

DESIGNING YOUR OWN ECOSYSTEM

In this project you will be creating a unique ecosystem that shows the biotic factors and abiotic factors that interact to form the ecosystem. You will show the feeding relationships between organisms in the ecosystem by making a food web. In addition, you will also specifically describe an organism at each trophic level that lives in your ecosystem. You will have some class time to work on the project, but you will need to use some out of class time also. This counts as an exam grade. **Project is due: May 3**
(EC will be given for projects turned in by 4/30)

ECOSYSTEM REQUIREMENTS:

- **Location** – where is it located? (Which ecosystem is it located in? Is it near cold or warm waters? Is it on the coast or found inland?)
- **Living Community** – create your ecosystem. You must have (1) endangered organism, (1) climate change species, (1) invasive species (this is the one you created after the webquest), (5) flora found your ecosystems natural habitat and (4) additional fauna from the region.
- **Trophic Levels: Must have organisms from each of the following trophic levels** (give population size of each level – create your own population size): please don't forget your information about the energy pyramid
 - Producers
 - Primary Consumers
 - Secondary & Higher Consumers
 - Decomposers
- **Abiotic Factors** – (non-living factors that add value to the ecosystem, go back to your notes if you don't remember all 7 factors)
 - describe **climate for your biome** (temperature, precipitation, seasons, amount of sunlight, etc)
 - **what type of geology formed your biome** (Mountain chain, valley, seafloor spreading, volcanic actions, plate movements)
 - **surface conditions** (tidal pools, vegetation, weather, atmospheric interaction with the ocean, properties of water in your ecosystem, soil texture, atmosphere, etc)
- **Waves & Tides:** (How is your ecosystem affected by tides or waves?)
- **Buildings/Areas of land:** choose 2 to add to your ecosystem –
 - 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
- **Pollution in the ecosystem:** choose 1 -2 ways that your ecosystem will handle pollution. Draw them! What system is in place for your ecosystem...landfill, recycle center, composting in the neighborhood, etc.

Written report:

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

Geographer: Locate the ecosystem

- 1) **Location** – where is it located? (Which ecosystem is it located in? Is it near cold or warm waters? Is it on the coast or found inland?)
- 2) Make a data table of plants, mammals, birds, insects and endangered species present in this type of ecosystem. (you will work heavily with the Biologist)
- 3) **Abiotic Factors** – (non-living factors that add value to the ecosystem, go back to your notes if you don't remember all 7 factors)
 - a) describe **climate for your biome** (temperature, precipitation, seasons, amount of sunlight, etc)
 - b) **what type of geology formed your biome** (Mountain chain, valley, seafloor spreading, volcanic actions, plate movements)
 - c) **surface conditions** (tidal pools, vegetation, weather, atmospheric interaction with the ocean, properties of water in your ecosystem, soil texture, atmosphere, etc)
- 4) How do the buildings affect the water quality in your ecosystem?
- 5) How do the buildings affect overall health of the ecosystem?

Biologist: You will need to do the research for your ecosystem.

- 1) You need to include:
 - a) (1) endangered organism
 - b) (1) climate change species
 - c) (1) invasive species (this is the one your created after the webquest)
 - d) (5) flora found your ecosystems natural habitat
 - e) (4) additional fauna from the region.
- 2) How does your invasive species affect the other organisms in your ecosystem?
- 3) Create the trophic level pyramid and add all flora and fauna that your **Artist** will need to draw into the ecosystem.

Environmentalist: Environmental Impact Assessment

The preparation of the Environmental Impact Assessment goes hand in hand with the actual drawing of the ecosystem. You will need the following items:

- a. How does development of the buildings/areas in your ecosystem affect pollution or development in the ecosystem?
- b. What are the types of garbage and waste materials produced by your buildings in your ecosystem?
 - i. How will these be disposed of?
 - ii. Is there a recycling program in effect? Where is that located?
- c. How does the development of these man made buildings/areas affect other nearby ecosystems?
- d. How does this development affect air and water quality in your ecosystem?
- e. How do these buildings/areas affect your endangered/threatened species?

Artist: Draw the ecosystem and include all parts.

Your ecosystem must be drawn on poster paper. As your role you must include:

- **Living Community** – create your ecosystem. You must have (1) endangered organism, (1) climate change species, (1) invasive species (this is the one your created after the webquest), (5) flora found your ecosystems natural habitat and (4) additional fauna from the region.

- **Trophic Levels: Must have organisms from each of the following trophic levels** (give population size of each level – create your own population size): please don't forget your information about the energy pyramid (drawn on the back of the actual habitat)
 - Producers
 - Primary Consumers
 - Secondary & Higher Consumers
 - Decomposers
- **Buildings/Areas of land:** choose 2 to add to your ecosystem –
 - 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
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 - Sports Stadium – Build a large sports field for sport or sports of your choice
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- **Pollution in the ecosystem:** choose 1 -2 ways that your ecosystem will handle pollution. Draw them! What system is in place for your ecosystem...landfill, recycle center, composting in the neighborhood, etc.
- **FOOD WEB REQUIREMENTS**
 - Somewhere on your poster or model (on the back):
 - Create a food web for your community of organisms that shows the interactions between the producers, primary consumers, secondary & higher consumers, and decomposers.

Grading Rubric for Designing an Ecosystem

ECOSYSTEM

▪ Poster	50 pts	_____
▪ Location	5 pts	_____
▪ Community		
○ All trophic levels	10 pts	_____
○ Endangered Species (1)	5 pts	_____
○ Climate Change Species	5 pts	_____
○ Invasive Species	5 pts	_____
○ Flora (5)	15 pts	_____
○ Fauna (4)	10 pts	_____
○ Proper # of organisms at each level	5 pts	_____
▪ Abiotic factors		
○ Climate	5 pts	_____
○ Surface conditions	5 pts	_____
○ Geology	5 pts	_____
▪ Waves & Tides	5 pts	_____
▪ Buildings (2)	10pts	_____
▪ Pollution	5 pts	_____

Total 150 pts _____

FOOD WEB

▪ Drawing	5 pts	_____
▪ All trophic levels represented	5pts	_____

Each Group Member's contribution
(Written Report or Drawing)

total	100 pts	
Biologist	25 pts	_____
Environmentalist	25 pts	_____
Artist	25 pts	_____
Geographer	25pts	_____

Project Total	260 pts	_____
Multiple Choice Test	40 pts	_____
Overall Total	300 pts	_____