STUDENT RESOURCE → ENVIRONMENTAL IMPACT

Suggested Topics

Understanding the Environmental Impact of Fuel and Energy Production

Oil Extraction
- Extracting crude oil to meet global energy demands and produce products like gasoline and diesel.
- Disrupts natural landscapes, causes habitat fragmentation, and generates significant air and water pollution, including oil spills.
- Implement stricter regulations on drilling practices and invest in spill prevention technologies.

Coal Mining
- Extracting coal for electricity generation and industrial use.
- Causes habitat destruction, soil erosion, and water contamination with toxic chemicals. Releases dust and harmful gases.
- Adopt cleaner mining technologies and rehabilitate mined areas.

Natural Gas Extraction
- Extracting natural gas for heating, electricity, and industrial use.
- Involves hydraulic fracturing (fracking), which can lead to groundwater contamination and induced seismic activity. Releases methane, a potent greenhouse gas.
- Improve fracking techniques to minimize environmental impact and capture methane emissions.

Nuclear Energy
- Generating electricity with low greenhouse gas emissions.
- Requires uranium mining, leading to habitat destruction and radioactive contamination. Produces radioactive waste.
- Develop safer waste storage solutions and explore alternative nuclear technologies like thorium reactors.

Hydropower
- Producing renewable electricity from water flow.
- Alters river ecosystems, affecting fish populations and water quality. Can lead to methane emissions from submerged vegetation.
- Implement fish-friendly turbine designs and manage reservoir water levels to reduce methane emissions.

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Suggested Topics, cont.

Solar Energy
- Generating renewable electricity from sunlight.
- Requires large land areas for solar farms, potentially affecting local ecosystems. Manufacturing and disposal of panels can generate waste.
- Use degraded lands for solar farms and improve recycling processes for solar panels.

Wind Energy
- Generating renewable electricity from wind.
- Can affect bird and bat populations through collisions with turbines. Manufacturing and disposal of turbines can generate waste.
- Design bird-friendly turbines and develop better recycling methods for turbine components.

Biofuels
- Producing renewable fuels from biological materials.
- Requires large land areas for crop production, potentially leading to deforestation and habitat loss. Can contribute to air pollution when burned.
- Use waste materials for biofuel production and improve combustion technologies to reduce emissions.

Geothermal Energy
- Generating renewable electricity and heating from the earth's heat.
- Can cause land subsidence and release greenhouse gases from underground reservoirs. Drilling and plant construction can impact local environments.
- Monitor and manage subsidence risks and improve drilling techniques to minimize environmental impact.

Deforestation
- Harvesting timber for construction, paper, and biomass for generating electricity and heat.
- Leads to habitat destruction, threatens wildlife, reduces biodiversity, and increases carbon dioxide levels.
- Implement sustainable logging practices and reforestation programs.

NAME_____ HR_____

DATE_____

Exit Ticket

Outline and Assessment

Writing Prompt: Write a paragraph that explains the impact of energy production on the environment. Your paragraph should include the following:

- **Identify the Activity:** Name the human activity and/or type of energy production.

- **Reason for the Activity:** Explain why this activity is done. What are the benefits or purposes of this activity?

- **Describe the Impact:** Explain how this activity affects the environment.

- **Suggest Solutions:** Propose one or two ways to reduce the negative impacts of this activity.

Use this structure and information to guide your writing. Be sure to include specific details and examples from your research to support your points.

Rubric for Exit Ticket

Criteria	Excellent (3)	Good (2)	Needs Improvement (1)
Content	Thoroughly addresses all parts of the prompt with clear and detailed explanations.	Addresses most parts of the prompt with some detail.	Addresses few parts of the prompt with limited detail.
Organization	Paragraph is well-organized, with a clear and logical flow.	Paragraph is organized, with minor issues in flow or clarity.	Paragraph is poorly organized, with unclear or illogical flow.
Grammar	Free of grammatical, spelling, and punctuation errors.	Contains minor grammatical, spelling, or punctuation errors.	Contains multiple grammatical, spelling, or punctuation errors.
Use of Research	Effectively uses specific details and examples from research to support points.	Uses some details and examples from research to support points.	Provides few or no details and examples from research to support points.
Demonstrates Understanding	Shows a thorough understanding of the topic, with insightful analysis and connections.	Shows a good understanding of the topic, with some analysis and connections.	Shows limited understanding of the topic, with little analysis or connections.