Web of Water Webisode 3: In the Sandhills
Discussion Questions and Answers

South Carolina Science Standards Grades 2-12

These standards correlate to discussion questions and answers for Webisode 3 of the Web of Water Series at http://www.webofwater.org.

QUESTIONS:

1. Why is there a “Fall Line” in the middle of the state?

2. Explain the difference between an exotic and native species? How do they affect one another?

3. The fish ladder was built to help fish migrate up the river. What is migration?

4. Who were the Catawba?

5. Who was Robert Mills and what did he have to do with the canals in Columbia?

6. What role did the river play in the development of the city of Columbia?

ANSWERS:

1. In the Sandhills region of South Carolina, the igneous and metamorphic rock of the hilly Piedmont meets the sandy soils and sedimentary rock of the lower regions in the middle of the state. Sedimentary rock erodes faster than metamorphic and igneous rock. Over millions of years this has left a shelf that crosses three states called the Fall Line or Fall Zone. Learn more about the context of the Fall Zone in the Three Rivers module of RiverVenture.org, or find out more about rocks and the rock cycle in the Carrick Creek module of RiverVenture.

2. Exotic species of plants and animals come from foreign lands. Native species are naturally occurring in a region. Plants and animals often compete for sunlight, food, or other resources. Often in places where exotic plants or animals have been introduced, they do not have natural predators, and so they choke out native species. These exotic species are often referred to as invasive. An example of an invasive animal species is the Green Porcelain Crab, introduced to the salt waters of Charleston Harbor. Some theories as to how the crab got there are 1) through the aquarium trade, or 2) on incoming ships importing seafood into South Carolina. Go to the Estuary at RiverVenture.org to learn more about the Green Porcelain Crab. An example of an invasive plant species is Kudzu, which you can learn more about in the Three Rivers module of RiverVenture.org.

3. Migration is the movement of organisms from one area to another. Many kinds of fish migrate in order to feed, reproduce, or to regulate their body temperatures. Pacific salmon are well-known for their migration patterns. As adults, these fish migrate from the sea back to the freshwater streams in which they hatched in order to spawn, or lay eggs of their own.

4. The Catawba are an American Indian tribe that lived near the Piedmont and Sandhills. Historical records show members of the Catawba tribe have lived in South Carolina since 1650. The original Catawba called themselves "Ye Iswa," meaning "river people. Go to Periscope at Knowitall.org in order to learn more about the Catawba and other Native Americans of South Carolina. At Periscope, look for the November issue on Native American Heritage Month.

5. Robert Mills was a famous architect of Scottish decent. He designed many famous buildings including the Washington Monument in DC. He also helped design the canal systems in Columbia, South Carolina and others across the state, including the Landsford canal on the Catawba River at what is now Landsford Canal State Park. The Landsford canal was part of a series of canals running up and down the Fall Line along the Catwaba and Wateree rivers, circa 1820. These structures helped to make the rivers more navigable for trade among settlements along rivers in the upstate and those along the rapids created by the Fall Line. Learn more about canals, their structure, the canal era and its contribution to hydroelectricity in the Three Rivers module of RiverVenture.org.

6. The three rivers that converge on Columbia brought many travelers. The difficult navigation of the Fall Line made the area a popular rest site. This contributed to the creation of the city. The rivers have afforded many crucial accommodations to early settlers and modern day inhabitants of the area, beginning with bountiful natural resources, transportation and trade routes, hydroelectricity, and now recreation. Learn more about settlement along the three rivers near Columbia at RiverVenture.org.

GRADE 2

Animals

Standard 2-2: The student will demonstrate an understanding of the needs and characteristics of animals as they interact in their own distinct environments. (Life Science)

Indicators

2-2.1 Recall the basic needs of animals (including air, water, food, and shelter) for energy, growth, and protection.

2-2.5 Illustrate the various life cycles of animals (including birth and the stages of development).

GRADE 3

Habitats and Adaptations

Standard 3-2: The student will demonstrate an understanding of the structures, characteristics, and adaptations of organisms that allow them to function and survive within their habitats. (Life Science)

Indicators

3-2.1 Illustrate the life cycles of seed plants and various animals and summarize how they grow and are adapted to conditions within their habitats.

3-2.2 Explain how physical and behavioral adaptations allow organisms to survive (including hibernation, defense, locomotion, movement, food obtainment, and camouflage for animals and seed dispersal, color, and response to light for plants).

3-2.3 Recall the characteristics of an organism's habitat that allow the organism to survive there.

3-2.4 Explain how changes in the habitats of plants and animals affect their survival.

3-2.5 Summarize the organization of simple food chains (including the roles of producers, consumers, and decomposers).

GRADE 3

Earth's Materials and Changes

Standard 3-3: The student will demonstrate an understanding of Earth's composition and the changes that occur to the features of Earth's surface. (Earth Science)

Indicators

3-3.5 Illustrate Earth's saltwater and freshwater features (including oceans, seas, rivers, lakes, ponds, streams, and glaciers).

3-3.6 Exemplify Earth materials that are used as fuel, as a resource for building materials, and as a medium for growing plants.

GRADE 4

Organisms and Their Environments

Standard 4-2: The student will demonstrate an understanding of the characteristics and patterns of behavior that allow organisms to survive in their own distinct environments. (Life Science)

Indicators

4-2.2 Explain how the characteristics of distinct environments (including swamps, rivers and streams, tropical rain forests, deserts, and the polar regions) influence the variety of organisms in each.

4-2.5 Explain how an organism's patterns of behavior are related to its environment (including the kinds and the number of other organisms present, the availability of food and other resources, and the physical characteristics of the environment).

4-2.6 Explain how organisms cause changes in their environment.

GRADE 5

Ecosystems: Terrestrial and Aquatic

Standard 5-2: The student will demonstrate an understanding of relationships among biotic and abiotic factors within terrestrial and aquatic ecosystems. (Life Science)

Indicators

5-2.5 Explain how limiting factors (including food, water, space, and shelter) affect populations in ecosystems.

GRADE 5

Landforms and Oceans

Standard 5-3: The student will demonstrate an understanding of features, processes, and changes in Earth's land and oceans. (Earth Science)

Indicators

5-3.6 Explain how human activity (including conservation efforts and pollution) has affected the land and the oceans of Earth.

GRADE 6

Structures, Processes, and Responses of Plants

Standard 6-2: The student will demonstrate an understanding of structures, processes, and responses of plants that allow them to survive and reproduce. (Life Science)

Indicators

6-2.1 Summarize the characteristics that all organisms share (including the obtainment and use of resources for energy, the response to stimuli, the ability to reproduce, and process of physical growth and development).

GRADE 6

Structures, Processes, and Responses of Animals

Standard 6-3: The student will demonstrate an understanding of structures, processes, and responses of animals that allow them to survive and reproduce. (Life Science)

Indicators

6-3.2 Summarize the basic functions of the structures of animals that allow them to defend themselves, to move, and to obtain resources.

6-3.4 Explain how environmental stimuli cause physical responses in animals (including shedding, blinking, shivering, sweating, panting, and food gathering).

6-3.5 Illustrate animal behavioral responses (including hibernation, migration, defense, and courtship) to environmental stimuli.

GRADE 7

Ecology: The Biotic and Abiotic Environment

Standard 7-4: The student will demonstrate an understanding of how organisms interact with and respond to the biotic and abiotic components of their environment. (Earth Science, Life Science)

Indicators

7-4.3 Explain the interaction among changes in the environment due to natural hazards (including landslides, wildfires, and floods), changes in populations, and limiting factors (including climate and the availability of food and water, space, and shelter).

7-4.5 Summarize how the location and movement of water on Earth's surface through groundwater zones and surface-water drainage basins, called watersheds, are important to ecosystems and to human activities.

GRADE 8

Earth's Biological History

Standard 8-2: The student will demonstrate an understanding of Earth's biological diversity over time. (Life Science, Earth Science)

Indicators

8-2.5 Summarize the factors, both natural and man-made, that can contribute to the extinction of a species.

GRADE 8

Earth's Structure and Processes

Standard 8-3: The student will demonstrate an understanding of materials that determine the structure of Earth and the processes that have altered this structure. (Earth Science)

Indicators

8-3.2 Explain how igneous, metamorphic, and sedimentary rocks are interrelated in the rock cycle.

9-12
BIOLOGY

Standard B-6: The student will demonstrate an understanding of the interrelationships among organisms and the biotic and abiotic components of their environments.

Indicators

B-6.2 Explain how populations are affected by limiting factors (including density-dependent, density-independent, abiotic, and biotic factors).

9-12

EARTH SCIENCE

Solid Earth

Standard ES-3: Students will demonstrate an understanding of the internal and external dynamics of solid Earth.

Indicators

ES-3.6 Explain how the dynamic nature of the rock cycle accounts for the interrelationships among igneous, sedimentary, and metamorphic rocks.