Engineering a Better Seed Bank

*Standard(s)***:**

9.1.2.2.1. Identify a problem and the constraints on possible design solutions.

9.1.2.2.2. Develop possible solutions to an engineering problem and evaluate them using conceptual, physical and mathematical models to determine the extent to which the solutions meet the design specifications.

Objectives:

The student will:
a. Compare and contrast two different seed banks.
b. Summarize the properties of each design as being positive, neutral, or negative.
c. Propose a possible design solution to a negative property of the design.

Type of Activity:

Research / Information Organization / Critical Thinking

Duration:

50 min. plus additional homework time

Timing in relation to Nobel Conference:

__x__ pre-conference activity
_____ during conference activity
__x__ post-conference activity

Connection to Nobel Conference:
Cary Fowler

Teacher Tips:

Recommended Prior Student Knowledge:

The knowledge that seed banks exist in the world.

Concepts, Connections, and Terms:

- Engineering
- Systems
- Technology

Materials:

- Internet Access - possible web searches relating to:
  "World Seed Bank"
  "Millennium Seed Bank"
  "Svalbard Seed Bank"

Description of Activity: The student will compare and contrast two different seed banks and summarize the properties of each design as being positive, neutral, or negative. A potential solution will be proposed by the student to combat a negative design property.

Procedure:

1. Research either the structural or operational designs of two different Seed Banks.
2. Compare and contrast your research using a Venn Diagram.
3. Construct a data table that summarizes several properties of the design as positive, neutral or negative. You should list at least two in each section.
4. Propose a solution to eliminate one of the negative properties of the design.

Assessment:

Venn Diagram
Data Table
Proposal

Extensions:

1. Construct a mathmatical **model** of engery usage in one of the seed banks. Using your model, demonstrate how alternative energy technology could decrease the energy usage by the seed bank. (cost analysis)

2. Prepare a short report explaining humidity control as it relates to seed storage.