

Teacher name: Kathy Grant

Grade level: Thetford Academy - Grade 7

Unit title: River Study Field Work: Site Maps and Macroinvertebrate Studies, Nature Journals, Classification

GEs/ GSEs:

Macroinvertebrate Biology, Conducting a Site Survey, Observations in Nature, Making and Keeping a Nature Journal, Animal Classification, Dichotomous Keys

Earth Science	Life Science Technology Standards	
S7-8:48	S7-8:36	IT7-8: I
S7-8:49	S7-8:38	iT7-8:2
		IT7-8:3
Content:	Process:	
Water Cycle	Sampling Techniques	
River Vocabulary	Measuring Water Flow and <i>Volume</i>	

Essential Questions:

- 1 How does a scientist learn about river ecology?
- 2 What macroinvertebrates live in the stream on our campus and how are they adapted for life there?
- 3 How does the water in a stream or river fit into the earth's water cycle?
- 4 How are these animals classified?

Length of Unit: multiple class periods (54 minutes each) spread throughout the entire school year

Assessments of learning:

- I. Students will produce a portfolio of aquatic insect identification cards in the form of a field guide. Each student will research and produce 1 card then share and collect cards from their classmates.
 - 1 Students will complete a site summary sheet with test data.
 - 2 Students will produce a quadrat study diagram.
 - 3 Students will make a journal and learn some basic drawing techniques to sketch from nature.
 4. Students will learn to make and use dichotomous keys to classify animals.

Activities to support learning targets: (in no particular order and spread throughout the academic year)

- Read *The Mystery of the Missing Cutthroat* by Jean Craighead George
- **Make nature journals**
- **Learn and practice drawing techniques**
- **water cycle, river vocabulary review, how to measure current and flow**
- **lessons on animal classification -making and using dichotomous keys for arthropods**

- **Electro fishing demonstration to see how biologists sample the salmon population in Vermont**
- **Site visits -go to the stream in different seasons to see how it changes over time-
sketch site, measure TO, dissolved O₂, pH, current, and volume**
- **build kick nets and quadrat frames, select invertebrate for research**
- video -"Bugs of the Underworld"
- **read nature articles from local newspapers**
- Springtime site visit-(with Susan) -use a longer class period to collect, identify, and **observe specimens**
- **research species and produce identification card**
- make portfolio to hold card collection
- Site visit #3 -quadrat inventory and sketch
- presentations -finish portfolios and swap *the* trading cards

Supporting resources:

Susan Sawyer, naturalist

Water Quality Monitoring in Rivers, The Asia Foundation, 2008 *River Fieldwork Guide for Teachers*, Vermont Institute of Natural Science, 2006 *A Guide to Common Freshwater Invertebrates of North America* by J. Reese Vas hell *Earth and Space Science Exploring the Universe*, McGraw Hill, Wright Group