

Example Project A

Life on the Farm...Designing a Model Farm

The Project

Life on the Farm...Designing a Model Farm is a three-week project designed by Suzanne Dwyer for her 8th Grade Earth Science class at the New York City Lab School for Collaborative Studies. Included here are the project introduction and supporting rubrics. Other support materials from the original project are not included here.

Suggestions for Reading

For the purpose of informing their jigsaw colleagues about the design of this project, workshop participants are encouraged to focus on the details on the introductory page and more generally on the rubrics that follow.

The School

The Lab School is an urban, 6-12 grade public secondary school of 740 students with screened admissions and a special education inclusion program. It has a graduation rate near 100%, 12% free lunch, and a student population of 50% White, 13% Black, 11% Hispanic and 26% Asian. Co-directors Sheila Breslaw and Robert Menken founded the school based on their success in creating a program for low-performing, educationally short-changed students in another high school. The mission of the Lab School focuses on collaborative problem solving among students and staff alike. The co-directors foster the same instructional methods in the Lab School that they developed in their program for challenged students.

Life on the Farm—Designing a Model Farm
Earth Science: Mrs. Dwyer

Having spent several weeks learning about soil structure and productivity you will now have the opportunity to apply what you know in order to help feed the world. You and your group will be creating (on paper) a model of a functioning farm. Each of you will have an expert role and be responsible for researching a particular aspect of farming. You will work as a farm production group (this is a technical name, though you can choose to name your own farm) with four others. Important to the success of your farm is being able to recognize yourselves as skilled members of a team, a larger agricultural community, a society who all depend on your vision of the “bigger picture.”

Ask yourself regularly: how are living things connected? Recognize cycles between nature and life. Are there certain things that you can do on your farm that can be viewed as supporting nature and her processes, or might they be exploitative? Will “profiting” from your farm monetarily now prove to be beneficial to you and your family in the long term? Who are you ultimately responsible to: the land? yourself? Make a dream farm, but support your ideas with real life questions and “nitty gritty” logistics.

Content

The following paragraphs describe the “expert groups.” Each of you will have questions specific to your area of expertise that you will address through your research. Additional ideas will be ones that you yourself (with my guidance) will develop naturally as you explore your topics. There are, however, a few required topics that you as an expert (and a member of a farm production group) cannot ignore and these are indicated below. A more detailed rubric of criteria will be provided.

Physical Geographer

Know your region including: country’s climate, natural disasters to which your land might be vulnerable, terrain (topography), elevation, what is traditionally grown in this area and why, and soil type. In addition you will be responsible for creating a calendar for the farm, which includes when to plant, harvest, etc.

Crop Specialist

You will manage the logistics of the farm: what will be grown on the farm, how much will be grown. Will you grow only one crop or several? What is crop rotation and is it appropriate to your farm? What kinds of seeds will be used? Biogenetically engineered seeds? What is the growing cycle of these plants? What nutrients are needed for the crops to thrive? What are the pests, fungi, etc., that could threaten your crop?

Horticulturalist

Determine the philosophy of the farm. Will you grow organically or conventionally? What does this really mean technically and legally? (There are scientific regulations applied to both forms of agriculture.) Depending on the country of your farm, there may be regulations that may vary from U.S. regulations on chemicals used in farming...find out about this. What herbicides and fertilizers will be used (be specific)?

Hydrologist

You will need to determine how to irrigate the farm. You will need to create a water budget for your farm as well as make a map of where your farm exists within the watershed system. You will be in charge of the designing and documenting (blueprint/map) of the farm but all must contribute to it. What buildings will be necessary and how will they be designed for efficiency?

Business Manager

You will be responsible for learning about how to keep the farm "afloat." What is the current price of your crop(s)? What tools and/or animal labor will be used for planting and harvesting, milking cows, etc.? What does all this cost? Will you need loans? You must determine the size (acres or hectares) of the farm that you will be able to keep. Where will your workers come from? Are they immigrants? Are there problems trying to hire only seasonally employable help? Are there any farmer or farm workers unions and organizations that can provide you with support if you need it? You will plan a calendar along with the Physical Geographer.

Rubric for Business Manager			
Crop Market Knowledge Includes:			
MINIMUM EFFORT	PASSING	STRONG PERFORMANCE	EXCELLENT PERFORMANCE
Labor Indicates: immigrant vs. indigenous workers; seasonal vs. full-time help	Indicates: immigrant vs. indigenous workers; seasonal vs. full-time help; gives rationale for one or other	Passing PLUS specific recommendations for one type of labor over another	Enhanced understanding of the idea of productivity and responsibility in planning how to manage labor and costs; researches unions
Equipment and Supplies Indicates: own vs. lease/rent; high tech vs. traditional; machinery vs. human power	Gives rationale for: own vs. lease/rent; high tech vs. traditional; machinery vs. human power	Passing PLUS specific recommendations for your farm as to the superiority of one mode of operation vs. another	
Budget Issues Indicates: crop costs vs. selling price; crop insurance vs. none; loans vs. capital funding	Gives rationale for: crop costs vs. selling price; crop insurance vs. none; loans vs. capital funding	Passing PLUS names of specific programs offering insurance and funding	Does some research into different lending programs
Operations and Distribution Lists: seasonal vs. regular hours; export vs. local distribution; methods of distribution	Gives rationale for: seasonal vs. regular hours; export vs. local distribution; methods of distribution	Passing PLUS specific methods and reasons for operations	
National and Regional Economic Climate Gives less than <i>passing</i> requirements	Indicates: government regulations; govt. subsidies vs. loans; % GNP for your crop; type of economy	Gives specifics beyond but related to passing category	Contacts an expert or gives financial analysis of (agrarian) economy of country
Bibliography Contains fewer than two resources	Contains two resources, and includes most important information; one citation included	Contains no fewer than three resources and includes most important information; two citations included	Contains no fewer than four resources; three citations included

Rubric for Horticulturalist			
Agricultural Knowledge Includes:			
MINIMUM EFFORT	PASSING	STRONG PERFORMANCE	EXCELLENT PERFORMANCE
<p>Philosophy Defines simple philosophy of conventional or organic methods</p>	Compares and contrasts conventional vs. organic, giving two pros and two cons for each method	Makes a convincing argument as to the superiority of one method of farming over another and gives a minimum of three pros and three cons	Enhanced understanding of the idea of productivity and responsibility in defining philosophy
<p>Fertilizers In line with soil profile, names a fertilizer</p>	In line with soil profile, gives two types of fertilizer and tells why used	In line with soil profile, gives two types of fertilizers and explains complexity in applications due to differing soil conditions	Discovers some alternatives to standard techniques and documents their specific application to your farm conditions
<p>Pesticides/ Herbicides Lists pesticides and herbicides</p>	Lists a minimum of two pesticides and herbicides and documents that they are effective for your problem	Gives passing requirements and argues for the biological/technological advantage of using one type over another	Does some research into the pros and cons of experimental biological/ technological methods
<p>Plant Diversity Tells one way how plant diversity vs. monocultural farming effects the natural soil</p>	Elaborates on the choice of plant diversity vs. monocultural farming, giving one pro and one con	Provides passing information and discusses plant diversity pros and cons using examples of other biomes	Gives well-researched examples of areas of biological diversity (citing long-term research that has been done), and explains how this bears on your farm
<p>Bibliography Contains fewer than two resources</p>	Contains two resources and includes most important information	Contains no fewer than three resources and includes most important information	Contains no fewer than four resources

Rubric for Physical Geographer			
Regional Knowledge Includes:			
MINIMUM EFFORT	PASSING	STRONG PERFORMANCE	EXCELLENT PERFORMANCE
Country Includes: population; industrialized or developing? minerals mined; natural resources, (i.e., oil?)	Includes minimum and mentions shortage or abundance of resources	Includes minimum and a discussion of shortage or abundance of resources	Any unusual stresses on government (i.e., war)? Is environmental quality a priority for this area of the world? Why or why not? Unusual info that can be related to productivity (i.e., birthrate, conversion)
Climate Has graphs but they are inaccurate and lack conversions	Has strong performance but graphs are inaccurate	Includes graphs: 12-month precipitation w/ annual average; 12-month temperature w/annual average; must include metric conversion scale	Includes extra graphs with information on micro regions
Natural Disasters (can be a result of human ignorance or poor planning) lists main disasters that effect land erosion	Lists main disasters and explains briefly their effect on land erosion	Meets passing PLUS lists pros and cons of effects on the land	Includes prevention(s) taken to alter effect on land
Terrain Lists basic land forms and water features in and on land	Discusses specific land forms of the region and identifies some that will assist your farm	Includes general and specific land features and explains the advantages and disadvantages of these features for growing; water is included	
Crops Traditionally Grown Identifies less than four crops	Identifies four to six crops	Identifies more than four crops and describes what in particular about the region allows them to thrive there	Identifies the crops' origins. Were they brought from other lands? Are there cultural choices for growing crops?
Soil Profile Includes soil profile	Includes soil profile and weak prescriptions for improving soil fertility	Includes soil profile and prescriptions for improving soil fertility	Explains land use in the region. Is it used for crops only or has it several purposes in one area?
Bibliography Contains fewer than two resources	Contains two resources, and includes most important information	Contains no fewer than three resources and includes most important information	Contains no fewer than four resources

Rubric for Crop Specialist			
Agricultural Knowledge Includes:			
MINIMUM EFFORT	PASSING	STRONG PERFORMANCE	EXCELLENT PERFORMANCE
Crops Chooses a crop best suited to environment and explains one reason why it's suitable	Includes minimum and adds another crop with explanation of suitability	Makes effective use of five natural resources in choosing three or more crops to grow; explains why they are productive to grow	Enhanced understanding of the idea of productivity in planning what and how to grow your crops
Acreage Indicates size of the farm	Indicates dimensions for fields and two reasons why the size is accurate	Indicates dimensions for each field and shows knowledge of why these sizes result in a productive farm	Researches specific statistics about the area
Seeds Indicates source/economy where seeds are derived from	Indicates minimum and makes a decision that shows why one seed is chosen over another	Gives basics and indicates the biological technological advantage to using one seed type over another	Does some research into pros and cons of experimental seed technology
Nutrients Lists two nutrients needed for your specific crops and two nutrients that are missing from your land	Gives minimum, describes what fertilizers you will add, and briefly explains why	Gives basics and explains what can be done to improve structure of soil, including fertilizer and more	Gives creative solutions to deficits in soil (i.e., intercropping)
Threats to Crops Gives one predator and one other threat to each crop	Gives two predators and two other threats to each crop	Gives two predators and two other threats and proposes at least two solutions in combating the problem (must be compatible with your farm philosophy)	Contacts an expert such as Agricultural Extension Service in U.S. area and gets their suggestions
Bibliography Contains fewer than two resources	Contains two resources and includes most important information	Contains no fewer than three resources and includes most important information	Contains no fewer than four resources; contains quotes

Rubric for Hydrologist			
Agricultural Knowledge Includes:			
MINIMUM EFFORT	PASSING	STRONG PERFORMANCE	EXCELLENT PERFORMANCE
Watershed Creates an inaccurately detailed map of the regional watershed	Creates an accurate map of the regional watershed	Creates a well-detailed and accurate map of the regional watershed	Enhanced detail and accuracy included on the map
Farm Location Places farm in watershed with no or inaccurate reason	Explains scientifically but briefly why the farm is established in a point within a watershed system	Explains in depth, in scientifically accurate terms, the best location for the farm	Researches specific statistics about the area
Water Budget Creates a chart for yearly water usage but it is incomplete or inaccurate	Creates an accurate chart for yearly usage	Creates a chart for water usage and discusses water conservation issues	Consults with a specialist and gives a detailed plan for conservation
Irrigation Lists one technological method for irrigating crops	Explains what technology will be used for irrigation system	Explains in depth the technology that will be used for irrigation	Researches alternative forms of technology for irrigation that are applicable to your climate
Bibliography Contains fewer than two resources	Contains two resources, and includes most important information	Contains no fewer than three resources and includes most important information	Contains no fewer than four resources; contains quotes

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