

Ecosystem Development Project

You are going to work in a group to develop a large parcel of land. The development project will incorporate real world economic, social and environmental issues. The loan for your team to build this project has already been approved. I am the foreman (well woman). I am both the advisor and judge of who will win the development project. The project will include a minimum of 3 posters for the class presentation. A written report will be produced to detail the proposal.

Groups:

Each member of the groups is expected to complete his or her fair share of the project. All group members are expected to compromise, collaborate and share information and ideas. All students must be present at the end of the project. The project is broken into sections, however if a member does not complete his or her part the remainder of the group must pick up the slack. These students will earn extra credit and the underperforming student will be docked points.

Background info:

In your city, there will be a vote at the next city council meeting on the proposed sale of a large parcel of land that has a creek (or canal), wetlands and a farm. Your project must first go through the planning commission (requirements below) and then to the city council (presentation)

Each group represents a development company (you may name your company too) with different ideas on how to best develop the land. All bidding interests will be required to present an environmental impact assessment, a blueprint of land development, and a statement of the social and economic benefit for the community. Additionally, each project bidder must establish an ecosystem management plan to improve and maintain the land not developed in the project. The city council will determine which bidding party will develop the land based on interest of the community.

Your city is interested in a monetary gain that would be realized with the development of the property. Pollution from external sources is a concern for the city residents and some open space is desired regardless of which plan is accepted.

Your projects can include:

- Power plant – a power plant large enough to provide 50% of the electricity for the surrounding area
- Amusement park – a family oriented park
- Residential district – a mix density residential community
- Zoo – a large zoo
- Mall – a cooperation of locally owned stores in one location (no big box stores)
- Amphitheater – a large outdoor arena for music concerts
- Office Park – a large office park for multinational companies
- Oil Refinery – a fossil fuel refining factory focusing on high quality fuels for cars
- Farm – a locally owned agricultural company
- University – the state university wants to open a campus extension here
- Factory – a large factory where something is manufactured
- Sports Stadium – Build a large sports field for sport or sports of your choice
- Park/open Space – used for both wildlife and recreational activities

Order of progression:

1st Biologist (with emphasis of Zoology and Botany) – Research animals and plants for the environmental survey and your type of development that will be created; example if you are going to build an amusement park, research six flags to get an idea of what you are going to need to build.

2nd Geographer – Discuss and draw a rough copy of the blueprint to generate ideas of everything you are going to build. Make estimates of proportions of what you are going to build in relation to the entire plot of land. Create a data table for the environmental survey

3rd all members – put it all together

4th present

Written report:

The written report will include four sections. Each section is assigned to a particular person's role.

Geographer: *Environmental Survey: Before you develop the land*

The object of this survey is to show the people that you have carefully examined what currently exists at and around the development site. The items that are part of your survey are:

- 1) Make a data table of plants, mammals, birds, insects and endangered species present in this type of ecosystem. Columns include the common name, species name, habitat, food source, and autotroph/heterotroph. Provide 20 different species total (5 must be endangered species)
- 2) Explain about the climate of the area
- 3) How does the fertilizer from the farm affect the creek/canal's water quality? How do the wetlands affect the creek/canal's water quality?

Biologist: *Ecosystem Management Plan – Open space on your land after you develop*

Part of the parcel needs to be maintained as open space to help the environment. Your team gets to decide how much land to set aside from development. You also need to create a management plan for the open space. The management plan should incorporate:

- 1) Pest control – Are you going to use pesticides, herbicides, fungicides or bat houses for insect control
- 2) Native or non native plants – Which will you plant? Are you going to try to control non-native plants?
- 3) Animal management – Is the land large enough for big animals? Will you allow hunting to control population size?
- 4) Water usage – Are you going to irrigate the trees and lawn, drill for wells or put the creek into a pipe and cover it? Or are you going to come up with another plan?
- 5) Recreational use – Are you going to have hiking trails, a sports park or parking?

Environmentalist: *Environmental Impact Assessment – After you develop the land*

The local people will be very interested in what effect your planned development will have on their environment and quality of life. A careful, scientific presentation of the facts will help to make the best decision. Although you are doing research and presenting the impact of your fictional development, you must use real facts. The preparation of this Environmental Impact Assessment goes hand in hand with the drawing of the blueprint for your planned development. Include the following items:

- 1) A list of the main things you will be building on the parcel

- 2) How will the development affect the traffic on neighboring highways, freeways and roads?
- 3) List the types of garbage and waste materials produced by your development and explain how you will dispose of them. (How will you reduce, reuse and recycle?)
- 4) How will your development affect the surrounding ecosystems, the creek/canal, and the quality of air and water in the city?
- 5) How much electricity, heating, cooling, and water will your development need and how are you going to supply this demand?
- 6) Explain how your development will affect city services like police, fire, schools, sewage and health care. What are you going to do to lessen impact?
- 7) Make up a birth rate, death rate and current size of one animal population in your ecosystem before you develop.
- 8) A review of the impact of this development on your endangered or threatened species. Use one species as an example.

Economist: *Economic and Social Benefits – Benefits the community receives after you develop.*

The main reason why we develop is to provide either an economic or social benefit to society. In what way will your development provide a benefit? Listed below are some possible benefits:

- 1) Make estimates on each economic benefit and explain how you arrived at that amount. Economic benefits would be things that will bring:
 - a. Jobs – What kind of jobs will you have?
 - b. Increased land value – Does this attract people to move here or leave? Explain
 - c. Lower impact on city resources (water, sewage and energy)
- 2) Social Benefits would include things like:
 - a. Entertainment and relaxation
 - b. Education
 - c. Health care
 - d. Provide shelter, day care, clothing or food for families

Presentation Posters:

There are 3 required posters: the posters must be large so that the students in the back of the room can see and read it during the presentation. You can create additional posters outlining your impact assessment and management plan.

- **Geographer:** The blueprint is a drawing of the entire site and the surrounding area. It should show the location of all buildings, parking lots, roads, landscaping and preserved open space. Make sure to consider, especially with homes, what is next to your plot of land and plan accordingly. The blueprint should be drawn to scale using a ruler/meter stick.
- **Biologist:** Create a food web of the plants, animals, insects and decomposers of the local ecosystem. Draw an energy pyramid with labels that show how 90% of energy is lost as heat at each level.
- **Environmentalist:** Draw diagrams to show how your development will affect the Carbon Cycle (CO₂), water cycle (water usage and water pollution) and Nitrogen Cycle (air or water pollution). All three cycles need to include arrows with labels going into your development and arrows with labels coming out of the development.

