



**Environmental
Education
Programs**



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About Us



In 1971, the Loyalhanna Watershed Association (LWA) was founded as a non-profit 501(c)(3) to address the various pollution impacts and preserve natural areas throughout the Loyalhanna Creek Watershed. One of the oldest watershed groups in PA, LWA's primary objectives remain to protect and improve our area waterways, conserve land parcels and riparian corridors as green open space, provide educational opportunities to students of all ages and backgrounds, and foster a watershed stewardship ethic in the communities we serve. The LWA is headquartered at the Watershed Farm, a historic 123-acre farm property located in Ligonier, PA.

Our Facilities

The Watershed Farm features:

- a modern classroom (seating for 80)
- a restored wetland habitat
- an abundance of native wildlife and vegetation
- a sustainable cattle farming project
- streams and riparian areas
- beehives
- bird boxes
- pollination gardens
- monarch milkweed habitat
- unique viewsheds
- walking trails
- sustainable design projects such as rain gardens and permeable paving to control run-off



Overview of Programs



The Loyalhanna Watershed Association (LWA) offers innovative, hands-on environmental science programs for students in public and private schools, homeschoolers, environmental clubs, and scouting groups within the Loyalhanna Creek Watershed. Any program can be adapted to meet your group's special needs, but most are designed to last approximately 2.5 hours for groups of 25 students or less.

Throughout all programs, students will learn how the natural world works, understand how we as humans interact with and impact the environment, and find ways to manage these effects on the environment. Programs are offered on site at the Watershed Farm property and Nimick Family Education Center and some programs can be adapted for school classroom settings. As part of LWA's mission, all programs are offered at no cost to area students.

LWA has developed a unique education curriculum featuring lessons on a variety of environmental and ecology topics that are relevant to the PA Academic Standards for Environment and Ecology, and individual programs incorporate science, technology, engineering and/or math (STEM) objectives. In 2018, we were honored with the PA Governor's Award for Environmental Excellence for this curriculum.

Our Instructors

Lynne Donnelly is LWA's lead program instructor. She has a Masters Degree in Teaching from Johns Hopkins University and has taught for many years at the elementary, middle, and college levels. She brings a love for science and an enthusiasm for getting students into nature.



Josh Penatzer, has a Bachelor's Degree in Environmental Studies from the University of Pittsburgh and has worked 7 years as LWA's Project Manager. He shares his expertise of our local waterways and aquatic science with students when leading electrofishing or stream study programs.



Susan Huba, LWA's Executive Director, holds a Bachelor's Degree in Biology from Grove City College and has worked at LWA for 13 years. She has worked with hundreds of students from area school districts as well as local colleges and community organizations, sharing a passion for environmental stewardship.



Pennsylvania Standards Aligned System (SAS)

LWA's education programs meet a wide range of PA SAS standards, which outline what students should be able to understand in the following areas:

- 3.1 Biological Sciences
- 3.2 Chemistry and Physics
- 3.3 Earth and Space Sciences
- 3.4 Technology and Engineering
- 4.1 Ecology
- 4.2 Watersheds and Wetlands
- 4.3 Natural Resources
- 4.4 Agriculture and Society
- 4.5 Humans and the Environment

Refer to the charts throughout this booklet to identify which SAS areas are covered in each program. Programs will be adapted to meet the needs and ages of students participating.



Grades K-3 Education Programs SAS Standards

Program	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	4.5
Habitats are Homes	★				★	★	★		★
Animal Adaptations	★				★	★			
The Power of Plants	★		★		★	★	★	★	★
Water, Water Everywhere!		★	★		★	★			★
Who Eats Who?	★	★			★	★		★	★
Swim, Hop, Crawl, and Fly	★				★	★			
Wonderful Wetlands	★		★		★	★	★	★	★
Reduce, Reuse, Recycle	★			★	★				★
Bats and Owls	★				★				★
Pollinators and Monarchs	★				★		★		★



Outside at Watershed Farm from March-October



Can be adapted to a classroom year-round

Habitats are Homes

Take a tour of the many habitats on the Watershed Farm. Identify living and non-living things in each area. What are the basic needs of all living things and how are these needs being met on the property? Identify animal homes and compare them to our homes. Make a take-home terrarium.



Animal Adaptations



How do animals adapt to meet their needs? Explore hibernation, migration, and adaptations (such as beak shape and coloration) through observation of local wildlife, games, and hands-on activities. Recognize how different parts of an animal are used for survival. Experience eating like a bird using a variety of “beaks.” Design a new species of bird and describe how its body characteristics would make it suitable for its environment. Make a bird feeder to take home.



The Power of Plants



Discover that plants have many uses for humans and animals. Go on a walk to discover berries, fruits, flowers, and many other plant gifts and how they are used by animals.

Identify easily recognizable native and invasive plants. Learn how seeds are dispersed in a variety of ways. Label plant parts and find these parts on real plants. Look for plant adaptations (such as thorns and different root systems) and discuss how they help the plant to survive. Collect wildflowers to create a colorful suncatcher to take home.

Water, Water Everywhere!



Learn the importance of water to all living things and be able to recognize water sources such as streams, ponds, and wetlands. Create a water cycle model. Look at moving and still waters and explain why water moves or does not move throughout the property. Discover animals that live in and near the water. Recognize young stages of aquatic animals and match them with their adult counterpart. Create a 3D macro-organism art project to take home.



Who Eats Who?



Discover that plants and animals get their energy from the sun and that energy is passed through a food chain. Go on a scavenger hunt to find producers, consumers, and decomposers on the farm property. Examine a decomposing log and the organisms that depend on leaf litter. Play a food chain game and create a food chain model.

Swim, Hop, Crawl, and Fly



Identify fish, insects, and amphibians through live observation and models. Learn about the characteristics of each. Catch terrestrial and aquatic insects and look for frog eggs and tadpoles. Sort insects according to how they move—do they fly, hop, swim or crawl? Identify the body parts of an insect, fish, and amphibian and discover how these body parts have specific purposes. Create a life cycle model of an insect or an amphibian.



Wonderful Wetlands



Explore a restored wetland and discover the plants and animals that live there! See how the wetlands provide habitat for an abundance of wildlife. Identify common types of plants found in wetlands (reeds, cattails, sedges, rushes). Create a water plant work of art.

Reduce, Reuse, Recycle



Discover many natural resources around the Watershed Farm. How do humans and animals depend on these resources? Learn about renewable and non-renewable resources. Sort clean trash and discuss how each item could be reduced, reused, or recycled. Decorate reusable shopping bags to reduce plastic bags and/or make a bookmark out of recycled material.

Grades K-3 Programs Continued... Adaptable to Grades 4-5

Bats and Owls



Look into the nocturnal life of these amazing nighttime friends. Understand the importance of bats for controlling insect populations. Play a game to demonstrate how bats use echolocation. Compare and contrast a bat with an owl. Look at wing structure, flight patterns, and listen to owl calls. Dissect an owl pellet and sort bones to determine what an owl eats.



Pollinators and Monarchs



****September program dates
recommended for monarchs***



Butterflies, bees, oh my! Dissect a flower to see how pollination works. Become a cheese puff pollinator. Watch a demonstration by our resident beekeeper and observe a working bee hive. Have a taste of

local honey! Take a walking tour to survey pollinators around the property. Learn about the amazing monarch butterfly and its life cycle. In September, monarch caterpillars, chrysalises, and adults are abundant in the Watershed Farm's milkweed gardens.



Grades 4-8 Education Programs SAS Standards

Program	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	4.5
Discover Wetlands	★	★	★		★	★			★
Stream Study	★	★	★		★	★	★		★
The Dirt on Soil		★					★		
Native and Invasive Species	★				★		★		★
Challenges Facing the Loyalhanna Creek Watershed	★	★	★	★	★	★	★	★	★
Sustainable Agriculture				★	★		★	★	★
Something's Fishy	★	★			★				



Outside at Watershed Farm from March-October



Can be adapted to a classroom year-round

Discover Wetlands

Explore a restored wetland to discover how the wetland acts as a sponge to alleviate excess run-off, provides habitat for a variety of animals, provides a nursery for young wildlife and is a resting place for migratory birds. Students will conduct experiments to see how the wetland acts as a water filter and neutralizes impurities. Students will measure pH, nitrogen, and dissolved oxygen in the water and determine the relationship between dissolved oxygen, temperature, and aquatic plant life.



Stream Study

Learn the name and location of our watershed, the living and non-living components of a stream ecosystem, what macroinvertebrates are and how they are important indicators of water quality.

Investigate the health of a freshwater stream habitat by taking a look at what animals live under the water through hands-on collection and identification activities. Measure rate of water flow, dissolved O₂ and other water quality parameters. ***For classroom adaptations, water samples and macroinvertebrate samples will be brought in by the instructors.***



The Dirt on Soil

Explore the unseen world in soil. Why is soil a natural resource? Is all soil the same? Dig in soil to discover and collect organisms that live there. Compare different types of soils through texture, color, firmness, and the ability to hold water. Conduct tests to determine pH, nitrogen, phosphorus, and potassium levels. Conduct an experiment to see how soil can filter pollutants from water and relate this discovery to one of the many functions of the wetland. ***For classrooms, students are presented with an authentic farming problem and will complete a writing prompt based on their test conclusions.***

Native and Invasive Species ☀️

Identify and survey native and invasive plants on a grid. Calculate percentages of native vs. invasive plants to determine the health of the wetland vegetation. Play a game to demonstrate how invasive plants take hold in a ecosystem. Observe rotational grazing practices on the Watershed Farm and how these practices reduce the foothold of invasive weeds. Learn about the plight of the bat in western PA and white nose syndrome's relationship with an invasive fungus. Calculate the bat loss and its effect on the insect population in PA. Learn about other invasive plant and animal issues and how scientists are addressing these issues.



Challenges Facing the Loyalhanna Creek Watershed ☀️ 🏠

Understand the importance of water conservation and that “we all live downstream” in order to create an awareness of our environmental responsibilities. Build a model watershed. Determine our watershed address and use maps to follow the flow of water from our watershed. Learn about challenges in the Loyalhanna Creek Watershed including abandoned mine drainage, nutrient overloading, and sedimentation. Investigate permeable vs. impermeable surfaces and their impact on waterways. Engineer a solution to one of these challenges and test it using a variety of materials on a working stream table. ***Stream tables not available in school classrooms. Other activities will be substituted.***

Sustainable Agriculture

Analyze data to increase awareness of the amount of land needed to feed our citizens. Understand the impact agriculture has on the environment and water systems. Explore sustainable agriculture practices to address these concerns. Tour



the sustainable cattle farm on the Watershed Farm property to observe some of these sustainable practices. Use a clinometer to measure slope on the farm and draw conclusions about run-off and crop challenges. Test soil and water for nitrate and phosphorus run-off and discover how rotating crops maintains healthy soil.



Something's Fishy

(1.5 hours only)

Explore the processes of osmosis and diffusion through hands-on activities. Then, follow the scientific method to test, measure, and analyze the effect of varying salinity on water beads to discover why freshwater fish cannot survive in salt water.

Grades 9–12 Education Programs

SAS Standards

Program	3.1	3.2	3.3	3.4	4.1	4.2	4.3	4.4	4.5
Stream Study	★	★	★		★	★	★		★
Discover Wetlands	★	★	★		★	★			★
Native and Invasive Species	★				★		★		★
Electrofishing Demonstration	★	★		★	★	★	★		★
Challenges Facing the Loyalhanna Creek Watershed & Water Quality Testing	★	★	★	★	★	★	★	★	★
Sustainable Agriculture				★	★		★	★	★

☀️ Outside at Watershed Farm from March-October 🏠 Can be adapted to a classroom year round

Stream Study ☀️ 🏠

Learn the name and location of our watershed, the living and non-living components of a stream ecosystem, what macroinvertebrates are and how they are important indicators of water quality. Investigate the health of a freshwater stream habitat by surveying macroinvertebrates and use mathematical calculations to calculate %EPT as a measurement of stream health. Measure rate of water flow, dissolved O₂, nitrates, phosphates, and pH. **For classroom adaptations, water samples and macroinvertebrate samples will be brought in by the instructors.**



Discover Wetlands ☀️

Explore a restored wetland to discover how the wetland alleviates excess run-off, provides habitat for a variety of animals, provides a nursery for young wildlife, and is a resting



place for migratory birds. Students will conduct experiments to see how the wetland acts as a water filter and neutralizes impurities. Students will measure pH, nitrogen, and dissolved oxygen in the water and determine the relationship between dissolved oxygen, temperature, and aquatic plant life utilizing graphing comparisons.

Native and Invasive Species ☀️

Identify and survey native and invasive plants on a grid. Calculate percentages of native vs. invasive plants to determine the health of the wetland vegetation using FAC and OBL standards. Observe rotational grazing practices on the Watershed Farm and how these practices reduce the foothold of invasive weeds. Learn about the plight of the bat in western PA and white nose syndrome's relationship with an invasive fungus. Calculate the bat loss and its effect on the insect population in PA. Learn about other invasive plant and animal issues and how scientists are addressing these issues.



Electrofishing Demonstration ☀️

Discover what species of fish live below the surface of our local waterways. Assist in a scientific electrofishing survey by netting and identifying a variety of fish species commonly found in coldwater streams. View species up close and determine how they adapt to life underwater and learn what habitat and water conditions are ideal for their survival and reproduction.

Challenges Facing the Loyalhanna Creek Watershed & Water Quality Testing



Understand the importance of freshwater conservation. Learn about current challenges in the Loyalhanna Creek Watershed including abandoned mine drainage, nutrient overloading, and sedimentation. Use Hach® testing kits to test water samples from two sources and compare results of pH, Dissolved O₂, Nitrates, and Iron. Use this data to infer the sources of the water samples and explain how this conclusion was made.



Sustainable Agriculture



Students will develop an awareness of economic, environmental and community impacts on agriculture. Students will learn about key agro-ecological management practices, including soil management, crop/grazing rotation and pest management, and will recognize these best practices as necessary for sustainability. Students will tour LWA’s sustainable farming project and will perform calculations to identify the quantity of water and acreage of pasture needed to establish a similar operation. Using the universal soil erosion equation, students will reach

How to Register

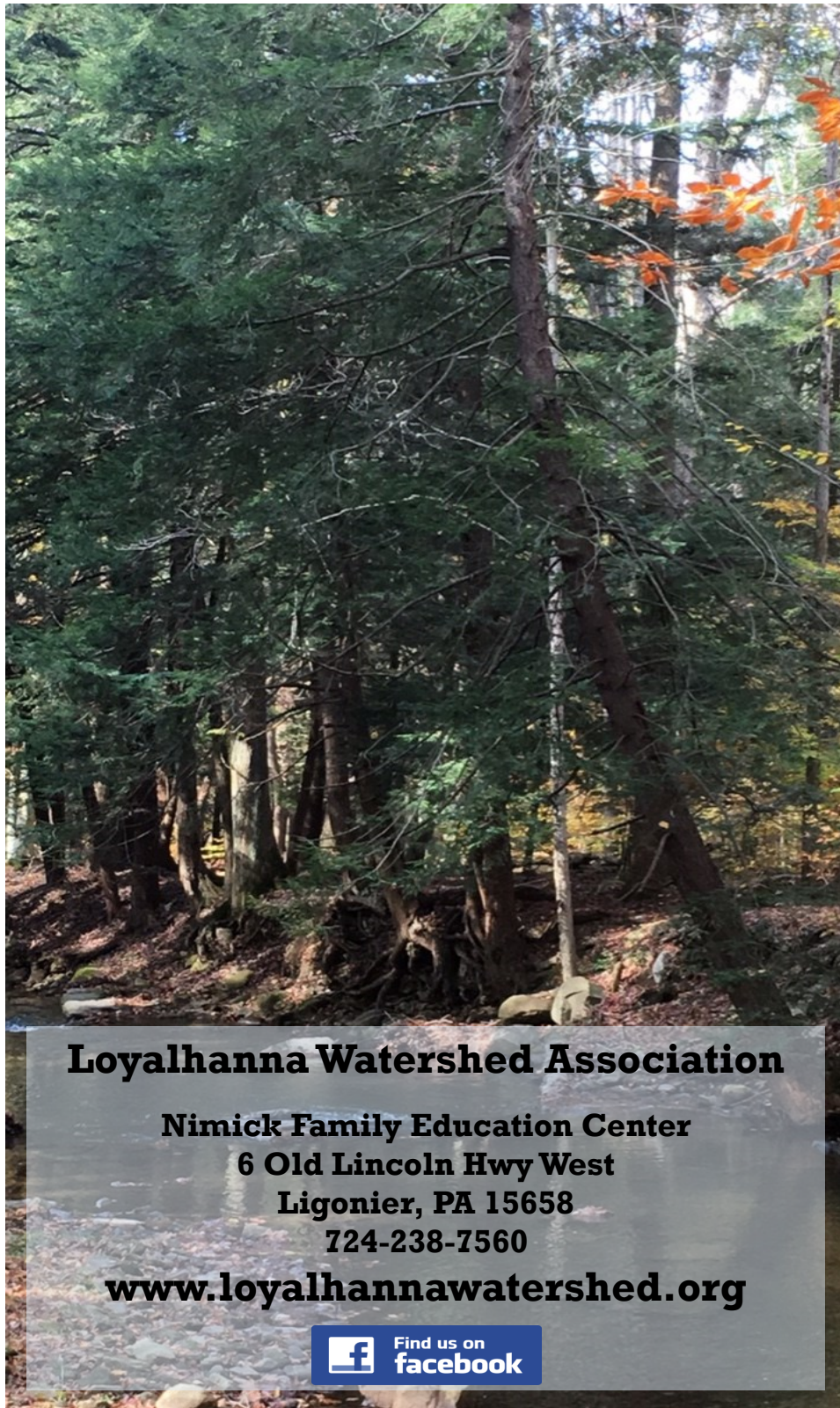
If you would like to schedule a program for your group, please contact Susan Huba at the LWA Office by email, susan@loyalwater.com or phone, (724) 238-7560, ext 1#. The following information should be provided:

- Name of Group/School
- Program(s) of Interest
- Grade/Age of Students
- Number of Students
- Date & Time Preferences

Programs are scheduled on a first-come, first-served basis per staff and date availability. We will make every effort to accommodate your group!







Loyalhanna Watershed Association

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