



Let's Learn About Stewardship and River Basins

What affects the Rivers Basins more Humans, Farms, or Industries?

Introduction:

Have you wondered how people have impacted the local river system? Whether it is from just daily use recreational or waste, farming or industrial? Are we harming the rivers, or having little to no effect? This project which will examine river basins found in North Carolina and the challenges that they face.

Curriculum alignment:

Goals and Objectives are based on North Carolina's 8th grade curriculum
Science: `

8.E.1.1 Local river basin and water availability

8.E.1.3 predict the safety and potability of water supplies in North Carolina based on physical and biological factors

8.E.1.4 Conclude that good health of human requires: monitoring of the hydrosphere, water quality standards, Methods of water treatment, maintaining safe water quality, stewardship

Social Studies:

8.H.3.3 Explain how individuals and groups have influenced economic, political, and social change in North Carolina and the United States

8.G.1.1 Explain how location and place have presented opportunities and challenges for the movement of people, goods, and ideas in North Carolina and the United States

- Students will compare the water quality of different rivers that are located in North Carolina.
- Students will trace the path that each river travels
 - Towns
 - Industries
- Students will determine which waterway is more polluted and why?

Prior Knowledge:

Students should already have a basic knowledge of the following freshwater terms:

River Basin- the portion of land drained by a river and its tributaries

Dissolved Oxygen- amount of oxygen found in water
PH level- amount of acids or bases found in water
Nitrates- key pollutants in the eutrophication of water systems
Eutrophication- excessive richness of nutrients in the water due to runoff from the land which causes a dense growth of plant life and death of animal life due to the lack of oxygen
Bioindicators- living organism that signals if something has changed in an ecosystem
Turbidity- how clear the water is
EPA- environmental Protection Agency

I have created a Quizlet (NC water quality).

<https://quizlet.com/154728591/nc-water-quality-flash-cards/>

Students have reviewed the terms through quizlet and taken the test that goes along with the vocabulary in order to ensure mastery.

Teacher Materials:

1. Order NC river basin posters and packets from www.eenorthcarolina.org (this is the weblink for NC river basin information)
2. Laminate copies of North Carolina river basins (5 copies one for each group)
3. Obtain some type of access to the internet (laptop, ipads, etc...)
*if internet is down print out information for students to use from water monitoring stations, and websites listed.
4. You will need the following items for your students:
 - Poster board
 - Rulers
 - Colored pencils/markers
 - Index cards

Student Materials:

Map of river basins
Pamphlets about river basin
Access to internet or materials
Copy of chart
[Copy of student instructions](#)

Time and Location

This part of the lesson will take two 90 minutes classes

Part I

Activities:

1. Students will be put into groups of three or four (whichever works best for your class)

2. Review key terms
3. Students will be given a colored map of all found within the state river basins and pamphlets on their river basin.
4. They will locate the river basins that they are focusing on. (Teacher will need to walk around and check with each group to make sure that they are able to locate where their river basin is.)
5. They will need to decide who will be the recorder, task keeper, retriever, information gatherer.
6. Students will be given a piece of poster board.
7. Students will need to create sections on their poster for each section.
8. They will list all major towns that are found within each river basin. Students will find this on the large river basin poster. They will recorder the ones listed within each river basin.
9. Students will place a star by the cities that are urban and a square by the ones that are rural. Students can use the following website to make that they have the star/square by the correct city. (you may want to discuss what populaton in a city it urban versus rural. My students are from a very small town and have a hard with time with this.
<http://www.togetherweteach.com/TWTIC/uscityinfo/33nc/ncpopr/33ncpr.htm>
10. Students will use the internet and hand-outs to determine what are the major pollutants for each of the river basins. Students will then create a list of the pollutants under each river basin. This information can be found in the packet.
<http://classroom.synonym.com/pollution-cape-fear-river-4854.html>
11. As each group finishes, they will need to call the teacher over to discuss what they have learned.
12. Students will then look up water quality stats from three different locations on their river.
http://www.eenorthcarolina.org/Documents/RiverBasin_pdfs/final_web_neuse.pdf
https://iaspub.epa.gov/waters10/attains_watershed.control
http://www.eenorthcarolina.org/Documents/RiverBasin_pdfs/final_web_capefear.pdf
<http://rivernet.ncsu.edu/>
13. Once students have reviewed the information, they will need to complete the table: See attachment (I tell mine that this is a template and they will need to create their own spreadsheet/excel document)
14. Did any of the locations have a higher reading in any areas that the turned them into an outlier? What could have caused this?
15. Now use the internet to discover how cities and industries keep from polluting the river. (if internet is not available, they can write down how they believe each group should handle the waste then go over the correct answer as large group using the smart board)
 - a. Waste from farms

- b. Industries
- c. Humans

Part II (extension to lesson)

Time and Location:

This part will take one class period (90 minutes).

Activities

16. Guest speaker from Smithfield Hog Production or any guest speaker from a corporation in your area.
 - a. They will explain to students how they have regulations to follow.
 - b. How they protect the land and waterways of North Carolina

This part will take one 45 minute class

17. After they have listened and learned from the representative from Smithfield Hog production students will complete the following activity (next day or same day if Smithfield representative wants to work with them.)

Students will bring in water samples from local ponds, rivers, streams, and household water. Students work in small groups to complete water testing to discover which one is cleaner (they can look at turbidity, ph, coliform, etc)

Safety:

If a student is going to collect water from a stream, river, or pond make sure they inform their parents of their locations.

Assessment:

the final project and how students answer questions that the teacher ask as they are completing the project and the information that they present to the class.

- In my lower/middle level class....groups are made up of four. My high level class pairs up with one other person.
- I mix my groups so that my higher-level students can work with my lower level students.
- An extension could be to have students pick an animal that lives in river basins and to research it --

Author Information:

My name is Michelle Shepard and I have been teaching middle school social studies and science for 25 years in North Carolina.

