

Teacher Instructions

Title: Capturing Watershed Experiences

Grade Focus: 6th or 7th

Subject: Life Science, Environmental Science

Technology Integration: Digital Imaging, Animoto

Recommended Time to Completion: 3 hours

INTRODUCTION:

Students will learn that some organisms require specific conditions for survival and that living things are adapted to their environments. The abiotic environmental features affect the diversity and fitness of living things in an ecosystem.

PREREQUISITE EXPERIENCE:

Students will need to have a basic understanding of the abiotic and biotic features of a watershed, have prior knowledge of search engines, and a basic understanding of how to use Animoto.

You may want to review these words prior to the lesson:

Important Vocabulary Words

Abiotic/Biotic
Benthic
Ecosystem
Erosion
Fitness
Habitat
Invertebrates
pH
Streamflow
Tributaries
Turbidity
Vegetation
Velocity
Vertebrates
Watershed

TEACHER PREP TIME: 1 – 2 Hours

Prior to the lesson, you may want to review these videos.

- A Natural Focus with Laurie Sanders: What Is a Watershed? Environmental Media. 1998.
Discovery Education. 13 January 2009
<http://streaming.discoveryeducation.com/>
- Welcome to the Watershed! Environmental Media 1998.
Discovery Education. 13 January 2009
<http://streaming.discoveryeducation.com/>
- The Watersheds and Wetlands of North America. Environmental Media. 2001.
Discovery Education. 13 January 2009
<http://streaming.discoveryeducation.com/>

If you do not have access to United Streaming, you can sign up for a free 30 Day Trial at www.unitedstreaming.com.

You will also need to be familiar with how to use Animoto. The following links will help you gain a basic understanding of Animoto.

<http://www.nortellearnit.org/LearnIT/videoembeds/animoto/>
http://www.nortellearnit.org/technology/Video_Productions/
<http://animoto.com/help/faq>

These web sites give information on tributaries.

- <http://www.estuary.cog.ny.us/council-priorities/living-resources/tribs.htm>
- <http://www.clover.okstate.edu/fourh/lit/lit21.pdf>

MATERIALS:

The web site listed below can give you some insight to the materials and equipment needed for collecting samples during your field work.

<http://watershed.syr.edu/taxkey/Materials.html>

Collect the following equipment:

- Stream survey equipment
- Fine mesh nets or screens
- White bins or wash basins
- White ice cube trays
- Turkey basters or large droppers
- Magnifying lenses
- Boots as necessary
- Ph paper, meters, or probeware

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- Thermometers or probeware
- Digital cameras
- Macro-invertebrate classification keys

PROJECT:

Students will explore and analyze a micro-watershed with established protocols for citizen science. They will present their findings with Animoto technology that is engaging and highlights overarching themes and enduring understandings.

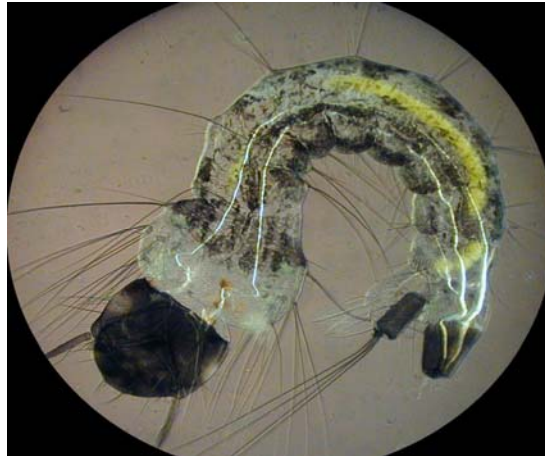
ASSESSMENT/GRADING:

Students will be graded using the assessment rubric.

TIME MANAGEMENT TIP:

Prior to the actual lesson, the students need to be prepared for using the collection equipment and digital cameras. Also, students will be creating the final Animoto video in a group of 3-4.

Engage



Is this a water or land creature? How do you know? How is this "critter" adapted to life in a particular habitat?

Next, choose a partner and brainstorm a list of organisms you might expect to find in a fresh water biome. How would your list change if you were comparing organisms that live in a tributary to those found in a larger body of water?

Your class will be creating a dichotomous key to help classify invertebrate and vertebrate organisms you will find in a tributary and a stream. A dichotomous key is used for identification of organisms based on a series of choices between two alternative characters.

Use the web site links below for examples on how to create a dichotomous key.

<http://nerds.unl.edu/pages/preser/sec/skills/dkeys.html>

http://www.messiah.edu/Oakes/fungi_on_wood/introduction%20page/keys.htm

http://www.wisc.edu/cbe/assets/docs/pdf/biolearn/Classification/What_IsLife/dichotomous_key.pdf

Explore

Explore

Prepare to wear your boots today! You are exploring the wonders of nature. You and your classmates will visit a tributary and a larger stream to take samples and measurements of the water and identify the organisms located in the water.

Your group includes 3 – 4 individuals. Assign one person to record the information gathered. Prior to going to the site, print off a sample collection form from <http://watershed.syr.edu/taxkey/Form.html> or create your own form.

Measurements may include:

- temperature
- pH
- turbidity
- velocity
- streamflow (higher levels)
- vegetation, erosion
- streambed composition
- benthic macro-invertebrate classification

Assign another person to take digital photos of organisms and interesting finds. (Digital photographers should record images as though they were capturing the activities to explain to an absent classmate.)

All other group members are part of the collection process.

After classifying the organisms, return them to the stream.

If visiting a larger stream is inconvenient or unsafe, have students compare different areas of the smaller stream (e.g., pool versus riffle, above and below another tributary, different streambed, etc.)

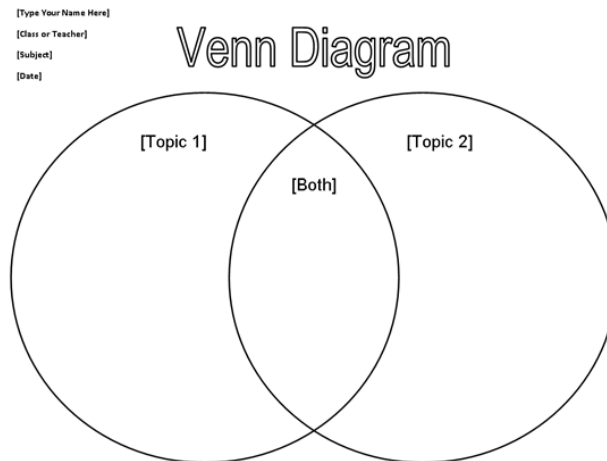
Explain

Explain

Now that you have collected your samples, taken your measurements, and documented what you've seen through digital imagery, use this information to analyze on the abiotic and biotic features of the tributary and the larger stream.

Next, create a Venn Diagram comparing the abiotic features of the tributary to the larger stream. Also, create a Venn Diagram describing the biotic features of the tributary versus the large stream.

Example:



Using the web site, <http://www.usgs.gov/>, locate the graph(s) for real-time water data nearest to the watershed you explored. Download the graph for use in the final project.

Elaborate

Elaborate

Develop a story that includes your first-hand experience in collecting organisms, images and descriptions of the location and web-based research. Assemble all images and text in one document such as Microsoft Word.

Next, use this information to create a multimedia presentation utilizing Animoto.

Animoto is a free online tool for creating exciting videos with special effects and music. It combines your images and music into a customized Animoto video. Animoto automates the process using a video production artificial intelligence agent to match builds, fades, etc. to the cadence of your music and the "flavor" of your video. You can email it, post it, and share it. Educators can register for free accounts that enable their class to create videos using Animoto.

An example of a watershed collection presentation is located on the Animoto web site.

<http://animoto.com/play/y4FFPEhaNeXjk1vY1BvjPw?from=share>

Using images taken at the collection sites and images found on the Internet, create a professional looking presentation using Animoto.

<http://education.animoto.com/>

Remember to choose your images wisely to limit the running time for your Animoto video to no more than 2 minutes.

Tip: When you decide what images (pictures), sounds or text that you want to use in your production, be sure to check for a copyright notice. Some web sites want you to use their materials for educational projects while others don't. A good practice for you should be to look for an email address on the web page from which you want to use materials, and send a request for permission to use the materials or information in your class production.

It is also important that you identify materials that you use completely in your production. This is called "making a citation of" or "citing" someone else's work. The format that is typically used is as follows:

Last Name, First Name of Author (if known). "Title of work/article/page." *Title of Complete Document* (if applicable).
Date last modified. URL (date visited).

Find out more about copyright issues and fair use policies viewing video tutorials about these topics at

http://nortellearnit.org/technology/Digital_Ethics/

Evaluate

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Criteria	Level 1 (D)	Level 2 (C)	Level 3 (B)	Level 4 (A)
Quality of Research / Content	Content lacks detail	Content somewhat detailed	Content is detailed	Content is appropriate and detailed
Communication of Understanding	Communicates little information with clarity	Communicates some information with some clarity	Communicates information with clarity	Communicates comprehensive information with clarity
Technical quality of video (e.g. editing, transitions, lighting, composition, audio)	Poor	Satisfactory	Good	Excellent
Overall use of Technology to Present Findings	Use of technology does not reflect findings or group watershed activities.	Use of technology adequately reflects findings or group watershed activities.	Use of technology adequately reflects both findings and group watershed activities.	Use of technology reflects both findings and group watershed activities accurately and is entertaining or engaging for all audiences.

Extend

Extend

Consider some of these ideas for extensions.

1. Identify a micro-watershed near your home. How would you evaluate the watershed? Is it a healthy watershed? If not, describe how you would make improvements.
2. Write a letter to your community leaders asking to protect and preserve a watershed in your community.
3. Write and produce an animation from the point of view of one of the organisms you found during your collection.

Related Resources

- <http://nerds.unl.edu/pages/preser/sec/skills/dkeys.html>
- <http://animoto.com/play/lkMmb8lxexjX9moZx3UneQ>
- <http://www.usgs.gov/>
- <http://nerds.unl.edu/pages/preser/sec/skills/dkeys.html>
- http://www.messiah.edu/Oakes/fungi_on_wood/introduction%20page/keys.htm
- http://www.wisc.edu/cbe/assets/docs/pdf/biolearn/Classification/WhatIsLife/dichotomous_key.pdf

Standards

Nortel LearniT is in the process of completing the state alignments for this lesson. They will be available in the near future on the Nortel LearniT web site.