

## 5E Lesson Plan

**Topic:** Natural Resources Topics

**Grade Level:** 11-12th

**Logistics Information:**

- a. Iowa Core Essential Concepts:  
*Life Science and Science as Inquiry*  
Understand and apply knowledge of the inter-dependence of organisms.  
Understand and apply knowledge of the behavior of organisms.  
Think critically and logically to make the relationships between evidence and explanations.
- b. Skills:  
Use communication skills to gather information and put it in written form to inform people about environmental concerns.  
Use field experience skills to gather specimens.  
Use analytical skills to see the complex relationship of invasive species to other plants and animals and how they can impact the economics of the area.

Characteristics of Effective Instruction are embedded in the learning cycle. (Student-centered Classroom; Teaching for Understanding; Assessment for Learning; Rigor and Relevance; Teaching for Learning Differences)

**Background Information:** 11-12th grade Environmental Science Class with a variety of learning styles and levels. Several students are on accommodation plans or IEPs and have alternate assessments.

**Materials Required:** Access to computers for some of our work; may need seine nets, hip boots/waders and specimen jars for collecting

**Time Period:** 10-12 Day Unit

**Name of the Unit:** Invasive Species in Iowa

Plan of the Unit

- a. Goals of the unit: Get the students to understand the severe consequences that invasive species can have on the habitat and economic concerns to an area. Appreciate the fine balance that occurs in nature. See how cause and effect relationships work.
- b. How this unit related to the curriculum: Of the Natural Resource Issue in Iowa – Invasive species is starting to majorly impact our wetlands and other wild areas. Because of the potential significance that invasive species has on Iowa’s economy it is a great fit for this unit.

Previous Grade/Course	Current Grade/Course	Next Grade/Course
10 <sup>th</sup> / Biology	11-12 <sup>th</sup> /Environmental Sciences	12 <sup>th</sup> / Advance Biology

**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. Note: headings are provided for informational purposes only, they can occur in any order; a phase may happen more than once (e.g., evaluation)

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
<b>ENGAGE:</b> Show Power Point Presentation – Invasive Aquatic Species in Iowa.	Hope student will have questions and concerns about the problems invasive species can bring.	Keep a journal of initial questions posed by the group and see if they get answered by the end of unit.	Use an exit ticket asking for two things they learned from the power point and what they want to learn more about.
<b>EXPLORE:</b> Field Trip to Clear Lake to witness Zebra Mussel problem and get information about other issues affecting the lake.	Anticipate a great deal of eagerness for the field experience and need to make sure students understand the purpose of event. Students will be gathering specimens and other information.	Make necessary arrangements for a successful trip. Coordinate transportation and communicate with necessary groups; parents, speaker, school administrators. Etc. Need to spell out behavior expectations of students.	After trip, the students will put together an assessment where each student provides questions to be used. Teacher will also add appropriate questions and smooth out the test instrument. Expectation of 75% correct on assessment.
<b>EXPLAIN:</b> Guest speaker – Kim Bogenschutz, Iowa DNR Invasive Species Specialist	Based on previous experiences, students should have a list of question for the speaker.	Introduce speaker and give them background about the less and what is trying to be achieved.	Understanding will be assessed by a checklist based on student questions and answers. Appropriate dialogue with guest speaker will be an indicator of understanding.
<b>ELABORATE:</b> Use <i>Project Learning Tree – Secondary Environmental Education Program</i> “Global Invaders” Activity - #1	This activity should generate interest and students have the opportunity to be creative in presenting information and getting it across to an audience.	Provide appropriate students pagers. Get a map of the world to track the advancement of invasive species. Have access to a computer to research the various invasives.	Use the “Understanding Invaders Worksheet” from the lesson. How well did they express themselves or come up with solutions? Use the content questions for the final assessment.

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EVALUATE: <i>Project WILD Aquatic “Aquatic Times”</i> P. 174 - Use the final student produced and edited articles as the evaluation tool for this unit.	Students will highlight various invasive species in articles written in a newspaper/magazine format.	Teacher will have the local news paper editor come to class and explain how to write articles for a paper and magazine.	Based on a class generated rubric, the various articles for magazine/paper will be assessed on their merits and quality of written content.

**Briefly note how the characteristics of effective instruction are incorporated in the learning cycle.** Students will be exposed to a number of learning experiences during this unit and will have the opportunity to form their own personal opinions about Invasive Species. Long term impact of this lesson will be to open student’s eyes to issues that need to be addressed in order to maintain a rich outdoor experience in the state. Hopefully, some students will become an advocate for natural resources in their local area and state.