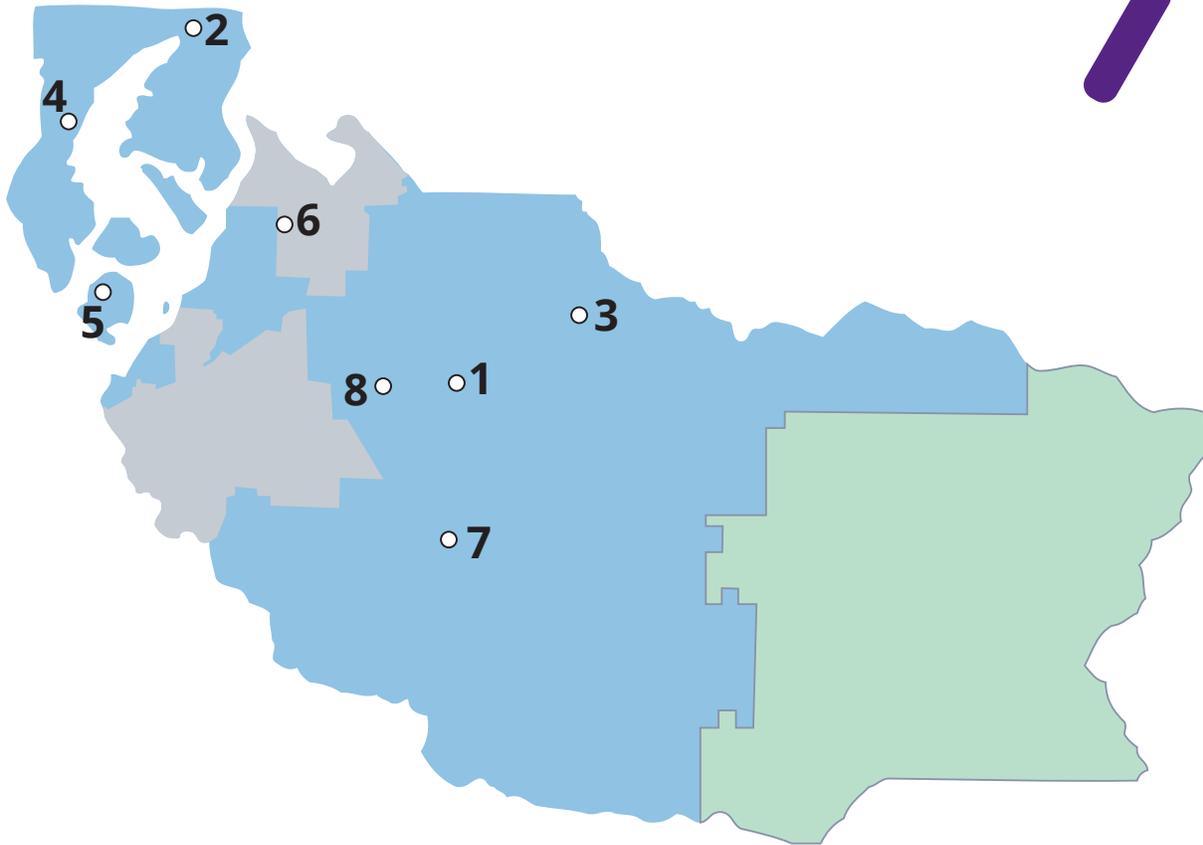
1. Pour about ½ cup of baking soda into the drain
2. Add a cup or more of white vinegar. The mixture will start to fizz.
3. Cover the drain with a stopper or plunger for a couple of minutes until the fizzing stops.
4. Rinse well with hot or boiling water. Repeat as necessary.

tsp. = teaspoon | T = tablespoon | oz. = ounces

Recipes from "Clean House, Clean Planet" by Karen Logan



## Where does your recycling and garbage go?



**1. Hidden Valley Transfer Station**

17925 Meridian E, Puyallup  
(253) 847-7555  
7 days, 8 a.m.-5:45 p.m.  
Recycling/Yard Waste/Disposal  
Compost Factory

**2. Purdy Transfer Station**

14515 54th Ave, Gig Harbor  
(253) 847-7555  
7 days, 9 a.m.-4:45 p.m.  
Recycling/Yard Waste/Disposal  
Compost facility

**3. Prairie Ridge Transfer Station**

11710 Prairie Ridge Dr E, South Prairie  
(253) 847-7555  
7 days, 9 a.m.-4:45 p.m.  
Recycling/Yard Waste/Disposal

**4. Key Center Transfer Station**

5900 block Key Peninsula Hwy, Lakebay  
(253) 847-7555  
Wed-Sun, 9 a.m.-4:45 p.m.  
Recycling/Yard Waste/Disposal

**5. Anderson Island Transfer Station**

9607 Steffensen Rd, Anderson Island  
(253) 847-7555  
Sun: 10 a.m.-2 p.m., Mon: 1-5 p.m.  
Recycling/Yard Waste/Disposal

**6. Tacoma Transfer Station\***

3510 S Mullen St, Tacoma  
(253) 591-5543  
7 days, 8 a.m.-6 p.m.  
Recycling/Yard Waste/Disposal

**7. 304th Street Landfill**

30919 Meridian St E, Graham  
(253) 847-7555  
*Public access by tour only*

**8. Pioneer Recycling Services**

4109 192nd St E, Tacoma  
Recycling sorting facility  
*No public access*

HHW=Household hazardous waste

\* The City of Tacoma and JBLM are not part of Pierce County's solid waste system

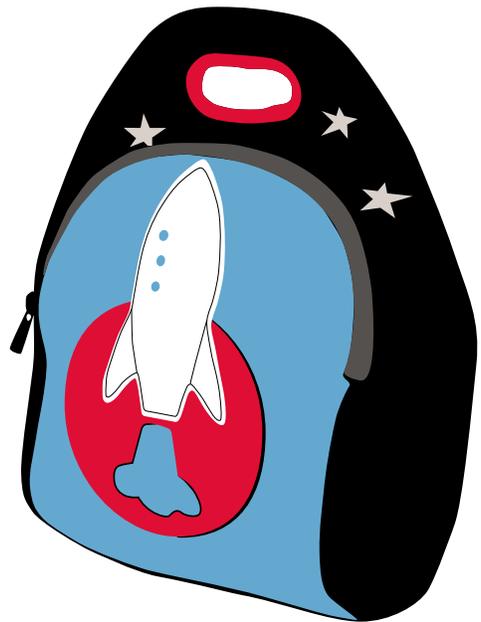
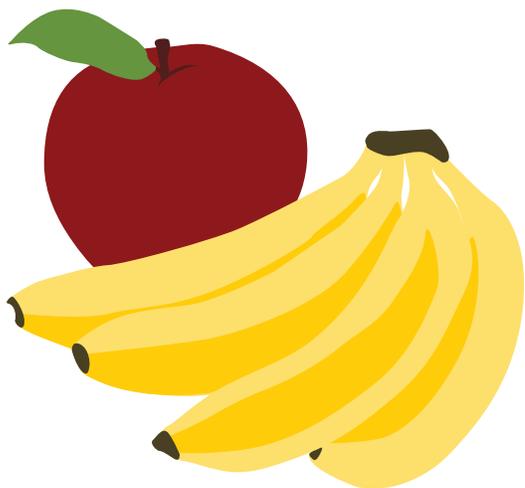
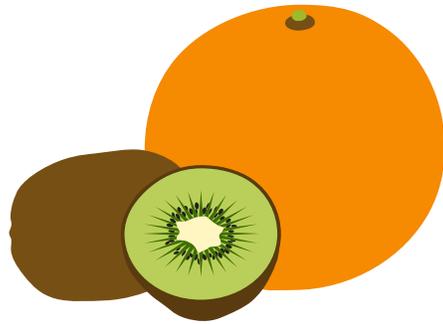
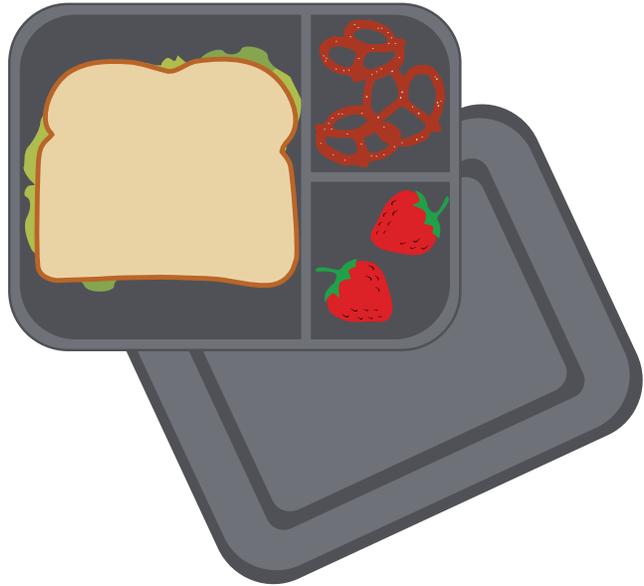


## Pack a waste-free lunch

When you're done eating lunch do you have leftover wrappers, sandwich bags, juice boxes, and paper bags? Say "goodbye" to all this garbage and learn how to pack a waste-free lunch.

### Waste-free lunch tips:

1. Carry your lunch in an insulated bag, lunch box or cloth bag
2. Pack your sandwich in a reusable food container
3. Choose fruit that comes in its own natural packaging: orange, banana, apple, kiwi
4. Ask your family to buy in bulk and pack snacks and vegetables in reusable food containers
5. Use a reusable water bottle or thermos for your drink





## Consumer survey

How much do you think about the things you buy and the companies that create them? Complete the Consumer Survey and find out how your shopping habits rank with others.

Take a look at some of the products in your home. Do you know anything about the companies that produced these products? Do you know where the product is made? What was the main reason you purchased this product? Complete the following survey to find out your consumer consciousness.

Circle your answer to the questions below. When you have answered all of the questions, add the numbers to get your total score.

How often do you:	Never	Sometimes	Often
Buy things because the advertisements are cool?	3	2	1
Notice where your clothes are made?	1	2	3
Shop around in order to find an environmentally friendly product?	1	2	3
Buy things you like even when you already have a similar item at home?	3	2	1
Consider whether you really need something before you buy it?	1	2	3
Reuse things you have instead of disposing of them and buying new things?	1	2	3
Consider what goes into making something you have bought and the waste it produces?	1	2	3
Read consumer information articles about the quality and durability of products before you buy them?	1	2	3
Buy the cheapest products regardless of durability?	3	2	1
Think about what happens to a product or package after you use it?	1	2	3
Buy single-use items (disposable batteries, juice boxes, sandwich bags) even though longer-lasting alternatives are available?	3	2	1
Avoid single-serving convenience foods when less-packaged snacks are available?	1	2	3
Spend money to repair an item when you could get a new one for nearly the same price?	1	2	3
Express concerns about the need to use less wasteful products or other waste reducing suggestions?	1	2	3
Encourage family and friends to consider the environmental impacts of their purchases?	1	2	3

Total score: \_\_\_\_\_

## Consumer survey (cont.):

### If your score was:

#### **25 or less**

Like most American citizens, you are probably contributing your full share of garbage to our rapidly diminishing landfill space, including many reusable or recoverable materials.

#### **Between 26 and 39**

You are doing some reducing, reusing, and/or recycling. If these were practiced consistently by the majority of the population we could reduce the increasing amounts of waste.

#### **40 or more**

You're an environmentally conscious consumer, and it's clear that you take the Earth into consideration when making your purchases.



## Home waste assessment

Take a look at what is thrown away in your home each day. Fill out the chart on the next page and go over the results with your family.

Use Pierce County's [Recycling Reminders](#) to help you sort your recycling.

Be extra careful with any items that might be considered [household hazardous waste](#).

### Example:

Day of the week: Monday Tuesday Wednesday Thursday Friday Saturday Sunday

What was in your trash?	Quantity?	Can you reuse, recycle, or compost it?	Are there ways to reduce waste?
Chip bags (single serving)	8	No	Buy big bags
Moldy pizza	1 slice	No	Eat leftovers before they go bad
Orange peels	6	Compost	Start worm composting at home
Yogurt tub	1	Recycle	Rinse and put in recycling bin
Napkins	5	No	Could use cloth napkins instead
Plastic bags	2	Reuse	Can also recycle at the grocery store

### Questions:

1. Did you find things in your trash that can be recycled? If yes, what items?
2. Did you find any household hazardous waste? If yes, be careful and have an adult take it to the closest drop-off site.
3. How can you and your family reduce the amount of stuff you throw away?
4. Now take a look in your recycling bin. Are there items that don't belong? Can any items be recycled at a transfer station or other drop-off location?

## Home waste assessment (cont.):

Day of the week: Monday Tuesday Wednesday Thursday Friday Saturday Sunday

What was in your trash?	Quantity?	Can you reuse, recycle, or compost it?	Are there ways to reduce waste?

Day of the week: Monday Tuesday Wednesday Thursday Friday Saturday Sunday

What was in your trash?	Quantity?	Can you reuse, recycle, or compost it?	Are there ways to reduce waste?

Day of the week: Monday Tuesday Wednesday Thursday Friday Saturday Sunday

What was in your trash?	Quantity?	Can you reuse, recycle, or compost it?	Are there ways to reduce waste?



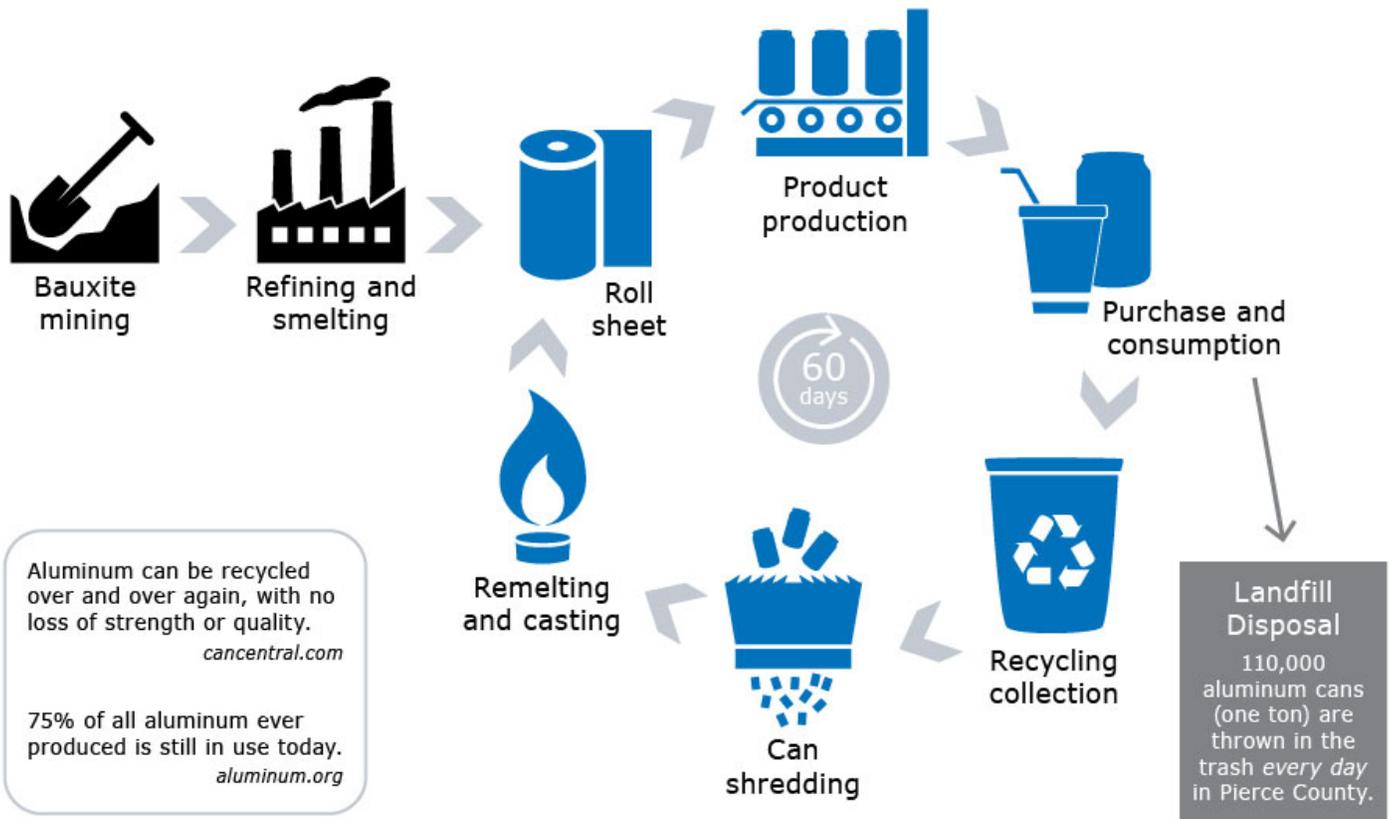
## Life cycle assessment

This is the process of researching a product from start to finish. It means looking at all the resources (materials, water, and energy) used to make a product, any pollutants or hazardous wastes produced, and the impact of the product's disposal at the end of its life.

See the example below. Then, select a product and do your own life cycle assessment. When finished, what did you learn about this product that you didn't already know? Are there things you can do to help save energy or resources in the life cycle of this product?

More information about product life cycles can be found in the [EPA Curriculum on Waste and Products \(pgs. 25-44\)](#) and at the [Story of Stuff website](#).

### Life Cycle of an Aluminum Can





## Packaging Profile

What can you learn when you look closely at how your favorite things are packaged? Select a recently purchased item, still in its packaging, and use the packaging profile form to complete this activity.

Product Name: \_\_\_\_\_

Type of Product: \_\_\_\_\_

Where is it manufactured? \_\_\_\_\_

How far did it travel to get to you? \_\_\_\_\_

### Observations

1. Describe all parts of the packaging: *Example: plastic bottle, plastic screw cap, paper wrapper*
2. How much is the packaging for protecting the product or to advertise?
3. What natural resources make up the packaging?  
(How much of it is paper, plastic, glass, metal or other materials?)
4. Is the packaging made of recycled materials? Is the product made from recycled materials?
5. Is the packaging recyclable in Pierce County? Is the product?
6. What purpose does each piece of packaging serve? (portion size, health, safety, freshness, anti-theft, other reasons?) Is all the packaging necessary?
7. Are there ways for this item to be refilled or reused?
8. After the product is used, what is thrown away? What is recycled? Is any part of it reusable?

**Something to think about:** This is just one item. What about packaging of other things you use everyday? How much of it is truly necessary? Can you think of ways to redesign the packaging for an item? List your ideas and draw a picture.

Adapted from Project Learning Tree: Exploring Environmental Issues—Municipal Solid Waste



## "Your trash, my treasure!"

Learn to "upcycle" by making something fun and useable from items you might usually throw away. Find more ideas online at [piercecountywa.org/upcycle](http://piercecountywa.org/upcycle)

### Cereal Box Journals

#### Materials:

- Empty box (cereal, cracker, cookie, etc.)
- Hole punch
- Notebook paper
- String, yarn/ribbon or twist ties, rubber bands and a stick (for binding the pages and cover)

#### Directions

1. Decide what size notebook you would like to make
2. Cut the front and back covers out of your box
3. Punch holes in the of each cardboard piece.
4. Put notebook paper between the two cereal box cut outs.
5. Use ribbon, string, or yarn to tie the covers and notebook paper together.



### Lid Art

#### Materials:

- Lids from empty containers
- Glue
- Paper

#### Directions

1. Collect and save lids from items that have been thrown away or recycled.
2. Use the lids to create your own work of art!
3. Lids can be glued to paper or stacked into a structure or sculpture.

## "Your trash, my treasure!" (cont.):

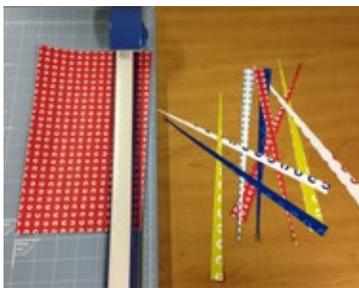
### Paper Beads

#### Materials:

- Sheets of paper (magazines, newspapers, construction paper, etc.)
- Scissors or a paper cutter
- Small round dowel (pencil, lollipop stick, bamboo skewer)
- Glue
- String (embroidery floss, fishing line, elastic, etc.)



#### Directions



Cut the paper into long triangles. Your beads will be the size of the base of your triangle.



Wrap the base of the triangle around a pencil, skewer, etc. and continue to roll the rest of the triangle around the pencil, leaving 1 inch for glue.



Squeeze a little bit of glue on the last inch of the triangle, and finish rolling the triangle around the pencil.



Wipe any glue that seeps out from between the rolls of the triangle over the rest of the bead.



When the glue has dried, slide the bead off of the pencil.

Slide the beads onto string and tie the ends together.



### Pencil Holder

#### Materials:

- Empty tin can
- Paint, cloth, paper, stickers, embellishments like sequins, rhinestones, etc.

#### Directions

1. Remove the label and wash an empty tin can.
2. Decorate your can.
3. Add your favorite pencils, pens, markers, or crayons.