



# Environmental/Agricultural Sciences and Engineering (EASE)

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## Engineering Process

### Investigation

- Analyze and define a problem by identifying the needs (criteria) and limitations (constraints) based on economic, environmental, social, and ethical considerations
- Justify design choices with scientific reasoning and evidence

### Experimentation

- Apply the steps of the engineering process to design, build, and test a solution to an identified problem

## Scientific Method

### Investigation

- Define independent variables and dependent variables
- Plan a simple investigation, identifying independent and dependent variables and controlling for fairness
- Form a testable hypothesis based on background knowledge or prior observations
- Analyze and interpret data from experiments to draw conclusions

### Experimentation

- Conduct a controlled experiment, collect quantitative data, and use evidence to support or refute the hypothesis

## Natural Resources (soil, water, air, biodiversity)

### Investigation

- Explain how human activities (e.g., farming, construction, pollution) impact the availability and quality of soil, air, and water
- Describe the cycle of matter (like carbon, nitrogen, and water) and how resource availability affects those cycles

- Evaluate the environmental consequences of using nonrenewable natural resources.

#### Experimentation

- Investigate and propose ways to conserve natural resources, such as by recycling, reusing, or reducing waste.

## **Sustainability (Climate, Energy, Human Impacts)**

#### Investigation

- Compare advantages and disadvantages of different energy sources (solar, wind, fossil fuels, nuclear) based on environmental and economic factors
- Analyze how urbanization and agriculture impact ecosystems and water/air quality

#### Experimentation

- Develop and defend a sustainability plan for school or home that addresses issues like energy use, waste reduction, climate adaptation, and/or ecosystem resilience.

## **Communication (understanding)**

#### Investigation

- Create visuals like diagrams, tables, graphs, charts, models, and labeled sketches to clearly explain ideas and findings

#### Experimentation

- Defend conclusions and effectively communicate it to an audience using quantitative data and evidence-based reasoning

## **Food Systems**

#### Investigation

- Describe how soil, water, and climate affect food production
- Identify inputs (like fertilizer, water, labor) and outputs (like crops, waste) within a simple food system

#### Experimentation

- Evaluate ways to reduce food waste and improve sustainability within my community or school

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