



Environmental/Agricultural Sciences and Engineering (EASE)

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Engineering Process

Investigation

- Evaluate trade-offs in engineering solutions, considering environmental, economic, and ethical implications
- Critique peer or published engineering designs, identifying strengths, weaknesses, and potential improvements

Experimentation

- Design and optimize a prototype using an iterative (requiring constant refining and optimization) design process, collecting and analyzing data to justify design modifications, and present a final solution

Scientific Method

Investigation

- Develop a research question and a complex hypothesis based on a literature review

Experimentation

- Design and conduct a controlled experiment with appropriate controls, identify and analyze sources of error, and draw conclusions based on statistical analysis of the data

Natural Resources (soil, water, air, biodiversity)



Investigation

- Evaluate conservation and remediation strategies (e.g., wetland restoration, carbon sequestration, soil amendments)
- Analyze case studies of resource extraction and propose more sustainable alternatives
- Assess the ecological, economic, and social trade-offs of managing natural resources

Experimentation

- Conduct a life cycle analysis of a product to evaluate its full environmental impact from creation to disposal

Sustainability (Climate, Energy, Human Impacts)

Investigation

- Analyze datasets on carbon emissions, temperature change, or sea-level rise to identify trends and predict future impacts
- Analyze national or global energy policies and propose alternatives grounded in science, economics, and equity

Experimentation

- Collaborate to create a sustainability action plan to improve the sustainability of a specific industry or community by integrating principles of a circular economy

Communication (understanding)

Investigation

- Critically evaluate scientific claims and media reports for bias, validity, and supporting evidence

Experimentation

- Communicate complex scientific and engineering concepts through formal presentations and/or scientific posters, tailoring the message to a specific audience

Food Systems

Investigation

- Analyze and explain how population growth, urbanization, and climate affect food security

Experimentation

- Design a model of a sustainable agricultural system and evaluate its efficiency.

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