### Environmental Sciences - High School

**Eliciting Student Thinking**

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<th>Author(s)</th>
<th>Avatar(s) &amp; Environment</th>
<th>Suggested Learner Audience</th>
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<td><strong>Simulations for Secondary Science Teachers Conference</strong></td>
<td><strong>Host Avatar(s)</strong></td>
<td>● Pre-Service Teachers</td>
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<tr>
<td>John Clark</td>
<td>Nina/Michael</td>
<td>● Non-credentialed Teachers</td>
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<tr>
<td>Dr. Anita Deck</td>
<td>Simulation Avatars</td>
<td>● Novice Teachers</td>
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<tr>
<td>Dr. Michael Hynes</td>
<td>Ciara, Angela, Jordan, James, Stephanie</td>
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<tr>
<td>Dr. Liz Kolb</td>
<td>Environment [ML3z]</td>
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<tr>
<td>Dr. Demetrice Smith-Mutegi</td>
<td>High School</td>
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<tr>
<td><strong>Mursion</strong></td>
<td>Julie Snyder</td>
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**Avatar(s) & Environment**

- **Host Avatar(s)**: Nina/Michael
- **Simulation Avatars**: Ciara, Angela, Jordan, James, Stephanie
- **Environment [ML3z]**: High School

**Delivery Mode(s) Available for Scheduling**

1:1, Facilitated Group

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This scenario was created in partnership with AACTE and the convening, Enhancing Science Education through Virtual Reality: A Conference to Design Simulations that Enhance the Clinical Preparation of Secondary Science Teachers, is funded by the National Science Foundation (NSF) 20-572 Discovery Research PreK-12, award #2040747.

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**Learner-Facing Vignette:**

You are a teacher in a High School Environmental Sciences classroom focusing today on an assignment related to Nuclear Power. For homework you gave your 11th grade students the following prompt:

*“You have been elected mayor of your city and you have been charged with determining if a nuclear power plant is a viable type of energy. Be prepared to present your conclusion to your citizens and share your justification.”*

You are prepared to spend your lesson digging into your student responses by posing questions that provoke students to share thinking about the content in order to evaluate understanding and surface ideas that will benefit other students. You may also find opportunities to clarify the difference between personal opinion and unbiased fact. To do this effectively, carefully choose your questions and check alternative interpretations of students' ideas and methods.

**Outcome:**

Your goal in this scenario is to elicit thinking from all students.
Strategies/Best practices to consider:

- Pose higher order questions that provoke students to share thinking about content
- Encourage students to consider the sources of their justification for accuracy and bias
- Build on questions to help connect students’ responses

Information about Intensity Level: Low

- Low intensity sessions are meant to build confidence for the learner. This setting is recommended for first time learners.

Supplemental Materials:

This scenario is gearing toward practicing the following of the Next Generation Science Standards 8 Practices of Science & Engineering:

<table>
<thead>
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<th>Engaging in Argument from Evidence</th>
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<td>Argumentation is the process by which explanations and solutions are reached.</td>
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<th>Obtaining, Evaluating, and Communicating Information</th>
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<td>Scientists and engineers must be able to communicate clearly and persuasively the ideas and methods they generate. Critiquing and communicating ideas individually and in groups is a critical professional activity.</td>
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Information for Course Instructor Scenario Selection:

This lesson utilizes the following Next Generation Science Standards listed below:

- **LS2-07.** Students design, evaluate, and refine a solution for reducing the impact of human activity on environmental diversity.
- **PS-1C** Physical science standard-students are made to understand what is the chemical process that’s happening in the power plant.
- **ESS-3C** Human Impacts on Earth Systems
- **AP Standards:**
  - ENG-3 (overarching): Humans use energy from a variety of sources, resulting in positive and negative consequences.
  - ENG-3.G.4: Nuclear power generation is a nonrenewable energy source. Nuclear power is considered a cleaner energy source because it does not produce air pollutants, but it does release thermal pollution and hazardous solid waste

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