

Kids in the Creek

Focused, hands-on, fun learning that supports the
North Carolina Science Curriculum Standards

The program has been offered by LJEA since 2011.
Received Governor's Award for Volunteer Service in 2015.

We currently involve over 500 students annually,
most with both an in-school and in-the-creek session.

Driven by volunteers - for teachers and students.

Let's work together to expand this outreach.





KIDS IN THE CREEK

*The most amazing thing about the Kids in the Creek program is not that **over 530** students from McDowell and Burke Counties participate each year, but the enthusiasm the students bring to it.*

- West Mcdowell – 207 Students
- East Mcdowell – 132 Students
- FCS – 104 Students
- Freedom High – 93 Students



The KITC program supports and enhances North Carolina Education Standards



Public Schools of North Carolina
State Board of Education | Department of Public Instruction

North Carolina Essential Standards 6-8 Science

Note on Numbering:

Physical Science (P) Earth Science (E) Life Science (L)

The North Carolina Science Essential Standards maintain the respect for local control of each Local Education Authority (LEA) to design the specific curricular and instructional strategies that best deliver the content to their students. Nonetheless, engaging students in inquiry-based instruction is a critical way of developing conceptual understanding of the science content that is vital for success in the twenty-first century. The process of scientific inquiry, experimentation and technological design should not be taught nor tested in isolation of the core concepts drawn from physical science, earth science and life science. A seamless integration of science content, scientific inquiry, experimentation and technological design will reinforce in students the notion that "what" is known is inextricably tied to "how" it is known. A well-planned science curriculum provides opportunities for inquiry, experimentation and technological design. Teachers, when teaching science, should provide opportunities for students to engage in "hands-on/minds-on" activities that are exemplars of scientific inquiry, experimentation and technological design.

Earth Systems, Structures and Processes

	Essential Standard	Clarifying Objectives	
8.E.1	Understand the hydrosphere and the impact of humans on local systems and the effects of the hydrosphere on humans.	8.E.1.1	Explain the structure of the hydrosphere including: <ul style="list-style-type: none"> • Water distribution on earth • Local river basins and water availability
		8.E.1.2	Summarize evidence that Earth's oceans are a reservoir of nutrients, minerals, dissolved gases, and life forms: <ul style="list-style-type: none"> • Estuaries • Marine ecosystems • Upwelling • Behavior of gases in the marine environment • Value and sustainability of marine resources • Deep ocean technology and understandings gained
		8.E.1.3	Predict the safety and potability of water supplies in North Carolina based on physical and biological factors, including: <ul style="list-style-type: none"> • Temperature • Dissolved oxygen • pH • Nitrates and phosphates • Turbidity • Bio-indicators
		8.E.1.4	Conclude that the good health of humans requires: <ul style="list-style-type: none"> • Monitoring of the hydrosphere • Water quality standards • Methods of water treatment • Maintaining safe water quality • Stewardship

Earth Systems, Structures and Processes

	Essential Standard	Clarifying Objectives	
7.E.1	Understand how the cycling of matter (water and gases) in and out of the atmosphere relates to Earth's atmosphere, weather and climate and the effects of the atmosphere on humans.	7.E.1.1	Compare the composition, properties and structure of Earth's atmosphere to include: mixtures of gases and differences in temperature and pressure within layers.
		7.E.1.2	Explain how the cycling of water in and out of the atmosphere and atmospheric conditions relate to the weather patterns on Earth.
		7.E.1.3	Explain the relationship between the movement of air masses, high and low pressure systems, and frontal boundaries to storms (including thunderstorms, hurricanes, and tornadoes) and other weather conditions that may result.
		7.E.1.4	Predict weather conditions and patterns based on information obtained from: <ul style="list-style-type: none"> • Weather data collected from direct observations and measurement (wind speed and direction, air temperature, humidity and air pressure) • Weather maps, satellites and radar • Cloud shapes and types and associated elevation
		7.E.1.5	Explain the influence of convection, global winds and the jet stream on weather and climatic conditions.
		7.E.1.6	Conclude that the good health of humans requires: monitoring the atmosphere, maintaining air quality and stewardship.

Structures and Functions of Living Organisms

	Essential Standard	Clarifying Objectives	
7.L.1	Understand the processes, structures and functions of living organisms that enable them to survive, reproduce and carry out the basic functions of life.	7.L.1.1	Compare the structures and life functions of single-celled organisms that carry out all of the basic functions of life including: <ul style="list-style-type: none"> • Euglena • Amoeba • Paramecium • Volvox
		7.L.1.2	Compare the structures and functions of plant and animal cells, including major organelles (cell membrane, cell wall, nucleus, chloroplasts, mitochondria, and vacuoles).
		7.L.1.3	Summarize the hierarchical organization of multi-cellular organisms from cells to tissues to organs to systems to organisms.
		7.L.1.4	Summarize the general functions of the major systems of the human body (digestion, respiration, reproduction, circulation, and excretion) and ways that these systems interact with each other to sustain life.

Structures and Functions of Living Organisms

	Essential Standard	Clarifying Objectives	
8.L.1	Understand the hazards caused by agents of diseases that effect living organisms.	8.L.1.1	Summarize the basic characteristics of viruses, bacteria, fungi and parasites relating to the spread, treatment and prevention of disease.
		8.L.1.2	Explain the difference between epidemic and pandemic as it relates to the spread, treatment and prevention of disease.
8.L.2	Understand how biotechnology is used to affect living organisms.	8.L.2.1	Summarize aspects of biotechnology including: <ul style="list-style-type: none"> • Specific genetic information available • Careers • Economic benefits to North Carolina • Ethical issues • Implications for agriculture

Ecosystems

	Essential Standard	Clarifying Objectives	
8.L.3	Understand how organisms interact with and respond to the biotic and abiotic components of their environment.	8.L.3.1	Explain how factors such as food, water, shelter and space affect populations in an ecosystem.
		8.L.3.2	Summarize the relationships among producers, consumers, and decomposers including the positive and negative consequences of such interactions including: <ul style="list-style-type: none"> • Coexistence and cooperation • Competition (predator/prey) • Parasitism • Mutualism
		8.L.3.3	Explain how the flow of energy within food webs is interconnected with the cycling of matter (including water, nitrogen, carbon dioxide and oxygen).

Understanding watersheds, runoff, erosion, pollution and prevention.



Typically, a 20-minute session that can be facilitated by volunteers of all ages. It can be adapted to specific learning objectives.



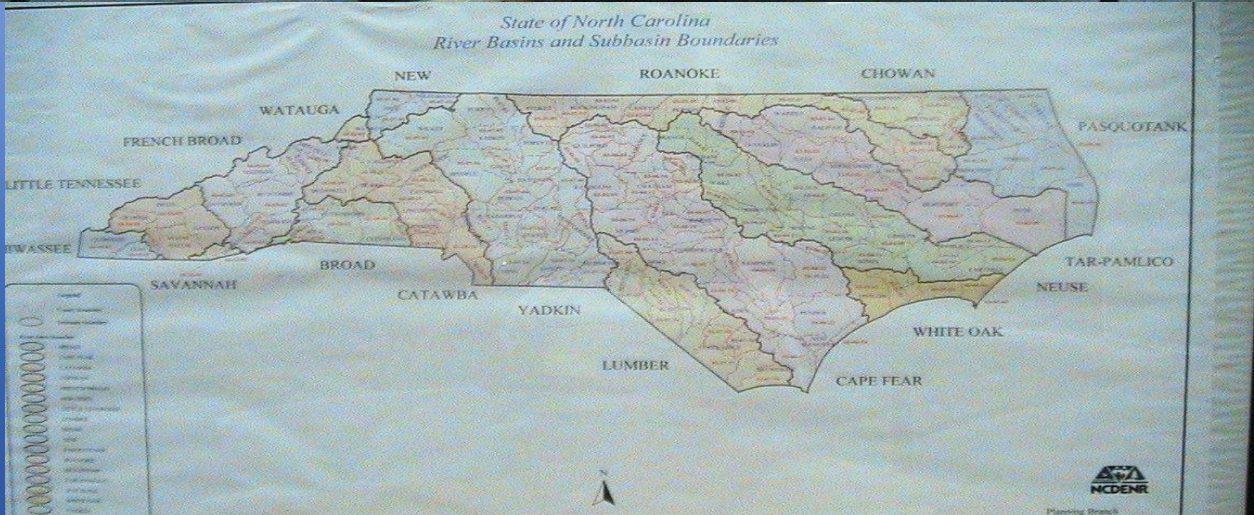
Understanding: Surface water and ground water interaction, well safety, ground water pollution and remediation.



This model can be used for grade levels from 3rd through college. It helps students “see” ground water flow.



A poster session emphasizes: fact-finding, data discovery, and interpretation. Recording citations and creative writing can be woven into this session.



IT CAN'T BE A WETLAND, THERE ARE TREES GROWING IN IT!!
 COMMON MYTHS AND MISCONCEPTIONS ABOUT WETLANDS
 AND THE STARTLING TRUTH

THIS ISN'T A WETLAND, I DON'T SEE ANY WATER.
 Not all wetlands have a continuous occurrence of water on the surface of the ground. Some wetlands have surface water during only a portion of the year. Some wetlands hold water within the soil, where it's used by plants growing in the area but can't be seen without digging. Wetlands may have water at or near the surface, and an occurrence may be either permanent or ephemeral.

OUR TOWN NEEDS A MORE CONVENIENT SHOPPING CENTER. DEVELOPMENT IS MORE IMPORTANT THAN WETLANDS.
 Wetlands can benefit communities through their natural processes known as wetland functions - see "Wetlands Are Buggy". The loss of these wetland functions can result in local economic burdens resulting from flooding, erosion, decreased water supply, increased water treatment costs, and lost revenue from recreation, fishing, hunting, and trapping. Legislation has been enacted to protect the unnecessary loss of wetlands. Regulations are aimed at stopping all development in wetlands, rather than just to ensure that development is done only after careful consideration of alternatives and impacts.

IF WE FILL THESE WETLANDS, WE CAN PREVENT FLOODING PROBLEMS.
 Filling wetlands for protection from flooding may indeed contribute to problems from natural disasters. These wetlands remaining in the watershed may be overbanked and incapable of performing their natural functions, such as storing and flood water storage, and neighboring or downstream properties may suffer the damage. Floods may increase as much as 50% in watersheds with little or no wetlands compared to basins with many wetlands.

WE SHOULD GET A PERMIT EASILY. WE'LL REPLACE THESE WETLANDS WITH NEW ONES THAT WILL BE JUST AS GOOD.
 A permit may be required, in accordance with Section 404 of the Clean Water Act, before certain activities can be undertaken in wetlands. The replacement of lost wetlands by creating new wetlands or enhancing degraded wetlands, preferred to an compensatory mitigation, is a relatively new technology which lacks a body of evidence on its success. Therefore, emphasis is

WETLANDS ARE BUGGY. DON'T BOTHER PROTECTING THEM.
 A history of wetlands, such as swamps, marshes, wet meadows, and bogs, provides functions that are important to the public. Wetlands can provide protection from flooding by retaining peak flood waters and protecting from erosion by interrupting the energy of waves and flood waters. They can improve water quality by filtering out pollutants. They can approach water supplies by retaining precipitation and gradually releasing ground water and streams. They support the food chains upon which fish and wildlife live, a resource that supports recreational fisheries. The land area comprising the lower 48 states contained nearly 115 million acres of wetlands at the time of colonial America. As of 1978, an estimated 104 million acres of wetlands remained - a 10% loss. Wetland losses between the mid 1920's to the mid 1980's averaged 45 acres per minute. Today the world has lost 50% of water, and the United States has lost 80% of water, all their original wetlands.

LET'S MAKE THIS A BETTER WETLAND BY FLOODING IT!
 While water on or in the ground is necessary in a wetland, there can be too much of a good thing. Although deep water is beneficial to certain wetland and fish, the water of the area for other fish and wildlife, as well as important wetland processes, may be diminished. Flooding a wetland can cause much of the vegetation to die. The water of the wetland is often pollutants, private sewage, and garbage - none can be done. This is a condition that is increasingly beneficial.

FORGET ABOUT SWAMPS, WE'LL GET MORE OPEN AREAS TO HUNT AND FISH.
 Wetlands support a variety of animals including game animals such as quail, wild turkey, and dove. Even wetlands that appear to be at the surface are much of the time either open natural or man-made wetlands and are still productive. Multiple can contribute to local economies through water associated with hunting, fishing, and other wildlife-based recreation.

THE TRUTH IS, WETLAND PROTECTION IS IMPORTANT.
 You can help pay for understanding the



Examining aquatic life helps students understand the link between water quality and a healthy ecosystem.

Volunteer opportunities include working in the stream or on the banks. You can start at any level and build your understanding of aquatic life and how we measure stream health.



Profiling the stream and estimating velocities allows the students to estimate discharge. They apply their geometry and math skills and we learn about: experimental design, field measurement error, data integration. Yep, we often get wet.

TEAM	m/sec Velocity	M ² Area	Q (discharge) Cubic Meters/second
Red	.416	0.66	0.27
Green	0.39 0.39	1.49	0.58
Blue	0.68	3.17	2.16
Yellow	0.65	1.38	0.87
Avg	0.53	Σ 6.7	3.53 M ³ /sec x 264 937 gallons/sec



Examining water's physical and chemical properties, in the stream, enhances students' interests and appreciation for laboratory procedures.



LJEA wants to sustain and expand the Kids-in-the-Creek program in 2020. To do so, we need to:

- Increase our stock of volunteers
- Identify additional interested teachers
- Prepare stream stations

Will (not can) you help?

What LJEA will do:

- Train you and integrate you into a team
- Link you to resources
- Provide equipment and supplies
- Support your activities



LJEA.ORG