Piankatank Learners Class Activity Options

How many classes are chosen will depend on how many students you have attending and the time limits you have. The length of the class session will also depend on your time limits and the number of groups. We try to limit each group to 15 students (20 at the most). At least one chaperone must accompany each group for supervision and assistance. The canoeing activity has very specific chaperone requirements.

We have done our best to list SOL connections. If these are very important to you, please double-check them.

Full lesson plans are available upon request.

 = This icon means this activity is at the waterfront area. We can only have two waterfront activities per day due to space restrictions. These classes will involve the possibility of getting wet and require water shoes.

 = This icon means the class can be held either indoors or outdoors. This is good for any day. These could be a good rainy-day alternative.

 = This icon features topics on forestry.

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Blue Crab Exploration

Students dive into the fascinating world of Atlantic blue crabs during this hands-on coastal ecology experience. Set on our dock and in kayaks in the bay, participants learn about blue crab anatomy, life cycles, behavior, and their critical role in estuarine ecosystems while actively trying their hand at crabbing using traditional hooks and bait. Through guided observation and identification, students distinguish between male and female crabs, explore adaptations like swimming legs and molting, and discuss how estuaries serve as vital nursery habitats. The activity also highlights human impacts such as pollution, habitat loss, and overharvesting, encouraging stewardship and conservation awareness. This engaging field experience blends science, inquiry, and outdoor adventure to bring marine ecology to life.

Bravo, Charlie!: Maritime Communication Challenge

Virginia Standards of Learning Alignment

In this interactive, team-based activity, students explore how humans develop and use standardized communication systems to solve real-world problems, particularly in maritime environments. By learning and applying international maritime signal flags, students practice interpreting symbols, conveying information accurately, and responding to simulated scenarios that emphasize safety and coordination. Students analyze the advantages and limitations of different communication methods, compare historical and modern technologies, and collaborate to solve challenges that mirror authentic maritime situations.

Student Learning Outcomes
Students will be able to: Explain how standardized symbols and signals improve safety and efficiency in maritime communication. Interpret and use visual symbols to convey information accurately
Compare historical and modern communication technologies and describe how technological advances influence human activity. Apply teamwork, problem-solving, and critical-thinking skills in time-sensitive scenarios

Virginia SOL Connections
Science
SOL 5.5 – Students investigate ecosystems and human interactions within aquatic and coastal environments, including how human activities rely on and impact these systems
SOL 6.1 – Students demonstrate scientific investigation, reasoning, and logic by interpreting symbols, communicating information, and working collaboratively
History and Social Science
SOL VS.1 – Students apply historical thinking skills, including analyzing artifacts, symbols, and primary sources related to maritime history and navigation
SOL USI.1 – Students use inquiry skills to analyze how technology and innovation affect exploration, communication, and safety
English
SOL 5.1 / 6.1 – Students participate in collaborative discussions, listen actively, and communicate ideas clearly using appropriate vocabulary and symbols
Career and Technical Education / 21st-Century Skills
Workplace Readiness Skills (WRS) – Communication, teamwork, problem-solving, and adaptability

Coastal Fishing: Marine Ecology & Fisheries Management (Virginia SOL–Aligned)

This experiential coastal fishing lesson immerses students in marine ecology through hands-on exploration of Virginia's coastal and estuarine systems. Conducted on the dock, the activity engages students in supervised recreational fishing while examining how abiotic factors—such as salinity, tides, temperature, and nutrient availability—influence aquatic ecosystems and fish populations. Students identify common coastal fish species, compare fishing rig designs, and investigate how feeding strategies and physical adaptations support survival in dynamic marine environments.

Educators guide students in analyzing food webs, energy transfer, and species interactions while connecting human activities—such as fishing regulations, licensing, and habitat stewardship—to long-term ecosystem sustainability. Students practice safe fishing techniques, make observations about species diversity, and participate in structured discussions about population dynamics and conservation-based resource management.

Virginia Standards of Learning Connections:

- **Life Science**
  - **LS.4** – Investigate how energy flows through ecosystems, including food webs and predator–prey relationships.

- **LS.7** – Analyze how populations are affected by biotic and abiotic factors, including resource availability and environmental change.

- **Earth Science**

- **ES.8** – Examine the hydrosphere, including water quality, ocean systems, and the impact of human activities on aquatic environments.

- **ES.10** – Evaluate how human use of natural resources affects Earth systems and the importance of conservation practices.

This lesson supports inquiry-based learning, reinforces real-world scientific applications, and encourages environmental stewardship through authentic field experiences aligned with Virginia's science curriculum.

Dock Discoveries Field Experience 

Dock Discoveries immerses students in authentic field science as they explore the rich "fouling community''—the diverse assemblage of organisms that colonize manmade marine structures—along a dock and in a brackish marsh. Using hand nets, buckets, identification guides, and magnification tools, students collect, observe, and analyze organisms that depend on this dynamic estuarine environment.

During the activity, learners:

- Investigate sessile organisms such as barnacles, mussels, tunicates, sponges, bryozoans, hydrozoans, and anemones.
- Examine mobile species, including small crabs, sea stars, grass shrimp, polychaetes, isopods, and mud snails.
- Analyze food webs, energy transfer, and the role of producers, consumers, and decomposers within this tidal ecosystem.
- Explore biotic and abiotic factors—temperature, water flow, nutrient levels, tides—and how they drive adaptations for survival.
- Identify ecological relationships, including predator/prey interactions, parasitism, coexistence, competition, and mutualism.
- Engage in guided inquiry by asking questions, making observations, and interpreting the ecological roles of collected specimens.

This experience deepens students' understanding of marine ecology, environmental change, and interconnected food webs through hands-on discovery and place-based learning.

Virginia Standards of Learning (SOL) Alignment (Grades 3–10)

Grade 3

- 3.4 — Behavioral and physical adaptations that help organisms survive.
- 3.5 — Aquatic ecosystems, diversity of organisms, and relationships among organisms.
- 3.8 — How natural events and human activity influence ecosystems.

Grade 4

- 4.3 — Populations and communities; food webs; organism interactions.
- 4.8 — Watersheds, water resources, and human impacts.

Grade 5

- 5.5 — Cell processes, photosynthesis, and energy transfer.
- 5.7 — Organisms' interactions, niches, and adaptations.

Grade 6

Supports concepts explicitly outlined in the Dock Discoveries curriculum itself:

- 6.L.2 — Flow of energy through ecosystems, photosynthesis, and food webs.
- 6.L.2.3 — Influence of abiotic factors (temperature, sunlight, water) on organism survival.

Grade 7 (Life Science)

- LS.3–LS.6 — Classification, cellular processes, and energy transfer in ecosystems.
- LS.7 — Adaptations, biotic/abiotic influences, and responses to environmental change.
- LS.8 — Ecological relationships, including competition, predation, parasitism, and mutualism.

Grade 8

- 8.L.3.1 — How food, water, shelter, and space determine ecosystem population dynamics.
- 8.L.3.2 — Producer/consumer/decomposer relationships and types of species interactions.

- **High School: Biology (Grades 9–10)**
- BIO.6 — Energy flow, nutrient cycles, and interdependence in ecosystems.
- BIO.8 — Population dynamics, community interactions, and the impact of environmental factors.

Estuary Exploration 

Estuary Exploration engages students in hands-on investigation of a coastal ecosystem. Using a guided scavenger hunt, learners explore the high marsh to identify plants, animals, and signs of ecological interactions while discussing how tides, nutrients, and abiotic factors shape this highly productive habitat. Students examine producer–consumer–decomposer relationships, observe adaptations that enable organisms to survive fluctuating salinity and water levels, and consider human impacts such as marine debris. The activity builds ecological literacy through observation, classification, and real-world environmental connections.

Virginia Standards of Learning (Grades 3–10)

Grade 3

- 3.4, 3.5 – Adaptations, ecosystems, and relationships among organisms.
- 3.6–3.10 – Natural resources, environmental change, and human impacts.

Grade 4

- 4.5, 4.6, 4.9 – Ecosystem interactions, weathering/erosion, Virginia's natural resources, including wetlands and estuaries.

Grade 5

- 5.5–5.7 – Photosynthesis, food webs, and organism interactions in ecosystems.

Grade 6

- 6.L.2 / 6.L.2.3 – Energy flow, producers–consumers–decomposers, and influence of abiotic factors.

Grade 7 (Life Science)

- LS.6–LS.8 – Ecosystems, nutrient cycles, interdependence, and environmental impacts.

Grade 8

- 8.E.1 / 8.E.1.2 – Hydrosphere, estuaries, marine ecosystems, and human effects.
- 8.L.3 – Population factors, organism interactions (competition, mutualism, parasitism).

High School (Grades 9–10)

- Biology (BIO.6, BIO.8) – Energy flow, ecosystems, and human impact.
- Earth Science (ES.6, ES.8) – Water systems, estuaries, and coastal processes.

Fiddle Facts 

Fiddle Facts introduces students to the ecology and behavior of fiddler crabs while teaching scientific population estimation methods. At the shore at low tide, students observe fiddler crab behaviors—such as feeding, predator avoidance, and mating displays—and learn how burrows provide protection and support reproduction. Using quadrats and data sheets, student groups count burrows, calculate averages, and use these sample plots to estimate the size of the entire crab population. This hands-on field study builds skills in data collection, ecological reasoning, and understanding how food, water, shelter, and space influence wildlife populations.

Virginia Standards of Learning Alignment (Grades 3–10)

Grade 3

- **3.4, 3.5** – Animal adaptations and relationships in ecosystems.
- **3.10** – Impacts on natural systems and observing living organism behaviors.

Grade 4

- **4.5, 4.6** – Ecosystem interactions and how organisms meet needs within habitats.

Grade 5

- **5.5, 5.7** – Food webs, population interactions, and environmental influences on organisms.

Grade 6

- **Scientific Investigation Skills** – Data collection, measurement, and analysis.

- **6.L.2** – Energy flow and interactions influenced by abiotic and biotic factors.

Grade 7 (Life Science)

- **LS.6–LS.8** – Populations, community interactions, and environmental influence on organism behavior.

Grade 8

- **8.L.3 / 8.L.3.1** – How food, water, shelter, and space affect population size.
- **8.L.3.2** – Producer-consumer-decomposer relationships and ecological interactions.

High School (Grades 9–10)

- **Biology BIO.6 & BIO.8** – Population dynamics, behavior, and ecological interactions.
- **Earth Science ES.6 & ES.8** – Coastal ecosystems and environmental influences on species distributions.

Fish Forms 

Fish Forms engages students in exploring how fish adapt to different aquatic environments. After learning about key adaptations—such as fin structure, body shape, coloration, scales, sensory organs, and specialized feeding mechanisms—students work in small groups to design a fish that could survive in a specific habitat. Using habitat cards and craft materials, each team creates a fish with adaptations that address feeding, movement, respiration, protection, and environmental challenges like changing salinity, temperature, and tides. Students then present their creations and explain how their fish's adaptations support survival and ecological interactions (competition, predation, mutualism). This hands-on activity builds understanding of form and function relationships and the role of abiotic factors in shaping aquatic life.

Virginia Standards of Learning (Grades 3–10)

Grades 3–5

- **3.4, 3.5** – Animal adaptations and relationships among organisms.
- **4.5** – How organisms meet life needs within ecosystems.
- **5.5, 5.7** – Photosynthesis, food webs, and organism interactions.

Grade 6

- **6.L.2 / 6.L.2.3** – Energy flow, adaptations, and responses to abiotic factors.

Grade 7 (Life Science)

- **LS.6–LS.8** – Interactions, adaptations, and environmental influences on populations.

Grade 8

- **8.L.3 / 8.L.3.1 / 8.L.3.2** – How food, water, shelter, and space affect populations; relationships among producers, consumers, and decomposers (directly listed in curriculum correlations).

High School (Grades 9–10)

- **Biology (BIO.6, BIO.8)** – Ecosystem dynamics, adaptations, and organism interactions.
- **Earth Science (ES.6, ES.8)** – Aquatic environments, abiotic factors, and habitat variation.

Hooks and Ladders Striped Bass- 

Hooks and Ladders is an interactive simulation that helps students explore the life cycle and migration challenges of anadromous fish—especially Striped Bass. Students roleplay fish, predators, fishermen, and dam operators as they navigate a large outdoor course representing the journey between freshwater spawning grounds and the ocean. Through hands-on movement, students experience limiting factors—such as predators, low river flow, turbines, habitat fragmentation, and fishing pressure—that impact fish survival. The activity deepens understanding of how human actions (dams, pollution, overfishing) and natural factors influence fish populations and the success of conservation efforts.

Virginia Standards of Learning (Grades 3–10)

Grades 3–5

- **3.5, 3.10** – Ecosystem relationships, environmental change, and human impacts on animal survival.
- **4.5** – How organisms meet life needs within ecosystems.
- **5.5, 5.7** – Food webs, life processes, and how environmental factors influence organisms.

Grade 6

- **6.L.2 / 6.L.2.3** – Energy flow, biotic and abiotic factors, and how environmental conditions affect organism survival.

Grade 7 (Life Science)

- **LS.6–LS.8** – Population interactions, environmental influences, and ecosystem dynamics.

Grade 8

- **8.L.3 / 8.L.3.1 / 8.L.3.2** – How food, water, shelter, and space affect populations, and relationships among producers, consumers, and decomposers

High School (Grades 9–10)

- **Biology (BIO.6, BIO.8)** – Ecosystem dynamics, population changes, and human impacts on species survival.
- **Earth Science (ES.6, ES.8)** – Watersheds, river systems, and how human modifications affect aquatic ecosystems.

ID That Tree  **Recommended for grades 5-8**

Adapted from resources provided by the Virginia Department of Forestry for Zoar State Forest. Camp Piankatank is located in the eastern region of Virginia and features all of the trees included in the lesson plan.

Objective- Students will use a scientific key to identify trees by their leaves.

Standards of Learning: Science 4.8, 5.1, 5.5, 6.1, LS.5, BIO.1, BIO.7

LP-SF-Tree-Trunks-ID-That-Tree-Zoar.docx- **Main lesson plan**

LP-SF-Tree-Trunks-Tree-Photo-Cards.pdf- **Tree ID cards**

LP-SF-Tree-Trunks-Tree-for-Me.docx **– only the worksheet from the last page of this resource will be utilized.**

Incredible Journey

Incredible Journey transforms students into "water droplets" as they travel through the many pathways of the water cycle. Using dice, station cards, and beads, students simulate real world water movement—evaporation, condensation, precipitation, transpiration, percolation, freezing, melting, and more—showing how water continuously shifts between Earth's reservoirs. As they build a bead bracelet tracking their path, students discover how solar energy, gravity, weather, plants, animals, and landforms influence water's movement and availability. This activity deepens understanding of Earth's systems, water distribution, and the importance of freshwater as a limited resource.

Virginia Standards of Learning (Grades 3–10)

Grade 3

- **3.6** – Soil and water's role in ecosystems, including water movement and patterns.
- **3.7** – Water cycle components and their importance to life.

Grade 4

- **4.6, 4.8** – Weather, climate, and Earth's water resources.
- **4.9** – Watersheds and human impacts.

Grade 5

- **5.1 (Investigation Skills)** – Modeling natural processes like the water cycle.
- **5.6** – Water on Earth and its distribution.

Grade 6

- **6.8** – Water as a natural resource, watershed processes, and Earth's systems interactions.

Grade 7

- **7.E.1 / 7.E.1.2** – Cycling of water and gases through Earth's atmosphere and how these processes shape weather patterns (explicitly listed in the activity's curriculum correlations).

Grade 8

- **8.E.1 / 8.E.1.1** – Hydrosphere structure, water distribution, river basins, and human impacts (explicitly listed in curriculum correlations).

High School (Grades 9–10)

- **Earth Science (ES.1, ES.2, ES.7)** – Water cycle processes, atmospheric interactions, and Earth systems models.
- **Biology (BIO.2)** – Matter cycling, including water movement through ecosystems.

Leaf ID and Leaf Bingo- Recommended for grade 3-5 

Leaf ID and Leaf Bingo — Extension and Outreach — Department of Ecosystem Science and Management

Marsh Munchers 

Marsh Munchers immerses students in an active simulation of an estuarine food web. Students take on the roles of various marsh organisms—detritus eaters, filter feeders, and predators—each with different feeding behaviors. As they collect "food tokens" while avoiding predation, students experience how producers, consumers, decomposers, and abiotic factors shape ecosystem dynamics. After the activity, students map the food web they created and analyze how energy flows through the system, how species depend on each other, and what happens when one part of the web is removed. This interactive lesson highlights the importance of estuaries as productive nursery habitats and strengthens understanding of ecological relationships and energy transfer.

Virginia Standards of Learning (Grades 3–10)

Grade 3

- **3.5** – Ecosystems contain living and nonliving components; relationships among organisms.
- **3.10** – Effects of human and environmental change on ecosystems.

Grade 4

- **4.5** – Organisms meet life needs and interact within ecosystems.
- **4.9** – Virginia's natural resources, including wetlands and coastal environments.

Grade 5

- **5.5, 5.7** – Photosynthesis, food webs, and organism interactions in ecosystems.

Grade 6

- **6.L.2 / 6.L.2.1** – Energy flow from producers to consumers to decomposers.
- **6.L.2.3** – Influence of abiotic factors like water, sunlight, and soil on organism survival.

Grade 7

- **LS.6–LS.8** – Interactions among organisms and environmental influences on population dynamics.

Grade 8

- **8.E.1 / 8.E.1.2** – Hydrosphere, estuaries, marine ecosystems, and resource sustainability.
- **8.L.3 / 8.L.3.1 / 8.L.3.2** – Population factors (food, water, space), and relationships such as competition, mutualism, parasitism, and predator–prey.

High School (Grades 9–10)

- **Biology (BIO.6, BIO.8)** – Energy flow, nutrient cycles, and ecosystem interactions.
- **Earth Science (ES.6, ES.8)** – Coastal ecosystems, hydrosphere processes, and human impacts.

Squid Dissection 

Squid Dissection introduces students to the anatomy, adaptations, and ecological role of one of the ocean's most advanced invertebrates. Through a guided dissection, students investigate both the external and internal structures of a squid—including its mantle, chromatophores, siphon, gills, hearts, ink sac, beak, and feeding tentacles—while learning how these features support movement, feeding, respiration, and defense. Students also explore squid taxonomy (Kingdom Animalia, Phylum Mollusca, Class Cephalopoda) and discuss the importance of squid in marine food webs as both predators and prey. This hands-on activity strengthens observation, classification, and scientific inquiry skills.

Virginia Standards of Learning (Grades 3–10)

Grades 3–5

- **3.4, 3.5** – Animal adaptations and relationships in aquatic ecosystems.
- **4.5** – How organisms meet life needs through structure and behavior.
- **5.5, 5.7** – Body systems, life processes, and food web interactions.

Grade 6

- **6.2 (Life Science foundations)** – Classification of organisms and the role of structure in survival.
- **6.L.2** – Energy flow and interactions among biotic and abiotic factors.

Grade 7 (Life Science)

- **LS.2, LS.4** – Classification, organism characteristics, and how structure relates to function.
- **LS.6–LS.8** – Ecosystem interactions, adaptations, and population dynamics.

Grade 8

- **8.L.3** – How organisms interact with and respond to biotic and abiotic components of their environment; predator-prey roles and food web relationships.

High School (Grades 9–10)

- **Biology (BIO.1, BIO.4, BIO.6, BIO.8)** – Scientific investigation, cell/organism structure and function, evolution and adaptations, and ecosystem dynamics.
- **Oceanography / Earth Science (ES.1, ES.7)** – Marine ecosystems and biological adaptations within ocean environments.

Stampers Bay Canoeing 

Stampers Bay Canoeing gives students a close-up, immersive experience in a dynamic salt marsh ecosystem. From their kayaks, learners observe *Spartina* grass, oyster beds, fiddler crabs, wading birds, and other estuarine species while exploring how tidal cycles shape habitat conditions. Along the route, educators highlight adaptations that help organisms survive fluctuating salinity, temperature, and water levels. Students also investigate how energy flows through the marsh food web—from phytoplankton and *Spartina* to consumers and decomposers—and discuss human impacts such as pollution, nutrient runoff, and habitat disturbance. This activity builds ecological literacy, emphasizes watershed stewardship, and strengthens students' ability to connect abiotic factors to biodiversity and ecosystem health.

A maximum of 30 participants, students and teachers, will be guided by an instructor on a canoeing trip exploring Stampers Bay and its accompanying marshes. Participants will start with an introduction to canoeing and the rules of travel on water, before embarking on a journey on which they will explore the tidal marshes and Berkley Island, looking for local wildlife along the way. Students will learn about the local ecology and food web while exploring native habitats. Participants will need to bring water shoes and be prepared to get wet up to their knees. No student's personal electronics will be allowed on the water. Grades 3-4 need to have one adult per two canoes (a 1:5 ratio). Grades 5+ need to maintain a ratio of 8 students per one adult. The adults must be willing and able to go canoeing. Camp Piankatank provides life jackets, which are required. Expect to have 3 people per canoe, possibly 4 per canoe for smaller children.

Virginia Standards of Learning (Grades 3–10)

Grades 3–5

- **3.5** – Aquatic and terrestrial ecosystems support diverse organisms; relationships among organisms.
- **4.5** – Life needs and interactions within ecosystems, including wetlands and coastal systems.
- **5.5 & 5.7** – Photosynthesis, food webs, and the role of environmental factors in organism survival.

Grade 6

- **6.8 (Earth Systems)** – Water as a resource, watersheds, and human impacts.
- **6.L.2** – Energy flow within ecosystems and the influence of abiotic factors (reinforced through tidal cycles, nutrient levels, and *Spartina* productivity).

Grade 7 (Life Science)

- **LS.6–LS.8** – Adaptations, ecological interactions, and population dynamics in changing environments.

Grade 8

- **8.E.1 & 8.E.1.1** – Hydrosphere structure, water distribution, and local river basins.
- **8.E.1.2** – Estuaries as nutrient-rich ecosystems; marine resources and sustainability.

High School (Grades 9–10)

- **Biology (BIO.6 & BIO.8)** – Energy flow, biotic interactions, and ecosystem stability.

- **Earth Science (ES.1, ES.6, ES.8)** – Coastal processes, human environmental impacts, and hydrosphere dynamics.

Swimming in the pool

Our pool is open from Memorial Day to Labor Day. Camp Piankatank provides lifeguards. Please schedule time for changing into and out of bathing suits. This activity can be done in the rotation of your educational activities or independently on an hourly basis if time permits. If operated in addition to your rotation of educational activities, there may be an additional cost.