

8b.6 Great Lakes as Power Source?

Story Extension for This Lesson:

As Sam and Alex are trekking along the shores of Lake Ontario, they come upon a massive industrial complex (see picture), the purpose of which they are unsure. Their guide, the wolf, informs them that it is a nuclear power plant. The Great Lakes have many nuclear power plants, along with hydroelectric projects. Although neither source of electricity produces greenhouse gases, there can be other negative side effects to these electricity production systems.

Grade: 8

Strand: Systems in Action

Big Ideas:

- Systems are designed to accomplish tasks. (Overall expectations 1, 2, and 3)

Overall Expectations:

1. assess the personal, social, and/or environmental impacts of a system, and evaluate improvements to a system and/ or alternative ways of meeting the same needs

Specific Expectations:

3.3 identify the various processes and components of a system

3.9 identify social factors that influence the evolution of a system

Inquiry Skills:

Searching, Recording, Analyzing, Writing

Instructions:

Part 1:

Use the story hook above, along with the photo of the Pickering Nuclear Power Plant. Ascertain how much background knowledge students have about hydroelectric and nuclear power.

Part 2:

Have students research either nuclear power or hydroelectric power. Have them create a simple labelled diagram of how this system works, along with a systems diagram that shows the inputs, outputs, and components of the system. Some starting points for research include the "How Stuff Works" website:

- <http://science.howstuffworks.com/nuclear-power.htm>
- <http://science.howstuffworks.com/environmental/energy/hydropower-plant.htm>

Have students use one of the **Systems Thinking Habits of Mind** to analyze their source of energy:

- <http://watersfoundation.org/systems-thinking/habits-of-a-systems-thinker/>

Part 3:

Have students focus on the 'Consequences' habit from Systems Thinking Habits of Mind to analyze their source of energy.

- Systems Thinking Habits of Mind: <http://watersfoundation.org/systems-thinking/habits-of-a-systems-thinker/>

What are the positive and negative consequences of nuclear or hydroelectric power? For hydroelectric power, the negative social effects of large dam projects (not necessarily on the Great Lakes) can be examined.

The following are helpful resources:

- <http://www.stopthegreatlakesnucleardump.com/>
- <http://www.kidsdiscover.com/teacherresources/whats-good-and-whats-bad-about-hydropower/>
- <https://www.YouTube.com/watch?v=b8cCsUBYSkw>
- <http://www.democracynow.org/2008/4/24/uptheyangtzedocumentarytakeson>

Materials List:

Language: Reading and Writing

- computers or tablets for research

Connections:

Subject Area:

English

Connects to:

Grade 8

Assessment Strategy:

Assessment of this project can focus on several different facets of this project:

- Research Skills (can be integrated with reading and writing)
- Media Literacy (a poster can be produced, showing the labelled diagram plus systems diagram)
- Science: systems analysis, plus social factors that pressure the nuclear industry

Handouts:

- Great Lakes nuclear hotspots map
final
- Pickering Nuclear



 Uranium Mining and Mill Tailings
 Operating Nuclear Power Reactors
 Closed Nuclear Power Reactors*

* Number in brackets () indicates the number of reactors.

[illegible]



Photo by JasonParis used Creative Commons license 2.0
<https://www.flickr.com/photos/jasonparis/7938635630/in/photostream/>

