Lesson Plan: Giants & Ghosts - Unseen Forces in Science, Art, and Story

Subject: Interdisciplinary (Chemistry, Literature, Art History, Media Studies, Philosophy)
Grade Level: High School (approx. age 15)
Time Allotment: Flexible; designed as a one-week thematic unit with 4 distinct modules.

Materials Needed

- **Texts & Media:**
  - Book: *Silent Spring* by Rachel Carson (at least the first 3 chapters)
  - Short Story: Voltaire's *Micromegas* (available online for free)
  - TV Episode: *Doctor Who*, "Planet of Giants" (Season 2, 1964)
  - Access to the internet for researching the Green Man symbol and medieval architecture.
- **Science Kits:**
  - MEL Chemistry: "Chemistry & Electricity" kit
  - MEL Chemistry: "Corrosion" kit
- **Project & Journaling Supplies:**
  - A dedicated notebook or journal for notes and reflections.
  - Art supplies for the final project (student choice is encouraged). Suggestions:
    - Modeling clay (air-dry or polymer)
    - Craft wire, aluminum foil
    - A piece of steel or iron (like a nail or steel wool) and a piece of copper (wire or a penny)
    - Found objects from nature (leaves, twigs, bark)
    - Small LED light
    - Access to a camera and presentation software (for the multimedia option)

Guiding Question for the Week

How do unseen forces—from microscopic chemicals to ancient ideas—shape our world on a giant scale? We will explore this by connecting stories of scale, the chemistry of transformation, and symbols of nature.

Module 1: A Matter of Scale & Perspective

Objective: To analyze how a change in physical or philosophical perspective reveals hidden truths about the world.

1. **Watch & Discuss:** View the *Doctor Who* episode "Planet of Giants."
   - **Journal Prompt 1:** What dangers, invisible to normal-sized people, become gigantic threats to the shrunken TARDIS crew? How does the story use a simple housefly or a kitchen sink to create suspense?
   - **Discussion:** The "villain" of the story isn't a monster, but a chemical pesticide called DN6. How does the change in the crew's size make them uniquely qualified to understand its true danger?

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2. **Read & Discuss:** Read Voltaire's *Micromegas*.
    - **Journal Prompt 2:** Micromegas is a giant from another star system, and he views humans as tiny, insignificant insects. What is Voltaire trying to say about human ego and our place in the universe?
    - **Discussion:** Compare the perspective of the giants in *Micromegas* to the shrunken humans in "Planet of Giants." How do both stories use the theme of scale to critique human actions and understanding?

Module 2: The Chemistry of Silent Change

Objective: To connect the abstract concept of unseen threats to tangible chemical processes like corrosion and electrochemistry.

1. **Read & Discuss:** Read the first few chapters of *Silent Spring* by Rachel Carson.
    - **Journal Prompt 3:** Rachel Carson writes about a "strange blight" and a "silent spring." What is this unseen force she is describing? How does she make the invisible threat of chemicals feel real and urgent?
    - **Discussion:** Connect this to "Planet of Giants." Rachel Carson is essentially doing for the whole planet what the Doctor did for one garden—revealing the massive danger of a chemical designed for a "small" problem.
2. **Hands-On Lab 1 - Corrosion:** Complete the experiments in the MEL Chemistry "Corrosion" kit.
    - Follow the kit's instructions to explore the process of rusting. Observe how oxygen and water, mostly invisible forces, work to break down solid metal.
    - **Lab Notes:** In your journal, describe the process. Think of rust as a "slow-motion fire." How is the slow, steady, and quiet process of corrosion similar to the environmental damage Carson describes?
3. **Hands-On Lab 2 - Electricity:** Complete the experiments in the MEL Chemistry "Chemistry & Electricity" kit.
    - Build a simple galvanic cell (a battery). Notice how an invisible flow of electrons between two different metals can produce measurable power.
    - **Lab Notes:** This is another "unseen force." How does creating electricity from simple chemical reactions change your understanding of the hidden energy present in the world around us?

Module 3: Enduring Symbols of Interconnection

Objective: To analyze how historical art and architecture symbolize the deep connection between humanity and the natural world.

1. **Research & Reflect:** Use the internet to research the "Green Man" or "Foliage Head" symbol. Find examples in medieval architecture (churches, cathedrals).
    - **Journal Prompt 4:** Sketch your favorite example of a Green Man. What do you think this symbol represents? Why would people carve a face made of leaves into a stone building? Consider ideas of nature, rebirth, and the wildness within civilization.
    - **Discussion:** The Green Man is a bridge between the human world (the carved face) and the natural world (the leaves). How does this symbol visually represent the very connection that Rachel Carson warns we are breaking?

Module 4: Synthesis Project - The Modern Green Man

Objective: To creatively synthesize the themes of scale, unseen forces, and human-nature interaction into a final project that demonstrates understanding and application of the concepts explored all week.

Your Challenge: Create a work of art or a demonstration that answers our guiding question: "How do unseen forces shape our world?" Choose **one** of the following project pathways.

Pathway A: The Corroded Green Man (Sculpture)

Create a sculpture of a Green Man. Incorporate a piece of iron or steel (like a nail or wire mesh) into the design. After sculpting, intentionally apply a corrosive agent (like the salt and vinegar solution often used in home experiments, or knowledge from your kit) to the metal parts.
Your final piece will be a powerful symbol of nature being slowly and silently altered by unseen chemical forces.

Pathway B: The Voltaic Green Man (Living Circuit)

Design and build a Green Man sculpture that incorporates a simple "earth battery" using principles from your electricity kit. Use two different metals (e.g., a copper wire and a galvanized nail) embedded in a lemon, potato, or even damp soil that is part of the sculpture. Use this tiny, nature-based power source to light up a single, small LED light within your artwork.
Your final piece will symbolize the hidden, life-giving energy within nature that we often overlook.

Pathway C: A Micromegas Report (Multimedia Presentation)

Create a short (3-5 minute) video or narrated slideshow from the perspective of Voltaire's giant, Micromegas. He has just visited Earth and is reporting back. He was initially unimpressed by the tiny humans, but then he looked closer (like the Doctor's crew) and saw the "giant ghosts" they have unleashed—the chemicals from *Silent Spring*. Use images of the Green Man as a symbol of the fragile world humans are impacting.
Your final presentation will be a modern-day philosophical tale, using storytelling to explain complex scientific and environmental ideas.

Final Assessment: Creator's Statement

Alongside your finished project, write a 1-2 paragraph "Creator's Statement" in your journal. Explain which project you chose and why. Most importantly, describe how your project connects at least **three** of the core topics from this lesson (e.g., *Silent Spring*, corrosion, the Green Man, *Doctor Who*'s perspective shift, etc.). This statement is where you explicitly demonstrate how you have synthesized the ideas from the week.