

# The 5 E's: A Model for Designing Lessons for Inquiry Planner<sup>1</sup>

## Logistics Information:

- a. Environmental Education Learning Cycle Example
- b. A synthesis of *Project WILD Aquatic*, *Project Learning Tree: Places We Live*
- c. Iowa Core Curriculum Concepts  
Life Science: 4A  
Earth Science: 1A, 2C
- d. Iowa Core Curriculum Characteristics of Effective Instruction embedded throughout
- e. Last modified April 17, 2010

**Background Information:** (What do observers need to know about our learners, classroom and school?): This learning cycle assumes a normal progression through the Iowa Core Curriculum.

## Materials Required:

Computer Internet access for students

If available, GIS access

Writing and drawing materials and some form of student journal

See referenced activities for any additional materials

## Time Period:

8 - 45 minute class periods (one week plus).

**Name of the Unit:** The Water Cycle and Interrelationships with the Environment

- I. Plan of the Unit
  - a. Goals of the unit: The student will develop an understanding of how individual decisions can impact the environment, both locally and globally.
  - b. How this unit related to the curriculum:

Previous Grade/Course	Current Grade/Course	Next Grade/Course
HS	Biology/Environmental Studies/Chemistry	NA

- c. Lesson Plan: Phases in a 5E Learning Cycle (in no particular order) are Engage, Explore, Explain, Elaborate, and Evaluate. There may be multiple experiences in each phase.

<sup>1</sup> Adapted from *Teacher to Teacher: Reshaping Instruction Through Lesson Study* (NCREL, 2002)

<b>Phases of the lesson: learning activities and key questions (and time allocation)</b>	<b>Student activities/ anticipated student reactions or responses</b>	<b>Teacher's response to student reactions/ Things to remember</b>	<b>Evidence of Student Understanding</b>
<p><b>ENGAGE:</b> (1 period) Discuss the uses of water in the world and show a slideshow of water in various conditions drawn from the links below and others you may find: <a href="http://www.ukrivers.net/pollutionpics.html">http://www.ukrivers.net/pollutionpics.html</a> <a href="http://www.123rf.com/stock-photo/water.html">http://www.123rf.com/stock-photo/water.html</a></p>	<p>Students will generate discussion based on the slideshow.</p>	<p>The teacher may point out particular slides of interest.</p>	<p>Students will journal reflections regarding the slideshow.</p>
<p><b>EXPLORE 1:</b> (1 period) Students will describe relationships between precipitation, runoff and aquatic habitats.</p>	<p><i>Where Does Water Run (Project WILD Aquatic, p. 21)</i></p>	<p>Additional time may be required if you have students determine dimensions.</p>	<p>Journal entries and Discussion</p>
<p><b>EXPLAIN 1:</b> (1 period) Students will 1) describe the characteristics of watersheds, 2) discuss the role of watersheds in providing wildlife habits as well as human habitat, and 3) give examples of watershed conservation.</p>	<p><i>Watershed (Project WILD Aquatic, p. 128)</i></p>	<p>Note-Use of GIS, GPS, etc. may be nice adjuncts to this activity. As written, math standards are integrated into this activity.</p>	
<p><b>ELABORATE 1:</b> (1-2 periods) Do extension activities dealing with calculation with regard to a watershed. Note- This activity should only be done if students have access to GIS capability.</p>	<p><i>Watershed (Project WILD Aquatic, p. 128)</i></p>	<p>Teacher will need to give guidance in accessing the GIS software.</p>	<p>Students will journal any calculations made and reflect on conclusions that may be drawn from them.</p>
<p><b>EXPLORE 2:</b> (1-2 periods) Students will identify major sources of aquatic pollution and categorize them as they deem severity of impact.</p>	<p><i>What's in the Water? (Project WILD Aquatic, [Objective 1, p.140)</i></p>	<p>Note-The activity background information could be used as a starting point for some student research.(Rather than be teacher directed)</p>	<p>Students will make appropriate journal entries with regard to areas they research.</p>

Phases of the lesson: learning activities and key questions (and time allocation)	Student activities/ anticipated student reactions or responses	Teacher’s response to student reactions/ Things to remember	Evidence of Student Understanding
<p><b>EXPLAIN 2:</b> (1 period) Students will make inferences about the potential effects of a variety of aquatic pollutants on wildlife and wildlife habitats.</p>	<p><i>What’s in the Water?</i> (<i>Project WILD Aquatic</i>, Objective 2, p.140)</p>	<p>Note-Use pollutants from p.144 to link to the DNR site and create a realistic situation based on student location.</p>	<p><i>Project WILD Aquatic [What’s in the Water? Evaluation 1 or 2, p.143 ]</i></p>
<p><b>ELABORATE 2:</b> (1-2 periods) Students will describe the characteristics of oligotrophic and eutropic aquatic habitats, emphasizing the effects of nutrient loading.</p>	<p><i>The Glass Menagerie</i> (<i>Project WILD Aquatic</i>, p.155)</p>	<p>Journal</p>	<p>entries</p>
<p><b>EVALUATE:</b> The students investigate a regional issue as they adopt the roles of shareholders and debate solutions to the depletion of North America’s largest aquifer.</p>	<p><i>Regional Community Issues: The Ogallala Aquifer</i> (<i>Project Learning Tree: Places We Live</i>, p.133)</p>		<p>Journal entries and possibly presentation.  Student essay/presentation</p>