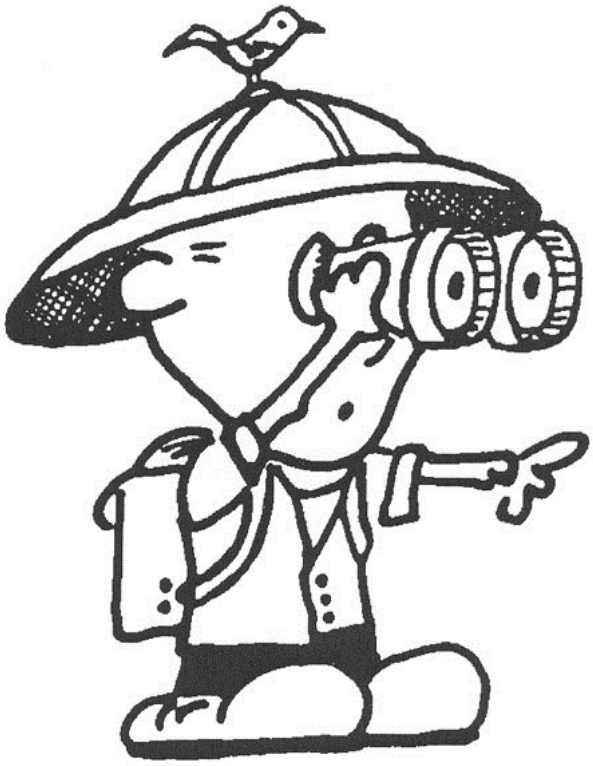
Wilbur D. May Arboretum & Botanical Garden

WILBUR'S EXPLORER GUIDE



ACTIVITIES FOR FIFTH GRADE

Table of Contents

A Note from a Horticulturist

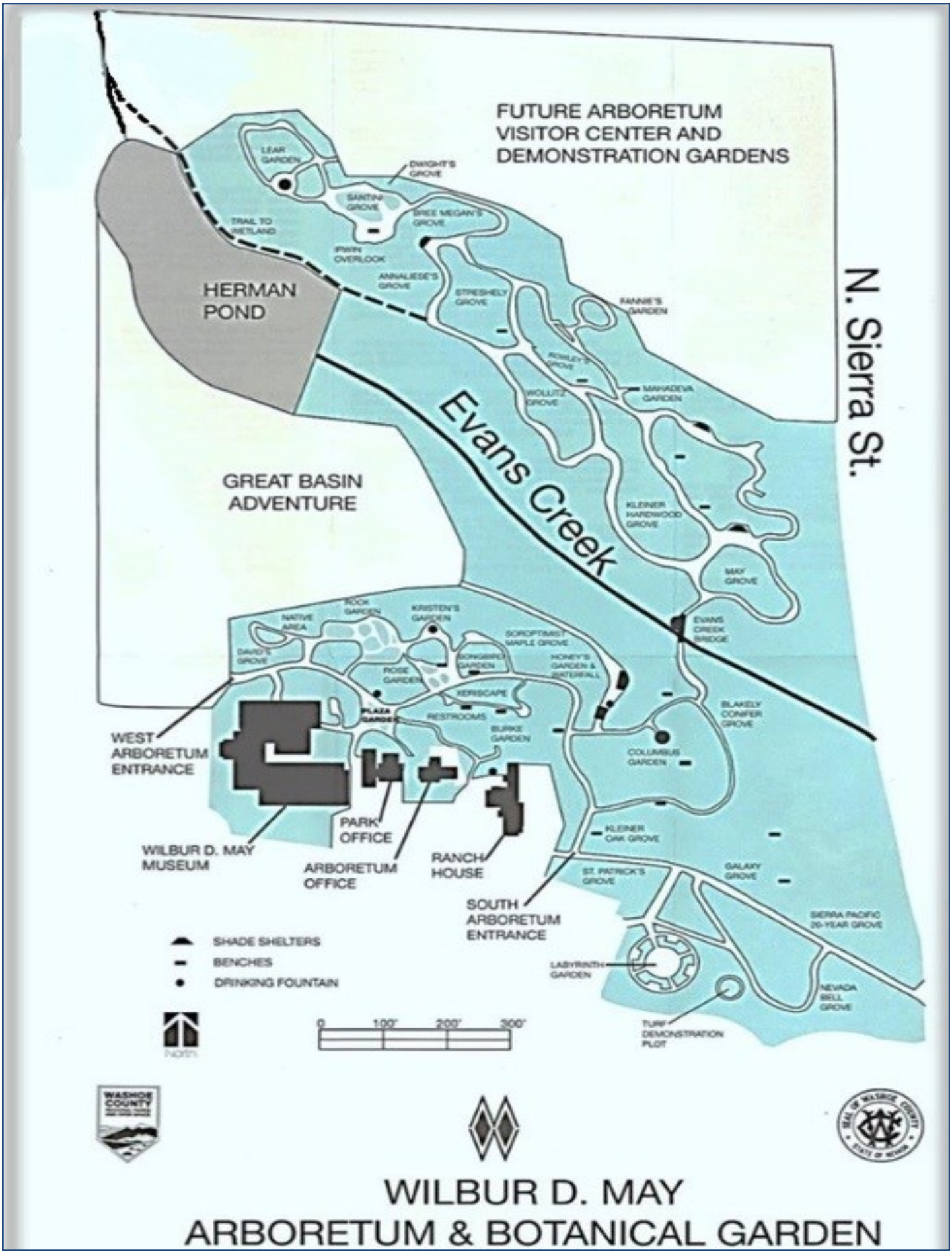
"The May Arboretum like many public gardens are an expression of the local cultural heritage and social norm. The May Arboretum is multifaceted and serves our community of all ages throughout the season. It is an outdoor environment to teach children and adults about our natural world. It is also a place for solace, reflection and peace. It provides the beleaguered urbanite an environment to surrender their busy schedule under an oak or willow tree in the wetlands or any garden or grove. Walking through the gardens rejuvenates the soul and offers a time and place to have a transcendent moment, unlike a busy parks or trails. The May Arboretum provides all of this and many more intangibles, and what is so unique about it, it is easily accessible.

Working here at the Arboretum is a gift and an honor because not every town has one. It is a pleasure working here because the gardens and groves were built with donated funds and by passionate people. I enjoy coming to work to experience and feel the dynamics of the seasons. I appreciate the diversity of my horticulture vocation; from the scientific aspect of keeping accurate botanical plants records and maps, learning about new plant varieties and botanical knowledge, managing a greenhouse, writing horticulture articles, planting and designing new gardens, educating and teaching the public, meeting with donors and most of all provide direction to this distinctive facility. I enjoy working with volunteers and the flexibility to escape into gardens for a walk or work with staff. It is the most rewarding job I have had in my 33 year horticulture career. But what is most gratifying are the frequent public comments I receive, e.g., "this is such a beautiful place, what a treasure and jewel it is".

-Bill Carlos, Horticulturist

Wilbur D. May Arboretum & Botanical Garden

2017



WILBUR D. MAY
ARBORETUM & BOTANICAL GARDEN

Who was Wilbur D. May?

Wilbur D. May was an explorer! He loved to travel to new places and learn about the plants, animals, and people. Wilbur visited far off regions like Africa, South America, and Asia. He often met with the local people and traded for artifacts.

Wilbur made over 40 trips around the world! He learned how to fly, became an artist, and even wrote a song about pizza! In 1936, Wilbur moved to Reno, Nevada where he bread horses and cattle. Wilbur loved education and sharing with the community. Toward the end of his life, his family worked to create a museum to display Wilbur's findings. They began working with Ed Kleiner to create an Arboretum & Botanical Garden too. In 1986 the Wilbur D. May Arboretum & Botanical Garden opened to the public.

Wilbur D. May
ARBORETUM

What is an Arboretum?

Like many people you may be wondering, what is an Arboretum? Similar to a Botanical Garden, an Arboretum is a collection of plants.

However, Arboretums are different because the collection is trees.

Think of an Arboretum as a tree zoo!

Arboretums are created for scientific research, education, and a place to explore.

Who takes care of the Wilbur D. May Arboretum?

The Wilbur D. May Arboretum is cared for by dedicated volunteers, maintenance workers, and horticulturists. A horticulturist is someone who takes care of plants and makes sure they grow. This team works very hard together to make sure the trees and plants are doing their best!

Time to put on your backpack!

Now that you know about Wilbur D. May and what an Arboretum is, grab your backpack and explore! The rest of this guide includes activities for grades kindergarten through fifth. Find your grade, challenge yourself, and discover the adventure that is awaiting you at the Wilbur D. May Arboretum and Botanical Garden!

Suggestions for Families

There are lots of different options in the backpack for exploration.

- You can create your own Arboretum adventure by using the bird guide, tree guide, magnifying glass, and tape measure while exploring the gardens.
- Use the tape measure to measure tree trunks, and compare to your height!
- Follow the activities in this guide that are appropriate for your child's age.
- Reading the Introduction to each activity will give background information and set you and your explorer up for success!
- All the activities can be modified to be more difficult or less difficult.
- Take your time when walking through the Arboretum and keep low voices to increase your chances of seeing wildlife.
- If you have different aged children, suggest the older children help the younger ones with their activities.
- Ask open ended questions such as:

What do you see?

What do you feel?

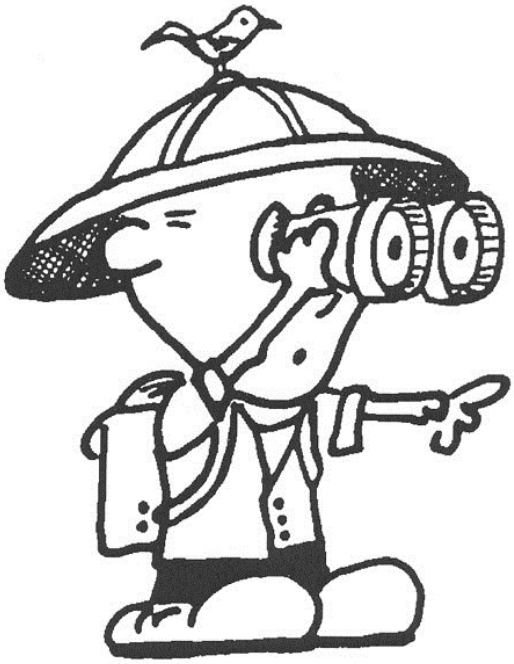
What does it remind you of?

What do you wonder?

Suggestions for Teachers

Wilbur's Explorer Pack is an opportunity to immerse students in the outdoor classroom under your direction. Each pack has the supplies needed for an enriching field trip such as a bird guide, tree guide, measuring tape, magnifying glass, along with the curriculum in this guide. All of the following activities have been designed around Next Generation Science Standards . The standards corresponding to each activity can be found on page 18. However, you don't have to follow this guide.

When deciding on outdoor classroom activities, be inspired. Give guidelines, and follow the curiosity and wonder of students. Asking lots of open ended questions can encourage discussion and exploration. With diverse gardens, ecosystems, and accessibility, the Wilbur D. May Arboretum is a beacon for education of all ages.

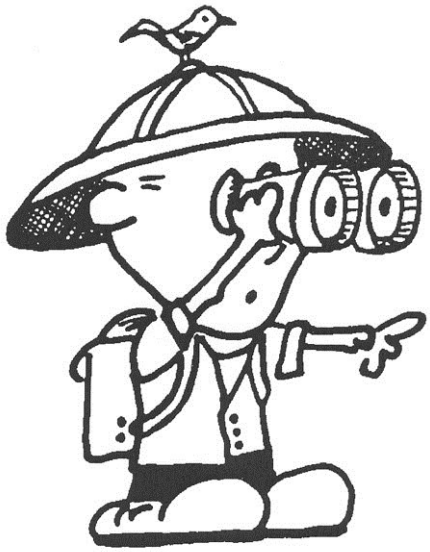


FIFTH GRADE

-A PLANT'S FAVORITE RECIPE

-GRASS, GEESE, COYOTES, OH MY!

-HIDDEN HEROES



A Plant's Favorite Recipe

Suggested Gardens: Native Area, Rock Garden.

Vocabulary: Dendrochronology.

Introduction: Trees are among some of the largest and oldest living organisms in the world. The Bristlecone Pine tree is the oldest living multi-celled organism in the world, with some trees being over 5000 years old. (We have a Bristlecone in the Arboretum but it's only about 30 years old.) The Giant Sequoia tree is the largest living thing on the planet by volume; the tree, General Sherman, is estimated to weigh 2100 tons. (We have Giant Sequoia in Arboretum and all around town!) Have you ever wondered what a trees needs to grow so large or live so many years?

The *Tree Recip*e section is how a tree follows the "recipe" each year to add a new ring of growth to the tree's trunk. The amount of water and sunlight affect the size of the tree ring added each year. A tree ring is made up of both a light and dark section; one section grows during the spring (light section) and the other section grows in the fall (dark section).

Activity: Plant Recipe Equation and Tree Rings

1. Turn to the page titled "Equation" follow the directions.
2. Visit the Native Area and find the tree stump.
3. Complete the page titled "Tree Ring".

Thinking Questions:

1. What do you notice about the tree rings?
2. What do you wonder about the tree rings?

A Plant's Favorite Recipe: Equation

Sun + CO_2 + H_2O = sugar + O_2

What plants need to survive, like ingredients for a meal.

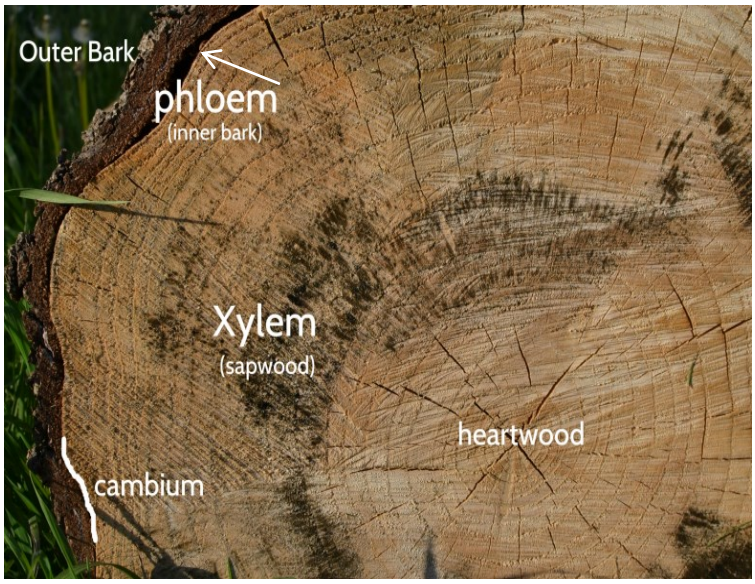
What the plant produces, like a meal.

Where do you think these ingredients come from?

The Tree's Recipe

Trees use the 'plant recipe' every year to add new rings to their trunk.

Each tree ring is made up of a light and dark section. The light color grows in the spring, and the dark color grows in late summer. Together the dark and light section make up a year.
The size of the tree rings indicates years of droughts or good rain. Large rings are indicators of wet years, while small rings are dry years.



The middle of the tree ring is called the **heartwood** and considered year zero..

A Plant's Favorite Recipe: Rings

Trees add girth to their trunk by taking in water and air, and creating sugars. Their **xylem** moves water up from their roots to their leaves, while the **phloem** moves sugar (sap) from the leaves down to the roots. The tree size is dependent on the amount of water and light received by the tree.

Examine the tree ring in your backpack..

How old is the tree? (Count the number of rings.)

What years did this tree get the least amount of water?

Why is the light section of the tree ring larger than the dark section of the ring? (Discuss the materials plants need to grow and the time of year.)

Do you think you could grow a plant without soil? Explain.

Grass, Geese, Coyotes, oh my!

Suggested Gardens: Herman Pond, lawn in front of May Museum.

Vocabulary: Energy Pyramid, food web, producer, consumer, food chain, keystone species.

Introduction: When walking through the Arboretum, no matter what the season, there is always one animal that crosses your path. It can be waddling through the grass, floating on the water, or flapping its wings through the sky; you are bound to see a Canada goose on your visit to the Arboretum. With so many geese around they have become important members in the Arboretum food chain. Canada geese are herbivores eating grasses and aquatic plants making them a level one consumer. They depend on producers to make a food source for them; however, they are not at the top of their food chain. Animals like coyotes, hawks, and mountain lions will happily enjoy geese for dinner. Let's watch some geese to make our own observations about these birds.

Activity: Gaggle of Geese

1. Observe gaggle of geese from far away (they will hiss and flap if you get too close).
2. Turn to the page titled "Food Chain" and follow the directions.
3. Turn to the page titled "Pyramid" and follow the directions.

Thinking Questions:

1. What are the geese eating?
2. Are there any predators near by?
3. What type of animal would eat a goose?
4. In your own words, what is a food web?

Grass, Geese, Coyotes, oh my!: The Food Chain

Sun

Grass

Goose

Coyote

What member of the food chain adds energy for others to use?

Plants, like grass, are called producers because they make their own food. What is the process called that turns the sun's energy into plant food?

Do you know what geese or coyotes are called if they can not produce their own food?

Grass, Geese, Coyotes, oh my!: The Food Pyramid

Label the energy pyramid below with the members from the geese food chain. The bottom member of the pyramid is the most important with all the members depending on it for energy.

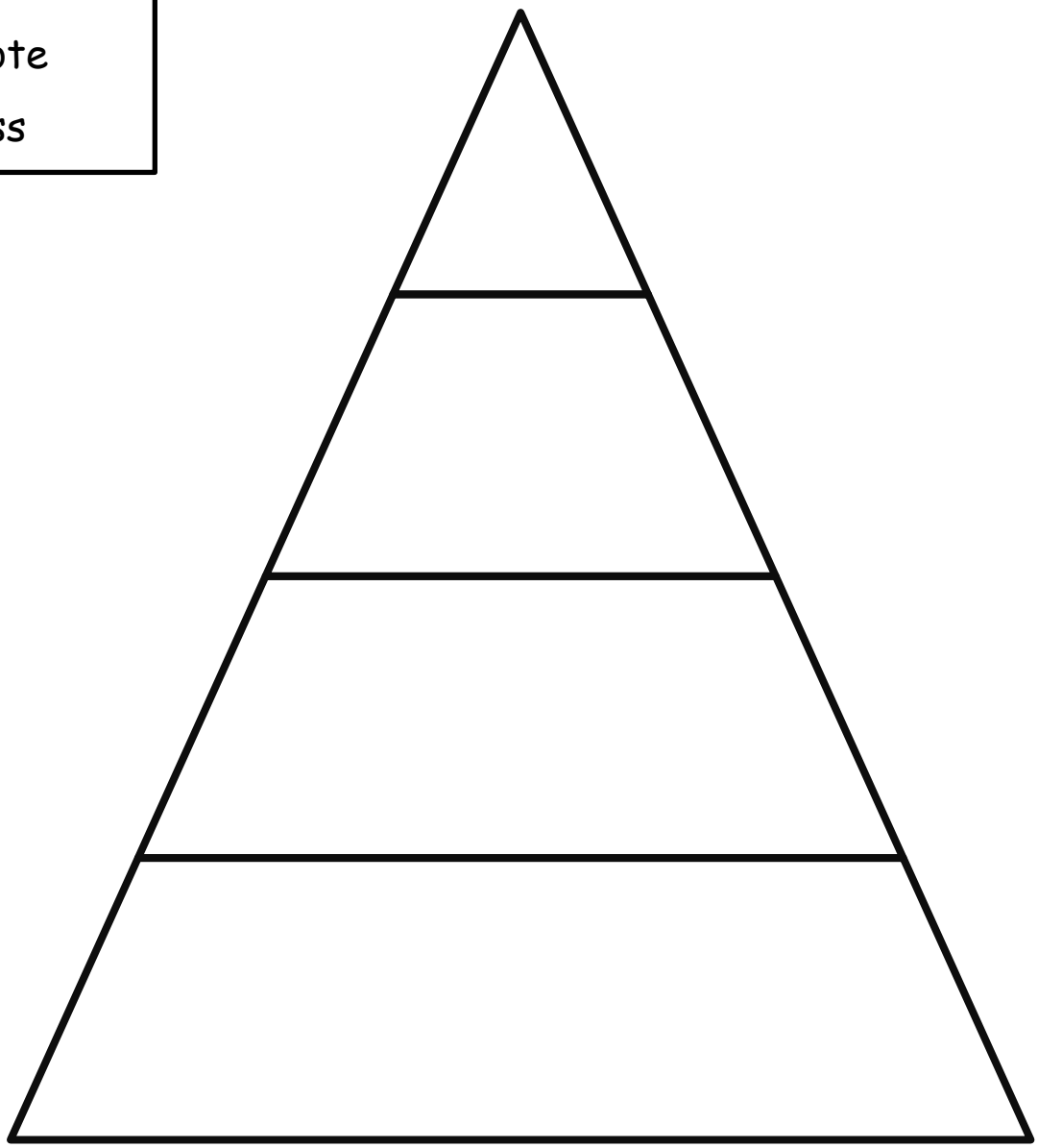
Word Bank

Goose

Sun

Coyote

Grass



Hidden Heroes

Suggested Gardens: Songbird Garden, Xeriscape, Kristen's Garden, Burke Garden, Klenier Grove.

Vocabulary: Decomposers, nutrient cycle, ecosystem.

Introduction: The movement of matter, energy, and nutrients are critical for all living organisms to survive, but have you ever wondered how this cycle keeps moving? The reason these cycles keep moving are due to a group that many people over look when they think of living organism? Do you know what this group is? (Decomposers!)

"Decomposers are living organisms that break down other living and non-living things into smaller parts. When plants and animals die, they become food for these decomposers. Decomposers can recycle dead plants and animals into chemical nutrients such as carbon and nitrogen that are released back into the soil, air and water as food for living plants and animals. So, decomposers can recycle dead plants and animals and help keep the flow of nutrients available in the environment."- Regents of the University of Colorado

Without the millions of decomposers we have in the world dead material would never decay and be returned to the earth. The nitrogen and carbon your body requires would remain in the atmosphere and not in the plants you eat.

Activity: Find the Hidden Heroes!

1. Explore the gardens of the Arboretum and see if you can find decomposers.
2. Decomposers live under leaves, in the soil, and dark moist places.
3. Turn to the page titled "What I Found" and follow the directions.

Hidden Heroes

Thinking Questions:

- Without the millions of decomposers we have in the world dead material would never decay and be returned to the earth. The nitrogen and carbon your body requires would remain in the atmosphere and not in the plants you eat.

1. What kinds of animals do you see?
2. What does decomposing material smell like?
3. What does the material feel like?

Examples of Decomposers

Mold on an orange

Mushrooms

Earthworm

Explore the Arboretum. How many decomposers can you find? Draw them below.

Next Generation Science Standards

Fifth Grade

5-LS1-1	From Molecules to Organisms: Structures and Processes. Support an argument that plants get the materials they need for growth chiefly from air and water.
5-PS3-1	Energy. Use models to describe that energy in animals' food was once energy from the sun.
5-LS2-1	Ecosystems: Interactions, Energy, and Dynamics. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

Acknowledgements

- Wilbur D. May Arboretum & Botanical Garden
- Backpacks made possible by generous donations from REI Outfitters
- Amanda Royal, AmeriCorps Arboretum Educator
- Bill Carlos, Horticulturist
- Susan Lester, Volunteer
- Kass Kirkham, Volunteer
- Bev Treadway, Volunteer
- Martha Stewart, Volunteer
- Danielle Ornelas, AmeriCorps Arboretum Educator
- Washoe County School District