

Aquatic Invasive Species and Their Control

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Grade 2

Science, social studies, language arts.

Lesson Overview:

Students will examine different aquatic invasive species and how they came to be introduced into waters of Lake Michigan, which is about 40 miles west of our location. Since this community is surrounded by inland lakes, which provide recreational and economic opportunities for residents, students will examine ways that they can protect the local waterways from infestation and produce posters that can be displayed at local marinas and boat launches.

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Learning objectives:

Students will be able to:

- Identify three aquatic invasive species and describe their life cycle.
- Follow local water sources to the Lake Michigan watershed using watershed maps and other local maps.

- Understand and analyze the negative impacts that invasive species have on the Great Lakes ecosystem.
- List methods of controlling further spread of aquatic invasive species.

State Benchmarks:

K-7 Standard L.OL: Develop an understanding that plants and animals (including humans) have basic requirements for maintaining life which include the need for air, water and a source of energy.

Understand that all life forms can be classified as producers, consumers, or decomposers as they are all part of a global food chain where food/energy is supplied by plants which need light to produce food/energy. Develop an understanding that plants and animals can be classified by observable traits and physical characteristics. Understand that all living organisms are composed of cells and they exhibit cell growth and division. Understand that all plants and animals have a definite life cycle, body parts, and systems to perform specific life functions.

L.OL.E.1 - Life Requirements- Organisms have basic needs. Animals and plants need air, water, and food. Plants also require light. Plants and animals use food as a source of energy and as a source of building material for growth and repair.

L.OL.E.2 - Life Cycles- Plants and animals have life cycles. Both plants and animals begin life and develop into adults, reproduce, and eventually die. The details of this life cycle are different for different organisms.

K-7 Standard E.FE: Develop an understanding that Earth is a planet nearly covered with water and that water on Earth can be found in three states, solid, liquid, and gas. Understand how water on Earth moves in predictable patterns. Understand Earth's atmosphere as a mixture of gases and water vapor.

E.FE.E.1 - Water- Water is a natural resource and is found under the ground, on the surface of the earth, and in the sky. It exists in three states (liquid, solid, gas) and can go back and forth from one form to another.

E.FE.02.11 - Identify water sources (wells, springs, lakes, rivers, oceans).

E.FE.02.13 - Describe the properties (visible, flowing, melting, dew) of water as a liquid (lakes, rivers, streams, oceans).

E.FE.E.2 - Water Movement- Water moves in predictable patterns.

E.FE.02.21 - Describe how rain collects on the surface of the Earth and flows downhill into bodies of water (streams, rivers, lakes, oceans) or into the ground.

E.FE.02.22 - Describe the major bodies of water on the Earth's surface (lakes, ponds, oceans, rivers, streams).

2 – C5.0.3 - Design and participate in community improvement projects that help or inform others. (See P4.2.2)

2 – G2.0.2 - Describe how the local community is part of a larger region (e.g., county, metropolitan area, state).

2 – G5.0.1 - Suggest ways people can responsibly interact with the environment in the local community.

2 – G5.0.2 - Describe positive and negative consequences of changing the physical environment of the local community.

2 – P3.1.2 - Use graphic data and other sources to analyze information about a public issue in the local community and evaluate alternative resolutions.

2 – P3.3.1 - Compose a statement expressing a position on a public policy issue in the local community and justify the position with a reasoned argument.

2 – P4.2.1 - Develop and implement an action plan to address or inform others about a public issue.

2 – P4.2.2 - Participate in projects to help or inform others

R.CM.02.01 - make text-to-self and text-to-text connections and comparisons by activating prior knowledge and connecting personal knowledge, experience, and understanding of others to ideas in text through oral and written responses.

R.CM.02.04 - apply significant knowledge from grade-level science, social studies, and mathematics texts.

W.GN.02.03 - write an informational piece including a magazine feature article using an organizational pattern such as description, enumeration, sequence, or compare/ contrast that may include graphs, diagrams, or charts to enhance the understanding of central and key ideas.

W.GN.02.04 - use the writing process to produce and present a research project; develop two research questions related to a teacher-selected topic; gather electronic or print resources and organize the information using key ideas with teacher assistance.

Materials needed:

Computer with internet access

Data projector

Smart Board

Paper

Pencils, markers, crayons, other writing materials

Great Lakes Most Unwanted Posters or other visuals identifying aquatic invasive species.

Riddle in a Bottle DVD

New vocabulary:

Ballast water: Water carried by ships for balance and stability.

Invasive species: An animal or plant that has a profound and negative impact on an ecosystem.

River system: A network of small rivers leading into larger rivers.

Runoff: Excess rainfall or snowmelt that flows over land into lakes and rivers because it was not absorbed by soil or plants.

Watershed: The area of land that drains into a river system.

Vocabulary definitions taken from Project FLOW, © Michigan Sea Grant, Regents of the

University of Michigan

Focus question:

Describe a time you went to the lake. What were things you saw on the shore and in the water? What things looked like they belong there? What things looked like they didn't belong? Today we're going to learn about some plants and animals that might look like they belong in the lake, but they don't. They're called invasive species.

Classroom activities:

1. Using a computer connected to the Smart Board, students will view the Nonindigenous Aquatic Species website from USGS. Using the interactive map feature, students will identify which species are in our local lakes and create a timeline of when the species was identified by placing pictures printed from the web site onto a magnetic white board and labeling them with the date it was identified in our county.
2. Using an activity borrowed from the Wisconsin Maritime Museum, students will create an outline of Lake Michigan using ropes. Fish icons will be placed in the lake, representing native fish populations before invasive species. Icons representing different aquatic invasive species

will be introduced to each lake, with subsequent drop in fish populations, demonstrating the effect of exotics on the native populations.

3. Students will view the video *Riddle in a Bottle*, introducing the concept of watersheds and water movement. Students will identify other bodies of water on a local map and trace where local streams and rivers go, marking where it connects with a larger body of water.
4. Using the Smart Board, we will use the *Nab the Aquatic Invaders* web site to learn more about aquatic invasive species and how they arrived in the Great Lakes region, as well as things being done to control them.
5. After showing either the Great Lakes Most Unwanted posters or examples of criminal “Wanted” posters, students will work in groups of four to learn more about three aquatic invasive species. One person will focus on how the invader got here. One person will focus on negative effects of the invader. One will focus on its life cycle. One will focus on ways to stop its spread. Each group will create a “Wanted” poster for each species to share their information.
6. After creating the posters, students will either write a letter to the DNR requesting permission to post copies of their posters to help stop the spread of aquatic invasive species in our local lakes, or they will write a letter to the editor of the local paper using the information they have learned to write a persuasive letter. A sample letter will be created in a whole group setting on the Smart Board prior to students attempting to write their own letters. Students may use the group letter as a template for their own.

Name: _____

Name of invasive species	
Where it's from and how it got here	

Negative effects (problems it causes)	
Life cycle	
Ways to stop it from spreading	

Assessment:

Police create a “Wanted” poster so people can help them catch criminals. Your group will create a poster to help stop aquatic invaders. For each of the invasive species your group researched, you will make a “Wanted” poster. You need to include what it looks like (a picture or drawing of your plant/animal), where it’s from originally and how it got here, what its crime is (problems it causes), how it lives (life cycle), and what other people can do to stop it from spreading. Be creative, but make sure other people can read it and understand it.

Rubric Made Using:
RubiStar (<http://rubistar.4teachers.org>)

Making A Poster : Invasive species poster

Teacher Name: **Ms. Thunell**

Student Name: _____

CATEGORY	4	3	2	1
Required Elements	The poster includes all required elements as well as additional information.	All required elements are included on the poster.	All but 1 of the required elements are included on the poster.	Several required elements were missing.
Attractiveness	The poster is exceptionally attractive in terms of design, layout, and neatness.	The poster is attractive in terms of design, layout and neatness.	The poster is acceptably attractive though it may be a bit messy.	The poster is distractingly messy or very poorly designed. It is not attractive.
Mechanics	Capitalization and punctuation are correct throughout the poster.	There is 1 error in capitalization or punctuation.	There are 2 errors in capitalization or punctuation.	There are more than 2 errors in capitalization or punctuation.
Use of Class Time	Used time well during each class period. Focused on getting the project done. Never distracted others.	Used time well during each class period. Usually focused on getting the project done and never distracted others.	Used some of the time well during each class period. There was some focus on getting the project done but occasionally distracted others.	Did not use class time to focus on the project OR often distracted others.

Date Created: **July 13, 2011**

You will write a letter either to the Michigan DNR or the Edwardsburg Argus.

If you choose to write to the Michigan DNR, you will request permission to post copies of your “Wanted” posters at area boat launches to help stop the spread of aquatic invasive species. In your letter, you need to let them know why you think it’s important to stop the spread of these invaders. Use the information your group learned during your research to help you write your letter.

If you choose to write a letter to the editor of the Edwardsburg Argus, tell what you have learned about aquatic invasive species, what people can do to help stop them, and why you think it’s important.

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RubiStar (<http://rubistar.4teachers.org>)

Letter-Writing : Invasive species DNR or newspaper letter

Teacher Name: **Ms. Thunell**

Student Name: _____

CATEGORY	4	3	2	1
Ideas	Ideas were expressed in a clear and organized fashion. It was easy to figure out what the letter was about.	Ideas were expressed in a pretty clear manner, but the organization could have been better.	Ideas were somewhat organized, but were not very clear. It took more than one reading to figure out what the letter was about.	The letter seemed to be a collection of unrelated sentences. It was very difficult to figure out what the letter was about.
Grammar & spelling (conventions)	Writer makes no errors in grammar or spelling.	Writer makes 1-2 errors in grammar and/or spelling.	Writer makes 3-4 errors in grammar and/or spelling	Writer makes more than 4 errors in grammar and/or spelling.

Date Created: **July 13, 2011**