



GETTING TO KNOW YOUR STREAM

STREAM ACTIVITY

SUMMARY

Students will make their first site visit to the stream they will be studying throughout the five modules of *It's Our Water*. Students will record observations in a systematic way, make sketches, and take measurements. These activities will allow students to become familiar with their study stream and some of its physical characteristics.

OBJECTIVES

Students will:

- make a plan-view sketch of about 20 m of the stream,
- make and record observations regarding the stream's size, shape, and general appearance.

TIME REQUIRED

- 50 minutes in Field
- 15 minutes in Classroom

MATERIALS

- Field notebooks and pencils
- Tape measures
- Rulers
- Plain paper or graph paper for sketching plan-view maps
- Cameras or video cameras (optional)

MAKING CONNECTIONS

Many students will have already seen the stream the class is going to visit, or be familiar with it in some way. However, most students probably have not observed it in a deliberate way. Students will likely learn quite a bit and make some interesting discoveries through the process of recording observations and measurements and making sketches. These observations and insights will provide the foundation for further activities with the stream.

BACKGROUND

Many high schools in North Carolina have a stream on the campus or within close walking distance. It may be simply a channelized "ditch" or a gully that has running water only after rain. Or it may be a larger



stream or river. Before taking your class, make a visit yourself to scout out a good section of the stream (about 20 meters long) for ongoing study and to take note of any potential safety issues. It is also a good idea to assess the condition of the stream the day before you plan to take students out to the stream. (See the Overview section to *It's Our Water* for general safety guidelines as well as what to do if you do not have an on-campus stream or the one you have is less than ideal for field work.) This initial stream activity is a good introduction to field-work and an opportunity for you to see how well your students handle being outdoors.

On this first visit to the stream, students should start becoming familiar with the stream and its physical characteristics. They should describe it in words, pictures, and measurements in enough detail so that when they return, they will know if any changes have occurred – if the water is noticeably higher or lower, muddier or clearer. In later activities, they will be monitoring these and other characteristics more accurately and precisely. For now, they will be describing these characteristics in more qualitative terms.

PROCEDURE

A short video with tips on how to implement this activity is available at www.itsourwater.info.

WARMUP

First, review the safety rules listed in the Overview and any others that you may have come up with when you scouted out the stream.

Then ask students if any of them have ever seen the stream you are planning to visit. How much do they remember about what it looks like? About how wide is it? How deep? Is it straight or curvy? Is the water clear, muddy, or "tea-colored"? How fast does the water

flow? Is the flow of water smooth or turbulent? Is the water clean or polluted? Are the rocks and sediments in the stream large or small? What colors are they? These questions can be discussed in class or the students can write about them in their field notebooks.

As a class, come up with a list of questions to guide observations while at the stream. The class might want to group the questions in categories, such as "river bed," "water," "sediments," "wildlife," etc. Or observations could be grouped according to the five senses.

Another helpful way to organize observation in the field is to move from large-scale to small-scale. First, make large-scale observations: describe the larger environment or habitat (forested, farm land, commercial or residential development, etc.) Then, make medium-scale observations about the stream and its appearance. Then, make small-scale observations about sediments, visible pollutants, organic matter, and wildlife in the stream.

There are a number of good ways to organize observations; the important thing is to have a plan to follow in the field so students don't return to the classroom having forgotten to take note of important physical characteristics of the stream. Make sure all students write in their field notebooks the types of observations they should record while in the field. Also, review the three parts of the activity (describing in words, describing in pictures, and describing in numbers) to minimize confusion while at the stream.

Divide the class into small working groups for the site visit.

THE ACTIVITY

PART I: DESCRIBING IN WORDS

1. In your field notebooks, describe the stream in words, using the questions or system that your class developed as a guide.
2. Write down any questions that occur to you about the stream while you are working. For example, why does the stream curve sharply here? Or, why is the stream so muddy?



PART II: DESCRIBING IN PICTURES

1. Sketch a plan-view map of the portion of the stream your class will be studying. Of course, it won't be exactly to scale, but make it as accurate as you can. The sketch should show the shape of the stream, changes in width or direction, and some physical details, such as location of gravel bars, rapids, large fallen trees, etc. Note the direction of flow on the map, and mark the approximate direction of north.
2. If cameras or video cameras are available, take pictures.



PART III: DESCRIBING IN NUMBERS

1. Make some key measurements to mark on your plan-view maps; for example, the width of the stream (in several places, if it varies), the depth of the water in different areas, the length of the portion of the stream they sketched, and the size of any other significant features on the map.
2. Depending on the nature of the stream, you may want to make some measurements of sediments: for example, measure the five largest rocks, five average rocks in a gravel bar, five average rocks in the stream bed, etc.





WRAP UP AND ACTION

In a class discussion, ask the students some of the questions you asked in the Warm Up. At this point, students should be able to answer the questions easily. Ask students if they were surprised by anything they observed. Was there anything about the stream that was different than how they remembered it (if they had visited it previously)?

Generate a list of questions students came up with while visiting the stream. Talk about ways to find the answers. Discuss the fact that this is how scientists come up with ideas for research projects. Keep this list to refer to as the unit progresses; activities in some of the later modules may answer some of the questions.

As a class, sign up for Stream Watch. To do so, contact:
Stream Watch Coordinator
Division of Water Resources
NCDENR
1611 Mail Service Center
Raleigh, NC 27699-1611
(919) 715-5433
www.ncwater.org/Education_and_Technical_Assistance/Stream_Watch/

HOMework

For homework, have students organize and present their observations and sketches neatly, to be used as part of their final report at the end of the unit. You may wish to discuss as a class the best way to organize and present the material.

ASSESSMENT

Have students:

- Describe the stream in words or pictures without looking at their notes.
- Compare and contrast the stream they visited to another stream they are familiar with.
- Explain why it is important to have a system or guide for making observations.

EXTENSIONS

Have students put together a poster presentation of their stream description, including sketches and photographs, to be displayed in the classroom or in the school media center.

If you have time, repeat this activity at another time when the stream looks different – when the weather or season is different, after a hard rain, or after a long drought. Have students compare and contrast their findings.

Have students describe the stream in artistic or literary ways – by painting a picture, writing a poem, or other creative endeavor.

Have students identify some of the plants and animals that live in and near the stream.

RESOURCES

Leslie, Clare Walker. 1995. *The Art of Field Sketching*. New York: Kendall Hunt Publishing Company.

Winborne, Ferne B. 2003. *A Guide to Streamwalking*. Raleigh, NC: Division of Water Resources, North Carolina Department of Environment and Natural Resources. http://www.ncwater.org/Reports_and_Publications/Stream_Watch/A_Guide_to_Streamwalking

2012 North Carolina Essential Standards

for 8TH GRADE SCIENCE GOALS & OBJECTIVES

The stream activities in each module are intricately tied. Although this activity may not be correlated to your standards, it is needed for the complete picture of the stream and to achieve the objectives listed below.

8.E.1: Understand the hydrosphere and the impact of humans on the local systems and the effects of the hydrosphere on humans.

8.E.1.3: Predict the safety and potability of water supplies in North Carolina based on physical and biological factors, including:

- Temperature
- Dissolved Oxygen
- pH
- Nitrates and phosphates
- Turbidity
- Bio-indicators



2012 North Carolina Essential Standards for 8th Grade Science GOALS & OBJECTIVES

8.E.1.4: Conclude that the good health of humans requires:

- Monitoring of the hydrosphere
- Water quality standards
- Maintaining safe water quality
- Stewardship

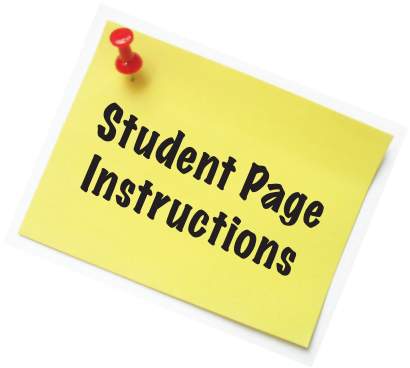
EEn.2.4: Evaluate how humans use water.

- Explain various water uses by humans and evaluate for benefits and consequences of use (ex. wells, aquifer depletion, dams and dam removal, agriculture, recreation).
- Evaluate the effects of population growth on potable water resources. Infer future effects.

- Explain how pollutants might flow through a watershed and affect inhabitants that share the same watershed.

EEn.2.4.2: Evaluate human influences on water quality in North Carolina's river basins, wetlands, and tidal environments.

- Evaluate issues of ground water and surface water pollution, wetland and estuary degradation, and salt water intrusion.
- Evaluate water quality of NC streams (chemical, physical properties, biotic index).
- Analyze non-point source pollution and effects on water quality (sedimentation, stormwater runoff, naturally and human induced occurrences of arsenic in groundwater).
- Evaluate conservation measures to maximize quality and quantity of available freshwater resources.



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