

*Wilbur D. May Arboretum & Botanical Garden*

# **WILBUR'S EXPLORER GUIDE**



## **ACTIVITIES FOR SECOND GRADE**

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## *A Note from a Horticulturist*

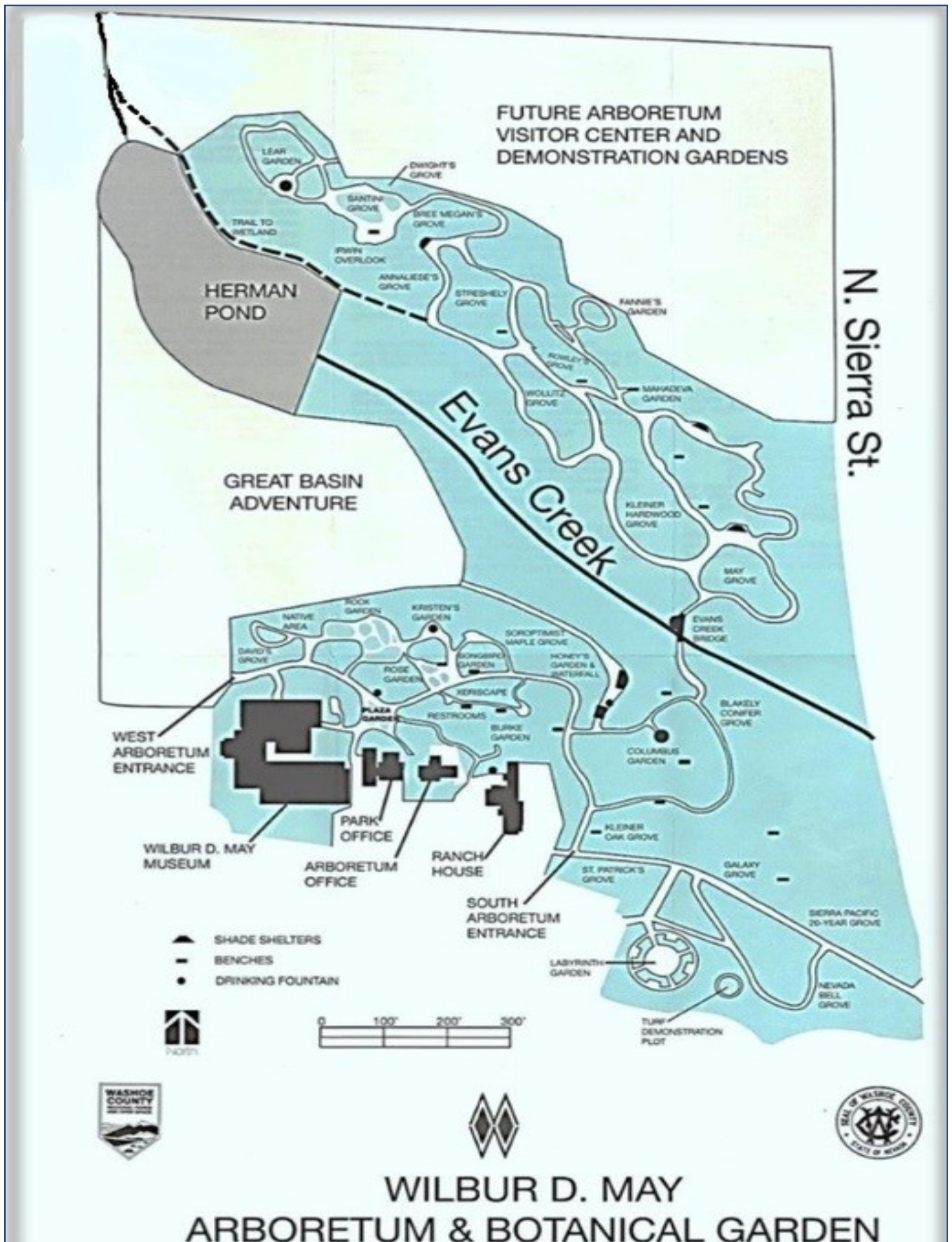
*“The May Arboretum like many public gardens are an expression of the local cultural heritage and social norm. The May Arboretum is multifaceted and serves our community of all ages throughout the season. It is an outdoor environment to teach children and adults about our natural world. It is also a 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*



# 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 bred 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.





# 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 21. 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.





# **SECOND GRADE**

**-SEED DISPERSAL**

**-THE DIVERSITY OF  
LIFE**

**-THE POWER OF WIND  
AND WATER**



## **Seed Dispersal**

**Suggested Gardens:** Kleiner Oak Grove, Rock Garden, Native Area, David's Grove, Labyrinth Garden.

**Vocabulary:** Arboretum, dispersal, pollinate.

**Introduction:** What makes you like certain plants? Is it how they smell, how they look, or how they taste? When you eat fruit or get grass seeds on your pants, you are helping to disperse seeds. This is one way plants move their seeds; they attract or stick to animals. Think of some of your favorite fruits like apples, berries, watermelon, and avocado. In the center of these fruits is a seed. You usually don't eat these seeds, but you help move the seeds around. What is the difference between a fruit and a vegetable? (A fruit has a seed on the inside while a vegetable doesn't. Tomatoes and cucumbers are a fruit!)

Have you ever walked through grass and gotten foxtails or burrs on your pants? If you have, you have helped a plant to disperse its seeds. Why would a plant want to move its seeds? (Ideas: To find a better habitat, prevent mating with parents, or create a larger population).

Seeds come in a wide variety of shapes and sizes to be dispersed in a variety of ways. Besides animals, seeds can be dispersed by wind, water, and gravity.

### **Activity: Seed Scavenger Hunt**

1. Explore gardens in the Arboretum.
2. Find 3-5 different Seeds.
3. Turn to the page titled Seed Dispersal and follow the directions.
4. Turn to the page titled Seed Dispersal: Coyotes and follow the directions.

## Seed Dispersal

### Thinking Questions:

1. Do seeds look like what they are going to grow into?
2. What do the seeds feel like?
3. Why are some seeds harder to find than others?
4. Why do plants want their seeds dispersed?
5. What's your favorite seed? Why?

Can you find any seeds in the Arboretum? Who do you think helps to disperse them? Look for all types of fruits, pods, and seeds.

Match the seed to who you think helps disperse it.

### Seeds



Foxtail Grass



Cedar Berries



Pinyon Pine nuts

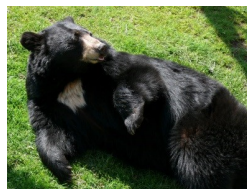


Blackberry

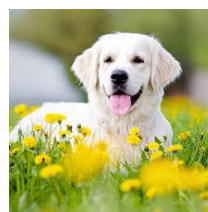
### Disperser



Pinyon Jay



Black Bear



Dog



Cedar Waxwing

## Seed Dispersal: Coyote

Now imagine a place where only coyotes can disperse seeds. Use the facts below to create and draw a seed that will be dispersed by coyotes. Explain how your design attracts the animal. Share your design with others.

### Coyotes

- Are not picky eaters (eat both plants and animals).
- Hunt for food at night.
- Have a strong sense of smell.
- Can be up to 2 ft. tall.
- Have thick fur to keep them warm.



## **The Diversity of Life**

**Suggested Gardens:** Evans Creek Bridge, Honey's Garden, Rock Garden, Native Plant Area, Songbird Garden, Plaza Garden.

**Vocabulary:** Biodiversity, ecosystem, environment

**Introduction:** The Arboretum has many different gardens that represent different ecosystems, each with unique plants and animals. The dictionary defines an ecosystem as "a community of interacting plants and animals with its physical environment." But what do you think of when you hear the word ecosystem? Do you think of a certain place? Do you think of an area with a lot of plants and animals? There are many different types of ecosystems: a desert ecosystem will look different from a forest ecosystem. On the surface, it may seem like some ecosystems do not have a lot in common with each other, but they all share one thing. Healthy ecosystems are bio-diverse - they have a lot of different kinds of life living in them.

### **Thinking Questions:**

1. What is an ecosystem? What makes an ecosystem?
2. What is the difference between living, and non-living things?
3. What is the difference between a wet and dry ecosystem?
4. If you visited the Arboretum at night, would you find more animals? What kinds?

### **Activity: Is it an Ecosystem? & Ecosystem Scavenger Hunt.**

1. Turn to page "The Diversity of Life: Is it an Ecosystem?" follow the directions.
2. Turn to the page titled "The Diversity of Life: Ecosystem Scavenger Hunt" and follow the directions.

## The Diversity of Life: Is it an Ecosystem?

Visit Honey's Garden and complete the activity below.

What is a habitat?  
Circle what you think a habitat is.  
'X' through what is not a habitat.



Pronghorn Antelope



Desert



Wetland






















Butterfly

In your own words, what is a habitat?

## The Diversity of Life: Ecosystem Scavenger Hunt

Today you are going to explore the habitats of the Arboretum.  
Check the boxes of the living things you see in the gardens. Use  
the blank spaces to add  
living things that are not on the list.

Amphibians	Insects	Mammals	Plants
<input type="checkbox"/> Frog 	<input type="checkbox"/> Butterfly 	<input type="checkbox"/> Human 	<input type="checkbox"/> Flower 
<input type="checkbox"/> _____	<input type="checkbox"/> Fly 	<input type="checkbox"/> Mouse 	<input type="checkbox"/> Grass 
<input type="checkbox"/> _____	<input type="checkbox"/> Bee 	<input type="checkbox"/> Rabbit 	<input type="checkbox"/> Sagebrush 
Reptiles	<input type="checkbox"/> Moth 	<input type="checkbox"/> Squirrel 	<input type="checkbox"/> Pine Tree 
<input type="checkbox"/> Snake 	<input type="checkbox"/> Ladybug 	Birds	<input type="checkbox"/> _____
<input type="checkbox"/> Lizard 	<input type="checkbox"/> _____	<input type="checkbox"/> Hawk 	<input type="checkbox"/> _____
<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> Blue Jay 	<input type="checkbox"/> _____
		<input type="checkbox"/> Robin 	
		<input type="checkbox"/> _____	



## The Power of Wind and Water

**Suggested Gardens:** Herman Pond, Evans Creek Bridge, Wollitz Grove, Kleiner Hardwood Grove

**Vocabulary:** Erosion

**Introduction:** National Geographic defines erosion as “the act in which earth (soil/rock) is worn away, often by water, wind, or ice.” In Reno, the main causes of erosion are wind and water. Years of erosion have shaped the mountains, lakes, and rivers you see today, with weather as the driving force. Erosion is a natural process, but it must be carefully managed when the safety of people and buildings are at risk.

The Arboretum is near downtown and surrounded by major roads like North McCarran Blvd. and Sierra St., so the ability to manage excess water and slow strong winds is important. The design methods here at the Arboretum help to slow water and allow greater absorption of water into the soil, which reduces the risk of flooding. Herman Pond and Evans Creek provide a place for water to be held and to safely travel down into the Truckee River.

Evans Creek offers a natural way to control excess water; the creek can hold water from storms, but only up to a certain amount. In large storm events, the safety of those that live around the Arboretum must be protected. To ensure safety, gardens must be designed to slow or prevent wind or water from causing damage. The four garden designs to look at today are wood chips, dams, terracing/steps, and tree windbreaks. There are examples of these throughout the Arboretum.

## The Power of Wind and Water

### Activity: Erosion Discovery

1. Turn to the page "The Power of Wind and Water: Erosion" and follow the directions.
2. Explore the Arboretum and see what steps the Arboretum has taken to prevent erosion.
3. Create your own design solution to erosion caused by wind or water.

### Thinking Questions:

**Wood chips**: slow water as it flows across the ground by adding an extra layer for the water to move through. Wood chips are also absorbent like a sponge, soaking up excess water. Placing wood chips on the ground prevents soil from being washed away and allows the ground to absorb more water.

**Dam**: blocks the flow of water, reduces floods, and creates an area capable of holding large amounts of water. These areas of water can then provide a habitat for water-loving plants and animals, for example, Herman Pond.

**Windbreaks**: help to slow strong winds that can damage plants and buildings. A wind break is a row of trees or tall bushes usually on the border of the garden one is trying to protect. Use math problem to help students understand how wind speed is reduced. Examples of this are the Sequoias in Kristen's garden.

**Terracing/Steps**: are levels cut into hillsides. The use of steps slows the movement of water and prevents erosion. Have students think about how fast they can run down a hill versus running down stairs. Terracing slows water down just like stairs slow students down.

## The Power of Wind and Water: Erosion

How does the Arboretum slow the large amounts of wind and water to prevent erosion?

Investigate Garden Design Solutions.  
Circle the designs you see in the Arboretum:

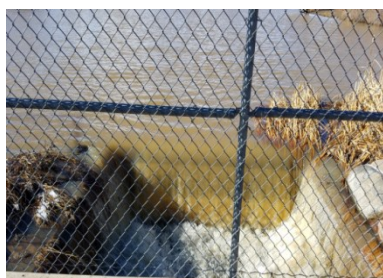
Wood Chips



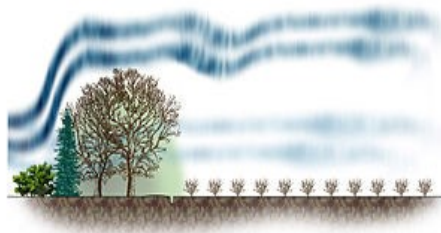
Steps (Terracing)



Dam



Lines of trees (wind breaks)



Rocks



Pipe Diversions



## The Power of Wind and Water: Erosion

Which garden design worked best?

Circle your answer below

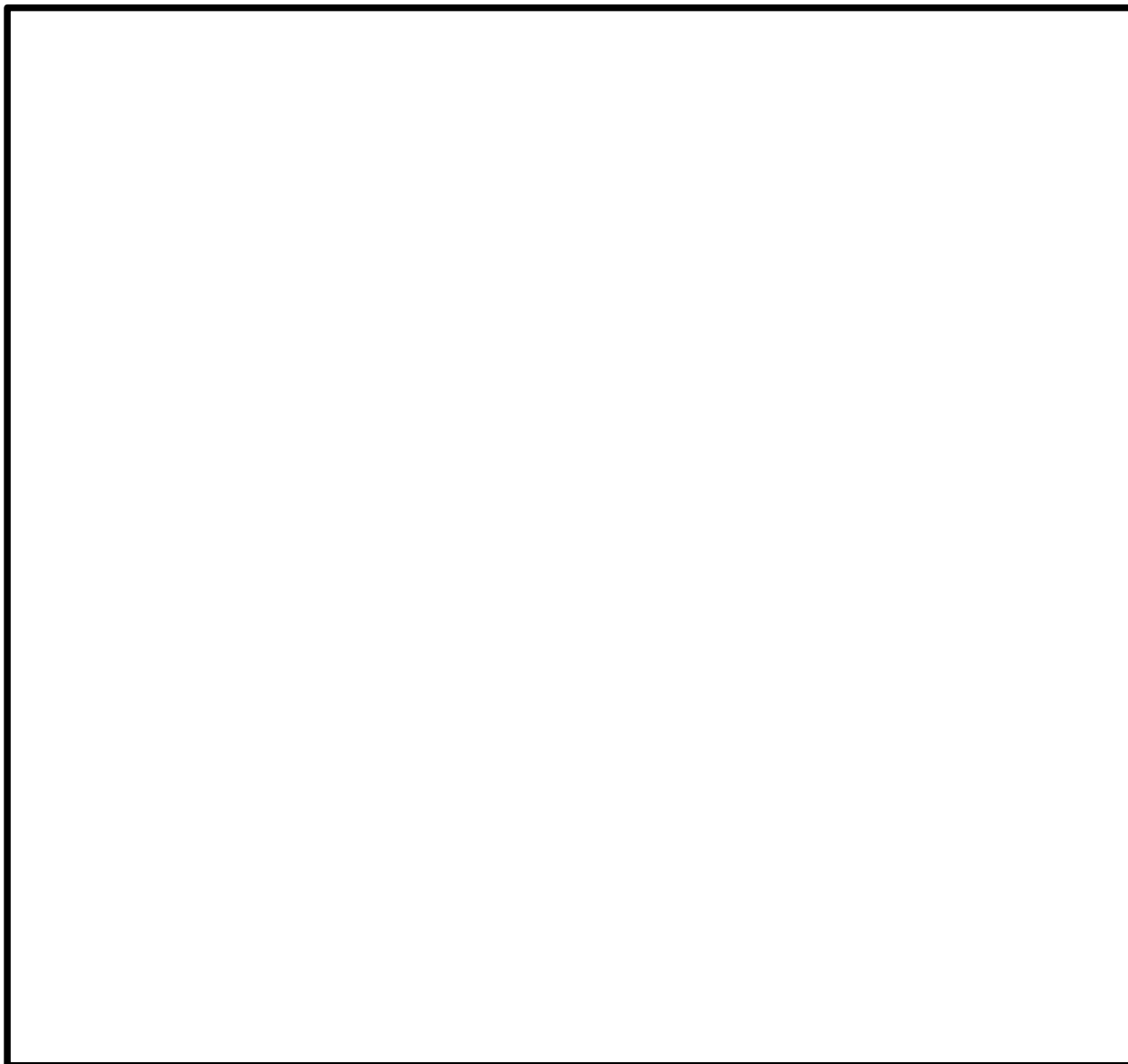
1. Wood chips
2. Dam
3. Steps
4. Rocks
5. Line of trees
6. Pipe Diversion
7. All of the above together

Why did you chose that garden design?

## **The Power of Wind and Water: Erosion**

What is your design solution?

My design controls: Wind, Water, or Both

A large, empty rectangular box with a black border, intended for a student to draw or write their design solution and controls.

## Next Generation Science Standards

### Second Grade

2-LS2-2	Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.
2-LS4-1	Make observations of plants and animals to compare the diversity of life in different habitats.
2-ESS2-1	Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.

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