

## Daily Lesson Plan

<b>Course Name:</b>	
<b>Unit Title: Radiation and the Human Body</b>	<b>Day: 13 of 15</b>
<p><b>Relevant NC Standard Course of Study Goal(s):</b></p> <ul style="list-style-type: none"> <li>● PSc.3.1.1 Explain thermal energy and its transfer. <ul style="list-style-type: none"> <li>○ Compare thermal energy, heat, and temperature.</li> <li>○ Compare conduction, convection, and radiation as methods of energy transfer.</li> </ul> </li>   <li>● Bio 1.1.3 Recall that chemical signals may be released by one cell to influence the development and activity of another cell.</li> <li>● Biol 2.1.1 The input of radiant energy which is converted to chemical energy allows organisms to carry out life processes. <ul style="list-style-type: none"> <li>○ Within ecosystems energy flows from the radiant energy of the sun through producers and consumers as chemical energy that is ultimately transformed into heat energy.</li> </ul> </li> <li>● Bio.2.2.1 Infer how human activities (ex. pollution) may impact the environment.</li> <li>● Bio.2.2.1 Summarize how humans modify ecosystems through population growth, technology, <b>consumption of resources and production of waste.</b></li> <li>● Bio.3.1.3 Mutations can be random and spontaneous or caused by <b>radiation and/or chemical exposure</b></li>   <li>● EEn.1.1.3 Explain how the sun produces energy which is <b>transferred to the Earth by radiation.</b> <ul style="list-style-type: none"> <li>○ Compare combustion and nuclear reactions (fusion and fission) on a conceptual level. Identify fusion as the process that produces radiant energy of stars.</li> <li>○ Identify the forms of energy (electromagnetic waves) produced by the sun and how some are filtered by the atmosphere (X-rays, cosmic rays, etc.).</li> <li>○ Summarize how energy flows from the sun to the Earth through space</li> </ul> </li> <li>● EEn.2.2.1 Explain the consequences of human activities on the lithosphere past and present. <ul style="list-style-type: none"> <li>○ Explain ways to mitigate detrimental human impacts on the lithosphere and maximize sustainable use of natural resources.</li> </ul> </li> <li>● EEn.2.2.2 Compare the various methods humans use to acquire traditional energy sources (such as peat, coal, oil, natural gas, nuclear fission, and wood). <ul style="list-style-type: none"> <li>○ Compare the methods of obtaining energy resources: harvesting (peat and wood), mining (coal and uranium/plutonium), drilling (oil and natural gas) and the effect of these activities on the environment.</li> </ul> </li> <li>● EEn.2.7.3 Explain how human activities impact the biosphere. <ul style="list-style-type: none"> <li>○ Summarize ways to mitigate human impact on the biosphere.</li> </ul> </li> <li>● EEn.2.8.1 Evaluate alternative energy technologies for use in North Carolina <ul style="list-style-type: none"> <li>○ Critique the benefits, costs and environmental impact of various alternative sources of energy for North Carolina (solar, wind, biofuels, <b>nuclear fusion</b>, fuel cells, wave power, geothermal).</li> </ul> </li> </ul>	

<b>Specific Lesson Objectives</b>
<p><b>Students will understand:</b></p> <ul style="list-style-type: none"> <li>the complexity of the issues surrounding nuclear power plant policies and development.</li> </ul>
<p><b>Students will know:</b></p> <ul style="list-style-type: none"> <li>key terms associated with nuclear power operations and management, vocabulary used to explain radiation and radioactivity</li> </ul>
<p><b>Students will be able to:</b></p> <ul style="list-style-type: none"> <li>use knowledge and skills from radiation unit to defend their assigned role in the town hall meeting and construct a debate speech with their peers.</li> </ul>

<b>Key Vocabulary/Formulae for this Lesson</b>
<ul style="list-style-type: none"> <li>all unit vocabulary</li> </ul>
<b>Materials</b>
<ul style="list-style-type: none"> <li>Specific candy (for secretly splitting students into groups)</li> <li>Town hall meeting handouts</li> </ul>
<b>Technology Needs</b>
<ul style="list-style-type: none"> <li>None</li> </ul>

<b>LESSON ACTIVITIES</b>			
<b>Opening (Hook, Warm-Up, Anticipatory Set, Review, etc.)</b>			
<p><i>Describe activity to elicit active involvement of students or refer to previous learning:</i> Students will break into groups according to teacher's preferences (candy buddies as an option is outlined in handout).</p>			
<b>Procedure: Include all sections that apply to this lesson; combine as necessary.</b>			
<b>Section</b>	<b>Time</b>	<b>What the Teacher will do:</b>	<b>What the Students will do:</b>
<b>Statement of Objective &amp; Purpose</b>	5 min	Teacher will introduce rules and concepts of Town Hall Meeting debate.	Students will listen to instructions and break into assigned groups according to teacher's directions.
<b>Input, Modeling, &amp; Check for Understanding</b>	5 min	Teacher will help explain each role to the group in front of entire class so that students are aware of roles that each group will play, and how they will need to respond to other interest groups in the class for their speech.	Students will listen and may (optional) take notes as teacher explains each role, so that they may be prepared to respond during town hall debate.

<b>Guided Practice</b>	30 min 45 min	<p>Teacher will monitor groups and circulate room to check for understanding and assist with students who need assistance with forming their debate points.</p> <p>Teacher will serve as “mayor” of the town and modulate meeting, keep order among the groups during speech time, and call up the next speakers as students present.</p>	<p>Students will meet with groups and use their notes, the internet (if available) to construct their debate speeches. Each student in the group will plan to speak on at least one concept during their group’s speech.</p> <p>Students will present their speeches to their classmates in a debate-style format.</p>
<b>Closing/ Summary</b>	5 min	<p>Teacher (Mayor) calls Town hall Meeting to order and calls for a Yes/No vote on the creation of nuclear power plant in the town. Teacher announces result of the vote and closes with brief discussion on overall points brought up during town hall debate.</p>	<p>Students vote yes/no on the creation of a new nuclear power plant in their town and participates in brief discussion of overall points raised during debate.</p>
<b>Assessment of Student Learning</b>			
<p><i>How &amp; when will you know that the students have learned this material?</i></p> <p>Teacher will take notes during town hall meeting on what each student presented/said to their peers and take informal evidences of learning from the debate.</p>			