

Standards below are based on the 2015 Kentucky Standards for Science

## **TVA Science Kids—World Water Monitoring**

### **4<sup>th</sup> Grade Science Standards**

#### **Structure, Function, and Information Processing**

- 4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction (during the Dissolved Oxygen Test we discuss how fish use gills to extract oxygen molecules from water)
- 4-LS1-2. Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways (we discuss animals that use visual cues for survival; prey/predator interactions and movement)

#### **Earth's Systems: Processes that Shape the Earth**

- 4-ESS2-1. Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation (definition of a watershed; discussion about runoff and pollution)

## **TVA Science Kids—World Water Monitoring**

### **5<sup>th</sup> Grade Science Standards**

#### **Structure and Properties of Matter**

- 5-PS1-4. Conduct an investigation to determine whether the mixing of two or more substances results in new substances. Chemical Reactions (chemical reactions discussed during Dissolved Oxygen test and pH test)

#### **Earth's Systems**

- 5-ESS2-1. Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact (discussion on how Dissolved Oxygen enters water)

- 5-ESS2-2. Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth (distribution of Earth's water)
- 5-ESS3-1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.
  - ESS3.C: Human Impacts on Earth Systems. Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments.

## **TVA Science Kids—World Water Monitoring**

### **6<sup>th</sup> Grade Science Standards**

#### **Matter and Energy in Organisms and Ecosystems**

- 06-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem (resource availability discussion; when one or more of our parameters are off, animals may migrate away which leads to prey/predator adaptation or migration)

#### **Interdependent Relationships in Ecosystems**

- 06-LS2-2. Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems (abiotic components - dissolved oxygen and temperature - can determine species adaptation/migration; suspended sediment/turbidity can affect growth of aquatic plants and therefore could affect oxygen byproduct or animals that require sight/visual cues for movement or to find prey/see predators)

#### **Earth's Systems**

- 06-ESS2-4. Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity (definition of a watershed; streams, tributaries, and runoff run into Tennessee River, which runs into Ohio River, Mississippi River, and eventually empties into Gulf of Mexico)

## Extended Resources

### Monitorwater.org

- **Map** - reading the map; land features that may affect water quality
- **Lesson Plans** - designed for grades 6-8
- **Books** - ELA component: pdf versions online; could be used before or after the program; vocabulary and questions at the end
- **Video Tutorials/Kit instructions**
- **Cabinet of Curiosities** - interviews with various scientists may inspire possible future careers in STEM

### In-person Logistics

- 70 minute session preferred; two 30 minute sessions also possible
- Self-contained classrooms?
- Info needed:
  - Get teacher names and email addresses
  - Dates for each school: Tuesday-Friday scheduling, prefer to do all schools at one time
  - Number of sessions needed for each school
  - Number of students in each class
  - Will send presentation and room setup info the day before the program
- Would selected body of water be recognizable to students?

### Virtual Logistics

- 9 videos (5-7 minutes each); can conduct lab as class time allows
- Options for group work or individual work
- Teacher packet
  - Teacher Prep document
  - Test directions document
  - Virtual Lesson Guide
  - Water collection instructions
  - Data sheet
- Info needed:
  - Teacher names and emails
  - Number of classes/number of students
  - Internet connectivity/capabilities
- Teacher feedback form