

**the Gov**

“Anniversary of Three Mile Island”  
Language Arts Lesson Plan

**the Gov**  
is a feature of

**the News**

A daily news broadcast for High School and Middle School students  
now under development by MacNeil/Lehrer Productions



**the Gov**



Segment 8:  
“Anniversary of Three Mile Island”  
Language Arts Curriculum

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the Gov



Spring, 2011

Dear Educator,

*the.News* online video reports for *the.Gov* and *the.Globe* provide middle and high school students with a valuable exercise in social studies and language arts with this **5:43 minute** segment on “The Anniversary of 3 Mile Island” at [www.pbs.org/newshour/thenews/thegov](http://www.pbs.org/newshour/thenews/thegov) . In the wake of the Fukushima Meltdown in Japan in March of 2011 Antonio Neves reports on past nuclear power disasters and future policy implications. Lessons for social studies and language arts are available to support this video in the “For Educators” section of the website. All videos and curricula have been informed by *the.News* instructional design that can be found on the website [www.pbs.org/newshour/thenews](http://www.pbs.org/newshour/thenews). The curriculum includes content-based standards, discussion questions, student activities, vocabulary and primary reference sources. A complete transcript of each video report includes time codes to assist in isolating specific segments of the video and to augment the instruction of media literacy and multimedia production. All of this material is presented as options to fit teachers’ instructional needs.

References to Larry Bell’s “The 12 Powerful Words” are highlighted in **bold** in the lesson plans and in the “thought starter” questions on the home page and educator’s page, and in the transcript (to denote where they are used in the video segment).

We have also added general topics to correlate to the lessons and video as well as concept based standards with conceptual lens and enduring understanding.

We welcome our partners at the Omaha Public Schools who have joined *the.News* in the second year of a special pilot project. We have also developed a new authoring tool for students called *YOU.edit* which gives students an online tool to remix the content of *the.News* reports, so they can create their own multimedia presentations. This editing tool can be found by clicking on the *YOU.edit* button on the home page of the website. Currently used with our OPS teacher consultants it is password protected so that it can serve as a viable educational asset that allows classroom teachers to assign multimedia projects within the security and content safety of *the.News* website.

Answers to student “**thought starter**” questions listed below the video.

- #1. Fukushima Daiichi Japan; Chernobyl Ukraine; 3 Mile Island Middletown Pennsylvania
- #2. City, state and federal.
- #3. Students’ ideas can be formulated by lesson plan activities.

Sincerely,

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## Anniversary of Three Mile Island Nuclear Disaster

This lesson was designed to support *the.News* video “Anniversary of Three Mile Island”

The video can be found online at [www.pbs.org/newshour/thenews/thegov](http://www.pbs.org/newshour/thenews/thegov)

### Omaha Public Schools Standards

<http://www.ops.org/District/LinkClick.aspx?fileticket=Hbqyrrg2ydM%3d&tabid=912&mid=2006>

### Writing

#### Grades 6-12

**Standard 5: Students will write for a variety of purposes and audience audiences in multiple genres.**

3. Select and apply an organizational structure appropriate to the task (e.g. problem/solution, persuasion)

4. Analyze models and examples (own and others’) of various genres in order to create a similar piece

### Conceptual Lens: Risks

**Enduring Understanding:** People who take risks have a responsibility to assess the situation, make decisions, and accept the consequences of their actions.

### Grade Level: 7-12

### Content Areas:

Language Arts, Civics, History, Media Literacy

### Key Concepts:

Students will become historians in the Three

Mile Island nuclear disaster by researching the disaster itself, the changes that have occurred because of the disaster, and the citizen and lawmaker responses to the disaster. Students will also create the perspectives of the citizens involved in the disaster and its aftermath. In addition, students will create public service announcements that either make citizens aware of what to do in a nuclear disaster or make citizens aware of the danger of nuclear power.

### Key Objectives:

Students will:

- **summarize** the reactions of people who remember the Three Mile Island nuclear disaster.
- **evaluate** the reactions of the people who were involved in the Three Mile Island disaster.
- **analyze** the changes made in nuclear safety due to the



Three Mile Island disaster.

- **formulate** public service announcements that highlight some aspect of nuclear safety.

### Key Vocabulary:

- **Boiling Water Reactor (BWR):** second most common nuclear reactor; where water heated by nuclear fission boils and turns into steam which powers a generator. The steam is then turned back into water by a condenser and used again (<http://www.cnn.com/2011/WORLD/asiapcf/03/12/explainer.nuclear.reactors/index.html>)
- **Chernobyl:** a place in Ukraine where a nuclear power plant — a generator powered by a nuclear reactor — underwent a meltdown in 1986. A cloud of radioactive gases spread throughout the region of Chernobyl and to foreign countries as well. Forty thousand people living nearby were evacuated. Dozens of deaths and hundreds of illnesses were reported to have been caused by the accident ([www.dictionary.com](http://www.dictionary.com))



- **China Syndrome:** derived from the theory that such a core that was damaged though nuclear meltdown would be so hot, it actually could burn its way through to the other side of the earth (<http://www.threemileisland.org/downloads//309.pdf>)
- **Coolant:** a substance circulated through a nuclear reactor to remove or transfer heat. The most commonly used coolant in the U.S. is water. Other coolants include air, carbon dioxide, and helium (<http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/3mile-isle.html/>)
- **Containment:** the gas-tight shell or other enclosure around a reactor to confine fission products that otherwise might be released to the atmosphere in the event of an accident (<http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/3mile-isle.html/>)
- **Core:** the central portion of a nuclear reactor containing the fuel elements, and control rods (<http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/3mile-isle.html/>)
- **EFMR:** nonprofit nuclear watchdog group in PA that monitor radiation levels surrounding the Three Mile Island Nuclear Station and the Peach Bottom Atomic Power Station so that any deviation from normal background radiation levels are immediately detected and reported (<http://www.efmr.org/mission.html>)

**Omaha Public Schools Standards**

<http://www.ops.org/District/LinkClick.aspx?fileticket=Hbqyrng2ydM%3d&tabid=912&mid=2006>

**Writing**

**Grades 9-12**

**Standard 4:** Students will apply the writing process to plan, draft, revise, edit and publish writing using correct spelling, writing, grammar, punctuation, and other standard conventions appropriate for grade level.

**Speaking and Listening**

**Grades 6-12**

**Standard 6:** Students will develop, apply, and refine speaking skills to communicate key ideas in a variety of situations.

1. Communicate ideas and information in a manner appropriate for the purpose and setting

**Multiple Literacies**

**Grades 9-12**

**Standard 9:** Students will research, summarize, and communicate information in a variety of media and formats (textual, visual, and digital)

2. Demonstrate ethical and legal use of information by citing sources using a prescribed format (e.g., citation of information used)
6. Gather and share information and opinions as a result of communication with others (e.g. video/audio chat, interview, pod cast, multimedia presentations)



- **Fuel Rod:** a long, slender tube that holds fuel (fissionable material) for nuclear reactor use. Fuel rods are assembled into bundles called fuel elements or fuel assemblies, which are loaded individually into the reactor core

(<http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/3mile-isle.html/>)

- **International Atomic Energy Agency:** set up as the world's "Atoms for Peace" organization in 1957 within the United Nations family; the Agency works with its Member States and multiple partners worldwide to promote safe, secure and peaceful nuclear technologies

(<http://www.iaea.org/About/>)

- **Nuclear Meltdown:** the severe overheating of the core of a nuclear reactor that results in either the partial or full liquefaction of its uranium fuel and supporting metal lattice, at times with the atmospheric release of deadly radiation

(<http://www.nytimes.com/2011/04/03/science/03meltdown.html?pagewanted=2>)

- **Nuclear Reactor:** a device in which nuclear fission may be sustained and controlled in a self-supporting nuclear reaction. There are several varieties, but all incorporate certain features, such as fissionable material or fuel, a moderating material (to control the reaction), a reflector to conserve escaping neutrons, provisions for removal of heat, measuring and controlling instruments, and protective devices. (<http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/3mile-isle.html/>)

- **Nuclear Regulatory Commission:** Grants rights to operate nuclear power facilities; an independent agency established by the Energy Reorganization Act of 1974, to regulate civilian use of nuclear materials (<http://www.threemileisland.org/government.html>)

- **Partial Nuclear Meltdown:** can occur when radioactive fuel rods, which normally are covered in water, remain partially uncovered for too long; the more the fuel is exposed, the closer the reactor comes to a full meltdown

(<http://www.nytimes.com/2011/03/14/world/asia/14nuclear.html?pagewanted=2>)

#### McRel

<http://www.mcrel.org/>

#### **Writing**

**Standard 2:** Uses the stylistic and rhetorical aspects of writing.

#### **Level IV (Grades 9-12)**

1. Uses precise and descriptive language that clarifies and enhances ideas and supports different purposes (e.g., to stimulate the imagination of the reader, to translate concepts into simpler or more easily understood terms, to achieve a specific tone, to explain concepts in literature)

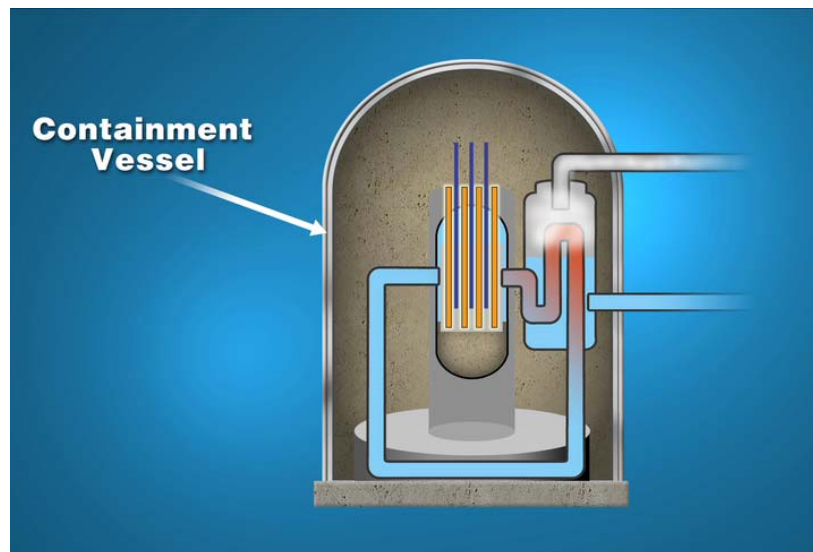
5. Uses a variety of techniques to provide supporting detail (e.g., analogies; anecdotes; restatements; paraphrases; examples; comparisons; visual aids, such as tables, graphs, and pictures)

6. Organizes ideas to achieve cohesion in writing

7. Conveys individual voice, tone, and point of view in writing.



- **Pressurized Water Reactor:** most common nuclear reactor; hot pressurized water from the reactor's core boils water in a separate circuit, making steam that turns a turbine. Water from the reactor and water that is turned into steam are in separate pipes and never mix (<http://www.cnn.com/2011/WORLD/asiapcf/03/12/explainer.nuclear.reactors/index.html>)
- **Primary System (Reactor Coolant System):** the cooling system used to remove energy from the reactor core and transfer that energy either directly or indirectly to the steam turbine (<http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/3mile-isle.html/>)
- **Public Service Announcement:** any announcement (including network) for which no charge is made and which promotes programs, activities, or services of federal, state, or local governments (e.g., recruiting, sale of bonds, etc.) or the programs, activities or services of non-profit organizations (e.g., United Way, Red Cross blood donations, etc.) and other announcements regarded as serving community interests (<http://www.museum.tv/eotvsection.php?entrycode=publicservic>)
- **Three Mile Island:** an island in the Susquehanna River, near Middletown, Pennsylvania, SE of Harrisburg; scene of a near-disastrous accident at a nuclear plant in 1979 that raised the issue of nuclear-energy safety ([www.dictionary.com](http://www.dictionary.com))
- **Three Mile Island Alert:** a non-profit citizens' organization dedicated to the promotion of safe-energy alternatives to nuclear power and is especially critical of the Three Mile Island nuclear plant; formed in 1977 (two years before the Three Mile Island accident) TMIA is the largest and oldest nuclear watchdog group in central Pennsylvania (<http://www.tmia.com/about>)



*Three Mile Island*



**Time Frame: 3-4 class periods**

**Materials:**

- *the.News* video “Anniversary of Three Mile Island”: <http://www.pbs.org/newshour/thenews/thegov>
- paper, pens and pencils
- computers with Internet access
- Online resources
- Handout #1: Paired Perspectives Poem
- Smithsonian National Museum of American History website about the Three Mile Island disaster (<http://americanhistory.si.edu/tmi/index.htm>)
- The *Washington Post* article “Three Mile Island’s Residents Remain on Alert Three Decades After Nuclear Crisis” - [http://www.washingtonpost.com/local/three-mile-islands-residents-remain-on-alert-three-decades-after-nuclear-crisis-/2011/03/18/ABbZsZx\\_story.html](http://www.washingtonpost.com/local/three-mile-islands-residents-remain-on-alert-three-decades-after-nuclear-crisis-/2011/03/18/ABbZsZx_story.html)
- The *NY Times* article “From Afar, A Vivid Picture of Japan Crisis” - (<http://www.nytimes.com/2011/04/03/science/03meltdown.html?pagewanted=1>)
- Handout #2: Analysis of Response
- Handout #3: Public Service Announcement Template
- Three Mile Island Alert watchdog group website: <http://www.tmia.com/>
- EFMR Monitoring Group website: <http://www.efmr.org/index.html>
- International Atomic Energy Agency “Manual for First Responders to a Radiological Emergency” (2006): [http://www-pub.iaea.org/MTCD/publications/PDF/EPR\\_FirstResponder\\_web.pdf](http://www-pub.iaea.org/MTCD/publications/PDF/EPR_FirstResponder_web.pdf)
- Ad Council public service announcements: <http://www.adcouncil.org/default.aspx?id=15>
- *the.News* “For Educators: Production Tips and Tools” script template: <http://www.pbs.org/newshour/thenews/foreducators/productiontips/the.News%20Script%20Template.pdf>

**Lesson Topics:**

- Three Mile Island nuclear disaster
- Fukushima Daiichi nuclear disaster
- Public Service Announcements
- Nuclear Safety





### Background:

On March 11, 2011, an earthquake measuring 9.0 on the Richter scale hit directly off the coast of Japan, causing a 13-foot high tsunami that erased entire villages in the northeastern part of Japan. Because of damage that occurred from the earthquake and the resulting tsunami, there were explosions in many of the **nuclear reactors** at the Fukushima Daiichi and the Fukushima Daini power plants. Though the cooling systems were restored at two of the three reactors at the Fukushima Daini power plant, workers for power company Tokyo Electric (who controls both power plants) have fought to control **partial**



**meltdowns** due to explosions in four of the six reactors at Fukushima Daiichi. Fuel in the reactors and spent fuel stored in the buildings is in danger of melting and releasing radioactive materials, which caused the Japanese government to raise the threat assessment level on March 18, 2011 to a 5 out of 7 on the international nuclear event scale (*NY Times*, “Status of the Nuclear Reactors,” updated: April 2, 2011). Japanese citizens are concerned about radioactive materials that are being released through the air and through water by leaks in the facilities; as of March 30, levels of cesium 137 that were 500 times above the safe limit were found in the seawater outside the power plant, and the air near the power plant held enough radioactive material to increase cancer risks after four days of exposure (*NY Times*, “Assessing the Radiation Danger, Near and Far,” April 2, 2011).

Though the Fukushima Daiichi power plant is one that uses the less common and more volatile **boiling water reactor** system, it reminds citizens worldwide of two nuclear disasters where the **pressure water reactor** system used in other power plants went awry: the Chernobyl nuclear disaster in Ukraine in 1986, and the **Three Mile Island** nuclear disaster in Pennsylvania in 1979. In the Chernobyl nuclear disaster, a flawed reactor design that was run by improperly trained plant operators resulted in an explosion and fires that released 5% of the site’s radioactive material into the air. It also killed thirty operators and firemen, all who contracted acute radiation syndrome and died within four weeks of the accident (World Nuclear Association). Over 300,000 people were eventually evacuated from nearby towns, but it took several days for the Soviet government to admit there had been a nuclear disaster and it was only when the Swedish nuclear site Forsmark detected radiation that had not come from its site that the Soviets were forced to admit the disaster.



Though it caused no injuries or deaths, the nuclear disaster on Three Mile Island in Middletown, PA was the worst nuclear power plant disaster to strike the United States. On March 29, 1979, a valve opened in the second reactor at

Third Mile Island, and it failed to close when it should have. As a result, the cooling water needed to keep the **core** from overheating poured out of the valve instead of keeping the core cool. There was no instrument that showed the level of **coolant** in the core; to plant operators, it seemed as if



the plant had more than enough coolant, so they lowered the amount (exacerbating the situation). Because of these actions and the original malfunction, the plant suffered a severe meltdown when half of the core melted. Though it was extremely dangerous, the **containment** building held the meltdown and large amounts of radiation were not released into the environment as they did in the Chernobyl accident and the Fukushima Daiichi accident (Nuclear Regulatory Committee). Though there was less physical danger to the citizens than there would be if there was a full meltdown, misinterpreted data and reports caused panic in the aftermath of the partial meltdown. Upon hearing the news of the destruction, citizens feared a “**China Syndrome**” in which there would be a core so hot that it “could burn its way through to the other side of the earth” (Thornburgh). Due to unsubstantiated reports of dangerous releases of radioactivity, Pennsylvania Governor Richard Thornburgh demanded that pregnant women and small children to leave the area, and a large-scale evacuation was considered even though there was a lack of strong data to support such action (Smithsonian National Museum of Natural History). The Food and Drug Administration urged citizens to take potassium iodide, a preventative treatment for radiation exposure that helps block the radioactive iodine that causes thyroid cancer (Wald and Revkin, December 11, 2001).

The crisis response and cleanup process cost about \$1 billion, a cost that was paid primarily by the citizens who used the nuclear plant for their power source (Morello and Mufson, March 19, 2011). As a result of the nuclear meltdown at Three Mile Island, residents put a series of emergency preparation tactics into place in Middletown, PA, including a “disaster room” that contains emergency evacuation routes, printed routes in the phone books, and emergency drills. Citizens also keep potassium iodide tablets stocked (Morello and Mufson, March 19, 2011). In addition, nonprofit watchdog groups, including **EFMR** and **TMI Alert**, monitor daily radiation amounts at the Three Mile Island and nearby Peach Island power plants. After the Three Mile Island nuclear incident, power plants in the United States changed safety requirements in the operation of the plants by adding auxiliary feedwater systems and allowing the plants to shut down automatically in a disaster. The federal government established the Institute of Nuclear Power Operations (INPO) to regulate the nuclear industry and created the Nuclear Energy Institute to provide a unified approach to nuclear regulatory issues (Nuclear Regulatory Commission, “Backgrounder on the Three Mile Island Accident”).





## LESSON PLAN

1. **Fishbowl:** Prior to watching *the.News* video, pose the following questions to the class:

- a) If there were a nuclear disaster near your town, how would you respond if you had thirty minutes to prepare? Five hours? Three days?
- b) Are you aware of natural or man-made disasters that could happen around you? What safety techniques are in place for those potential disasters, and how were you made aware of those techniques?

Have the students answer these questions in small groups, then share their answers as a class. Preamble the video with some basic background information about what happened at the Fukushima Daiichi and the Three Mile Island nuclear disasters.

2. **Video:** As the students watch *the.News* video about the anniversary of Three Mile Island, direct the students to **summarize** the reactions of the various people represented in the story. Do the people in the video feel positive or negative about nuclear power?

### McRel

<http://www.mcrel.org/>

### **Writing**

#### **Standard 4: Gathers and uses information for research purposes.**

##### **Level III (Grades 6-8)**

2. Uses a variety of resource materials to gather information for research topics (e.g., magazines, newspapers, dictionaries, schedules, journals, surveys, globes, atlases, almanacs, websites, databases, podcasts)

##### **Level IV (Grades 9-12)**

2. Uses a variety of print and electronic sources to gather information for research topics (e.g., news sources such as magazines, radio, television, and newspapers; government publications and microfiche; library databases; field studies; speeches; technical documents; periodicals; Internet sources, such as web sites, podcasts, blogs, and electronic bulletin boards)

5. Synthesizes information from multiple research studies to draw conclusions that go beyond those found in any of the individual studies

3. **Paired perspectives poem:** In an effort to accurately reflect the viewpoints of the people involved in the Three Mile Island nuclear disaster and its aftermath, students should **evaluate** the stakeholders' perspectives by creating a paired perspective poem about the nuclear disaster. Each student should receive a copy of Handout #1: Paired Perspective Poem.

In a paired perspective poem, the students should choose one event and write two poems from two different perspectives about that event. The poems should reveal the setting, details of the event, and the response and feelings of the people represented in the poems.



4. **Analysis of Response:** In pairs, students should use the following three sources to **analyze** how the situation at Three Mile Island could have been handled better, and how nuclear safety has improved as a result of the disaster:

- 1.) Smithsonian National Museum of American History website about the Three Mile Island disaster (<http://americanhistory.si.edu/tmi/index.htm>)
- 2.) The *Washington Post* article “Three Mile Island’s Residents Remain on Alert Three Decades After Nuclear Crisis” - [http://www.washingtonpost.com/local/three-mile-islands-residents-remain-on-alert-three-decades-after-nuclear-crisis-2011/03/18/ABbZsZx\\_story.html](http://www.washingtonpost.com/local/three-mile-islands-residents-remain-on-alert-three-decades-after-nuclear-crisis-2011/03/18/ABbZsZx_story.html)
- 3.) The *NY Times* article “From Afar, A Vivid Picture of Japan Crisis” - (<http://www.nytimes.com/2011/04/03/science/03meltdown.html?pagewanted=1>)

Students should record their answers on Handout #2: Analysis of Response.

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<http://www.mcrel.org/>

**Media**

**Standard 10: Understands the characteristics and components of the media**

**Level III (Grades 6-8)**

5. Understands aspects of media production and distribution (e.g., different steps and choices involved in planning and producing various media; various professionals who produce media, such as news writers, photographers, camera operators, film directors, graphic artists, political cartoonists)

6. Understands the ways in which image-makers carefully construct meaning (e.g., idea and word choice by authors, images created by photographers, television programs created by groups of people, photos or outlines chosen in newspapers)

**Level IV (Grades 9-12)**

2. Understands how different media (e.g., documentaries, current affairs programs, web pages) are structured to present a particular subject or point of view

3. Understands aspects of the construction of media messages and products (e.g., the significance of all parts of a visual text, such as how a title might tie in with main characters or themes)

4. Understands production elements that contribute to the effectiveness of a specific medium (e.g., the way black-and-white footage implies documented truth; the way set design suggests aspects of a character’s socio-cultural context; effectiveness of packaging for similar products and their appeal to purchasers)



5. **Public Service Announcement:** In groups of 3-4 people, students will **formulate** a 1-2 minute videotaped public service announcement that *either*

- A) highlights a plan of action that citizens should follow in the case of a nuclear emergency; or
- B) explains why nuclear power should be eliminated in the United States.

**Note to Teachers:** If students choose option A, they may use any of the resources listed in the resources section of this lesson plan, but pages 42-43 in the International Atomic Energy Agency, “Manual for First Responders to a Radiological Emergency” (2006) ([http://www-pub.iaea.org/MTCD/publications/PDF/EPR\\_FirstResponder\\_web.pdf](http://www-pub.iaea.org/MTCD/publications/PDF/EPR_FirstResponder_web.pdf)) is an excellent resource with which they can start.

If students choose option B, they may again use any of the resources listed in the resources section of this lesson plan, but both the EFMR Monitoring Group website (<http://www.efmr.org/index.html>) and the TMI Alert website (<http://www.tmia.com/>) both provide specific reasons why citizens no longer support the use of nuclear power in their respective areas.

**Note to Teachers** For students who have never created a public service announcement before, the Ad Council (<http://www.adcouncil.org/default.aspx?id=15>) has many examples that you may want to review with your students before they embark on their task to create their own announcements.

Students should fill out Handout #3: Public Service Announcement Template.

**Note to Teachers** You may also want to use the script template that is available on *the.News* “For Educators Production Tips and Tools” website (<http://www.pbs.org/newshour/thenews/foreducators/productiontips/the.News%20Script%20Template.pdf>). Students can use this to plan out each part of the public service announcement.





**Assessment:**

Students will be assessed on the final product of their public service announcements. The following rubric should be used:

**Multimedia Project: Public Service Announcement**  
the.News – Three Mile Island

Student Name: \_\_\_\_\_

CATEGORY	4	3	2	1
<b>Presentation</b>	Well-rehearsed with smooth delivery that holds audience attention.	Rehearsed with fairly smooth delivery that holds audience attention most of the time.	Delivery not smooth, but able to maintain interest of the audience most of the time.	Delivery not smooth and audience attention often lost.
<b>Sources</b>	Source information collected for all graphics, facts and quotes. All documented in desired format.	Source information collected for all graphics, facts and quotes. Most documented in desired format.	Source information collected for graphics, facts and quotes, but not documented in desired format.	Very little or no source information was collected.
<b>Permissions</b>	All permissions to use graphics "borrowed" from web pages or scanned from books have been requested, received, printed and saved for future reference.	All permissions to use graphics "borrowed" from web pages or scanned from books have been requested and received.	Most permissions to use graphics "borrowed" from web pages or scanned from books have been requested and received.	Permissions were not requested for several graphics "borrowed" from web pages or scanned from books.
<b>Attractiveness</b>	Makes excellent use of font, color, graphics, effects, etc. to enhance the presentation.	Makes good use of font, color, graphics, effects, etc. to enhance to presentation.	Makes use of font, color, graphics, effects, etc. but occasionally these detract from the presentation content.	Use of font, color, graphics, effects etc. but these often distract from the presentaion content.
<b>Requirements</b>	All requirements are met and exceeded.	All requirements are met.	One requirement was not completely met.	More than one requirement was not completely met.
<b>Content</b>	Covers topic in-depth with details and examples. Subject knowledge is excellent.	Includes essential knowledge about the topic. Subject knowledge appears to be good.	Includes essential information about the topic but there are 1-2 factual errors.	Content is minimal OR there are several factual errors.
<b>Originality</b>	Product shows a large amount of original thought. Ideas are creative and inventive.	Product shows some original thought. Work shows new ideas and insights.	Uses other people's ideas (giving them credit), but there is little evidence of original thinking.	Uses other people's ideas, but does not give them credit.
<b>Pre-write</b>	Pre-write is complete, with exceptional ideas and organization that show planning process.	Pre-write is complete, with ideas that show planning process.	Pre-write is complete, though shows little originality or thoughtful planning.	Pre-write is not complete.



**Extension:**

Advanced students can research other nuclear disasters in the United States and internationally that have caused changes in nuclear power plant safety.

**Partnership for 21st Century Skills**

<http://www.21stcenturyskills.org>

*Think Creatively*

- Use a wide range of idea creation techniques (such as brainstorming)
- Create new and worthwhile ideas (both incremental and radical concepts)
- Elaborate, refine, analyze and evaluate their own ideas in order to improve and maximize creative efforts

*Reason Effectively*

- Use various types of reasoning (inductive, deductive, etc.) as appropriate to the situation

*Use Systems Thinking*

- Analyze how parts of a whole interact with each other to produce overall outcomes in complex systems

*Make Judgments and Decisions*

- Effectively analyze and evaluate evidence, arguments, claims and beliefs
- Analyze and evaluate major alternative points of view
- Synthesize and make connections between information and arguments
- Interpret information and draw conclusions based on the best analysis

**Resources:**

- CNN, “Explainer: How a Boiling Water Reactor Works” (March 14, 2011): <http://www.cnn.com/2011/WORLD/asiapcf/03/12/explainer.nuclear.reactors/index.html>
- Dickinson College, “Three Mile Island Emergency: Government” - <http://www.threemileisland.org/government.html>
- Dickinson College, “Three Mile Island Emergency: How Does A Nuclear Reactor Work?” - <http://www.threemileisland.org/science/howitworks/index.html>
- EFMR Monitoring Group: <http://www.efmr.org/index.html>
- International Atomic Energy Agency, “Fukushima Nuclear Accident Update Log” (updated: April 3, 2011): <http://www.iaea.org/newscenter/news/tsunamiupdate01.html>
- International Atomic Energy Agency, “Manual for First Responders to a Radiological Emergency” (2006): [http://www-pub.iaea.org/MTCD/publications/PDF/EPR\\_FirstResponder\\_web.pdf](http://www-pub.iaea.org/MTCD/publications/PDF/EPR_FirstResponder_web.pdf)
- Nuclear Regulatory Commission, “Backgrounder on the Three Mile Island Accident” - <http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/3mile-isle.html/>



- *NY Times*, “Assessing the Radiation Danger, Near and Far” (April 2, 2011):  
<http://www.nytimes.com/interactive/2011/04/02/world/asia/assessing-the-radiation-danger.html?ref=science>
- *NY Times*, William J. Broad, “From Afar, a Vivid Picture of Japan Crisis” (April 2, 2011):  
<http://www.nytimes.com/2011/04/03/science/03meltdown.html?pagewanted=1>
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**Activity Designer:**

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**Handout #1**  
**Paired Perspectives Poem**

Name: \_\_\_\_\_

**A PAIRED PERSPECTIVES POEM is:**

a poem in which you reveal the inner thoughts (an *interior monologue*) from the point of view of two different people who are experiencing the same event.

In your paired perspectives poem, you will need to:

1. Choose what event you would like to depict. The event should be the title of the poem. You should choose from one of the following events, or select your own with teacher permission:

- 1) The first 48 hours of the nuclear disaster at Three Mile Island
- 2) The year following the nuclear disaster at Three Mile Island
- 3) March 28, 2011: The 32<sup>nd</sup> anniversary of Three Mile Island

2. Choose which people you will use for the perspectives. Choose from the following people, or select your own with teacher permission:

- 1) Mayor Robert Reid, who was the mayor of Middletown, PA during the Three Mile Island crisis and who still holds the title today
- 2) a member of EFMR, TMI Alert, or another nuclear watchdog group
- 3) a citizen who lives in Middletown and who has small children
- 4) a citizen who lives in Middletown and who supports the use of nuclear power
- 5) a citizen who lives in Middletown and who does not support the use of nuclear power
- 6) a legislator for the district
- 7) a power plant operator

3. Write a 20-line poem (10 lines from the perspective of each character) about the event. It should be written in first-person perspective. Some lines may be shared between the two perspectives, but you must clearly capture the voice of the two people. The setting should also be revealed through the people's voices.



Handout #2
Analysis of Response at Three Mile Island

Name: \_\_\_\_\_

In addition to the articles and websites referenced in this exercise, you may also refer to the.News "Anniversary of Three Mile Island" http:www.pbs.org/newshour/thenews/thegov

Article #1: Smithsonian National Museum of American History website about the Three Mile Island disaster (http://americanhistory.si.edu/tmi/index.htm)

Table with 2 columns: 'How did officials and people involved respond in a positive way to the Three Mile Island disaster?' and 'In what ways could the officials and people involved improve upon their reaction during the Three Mile Island disaster?'. Each column contains three checkmarks.

Article #2: The Washington Post article "Three Mile Island's Residents Remain on Alert Three Decades After Nuclear Crisis" - http://www.washingtonpost.com/local/three-mile-islands-residents-remain-on-alert-three-decades-after-nuclear-crisis-/2011/03/18/ABbZsZx\_story.html

Table with 2 columns: 'How did officials and people involved respond in a positive way to the Three Mile Island disaster?' and 'In what ways have the officials and people involved changed their approach to a nuclear disaster, should it happen again?'. Each column contains three checkmarks.



How do Middletown citizens feel about the use of nuclear power on Three Mile Island?

- ✓
- ✓
- ✓

**Article #3:** The *NY Times* article “From Afar, A Vivid Picture of Japan Crisis” - (<http://www.nytimes.com/2011/04/03/science/03meltdown.html?pagewanted=1>)

In what ways has nuclear safety improved since the Three Mile Island disaster?

- ✓
- ✓
- ✓
- ✓
- ✓
- ✓



**Handout #3**  
**Public Service Announcement Template**

**Directions:** In your groups, you will be responsible for creating a 1-2 minute videotaped public service announcement that highlights nuclear safety and what the public should do in the event of a nuclear disaster. Use the following template to plan your announcement. Your planning sheet will be graded as part of the final assessment. **(you may also refer/utilize video from: “Anniversary of Three Mile Island“** <http://www.pbs.org/newshour/thenews/thegov>)

**Title of your PSA:** \_\_\_\_\_

*(It should be something catchy that will make it memorable to viewers.)*

**In one sentence, summarize the main idea you’re hoping to communicate in your PSA:**

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*(What is the purpose of the PSA? How do you want readers to feel about your topic after they have seen the PSA?)*

**Emotion you’re trying to communicate, and why that emotion is appropriate for the topic:**

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*(Remember that you are supposed to convince viewers of the importance of your message. You should convey a certain tone so that the reader feels a certain way after seeing your PSA.)*

**Content you should include in the PSA\*\*:**

\*\*Do not forget to include sources!\*\*

✓ **Facts and statistics:**

✓ **Opinion statements:**



- ✓ **Quotations from experts or people close to the issue:**

*(This should be the most important part of your PSA, as this will help viewers believe you have a logical argument that is based in fact.)*

**Catchphrases or other additional phrases you wish to include:** \_\_\_\_\_

*(This should be something that will make the viewer remember your announcement.)*

**Design and order of public service announcement:**

- ✓ **Pictures?\***

**\*\*Be sure to cite sources within the PSA!\*\***

- ✓ **Order of announcement?**

*(Include stage directions here as well so that actors within the PSA will know what to do at each step of the taping.)*

Part 1:

Part 2:

Part 3:

Part 4:

Part 5:

Part 6:

- ✓ **Music?\***

**\*\*Be sure to cite sources within the PSA!\*\***