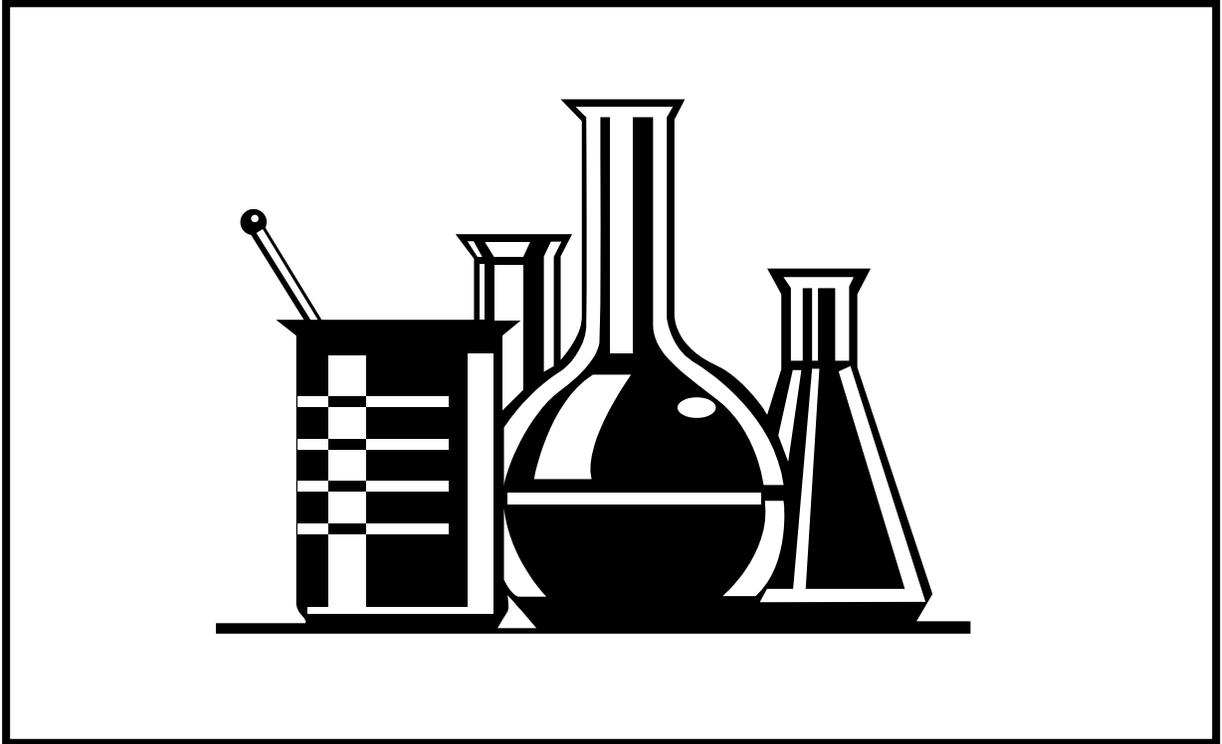




Turbid Waters!

2019 - Driftwood Education Center



Class Description:

Tidal rivers are home to many species of plants and animals. Through biological, physical, and chemical analysis, students will learn about tidal rivers and discover how human and natural factors influence the health of them.

**This class is composed of analysis and discussion.
Most appropriate for grades 6th -12th**

Driftwood Education Center
Po Box 20712 St. Simons Island, GA 31522
Phone: 912.638.3849 Fax: 912.634.0642
www.driftwoodee.org

Turbid Waters

Table of contents and outline:

I. Pre-class set-up (10 minutes)

1. Make sure supplies are prepared for class, chemicals, digital equipment, nets, and physical testing kits
2. Check iPads for battery life and documents needed

II. Introduction, assessment, and walking to dock (20 minutes)

1. Give an overview of what's going to happen in today's class, mentioning their scientific role
2. Assess what students already know about the various river systems and water quality

III. Water Testing (45 minutes)

1. Physical properties: temp – turbidity – tide
2. Chemical properties – pH - D.O. - salinity
3. Biological testing – collection and identification of organisms
4. Students will record data on iPad

IV. Group discussion and presentations (15 minutes)

1. Introduce leading questions
2. Create a group presentation around your findings
3. Present your findings and ideas to the class

V. Water Pollution Game (15 minutes)

1. Round One – Pollution Points
2. Round Two – Clean up a couple of the pollution points

VI. Safety on Docks

Georgia Performance Standards met

S5CS1.c Offer reasons for findings and consider reasons suggested by others.

S5Cs1.d Take Responsibility for understanding the importance of being safety conscious.

S5CS8.a Students will understand important features of the process of scientific inquiry.

S5P1. Obtain, evaluate, and communicate information to explain the differences between a physical change and a chemical change.

S6CS1. a and b: Students will explore the importance of curiosity, honesty, openness, and skepticism in science and will exhibit these traits in their own efforts to understand how the world works.

S6CS7.b: Recognize that there may be more than one way to interpret a given set of findings.

S6E3. Obtain, evaluate, and communicate information to recognize the significant role of water in Earth processes

S6E6. Obtain, evaluate, and communicate information about the uses and conservation of various natural resources and how they impact the Earth.

S7CS1.a: Understand the importance of—and keep—honest, clear, and accurate records in science.

S7L4. Obtain, evaluate, and communicate information to examine the interdependence of organisms with one another and their environments.

S8CS4.b: Use appropriate tools and units for measuring objects and/or substances.

SC6. Obtain, evaluate, and communicate information about the properties that describe solutions and the nature of acids and bases

SEV1. e. Plan and carry out an investigation of how chemical and physical properties impact aquatic biomes in Georgia.

SEV4. a. Construct and revise a claim based on evidence on the effects of human activities on natural resources.

South Carolina Performance Standards met

4.S.1, 5.S.1, 6.S.1, 7.S.1: The student will use the science practices, including the processes and skills of scientific inquiry, to develop understandings of science content.

4.E.2: The student will demonstrate an understanding of the water cycle and weather and climate patterns.

5.L.4: The student will demonstrate an understanding of relationships among biotic and abiotic factors within terrestrial and aquatic ecosystems.

7.EC.5: The student will demonstrate an understanding of how organisms interact with and respond to the biotic and abiotic components of their environments.

Concepts:

Focal points of this class are:

1. The health of water systems is important for all living organisms, and human and natural factors can influence this health.
2. Scientists investigate the world around them by using scientific inquiry.
3. Students will learn how to use scientific tools, graphs, and other resources to interpret data collected in the field.

Outcomes:

Upon completion of this class, students will be able to:

1. Think critically about issues with water quality and how they can positively impact these issues.
2. Gain the ability to chemically and biologically test water and to observe the health of a water ecosystem.

NEXT GENERATION SCIENCE Standards met:

3-LS4-3 Biological Evolution: Unity and Diversity – Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

3-LS4-4 Biological Evolution: Unity and Diversity – Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.*

3-ESS2-1 Earth's Systems – Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.

5-LS2-1 Ecosystems: Interactions, Energy, and Dynamics – Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

5-ESS3-1 Earth and Human Activity – Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

3-5-ETS1-2 Engineering Design – Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

MS-LS1-6 From Molecules to Organisms: Structures and Processes – Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.

MS-LS2-1 Ecosystems: Interactions, Energy, and Dynamics – Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.

MS-LS2-3 Ecosystems: Interactions, Energy, and Dynamics – Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.

MS-LS2-4 Ecosystems: Interactions, Energy, and Dynamics – Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.

MS-LS2-5 Ecosystems: Interactions, Energy, and Dynamics – Evaluate competing design solutions for maintaining biodiversity and ecosystem services.*

Florida Performance Standards met

SC.5.N.1, SC.6.N.1, SC.7.N.1. The Practice of Science

SC.5.N.2. SC.6.N.2. The Characteristics of Scientific Knowledge

SC.5.E.7.2. Recognize that the ocean is an integral part of the water cycle and is connected to all of Earth's water reservoirs

SC.5.L.15.1. Describe how, when the environment changes, differences between individuals allow some plants and animals to survive and reproduce while others die or move to new locations.

SC.5.L.17.1. Compare and contrast adaptations displayed by animals and plants that enable them to survive in different environments such as life cycles variations, animal behaviors and physical characteristics.

SC.5.P.8.2. Investigate and identify materials that will dissolve in water and those that will not and identify the conditions that will speed up or slow down the dissolving process.

SC.5.P.9.1. Investigate and describe that many physical and chemical changes are affected by temperature.

SC.7.E.6.6. Identify the impact that humans have had on Earth, such as deforestation, urbanization, desertification, erosion, air and water quality, changing the flow of water.

SC.7.N.1.5. Describe the methods used in the pursuit of a scientific explanation as seen in different fields of science such as biology, geology, and physics.

SC.912.L.17.20. Predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability.