

Please bring this unit overview to the follow-up session on **October 27, 2012**. We will work together to improve our units, which should be completed by **Friday, November 30**.

General Requirement:

Develop a unit or extended lesson sequence of at least three to five lessons based on the lectures, readings, and study tour provided by Phila-Nipponica. The unit should connect in a meaningful way to your regular curriculum. The final unit, including lesson plans and supplemental material such as primary sources should be sent or emailed to Paula Roberts (proberts@sas.upenn.edu) by Friday, November 30.

Purpose of Unit: Explain what you want your students to know and be able to do. How does the unit relate to your curriculum?

I teach Environmental Science. I would like to incorporate the Fukushima-Daiichi nuclear disaster into our curriculum. I would also like to incorporate the nuclear bombing of Hiroshima effect on health issues of the surrounding population and area.

Target Audience: 11th & 12th Grade Students

State Standards: (If these are used in your school)

Essential Questions: These are open-ended questions related to each of the major concepts you will teach. Three to five questions will help students relate information to major concepts.

1. How does the geography of Japan determine earthquake activity?
2. How did the detonation of the nuclear bomb in Hiroshima cause health problems?
3. What are the advantages and disadvantages of nuclear power as they relate to an environmentally sustaining society?

List major lessons.

1. Geography of Japan
2. Plate Tectonics & Cause of Earthquakes, Japan's location in terms of risk of earthquakes
3. Earthquakes on Ocean floor cause Tsunamis (Huge Waves)...Natural Geological Hazard
4. Nuclear Reactors: Structure, Function, and Safety Measures
5. Global Warming: function of carbon dioxide & relation to nuclear reactors
6. Nuclear reactor control: Private vs Government
7. Hiroshima: The fallout of a nuclear detonation & health issues
8. Case Studies: Three Mile Island (USA) & Chernobyl (Soviet Union)

Assessments: Describe in some detail. You should have two or more major assessments. Be sure to address different learning styles. Assessments should

require mastery of skills (reading, writing, critical thinking, speaking) as well as content.

The students will each receive a question, which they will research. They will prepare a written report and present their findings to the class. Each report will guide the class through the major topics discussed in class.

These are examples of their questions:

1. Did Fukushima's fate have an effect on nuclear reactor safety in Japan?
2. Did quake or tsunami cause Fukushima explosion/meltdown?
3. Will Fukushima residents ever go home?
4. Did the radioactive fallout from Fukushima warrant evacuation? Was the evacuation handled in the proper progression?
5. Were the Fukushima workers protected in cleanup of reactor explosion? Were proper safety precautions applied during crisis?
6. How safe are Japan's food and water?
7. Are nuclear reactors a good choice for Japan considering its geographical location? to tectonic plates?
8. Can you compare Fukushima to Chernobyl? Three mile island?

Describe how Phila-Nipponica provided the background and inspiration for this unit.

Let us be serious...I could not have received the first hand knowledge about Hiroshima or the Fukushima-Daiichi reactor disaster if it was not for this trip...I used the photos from Hiroshima and Sendai to pipe up interest in Japan...my students were very interested in my trip and our theme of "recovering Japan"...so we decided to incorporate both Hiroshima and the reactor disaster into a class project.

Teacher and student resources used in unit.

1. Classroom Text: Living in the Environment
2. Information from the trip: Photos and Interviews
3. Internet