

**READING THE RIVER, SUMMER 2001  
A UNIT FOR GRADE 5 SCIENCE**

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## Examining a Local Creek Ecosystem

### **GRADE LEVEL: 5**

### **OBJECTIVES:**

In this lesson students will:

1. Visit three creek areas near the school
2. Record visual impressions onsite through photographic experiences and art activity
3. Compare/contrast actual creek conditions in relation to class model
4. Use testing equipment in an appropriate manner
5. Utilize trained parent guides
6. Compile information for computer class project
7. Employ a multi-discipline approach

### **PROGRAM OF STUDIES:**

#### Scientific Inquiry

- Identify and refine questions that can be answered through scientific investigations combined with scientific information
- Produce accurate measurements
- Use appropriate tools, techniques, and technology
- Develop predictions and models

#### Conceptual Understanding

- Identify factors whereby human beings can affect the quality of life
- Design and build a model of a chosen ecosystem
- Understand the destructive forces of erosion

#### Applications/Connections

- Relate to social perspectives
- Develop a respect for resources
- Identify career opportunities

## **MATERIALS:**

- Journals
- Worksheet/evaluation of sites
- Disposable cameras
- Sketch pads, art supplies
- Water monitoring kits

## **ACTIVITY PROCEDURE: FIELD STUDY**

1. Student will be introduced to the parent “guides” in class. Desired objectives will be outlined, necessary materials and directions will be distributed.
2. Students will record their initial impressions of the field site with their disposable cameras and their sketchpads
3. Students will complete a checklist of descriptors
4. Students will use the water monitoring kits to test for temperature, dissolved oxygen, pH
5. Students will move to two other sites on the same creek and repeat the process
6. On return to class, students will compile collected information in format necessary for computer activity (making a pamphlet)

## **DEFINITION/EXPLANATION OF CONCEPTS**

Less than half of one percent of the earth’s water is accessible fresh water. Water management, therefore, has to be a dynamic effort. Industry and agriculture vie with the private sector for water. It is imperative that we develop safe methods to conserve water and prevent pollution.

An ecosystem is a combination of interlocking parts. Living things connect with each other and interact with a non-living environment to form a unit. A watershed is a unique example of this relationship. Water habitats support a vast food chain that is endangered by pollutants and neglect.

Healthy aquatic habitats support a diverse population. Sufficient food sources, dissolved oxygen, appropriate temperature, sheltered spawning areas and an absence of major pollutants are required. The major pollutants are silt, excess nutrients (from fertilizers), and industrial wastes. A wide variety of plant and animal life surrounding the body of water will complete

the food web. A disruption in any part of the food chain will have an adverse effect on the ecological health of the watershed.

Clearing land for residential, industrial, or agricultural growth causes significant increase in silt development. This, in turn, reduces the sunlight available to aquatic plants, necessary for the food chain, and depletes the filtering function. Damming for flood control has also adversely affected the health of our rivers.

Students need to recognize that we are all impacted by the health of our environment. Water is essential for life. We can see directly the consequences of our actions in the condition of our creeks, streams, and rivers.

### **ASSESSMENT**

1. Evaluate classroom preparation prior to field study through unit worksheets.
2. Monitor participation, note taking, and model construction in previous lessons of unit (see unit schedule)
3. Check folders to verify collection of data throughout unit
4. Provide checklist for pamphlet construction
5. On site, facilitate examination of the stream
6. Use a rubric to evaluate final product, the pamphlet.
7. Use a post test to assess acquired knowledge

NAME \_\_\_\_\_

**ONSITE DESCRIPTORS:**

RIVER BASIN \_\_\_\_\_ STREAM NAME \_\_\_\_\_

DATE \_\_\_\_\_

WEATHER CONDITIONS \_\_\_\_\_

LAND USE \_\_\_\_\_

**RIPARIAN VEGETATION:**

TREES \_\_\_\_\_

GROUND COVER \_\_\_\_\_

SHRUBS \_\_\_\_\_

ORGANIC DEBRIS \_\_\_\_\_

**STREAM DATA:**

**SUBSTRATES**

BOULDER \_\_\_\_\_

RUBBLE \_\_\_\_\_

GRAVEL \_\_\_\_\_

FINE SEDIMENT \_\_\_\_\_

**FLOW RATE:**

FAST \_\_\_\_\_

MODERATE \_\_\_\_\_

SLOW \_\_\_\_\_

RIFFLES \_\_\_\_\_

POOLS \_\_\_\_\_

**FIELD TESTS:**

AIR TEMPERATURE \_\_\_\_\_

WATER TEMPERATURE \_\_\_\_\_

DISSOLVED OXYGEN \_\_\_\_\_

pH \_\_\_\_\_

Adapted from Citizen's Qualitative Habitat Evaluation Index, Reading the River (2001)

**COMPUTER ACTIVITY**

**PAMPHLET CONSTRUCTED IN CONJUNCTION WITH COMPUTER TECHNOLOGY CLASS**

Pamphlet will include:

- Scanned photograph of test site
- Location information
- Visual description of site
- Testing results
- Pollution evidence
- Conclusion/Recommendation

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**RUBRIC FOR EVALUATING PRODUCT**

1. \_\_\_\_\_ Title
2. \_\_\_\_\_ Photograph
3. \_\_\_\_\_ Location indicators
4. \_\_\_\_\_ Adequate description of site, including land use, riparian condition
5. \_\_\_\_\_ Record of testing
6. \_\_\_\_\_ Listing of environmental concerns
7. \_\_\_\_\_ Recommendations
8. \_\_\_\_\_ Appearance of pamphlet

Comments:

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- 5 all requirements met; pamphlet appearance exceptional
  - 4 most requirements met; pamphlet appearance good
  - 3 most requirements met; pamphlet appearance adequate
  - 2 some requirements met; pamphlet appearance adequate
  - 1 few requirements met; pamphlet appearance unacceptable

TOTAL SCORE \_\_\_\_\_

### Lesson Context

Day	Objective	Activity
1	Assess prior knowledge	Pretest/Discussion; Journal entry: experiences on local waterways
2	Create a topographic map	Model of typical stream bed in a plastic box, using modeling clay presented by Conservation District agent
3	Create a dimensional model	Additional model construction outside on school grounds using natural components
4	Examine “Life on the River”	Prepare a short report on a stream animal habitat from resource material provided by the teacher
5	List reasons for/against damming	Construct a model dam using modeling clay in previously used plastic containers
6	Determine cause/effect of erosion	Teacher presented material; video
7	Discover pollution sources/effects	Enviroscape lesson presented by Extension Office representative
8	Web Search	Lesson provided by Computer Technology teacher
9	Interactive activity on computer	Continuation of Lesson #8
10	Poem/Literature/Music Component	Lesson provided by Music and Media Center teachers
11	Math Activity	Individual and group activities based on measurement
<b>12</b>	<b>Creek Studies/Art Activity</b>	<b>See proposed lesson (on site)</b>
<b>13</b>	<b>Creek Studies</b>	<b>See proposed lesson (in classroom)</b>
14	Post Test	Multiple choice and short answer quiz on major unit concepts
15	Pamphlet	Developed in conjunction with computer class

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