Teaching Inquiry: Engaging the Learner Within
Lesson Planning Template (modified format)

GENERAL INFORMATION

Librarian: Joy Ferguson

Lesson Plan/Unit Title: Nuclear Power and NYC

Appropriate Grade Level(s): 9-12 Required Time: 6 sessions

Library Context: multiple lessons in a unit

Collaboration Potential: moderate

Overview: The 11th grade social studies teacher noticed poor writing skills early in the year and wanted students to practice thesis writing and note-taking skills in addition to a planned activity about bias in information. The unit theme is Challenges to major urban areas: nuclear power plants (Geography). The teacher and the teacher-librarian (TL) worked together to create a unit that addressed all three skill areas while critically analyzing a complicated social, economic and environmental issue.

Content Topics: Nuclear Power, Urbanization, Government, Environment, Economy, Technology

Connection to State or Local Content Standards: New York, Social Studies

- Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science. Key Idea 7: Human decisions and activities have had a profound impact on the physical and living environment.
- Standard 5: Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.
- Standard 6: Students will understand the relationships and common themes that connect mathematics, science, and technology and apply the themes to these and other areas of learning.
- Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.

AASL Standards for the 21-st Century Learner Goals: (Use as many as needed)

Standard/Indicator:
- 1.1.3 Develop and refine a range of questions to frame the search for new understanding.

Benchmark for my students, if appropriate:
- Students will create questions for initial research and thesis statements.

Standard/Indicator:
2.1.1 Continue an inquiry-based research process by applying critical-thinking skills (analysis, synthesis, evaluation, organization) to information and knowledge in order to construct new understandings, draw conclusions, and create new knowledge.

1.4.2 Use interaction with and feedback from teachers and peers to guide own inquiry process.

**Benchmark for my students, if appropriate:**
- Students will turn essential questions to working thesis statements and then revised thesis statements.

**Standard/Indicator:**
- 1.1.7 Make sense of information gathered from diverse sources by identifying misconceptions, main and supporting ideas, conflicting information, and point of view or bias.
- 4.3.2 Recognize that resources are created for a variety of purposes.

**Benchmark for my students, if appropriate:**
- Students will take notes using a template to assess sources of information for main ideas and bias (Powerpoint note-taking template).
- Students will develop a group project demonstrating multiple perspectives.

**Standard/Indicator:**
- 2.1.2 Organize knowledge so that it is useful.
- 2.1.6 Use the writing process, media and visual literacy, and technology skills to create products that express new understandings.
- 2.3.2 Consider diverse and global perspectives in drawing conclusions.
- 3.1.4 Use technology and other information tools to organize and display knowledge and understanding in ways that others can view, use, and assess.
- 3.3.4 Create products that apply to authentic, real-world contexts.

**Benchmark for my students, if appropriate:**
- Students will produce a brief presentation of their research topic with main arguments and supporting evidence. (Powerpoint).
- Research will be uploaded to a class wiki and eventually opened to public viewing and shared with the school community.

**Standard/Indicator:**
- 1.3.4 Contribute to the exchange of ideas within the learning community.

**Benchmark for my students, if appropriate:**
- Students will share their findings to the class with brief presentations, review each other’s projects and engage in group editing.

**Standard/Indicator:**
- 3.1.6 Use information and technology ethically and responsibly.

**Benchmark for my students, if appropriate:**
- Students will provide references to cited information.

**Standard/Indicator:**
- 2.3.3 Use valid information and reasoned conclusions to make ethical decisions.
3.3.6 Use information and knowledge in the service of democratic values.

**Benchmark for my students, if appropriate:**
- Students will identify possible action steps for the project - for example, share the wiki in a letter to the governor, school paper, Greenpeace, or youth advocacy organization.

**Standard/Indicator:**
- 3.4.1 Assess the processes by which learning was achieved in order to revise strategies and learn more effectively in the future.

**Benchmark for my students, if appropriate:**
- Students will reflect on learning after each lesson and complete a self-assessment at the end of the unit.

**Motivational Goals:**
- The class will choose the topic as a group before the session starts in response to recent publicity with nuclear power plants and natural disasters.
- Student work will be shared publicly through a wiki.

**Assessment Methods and Criteria:**
- Students will plan and self-assess with the same project check-list
- Teachers will coach students and groups noting individual strengths and challenges
- The class will develop criteria for the wiki as a source of information and assess it in discussion

**Required Resources and Materials:**
- Map of area from Indian Point to NYC retrieved from: http://www.googlemaps.com
- Videos on nuclear power (see bibliography)
- Article on nuclear power (see bibliography)
- 5 books for book talk (see bibliography)
- Pathfinder on Nuclear Power/Indian Point (tbd -see bibliography and school databases)
- Sample wikis: Harvard Graduate School of Education
  - [http://a100educationalpolicy.pbworks.com/w/page/4040085/Recruiting-Quality-Teachers:-Main](http://a100educationalpolicy.pbworks.com/w/page/4040085/Recruiting-Quality-Teachers:-Main)
  - [http://a100educationalpolicy.pbworks.com/w/page/4003672/Policy-Analysis](http://a100educationalpolicy.pbworks.com/w/page/4003672/Policy-Analysis)
- Class wiki: http://nuclearpowerunit.pbworks.com/w/page/39978763/FrontPage
- Handouts:
  - Project checklist and timeline (guidelines for project and assessment)
  - Thesis generator (documents essential question and working thesis statement)
  - Reflective note-taking form (documents initial research)
  - Powerpoint note-card template (e-note-cards for documenting citations with details and quotes to support thesis statement and explain how citations support the thesis)
  - Thesis revision guide (questions for multi-step revision process)
  - Editing roles (roles for wiki revision)

**INSTRUCTION AND ACTIVITIES: SESSION 1**

**Set up/Prep:**
Students will choose a topic for inquiry as a group in prior session related to the challenges to major urban areas for making informative wiki (nuclear power/Indian Point plan)

- Projector for videos, photos and map.
- Make folders of all handouts.
- Make student journals/folders

**Direct instruction:**

- Show brief videos on nuclear power.
- Teacher Librarian (TL) will ask for student input to review the research process steps, then highlight the areas of focus of the wiki project (question and thesis development, detecting bias and dealing with conflicting information), and share sample wiki and model section format: Title, paragraph with main thesis statement, then two to three supporting statements that make sense for the reader. Be careful not to summarize too much.
- Students will read “A comeback for nuclear power” and TL will lead discussion analyzing article and of bias and how to look for it in various information resources, and whether and how it can impact the reliability of an information source.
- TL and Social Studies Teacher (SST) will introduce pathfinder and booktalk 3 books, one pro nuclear power, one con, and one discussing different perspectives.

**Modeling and guided practice:**

- SST projects the map and guides students in mind-mapping the issues of nuclear power. SST models a strategy of how to narrow down a research topic through the inquiry process but should also guide the mapping to cover major subject areas (e.g.: reasons against, reasons for, feasibility of alternatives, India Point and NYC, US policy, global policy). The brainstorm should bring up enough issues so that all students can choose their own subtopic. Subtopics will be grouped together to produce a coherent wiki page under the larger topic area (no more than 4 students).
- TL will engage students in discussion on good research questions and demonstrate sample questions for their topic in the Thesis Generator.

**Independent practice:**

- Students will complete at least three questions about their topic for initial research in Thesis Generator.

**Sharing and reflecting:**

- Warm up (after videos): SST will lead 10 minute human barometer activity asking students to take a stand on controversies mentioned in film. Select a few students to share their views each round and gauge what students already know about the subject.
- Reflection: Students write for 5 minutes in journal: what they knew about topic before class and explore their bias (if any).

**INSTRUCTION AND ACTIVITIES: SESSION 2**

**Set up/Prep:**
Computer lab.

Direct instruction:
- SST will distribute project checklist and timeline; and highlight goals for day: pre-research to create working thesis statements.

Modeling and guided practice:
- TL will ask students their strategies for choosing a resource in the initial phase of research.
- TL will give an example of using the Reflective Note-taking Form for initial phase of research.

Independent practice:
- Students do initial research to answer their essential question(s) and come up with working thesis, completing the Thesis Generator.

Sharing and reflecting:
- Warm up: write two questions on the board (one open, one closed) on how the wiki project could be used. Have students listen to (not interview) a partner answer the questions for 1 minute each then discuss responses as a group and finally discuss questions format. Students will likely highlight how open questions can lead to better answers.
- Reflection: SST will ask several students in the class to read their research questions.
- SST will lead discussion of what is easier than expected in the research process and what is challenging.

INSTRUCTION AND ACTIVITIES: SESSION 3

Set up/Prep:
- Draft class wiki pages based on brainstorm (check for changes in topic with thesis statements)
- Computer lab and projector to show video

Direct instruction:
- TL will highlight goals for the class: revise working thesis and use Powerpoint note-cards to research evidence to support thesis.
- TL will discuss the difference between a working thesis statement and a revised thesis statement and introduce group activity for revisions.
- TL will show format of Powerpoint Note-cards, which address assessment and use of information sources. TL will ask for student input on research basics: how citation can support thesis, citation basics (how to avoid plagiarism), and information assessment (ABCD: Authority, Bias, Citations, Date).

Modeling and guided practice:
- TL and SST will model group work for revision and further revision of working thesis statements.
• TL will demonstrate how Powerpoint note-taking template works and model moving note cards to improve the organization of the research.

Independent practice:
• Students will work in groups of three to make two revisions of thesis statements using Thesis revision strategies. TL and SST will approve final.
• Students continue research taking notes in Powerpoint

Sharing and reflecting:
• Reflection: Students write for 5 minutes about thesis revision process. Are they more confident about writing a thesis? How is the thesis better? Was it helpful to have others asking questions?

INSTRUCTION AND ACTIVITIES: SESSION 4

Set up/Prep:
• TL/SST may want to reorganize wiki depending on changes in thesis statements.
• Projector to view wiki, video

Direct instruction:
• SST will highlight goals: Use Powerpoint note-cards to research evidence to support thesis.
• TL will show Common Craft video: Wikis in Plain English
• TL will review wiki etiquette and remind students of guidelines for publicly shared information.

Modeling and guided practice:
• TL (or student) will demonstrate how to sign in to wiki, edit, save and create a link to a URL. TL will save Powerpoint content as Rich Text and upload it to wiki.

Independent practice:
• Students will continue research and most should complete Powerpoint template. TL and SST will circulate to help students with the research process noting common issues.
• Students take turns to log in to class wiki, test sandbox and enter their thesis statement and at least three cases of evidence from their Powerpoint template.
• Students may work on collecting copyright free and cited images for extra credit.

Sharing and reflecting:
• Reflection: SST will lead the class on a tour of the wiki and students will share their findings with the class. Class will examine how the subtopics fit together and highlight strengths and areas for improvement for each section (flow, at least basic information covered, not too much duplication). TL will take notes for next session.

INSTRUCTION AND ACTIVITIES: SESSION 5

Set up/Prep:
- computer lab and projector to share wiki.

**Independent practice:**
- Students will continue research but should be writing three paragraphs for wiki. TL and SST will circulate to help students with the writing and research process noting common issues.
- Students take turns to log in to class wiki, test sandbox, and post thesis and at least three items of supporting evidence.
- Students may work on collecting copyright free and cited images for extra credit (outside of class)

**Sharing and reflecting:**
- Warm up: give students 2 minutes to work on a difficult word game individually. Give them 2 more minutes to work on it in pairs (standing up). Give them 2 more minutes to work on it in groups of 4 (standing up). Split the room in half and give them 1 more minute (mingling). Share answers and reflect on how it was to come up with answers with more people involved. What if answers differed? Ask students if there is any analogy to the wiki project.
- Reflection: students write in journal 3 minutes on their contribution and the process.

**INSTRUCTION AND ACTIVITIES:  SESSION 6**

**Set up/Prep:**
- Computer lab and projector to share wiki.
- Prepare for editing roles. Determine if some editing roles will need to be combined for number of students/pages.

**Direct instruction:**
- TL will explain editing roles (handout “Wiki Editing Roles”) and ask students to sign up for roles

**Modeling and guided practice:**
- SST will demonstrate an edit on a part of the wiki written by TL based on class feedback.
- SST and TL will circulate to help students individually in the editing process.

**Independent practice:**
- Students edit wiki pages by adding or changing only necessary information that will make the wiki make sense, have complete citations be free of errors. If there is time, students can work on links for key concepts.

**Sharing and reflecting:**
- SST will ask for highlights of the wiki.
- SST will lead the class in options on how to proceed with the project – what recommendations do we want to make? Should Obama invest $54.5b in nuclear power plants and research? What more can the US government do? Is Indian Point a risk to the community? Pose the answers to these questions as the conclusion page of the wiki.
Add an action step: who should see it? Who would be interested? How can we make a difference? How do we share? (possibilities include letter to president, NRC, governor, school paper, etc.)

Students complete a self-assessment and TL and SST will assign points to assessment. If there is disagreement between the self-assessment and the teacher assessment there will be a brief conference with the student.

REFERENCES:


BIBLIOGRAPHY


- Overview article about nuclear power focused on the scientific angle. Includes references.


- Dr. Caldecott is a nobel prize winning advocate of freeing the world of the dangers of nuclear waste and nuclear war. In addition to the waste issue, she objects to the intense subsidies.


- Fun video explaining wikis.


- Written in an engaging style by a novelist who spent more than ten years studying the issues and visited Chernobyl and uranium plants. Extensive bibliography.


- One minute film about the creation of energy.


- Engaging first person account of a reporter’s coverage of the nuclear accident with history, photos and resources.

- Novel about a 13 year old girl who goes to live with her grandmother in Vermont and must deal with radiation from a nuclear accident.

- Very recent edition of series offering multiple perspectives from authoritative authors.

- Brief presentation of the basic issues around nuclear power.

- Clear reporting on the major arguments, though does not include latest information.

- Reporting before the accident in Japan that gives a brief history of changes in popular opinion.

<table>
<thead>
<tr>
<th>Supporting Materials</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>JF1_assessment</td>
<td>Research process and assessment</td>
</tr>
<tr>
<td>JF2_thesis generator</td>
<td>Thesis generator</td>
</tr>
<tr>
<td>JF3_reflective notes</td>
<td>Reflective note-taking form</td>
</tr>
<tr>
<td>JF4_powerpoint notes</td>
<td>Powerpoint note-card template</td>
</tr>
<tr>
<td>JF5_thesis revision</td>
<td>Thesis revision guide</td>
</tr>
<tr>
<td>JF6_editing roles</td>
<td>Editing roles</td>
</tr>
</tbody>
</table>