

Reading the River, 2006

Rowan County Waters Quality Assessment

Integrated Science
9th Grade

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Rowan County
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Context of Curriculum Product

During the chemistry section of integrated science, we discuss water and its' properties. These lessons will be added into that section so we can do more in-depth about water and the students will be able to relate more to what we are discussing and how it affects them.

Title of Curriculum

Rowan County Waters Quality Assessment

Objectives

1. Students will be able to properly use water testing kits to determine water temperature, pH, and dissolved oxygen concentrations.
2. Students will know how to correctly perform a habitat assessment to determine the quality of the body of water.
3. Students will be able to explain the importance of water preservation and water quality to the environment.

Program of Studies

S-HS-SI-3 Students will use equipment (e.g., microscopes, lasers), tools (e.g., beakers), techniques (e.g., microscope skills), technology (e.g., computers), and mathematics to improve scientific investigations and communications.

S-HS-SI-4 Students will use evidence, logic, and scientific knowledge to develop and revise scientific explanations and models.

S-HS-AC-2 Students will examine the interaction between science and technology.

S-HS-AC-3 Students will explore the impact of scientific knowledge and discoveries on personal and community health.

S-HS-AC-6 Students will investigate how science can be used to solve environmental quality problems (e.g., overconsumption, food distribution).

S-HS-AC-7 Students will use science to investigate natural hazards and human-induced hazards.

Core Content

SC-HS-1.1.5 Students will explain the role of intermolecular or intramolecular interactions on the physical properties (solubility, density, polarity, boiling/melting points) of compounds.

SC-08-1.1.4 Students will describe interactions which cause the movement of each element among the solid Earth, oceans, atmosphere, and organisms (biogeochemical cycles).

SC-HS-4.7.1 Students will

- analyze relationships and interactions among organisms in ecosystems.
- predict the effects on other organisms of changes to one or more components of the ecosystem.

SC-HS-4.7.2 Students will

- evaluate proposed solutions from multiple perspectives to environmental problems caused by human interaction;
- justify positions using evidence/data.

Materials

Lamotte conductivity meter
Lamotte dissolved oxygen test kit
Lamotte pH test kit
Lamotte thermometer
Habitat Assessment Field Data Sheet
Three samples of water for classroom data

Activity Procedure

Day 1 – Students will review water and its’ properties. Students will then be given information on how to use the equipment listed above. The students will learn how to test dissolved oxygen, pH, conductivity, and water temperature.

Day 2 – Students will be divided into groups of four. These groups will stay the same throughout the remainder of the unit. Each group will be given three water samples to test the water quality on using the skills from the previous day. After recording their data in the data table, students will discuss their results and find out any problems they are having. Students will also be taught how to perform a habitat assessment.

Day 3 – Students will get into their groups and be taken to the ponds behind the high school. Each group will test the dissolved oxygen, pH, conductivity, and water temperature at their particular site and make a habitat assessment. Each group will record their data in the data table.

Day 4 – Students will return to the pond and in their groups continue water testing and assessments. Groups will rotate testing the pond until all groups have completed all four tests and made a habitat assessment.

Days 5 and 6 – Students will be taken to Bratton Branch and follow the same procedures as were followed on Days 3 and 4.

Day 7 – Group data will be compiled into a class data table. Students will analyze the findings and make observations over any trends they may see. Students will then discuss how temperature, pH, and dissolved oxygen concentration interact and affect each other.

Day 8 – Students will be taught what causes water quality to all, how to keep water safe, and how to keep water from being polluted.

Days 9 and 10 – Students will create a PowerPoint presentation on water preservation and water quality.

Day 11 – PowerPoint presentations will be made to the class.

Data Tables

Group Members _____

Data Table 1 – Group Data from Class

Water Sample	Water Temp	pH	Conductivity	Dissolved Oxygen	Habitat Assessment

Data Table 2 – Class Table for Pond

Date	Time	Water Temp	pH	Conductivity	Dissolved Oxygen	Habitat Assessment

Data Table 3 – Class Table for Bratton Branch

Date	Time	Water Temp	pH	Conductivity	Dissolved Oxygen	Habitat Assessment

Evaluation

Water Quality Assessment

Teacher Name: **Ms. Edington**

Student Name: _____

CATEGORY	20	15	10	5
Data Collection	Data for all four tests was collected correctly. All was included on students' data sheet.	Data for three of the four tests was collected correctly. All was included on students' data sheet.	Data for some of the four tests was collected correctly. Some was included on students' data sheet.	Data was not collected correctly. No data was included on students' data sheet.
Habitat Assessment	Both habitat assessments were completed correctly. All was included on students' data sheet.	One habitat assessment was completed correctly. All was included on students' data sheet.	One habitat assessment was completed correctly. Not all was included on students' data sheet.	Neither habitat assessments were completed correctly. Not all was included on students' data sheet.
PowerPoint Presentation	Presentation contains information on water preservation and water quality. Group worked well together in the computer lab.	Presentation contains information on either water preservation or water quality. Group worked well together in the computer lab.	Presentation contains information on either water preservation or water quality. Group did not work well together in the computer lab.	Presentation does not contain information on water preservation or water quality. Group did not work well together in the computer lab.