

Instructional Plan: POND for Grades 3, 4, and 5

The overlying objective of the Nassau BOCES Pond Program is to provide specific content aligned to each grades' science curriculum while also providing real world applications for NYS ELA and Math Common Core Standards. Alignments are on reverse side of this document.

Vocabulary (teacher may add to list or request emphasis)

adaptations	abiotic	algae
amphibian	biodiversity	biotic
carnivore	consumers	cycle
decomposition	detritus	diversity
erosion	evaporation	habitat
herbivore	hibernation	
metamorphosis	photosynthesis	
producers	reptile	respiration
salinity	sediment	succession
turbidity	watershed	

Program Logistics:

- Group Size: 15 students/naturalist
- 1 adult chaperone/student group
- 1.5-2 hr session that is typically combined with another program for a 4 hr. day.
- The Pond is located at Caumsett State Historic Park. The Program is also possible at a location near your school.

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We are more than just a field trip... we provide a learning environment for your students!

Students use sampling equipment to collect organisms and field guides for identification

Lesson Objectives: Students will be able to...

- **Compare and contrast Pond vs. Lake in terms of:**
 - Succession and how ponds form
 - Temperature Stratification
 - Depth
 - What organisms live here
- **Describe a watershed**
- **Describe the inter-relationship between biotic and abiotic factors**
- **List plants and animals that live in a pond and describe**
 - Plant and animal adaptation
 - How organisms can be indicators of the health of a pond ecosystem
 - Create a pond food chain and food web
- **Explain pond nutrient cycles**
- **Describe how organisms survive seasonal changes**
- **Determine the water quality by identifying the organisms that live there.**

Instructional Activities (can include but not limited to):

- Using the senses to observe the pond ecosystem
- Observing properties of natural materials (color, shape, size, texture)
- Observing, collecting, counting, and sorting living and non-living specimens
- Using field guides and charts and dichotomous keys to identify organisms
- Use of field instruments to gather abiotic data and collect and observe specimens.
- Using a **Biotic Index** to determine the health of the Pond

Assessment

- The program will end with a summative "Q & A." focusing on the lesson's objectives.
- The teacher may elect to have students complete data sheets and/or writing activities back in the classroom.

Standard Alignments for Pond Program for grades 3, 4 and 5

Standards Type	Key Standards or Code	Standard Description	Instructional Activities
NYS Science Core Curriculum	Scientific Inquiry S 1.1 thru 1.3; S3.1 thru S3.3	Ask “why” questions in attempts to seek greater understanding concerning observed objects and events; seek clarification, organize objects/data through classification and use of simple charts and tables; interpret and recognize simple patterns/relationships.	The whole session is inquiry and discovery based. Students will use charts and keys as tools for species identification. Web of Life games will be used for students to recognize species interrelationships.
	Standard 4 Living Environment	<p>Key Idea 1: Living things are both similar to and different from each other and nonliving things.</p> <p>Key Idea 3: Individual organisms and species change over time.</p> <p>Key Idea 4: The continuity of life is sustained through reproduction and development.</p> <p>Key Idea 5: Organisms maintain a dynamic equilibrium that sustains life.</p> <p>Key Idea 6: Plants and animals depend on each other and their physical environment.</p> <p>Key Idea 7: Human decisions and activities have had a profound impact on the physical and living environment.</p>	<p>The Key ideas for Standard 4 are addressed throughout the program. Observations and discussions include organisms’ life cycles; complete and incomplete metamorphosis; nutrient cycles; a web of life game to demonstrate inter-relationships, plant and animal adaptations.</p> <p>The Biotic Index referenced below is used to determine the lack of pollution in the pond thus aligning to Key Idea #7</p>
NYS Common Core	Supporting Standards	Description	Instructional Activities
Math	Operations and Algebraic Thinking	<p>Grade 3: Represent and solve problems involving multiplication and division.</p> <p>Grade 4: Use the four operations with whole numbers to solve problems.</p> <p>Grade 5: Write and interpret numerical expressions. Analyze patterns and relationships.</p>	The Biotic Index activity incorporates math to solve real issues. Students will collect, identify, quantify and record organisms onto data sheets. Using established biotic values assigned to each organism based on its tolerance to pollution, students will use simple formulas to determine the health of the pond.
Math	Number and Operations in Base Ten	<p>Grade 3: Use place value understanding and properties of operations to perform multi-digit arithmetic.</p> <p>Grade 4: Use place value understanding and properties of operations to perform multi-digit arithmetic.</p> <p>Grade 5: Understand the place value system. Perform operations with multi-digit whole numbers and with decimals to hundredths.</p>	
Math	Measurement and Data	<p>Grade 3: Represent and interpret data.</p> <p>Grade 4: Represent and interpret data.</p> <p>Grade 5: Represent and interpret data.</p>	
ELA Anchor Standards Grades K-5	Comprehension & Collaboration	1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others’ ideas and expressing their own clearly and persuasively.	Students will participate in conversations related to their observations and data collection.
	Presentation of Knowledge and Ideas	4. Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.	Students in pairs or in groups of 3-4 will be responsible for presenting their findings related to the health of the pond and defending their assessment based on evidence
	Vocabulary Acquisition and Use	4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.	Students will use content-driven vocabulary throughout the program and practice the use of root words, prefixes and suffixes to determine meaning (example: carnivore, herbivore, omnivore)