HISTORIC GERMANTOWN SCIENCE Sleuths

Section 4 : Historic Fair Hill

LESSON OBJECTIVES

- *Know the living and nonliving components that make up an ecosystem.*
- *Gain an understanding of how various nutrients are cycled through ecosystems.*
- *Understand the difference between ecosystems and biological communities.*
- *Explain the difference between climate and weather.*
- *Explain the factors that determine climate.*
- *Read a pH strip and indentify common items as acid, base, or neutral.*

Key Terms

Biodiversity

the variety of all living things and their interactions

Climate

the average weather conditions of a particular region over a period of years

Test your knowledge

Multiple choice

1. How does high humidity generally impact the "feel" of a temperature?

- a. makes it feel significantly cooler
- b. makes it feel significantly warmer
- c. has no noticeable impact on the perceived temperature

2. What is the primary way wind speed influences climate?

- a. By distributing heat and moisture across a region
- b. By directly changing the overall temperature
- c. By significantly altering the amount of precipitation

3. When considering climate, how does a higher temperature generally affect humidity levels?

- a. It significantly decreases humidity
- b. It has no impact on humidity
- c. It allows for higher levels of humidity in the air

Match the term with its definition

Climate	○	○ the amount of water vapor in the air
Flora	○	○ plants of a region or environment
Biodiversity	○	○ the animals of a region or habitat
Humidity	○	○ the average weather conditions of a particular region over a period of years
Fauna	○	○ the variety of all living things and their interactions
Percolation	○	○ a measure of how acidic or basic a solution is; stands for “power of hydrogen”
pH	○	○ substances naturally formed in the Earth
Minerals	○	○ the process of a liquid slowly passing through a filter

Test your knowledge *(continued)*

From the images below, identify three (3) examples of flora and three (3) examples of fauna


Garter Snake


Sensitive Fern


Raccoon


Mica Schist Rock


Bloodroot

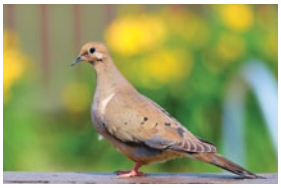

Bracket Fungus


American Holly Tree


Carpenter Bee


Monarch Butterfly


Tulip Poplar Tree


Mourning Dove


White Oak Tree


Carolina Wren


Sphagnum Moss


Grey Squirrel


Virginia Bluebells

FLORA	FAUNA

Test your knowledge *(continued)*

Answer the following questions below regarding the pH scale pictured below:

1. Which is more acidic *(circle your answer):* milk **OR** lemon

2: Which is more basic: *(circle your answer):* soap **OR** bleach

3: What is the only neutral substance (not acidic OR basic)? _____

4: What is the strongest acid shown on the pH scale? _____

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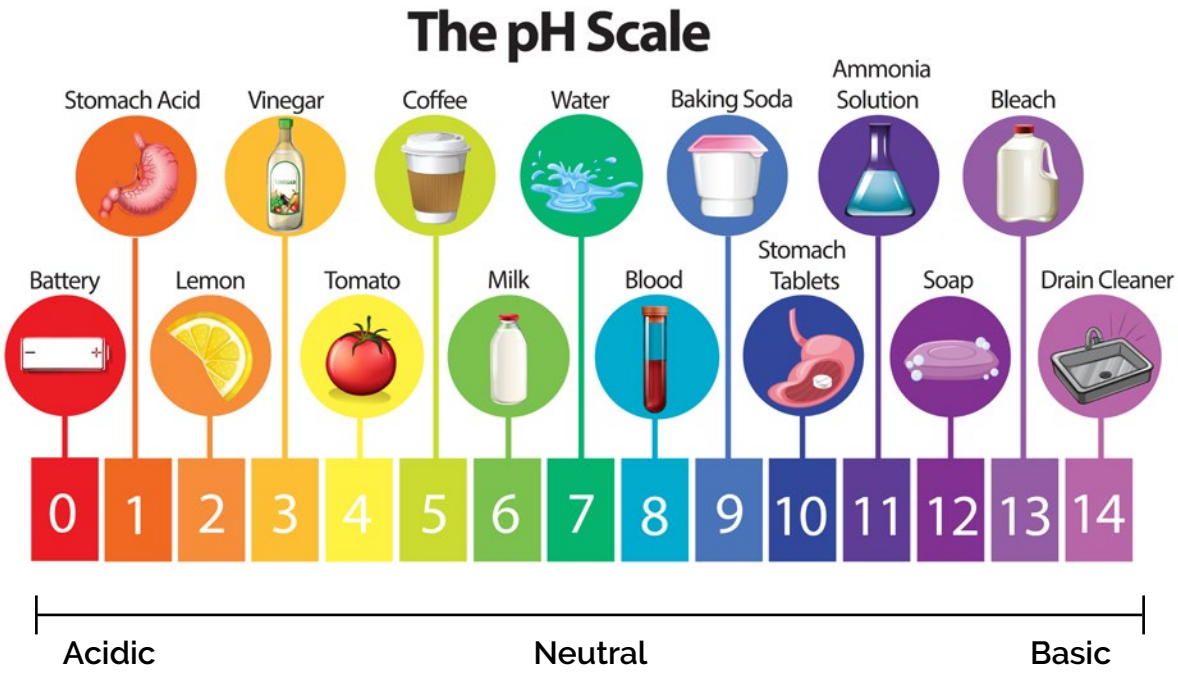


Site History

Fair Hill Burial Ground is located on Germantown Avenue, a street that was once a Lenape trade route. When Europeans colonized the area, it became a major thoroughfare between Philadelphia and the outlying rural areas. In the 17th century, the English king laid claim to the land and gave it to William Penn. It was then granted to George Fox, the founder of Quakerism. Fox left the land to Quaker Friends in 1691 as a Meetinghouse, a burying ground, and a place for children of the town to play and grow a garden.

At that time, the area consisted of farmland and wooded area outside of the Philadelphia city limits. In 1703, the original Meeting House was built. The Quaker burial ground was used from 1703 until the 1960s. It was one of the first racially integrated cemeteries in Philadelphia. Amongst those buried are many prominent women's rights activists and abolitionists from the 19th and 20th centuries.

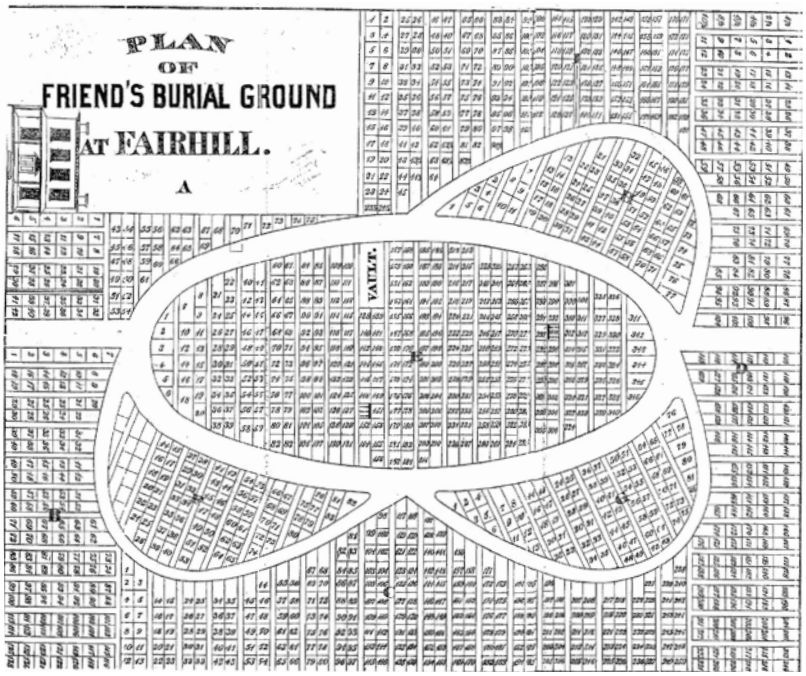
Key Terms

Flora

plants of a region or environment

Fauna

the animals of a region or habitat

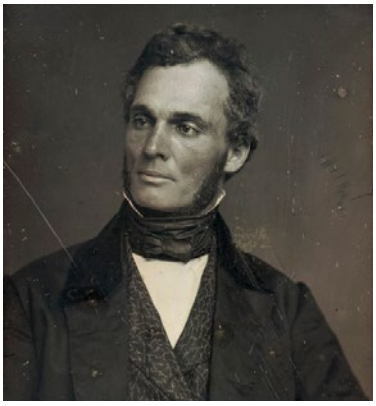


Fair Hill Burial Ground plot map

Site History *(continued)*

Lucretia Coffin Mott
by Joseph Kyle, 1842, oil on canvas, from the National Portrait Gallery

Lucretia Mott is buried at Fair Hill. Together with James Mott, her husband, she assisted freedom seekers who fled from Maryland and Delaware into Philadelphia throughout the 1850s. She founded the Philadelphia Female Anti-Slavery Society in 1833. Lucretia also co-founded the National Anti-Slavery Coalition of American Women, one of the few racially integrated groups of its kind. For a time, she and her family lived on North 9th Street in Philadelphia, where they entertained friends of both European American and African American descent. Their home at 338 Arch Street was a stop on the Underground Railroad.



Robert Purvis
between 1840 and 1849
from Boston Public Library

Also buried at Fair Hill is Robert Purvis. Purvis dedicated his life to important political issues related to African Americans' experiences during the late period of slavery, the Civil War, and the decades after the war ended. As an abolitionist, he worked hard to harbor freedom seekers, especially as a member of the Philadelphia Vigilance Committee, earning him the title of President of the Underground Railroad. He married into one of Philadelphia's leading free black families, the Fortens. His activities included participation in the American Anti-Slavery Society, created by William Lloyd Garrison, and lecturing in various American cities and across Europe.

Key Terms

pH

a measure of how acidic or basic a solution is; stands for "power of hydrogen"

Humidity

the amount of water vapor in the air

Site History *(continued)*

As the city of Philadelphia grew over the centuries, the landscape around Fair Hill changed significantly. In the early 20th century, many people in the neighborhood worked in the local factories but in the 1960s and 70's the factories closed and jobs moved away. As Black and Latinx people moved in, Whites moved out. Quakers moved away from Fairhill and in 1985 the meetinghouse and the burial ground were sold. By the late 1980s, the burial ground had become neglected and overgrown. It became a dumping ground filled with abandoned cars and trash. It became a blight on the community. Drug dealers had taken over much of the neighborhood and people used the grounds as a place to use.

In 1992, the Philadelphia Yearly Meeting received a call from neighbor Elizabeth Gutierez, asking the Quakers to come back to clean up the site. Margaret Hope Bacon, Quaker biographer of Lucretia Mott called Friends to come help clean up the 4.5 acre site. They formed a committee, then a non-profit corporation, and were able to raise the money to buy back the burial ground by 1993. After years of effort, today Historic Fair Hill embodies George Fox's original wish for this space to be a place for children to play and grow plants in the garden. A small garden was built, and over time, empty lots around the grounds were turned into vegetable gardens and fruit orchards.

Photo showing Fair Hill Burial Ground neglected and overgrown in the 1980s. *Credit: Friends Journal*

Did you know?

Did you know that the Historic Fair Hill Burial ground is on the National Underground Railroad Network? Also known as the "Network to Freedom", this program preserves the history of the Underground Railroad.

Key Terms

Minerals

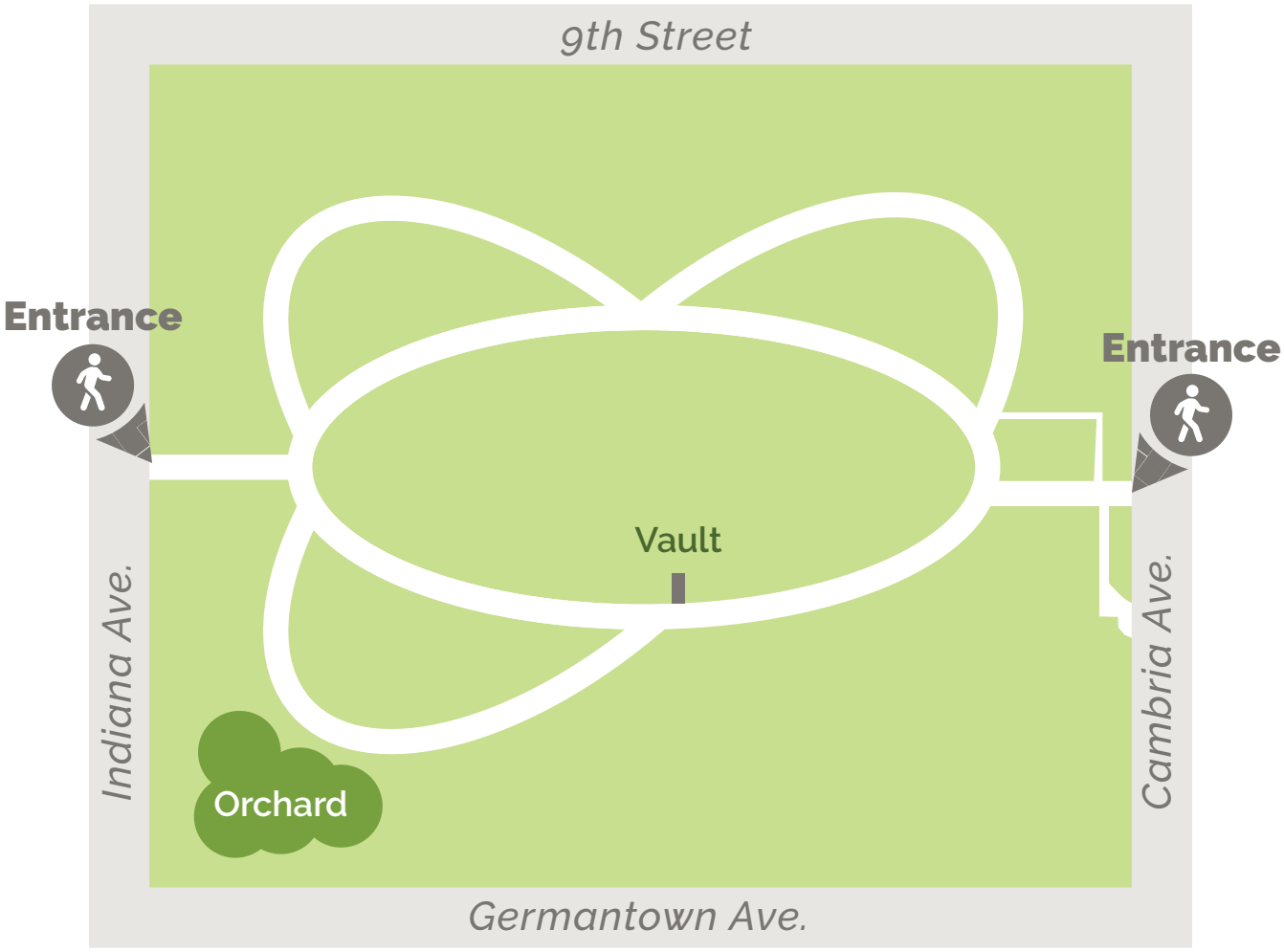
substances naturally formed in the Earth

Percolation

the process of a liquid slowly passing through a filter

Can't wait to see you at

HISTORIC FAIR HILL!



HISTORIC FAIR HILL
community • early literacy • greening

www.historicfairhill.com

What have you learned?

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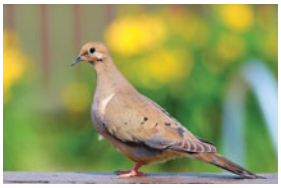
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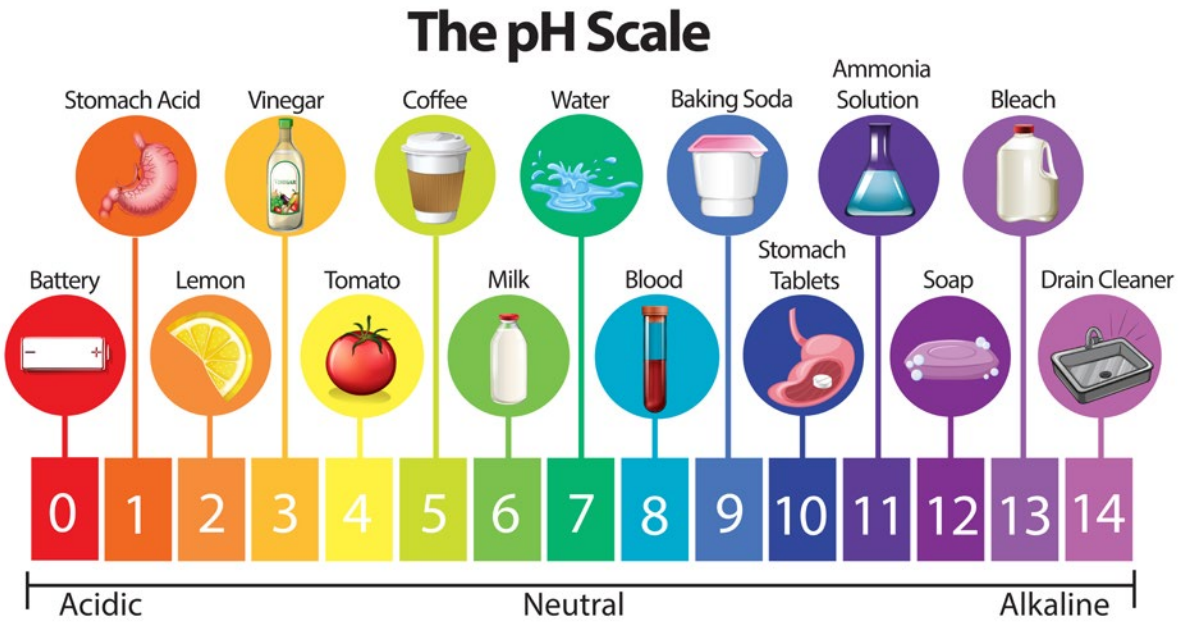


Did you know?

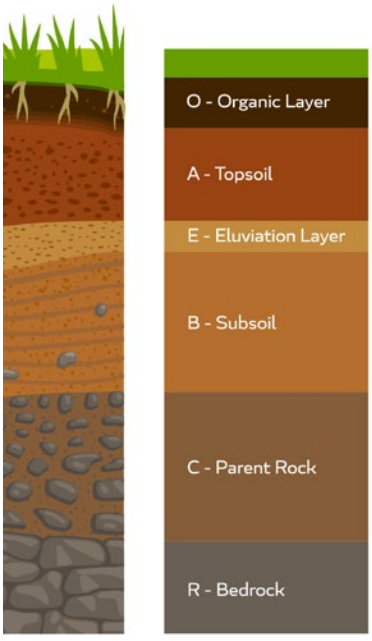
A single tablespoon of soil can contain more living organisms than the entire human population on Earth!

School Soil Testing

Using a soil probe, students will collect a sample of soil from around the school grounds to determine its usability.

Fertility Test- While the soil is still inside the probe, students will determine its fertility through observations of physical characteristics. Then they will remove the soil from the probe and put it through a series of performance tests as indicated on the fertility analysis sheet.

Texture Test- Healthy soil is called loam which is a proportional mixture of sand, silt and clay. Students will take a sample of the soil from the probe and fill the glass jar until it is about ⅓ full. Measure the height of the soil in the jar. Fill the jar to the shoulder with water. Tighten the lid and vigorously shake the contents for about 3 minutes. Let it sit for one minute, unbothered. After 1 minute, measure the amount of sediment that has collected at the bottom. This is the amount of sand. Wait another 4 minutes and measure again. The difference between the two numbers is the amount of silt. Clay would require several hours to dissipate, so students can just subtract the amount present from the starting amount measured before water was added. Finally, they can compare their percentages of sand, silt and clay with that of healthy soil or loam.



Soil Layers

pH Test- Using the water that percolates through the samples, students will test the pH of each sample by adding some of the percolated water to a pH strip to determine

Post-visit activity *(continued)*

Percolation Test - Students will add ¼ cup of soil to the percolation bottle. Students will pour 125mL of water into the bottles, over the sand, and time how long it takes for the water to pass through the soil sample. Next they will measure the amount of water that percolates through. Student groups will compare results. DO NOT DISCARD PERCOLATED WATER!!

Considering results, students will determine the health and usability of the soil.

Writing Prompt

Research a specific endangered species and explain how climate change is threatening its survival, and what actions could be taken to help.

An agronomist testing the pH of soil samples

Additional Activities/Resources

Links to Useful Sites

American Museum of Natural History- Biodiversity

American Museum of Natural History- Climate Quiz

BioInteractive- Biome Viewer

NASA Science- Climate Interactive

Smithsonian- The Big Picture soil interactive

PBS Learning Media- Three Levels of Biodiversity

PBS Learning Media- Earth's Energy Flows and Climate

BioInteractive- Biome Viewer STUDENT WORKSHEET PDF

Annenburg Learner- Earth's Solid Membrane: Soil

BioBlitz

Students will use a device to photograph the specimens (flora and fauna) found around the school grounds. They should get a minimum of three wild flora and three wild fauna. For the remaining time, they will attempt to identify the organisms (Google Lens or Seek by iNaturalist) as well as compare and contrast what was identified on school grounds and Fair Hill.

Micro Climate

At the designated areas around the school grounds (paved/ grass/ shaded/ sunny, etc), students will get the temperature, humidity, and wind speed of the micro climate. After the group collects the data, they will attempt to determine the size of the microclimate and indicate it on a map of the grounds. Finally, the student group will compare the data from the microclimate with that of the daily local climate data. Discuss the variations and the potential causes of the differences.

Claire Parkinson, a climatologist at NASA's Goddard Space Flight Center, speaks about sea ice and climate change. *Photo Credit: (NASA/Joel Kowsky)* License.

Did you know?

Did You Know that climatologists might travel to extreme locations like the Arctic to drill ice cores, dive deep into the ocean to study marine life, or climb mountains to collect data? Essentially, they become "Climate Detectives" by exploring different parts of the Earth to understand climate patterns

Climatologist

Climatologists study climate change, climate variability, and the effects of climate on the biosphere. They may work in a variety of settings, including government agencies, natural resources and utility companies, the media, private consulting firms. Their responsibilities may include:

Data collection: Gathering data from weather stations, satellites, or radar stations

Data analysis: Studying and interpreting data, maps, reports, photographs, and charts to predict long and short scale patterns

Modeling: Developing and using predictive models to predict the effect of weather or climate on agricultural crops, water resources, energy, and more

Forecasting: Preparing forecasts and briefings for clients, and weather and climate reports, forecasts, and summaries for the public

Research: Conducting research into the processes behind weather events, and analyzing historical climate information to help predict future trends

Consulting: Providing general consulting services, and liaising with other environmental professionals

Presentations: Preparing and making scientific presentations

Databases: Developing and maintaining databases and systems to organize and manage climate data and information

Acknowledgements

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Cover images include a solar microscope, bone slide with mosquito specimen, and meteorological tablets from the collection of the Wyck Association; Isaac Norris' Thirty Year Pocket Almanac from 1677 from the Stenton Collection on deposit at The Library Company of Philadelphia; and Hexamer General Survey of Wingohocking Hosiery Mills, Shoemaker Lane and Wingohocking Creek, Germantown, Philadelphia, Philadelphia County, Pennsylvania. vol.10 Plate 943, from the Free Library of Philadelphia.