Boom. Bust. Build.

Intro

As we have come to see through the course of our class, Environmental Science is primarily concerned with environmental problems that are the result of human activities. If you think back to the beginning of class, we learned that most environmental issues have their roots in the Industrial Revolution. Beginning with the Ford Motor Company in the early 1900s, America set itself apart as the world leader in manufacturing. Fortunes and cities were built around the assembly lines, the products they produced, and the jobs they created. Beginning in the 1980s, however, America’s industrial prowess began to decline. Factories shut down, jobs were lost, and towns emptied. Many of the structures created as monuments to American industry remained, but as heaps of their former glory. The crash of American manufacturing had profound environmental, social, and economic consequences.

You have been given control of one America’s former manufacturing centers. All that remains of the town is the abandoned industrial/warehouse/shipping district, a nearly empty downtown, and mile after mile of abandoned housing. The only inhabitants are the homeless who have taken up residence in the abandoned buildings and struggling families living in low-income housing.

Overview

* Write the environmental history of your city.
* Create a cleanup and revitalization plan for your city.
* Present your comprehensive renewal plan.

Stages

**Stage 1: Industrial and Environmental History of the City – Provide 1 Week to Complete**

**HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.**

**CT: Understanding the relationships within a system**

This paper will serve as the foundation for the remainder of your project. Please make sure that you take care to fully address each of the required elements. Deficiencies in this Stage will haunt you for the remainder of the project.

Write a narrative history for the rise and fall of your city. (2-4 pgs.) Your paper must include:

* A description of an industry and how that industry led to the growth of your town.
  + You must choose an industry that is heavily reliant on a natural resource.
* A discussion of the causes of the decline of the industry.
  + The decline of your industry must, in part, be based on changes in the availability of a key natural resource.
* A connection between the demise of the industry and the decline of the city.
  + This section must describe how changes in resource availability influenced human activity.
* A description of the environmental damage left by the industry.
  + Air pollution doesn’t count.
* An electronically-generated concept map (mindomo.com or bubbl.us) that uses the relationships between resources, industry, and citizens to depict the demise of your town. (Does not count against the total page count)
  + Your system must be represented in the form of either a negative or positive feedback loop.

**Stage 2: Environmental Restoration Plan - Due 1-2 Weeks After the History Submission**

**HS-ESS3-4. Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.\***

**CT: Assessing different approaches/solutions to a problem**

Create an environmental restoration plan (10 slide Keynote/Prezi/eMaze).

Write this presentation as if you were giving it to a panel of investors interested in helping your city.

Your Presentation must include:

* A specific description of the environmental damage left by your industry.
* Detailed plan to remediate the remaining damage.
  + Your detailed plan must include a pro-con comparison of three existing technologies that could be used to address the damage.
  + An evidence-based rationale for your choice of remediation technology.
* An overview of existing legislation related to the environmental damage.
  + Must include a breakdown of the relative benefits and drawbacks of two pieces of legislation related to your environmental damage.
* Three, specific new policies that could be implemented to prevent future damage.

**Stage 3: City Energy Plan - Due 2 Weeks After the Environmental Restoration Plan**

**HS-ESS3-2. Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.**

**CT: Assessing different approaches/solutions to a problem**

Your energy plan must be presented as an infographic (piktochart.com) and include the following:

* Description of energy sources traditionally used in your town.
* Pro-con evaluation of three different strategies for alternative energy generation in your town.
  + The competing alternative energy sources should be appropriate for the climate and topography of your town.
* Strategy for transition to renewable sources.
  + Your transition should include multiple stages that reflect a smooth transition to a sustainable energy plan.
* Your final plan must include 3 energy sources, 2 of which must be sustainable, and you must provide an evidence-based rationale for your final selection.
* Must explain the concept of a smart grid and smart appliances and how your town will benefit from a transition to a smart grid.

**Stage 4: Sustainable Home Design - Due 2 Weeks after the Energy Plan**

**HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.\***

**CT: 1. Creating Data 2. Analyzing data 3. Using computational models to find and test solutions**

Your home must be designed in and analyzed through <http://energy.concord.org/energy3d/>:

Your submission must include the following:

* A home modeled and landscaped using Energy3D.
* A floorplan for your house.
* A solar radiation analysis and an explanation of how the analysis informed your design decisions.
* Three energy performance analysis graphs:
  + One analysis after you finish constructing your house.
  + One analysis after a first round of revisions.
  + A final analysis after you have finished revisions.
* A description of each of the features you added to your house to reduce its energy consumption.
* You must print out the pieces of your house and construct a model of it.

**Stage 5: City Plan - Due the Week Before the Final Presentation**

**HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.**

**CT: Creating computational abstractions**

Design a detailed City Plan (Scale drawing on full-size, gridded poster board) for the downtown portion of your city.

Requirements

1. Your drawing must be appropriately scaled, and the area to be developed is 400 Acres (40 Squares X 40 Squares: 1 square = 0.25 Acres).
2. Your plan must incorporate three features that reduce the impact of human activity on the environment, and you must include a document that explains how those features reduce human impact.
3. Your plan must include at least 7 features of New Urbanism (<http://www.newurbanism.org/newurbanism/principles.html)>. Please indicate each feature on your city plan.
4. Your plan must include all the necessary, neighborhood amenities (see below).

A Few Tips

1. Do your drafts on graph paper before moving to the large poster.
2. Your roads may be 1 square wide. At this scale that would include 2 lanes for traffic, bicycle lanes, and sidewalks.
3. Choose 1 or 2 areas of focus (large park, performing arts complex, college, etc.) and build our from there.
4. Plan for public transportation.
5. Make sure your city is logically planned such that a person moving through the city would understand what to expect from one block to the next.
6. This is the downtown portion of your city. It should not contain water treatment plants, landfills, farmland, etc.
7. Rather than drawing and labeling each individual store and building, you may define the borders of a block of buildings and describe the various uses of the building (exp. “First Floor: Restaurants. Second Floor: Offices. Third-Fifth Floors: Mixed-Income Residences”).

Some points of reference

* High rise building = 2 acres
* Stadium = 16 acres
* Mall = 16 acres
* Large house with big yard = 1 acre
* 24 townhouses per acre
* Apartment complex = 10 acres

Neighborhood Amenities

* Multiple Types of Housing
* More than 1 grocery option
* Medical Services
* Facilities for Religious Gatherings
* Multiple Schools
* Entertainment Opportunities
* Employment (Multiple options)
* Transportation

**Stage 6: Final Presentation**

Your final presentation is your opportunity to tell the story of your city and your team’s plans for its restoration. Plan to give your presentation as if you were talking to a group who you were trying to convince to invest in your revitalization plan.

Presentation Requirements

1. 15-20 minutes in length
2. Incorporate each of the products your created for this project
3. Your plan for attracting a diverse community to your city
4. Description of the industry that will draw people back to your city