

Piedmont Environmental Center's Environmental Education Classes and Field Experiences 2016-2017

Science, Social Studies, Environmental Literacy and Math Content

Mission Statement: Piedmont Environmental Center provides programs and a place to learn, conserve, and enjoy the natural world through hands on experiences emphasizing the interrelated and fragile nature of life.

Schedule your class today!

- Teachers may contact PEC at (336) 883-8531 for class details and to reserve a date.
- The maximum number of students at PEC is 75 per day. For groups larger than 75, please consider arranging multiple days. The minimum number of students at PEC is 7 per day.
- Fee: \$3.50 per student with 15 or more students. No fee for teachers and chaperones.
- Small classes between 7-14 students are charged a minimum fee of \$50.
- A \$50 deposit is due 3 weeks after a reservation has been made. Deposits are applied to the balance that is due upon arrival. Deposits are non-refundable two weeks prior to the reserved date. PEC reserves the right to cancel your trip if a deposit is not received.
- PEC presents classes rain or shine. In the event of inclement weather, staff Naturalists are prepared with alternative class experiences within the curriculum framework and appropriate to the attending grade level. In the case of severe weather alerts or forecasts, a PEC Naturalist will contact the school to discuss options.
- Classes marked with * can be adjusted to one grade level higher or lower than original class. We may be able to adjust a specific class to your group's grade level.

New for Spring 2017 – Two STEM based classes focusing on biological science and forest measurements will be available in March 2017. These are six hour field classes. Group sizes over 25 students must arrange for multiple days. Call for more details.

Piedmont Environmental Center

In 1972, a group of concerned citizens worked with the city of High Point to secure property adjacent to High Point City Lake as a plant and animal preserve. Within a short time, a trail system was established and the first environmental education programs in Guilford County were offered at the site.

On the trails...

You see this term throughout the class descriptions. PEC's mission is to get students outside. The foot trails and Bicentennial Greenway pass through 376 acres of beautiful hardwood and pine forests, and lakeside habitats. There are three primary loop trails used during classes, each are about three quarters of a mile in length.



North Carolina Mapscape Exhibit



The North Carolina Mapscape is a 70 foot by 30 foot walk-on topographic relief map that represents the Central Southeast with NC at the center of the exhibit. Six geographic regions are represented by paint color on the map. Also marked on the map are: details of rivers and lakes (blue), interstates (grey), political boundaries (dark grey) and landmark cities and historic sites (brass markers).

PEC's Main Building

Design features of the main building include: active and passive solar technology, tower ventilation, natural lighting, recycled aluminum roof, recycled PVC carpets, recycled auto glass bathroom tiles, reused bricks, and much more. A wrap-around covered deck provides shade for lunch and shelter from rainy weather. Features of the main building are shared with students during the **Energy Concepts & Conservation** class.



You will also find:



Lobby- Check-in, maps and information at the reception desk.

Small Exhibits- Teachers may view these with their students during their visit.

Solar Heart Garden- Relax by the babbling water while your students reflect on their lesson of the day or enjoy the sounds of nearby birds and explore the native plants in the garden.

Classroom- A portion of the Mineral and Plant Labs are in the classroom as well as resource materials for PEC classes.

Auditorium- A/V presentations and serves as a multi-purpose teaching space.

Amenities- Restrooms, drinking fountain, recycling and trash bins are located near the rocking chairs on the deck. Small groups may enjoy a picnic lunch at three picnic tables on the back porch and large groups may eat on the steps of the Mapscape amphitheater.

Kindergarten

***Structure/Function-** (90 minutes) While on the prowl for arthropods, students use collecting tools and magnifying lenses to observe structural characteristics of living organisms that enable them to defend themselves, acquire food and reproduce. Students investigate the similarities and differences in animal body structures and behaviors. *Key words: Structure, growth, changes, movement, needs, arthropod.* Sc. Essential Standard K.L.1

***Weather and the Local Ecosystem-** (90 minutes) On the trails, students use basic instruments and practice weather data collecting skills by measuring current weather conditions. By measuring weather conditions at several locations, students will understand the change of weather patterns from day to day and throughout the year. During the hike, students look for evidence of how plants and animals are affected by environmental conditions and weather patterns. Throughout the course of the class, students learn about new technologies in weather and air quality monitoring being used by NC DENR and other government agencies. *Keywords: weather, climate, daily, monthly, seasonal and yearly patterns, weather tools.* Sc. Essential Standards: K.E.1

Sacred Earth- (90 minutes) **Tipi currently unavailable.**

Students experience an interpretation of nature and natural resources through stories, traditions and games of Native American Indians. Highlights include storytelling around a fire pit, a hike on the woodland wildflower trail and hand/eye coordination games. During the course of the class, students come to identify some of the similarities and differences between cultures in their use of natural resources. (available November– February only) *Key words: elements of culture, natural resource, tradition, needs.* SS. Essential Standards K.C.1

First Grade

***Life Cycles of Animals-** (90 minutes) During a hike, students make first hand observations of animals and determine their current life cycle stage. Then using the “Biological Clock” Chart, students connect the stages together to form geometric representations of different animal’s lives to compare and contrast. (The Biological Clock Chart—12 animal life cycle stages and behaviors arranged in a circle and depicted as the face of a clock.) *Key words: reproduction, metamorphosis, molting, needs.* CCSS.Math.Content.1.G.A.2 and Sc. Essential Standard 1.L.1

Soil Concepts- (90 minutes) See description under Third Grade. Sc. Essential Standards 1.E.2

Sacred Earth- (90 minutes) See description under Kindergarten. SS. Essential Standards 1.C.1

Second Grade

NC Geography on the Mapscape- (90 minutes) The North Carolina Mapscape is a 70 foot by 30 foot walk-on topographic relief map that represents the Central Southeast with NC at the center of the exhibit. Six geographic regions are represented by paint color on the map. Also marked on the map are details of rivers and lakes, highways, political boundaries, landmark cities and historic sites. Working in small teams, students are assigned a geographic region displayed on the Mapscape and a box of natural and cultural resource symbols for that region. Using guide sheets and hand held maps, students place their symbols on the Mapscape in appropriate locations. When all regions are completed, the students present their region to the group. During the second half of the class, students are guided on a timeline trail walk (with artifacts to hold and examine) through the forest that focuses on ways in which people of different time periods depended on the physical environment and natural resources. *Key words: symbols, legends, cardinal points, natural and cultural resources, timeline, artifact.* SS. Essential Standard 2.G.1 and 2.H.1



***Tales of the Forest-** (90 minutes) Students practice grammar and word use skills in an exciting and inspiring natural setting. During a trail walk, students brainstorm and record a vocabulary “word bank” as they make observations of seasonal changes, weather, and plant and animal lifecycles that are interpreted by the Naturalist staff. The last 30 minutes of the class, students refer back to their word bank and construct sentences that string together and form a “Tale of the Forest” they explored. *Key words: adjective, verb and noun forms, adverb, onomatopoeia, sentence, story, plant and animal structure and function, environmental conditions.* CCSS.ELA-Literacy L.2.1 and Sc. Essential Standard 2.E.1.2

***Weather & the Local Ecosystem-** (90 minutes) See description under Kindergarten. Sc. Essential Standards 2.E.1

Sacred Earth- (90 minutes) See description under Kindergarten. SS. Essential Standards 2.C.1

Third Grade

Plants Under a Microscope- (90 minutes) Using a 10-30X microscope, students view 10 fresh plant specimens and learn the function of different plant structures that help them survive in their environments. They then record their observations on plant handouts prepared by our staff. On the trails, students continue to look for examples of plant life cycle stages and begin an understanding of how soil, rain and other environmental factors can limit or sustain plants in a community. *Key words: growth, roots, stems, leaves, flowers, limiting factors.* Sc. Essential Standards 3.L.2

Soil Concepts- (90 minutes) Students examine how the basic properties and components of soil determine its limits and ability to support the growth and survival of plants. Student's hands will get a feel for soil particle sizes as they sift through prepared texture samples and soil samples collected on the trails. Students will practice their phonics and word recognition skills when the Naturalist staff helps them decode the Latin prefixes and suffixes in the names of soil organisms of a compost bin. Students then word play by inventing their own "yet to be discovered" soil organisms. *Key words: clay, sand, humus, bedrock, compost, texture, permeability, limiting factor, plant root types, suffix, prefix.*

CCSS.ELA-LITERACY.RF.3.3 and Sc. Essential Standard 3.L.2.4

Sacred Earth- (90 minutes) See description under Kindergarten. SS. Essential Standards 3.C.1

Fourth Grade

***Energy Concepts & Conservation-** (90 minutes) Students gain an understanding of alternative energy resources and energy independence concepts through a presentation and demonstrations focusing on the solar design elements of PEC's main building, and different kinds of solar powered models. A walk on the "Energy Trail" in the forest challenges students to find examples of energy transfer and interaction within an ecosystem. During the course of the class, students come to understand how energy conservation affects the economy and personal/family financial decisions. *Key words: Alternative and renewable energy, solar energy, reflection, refraction, absorption, energy independence, conservation, producer, consumer, bio-geo-chemical cycles, potential, kinetic.* Sc. Essential Standards 4.P.3

Mineral Lab and Geology Concepts- (90 minutes) While walking on the trails, students learn to identify parent rock material and look for evidence of the bio-geo-chemical processes that form local soils and topographic features. During the second element of this class, students participate in lab exercises that demonstrate the physical and chemical properties of 15 samples of North Carolina rocks, minerals and fossils. Lab exercises demonstrate mineral color, texture, streak, crystal shape and black light fluorescence and phosphorescence reactions. *Key words; igneous, metamorphic, sedimentary, bedrock (parent material), physical properties, erosion, weathering, fossil, change.* Sc. Essential Standard 4.P.2

Sacred Earth— (90 minutes) See description under Kindergarten. SS. Essential Standards 4.C.1

NC Geography on the Mapscape- (90 minutes) See description under Second Grade. SS Essential Standards 4.H.2.2

Fifth Grade

Watershed Concepts Land Based Experience- (2 hours) On the NC Mapscape, students locate major river basins of North Carolina. Students learn about our local water resources, how they are managed according to BMPs (Best Management Practices) and watershed tier regulations, while discussing our stewardship role. On the trails, students follow the course of water through the terrestrial ecosystem taking measurements of slope and soil permeability and interpreting the results. The trail leads to High Point City Lake where, as a group, students will take shoreline measurements of 7 water quality parameters, the results of which will contribute to the monitoring database PEC uses as an educational tool. *Key words: biosphere, bio-geo-chemical cycle, hydrological Cycle, potable water, physical and biological factors, water quality, water treatment, stewardship.*

Sc. Essential Standard 5.L.2

Defining an Ecosystem-(90 minutes) At the beginning of the class, students form partnerships and are given envelopes containing the materials needed to complete a small assignment. The assignment: at the end of the class, teams will go "on stage" and give a 30 - 45 second TV commercial style presentation. During a walk on the trails, Naturalist staff point out and explain the details of 10 terms that are used to define the structure and functions within an ecosystem. The students then select a term, fact or detail that was examined on the trail as a theme for their commercial. After a short preparation time, students perform their commercial for the audience. *Key words: interdependency, abiotic, biotic, limiting factors, energy transfer, symbiosis, forest community, aquatic community, water cycle, air cycle, geo-chemical cycles, successional change, environmental conditions.* CCSS.ELA-LITERACY.SL.5.4 and Sc. Essential Standard 5.L.2

Sacred Earth- (90 minutes) See description under Kindergarten. SS. Essential Standards 5.C.1

Middle and High School Classes

New for Spring 2017 -Two STEM based classes focusing on biological science and forest measurements will be available in March 2017. These are six hour field classes. Group sizes over 25 students must arrange for multiple days.

Energy Concepts & Conservation- (90 minutes) Students gain an understanding of alternative energy resources and energy independence concepts through a presentation and demonstrations focusing on the solar design elements of PEC's main building, and different kinds of solar powered models. A walk on the "Energy Trail" in the forest challenges students to find examples of energy transfer and interaction within an ecosystem. During the course of the class, students come to understand how energy conservation affects the economy and personal/family financial decisions. *Key words: Alternative and renewable energy, solar energy, reflection, refraction, absorption, energy independence, conservation, producer, consumer, bio-geo-chemical cycles, potential, kinetic.* Sc. Essential Standards 6.P.3 and 7.P.2

Plants Under a Microscope- (90 minutes) Using a 10-30X microscope, students view 10 fresh specimens and solve a 15 question challenge about 5 different plant groups (lichens, moss, ferns, non-flowering and flowering plants) designed to distinguish their structural similarities and differences. Then through a camera, students observe and record microscopic structures of different plant tissues that are vital in photosynthesis and transpiration. In the forest, students continue their understanding of the role plants play in sustaining all life as producers in an ecosystem. *Key words: stomata, vascular bundle (scattered and concentric), veins (parallel and reticulated), adaptation strategies.* Sc. Essential Standards 6.L.1.

Clean Air Teams- (2 hours) Working in teams, students practice measurement and statistics/probability skills as they investigate the "air shed" and how air quality affects the growth and reproduction of living things. During part one of the CAT class, students collect raw data (tally) during a 10 to 15 minute road use survey of Penny Road then interpret the results. Part two of this class takes place on the trails where the students measure the surface area of 10 lichens growing on rocks and logs using a transparent grid sheet. Part three is the "eye opener" when students make visual analysis of filters from particulate air sampling machines and see the amount of particulates their body processes every day. *Key words: center, spread, shape, abiotic, limiting factor, indicator species, symbiosis, particulate.* CCSS.MATH.CONTENT.6.SP.B.5 and Sc. Essential Standards 6.L.2. and 7.E.1

Fire Ecology- (2 hours) Students gain first hand experience in scientific investigation by measuring the effects of periodic prescribed fire treatment of a study area on PEC's North Preserve. Working in small groups, students set up study plots, collect and analyze data from two different forest communities: a deciduous forest and a loblolly pine forest. Students will then examine and discuss how limiting factors affect animal populations, predator and prey ratios and symbiotic relationships within the ecosystem. *Key words: plant population, humus depth, ground cover, canopy cover, limiting factors.* Sc. Essential Standards 8.L.3.

Watershed Concepts Land Based Experience- (2 hours) On the NC Mapscape, students locate major river basins of North Carolina. Students learn about our local water resources, how they are managed according to BMPs (Best Management Practices) and watershed tier regulations, while discussing our stewardship role. On the trails, students follow the course of water through the terrestrial ecosystem taking measurements of slope and soil permeability and interpreting the results. The trail leads to High Point City Lake where, as a group, students will take shoreline measurements of 7 water quality parameters, the results of which will contribute to the monitoring database PEC uses as an educational tool. *Key words: biosphere, bio-geo-chemical cycle, hydrological Cycle, potable water, physical and biological factors, water quality, water treatment, stewardship.* Sc. Essential Standard 6.L.2 and 8.E.1

Watershed Concepts and Stewardship (Canoe Based)- (5 hours) Students examine the geologic, biologic and hydrologic processes and human activities that influence water quality of a municipal water resource. From canoes launched at City Lake Park, students paddle along the shoreline and explore the coves of High Point City Lake taking measurements of dissolved oxygen, turbidity, temperature and pH in 3 locations. On the trails at PEC, students follow the course of water through the terrestrial ecosystem taking measurements of slope, soil permeability, biological indicators, water quality and interpreting their findings. *Key words: biosphere, bio-geo-chemical cycle, hydrological Cycle, potable water, physical and biological factors, water quality, water treatment, stewardship.* Sc. Essential Standards 6.L.2 and 8.E.1.

Class fee is \$20.00 per student. This class is limited to 25 students per day. Considerable planning is involved with this class. Please contact PEC Naturalists to discuss all the details.