**City Planning Project 2016**

AP Environmental Science

Together your class is embarking on an exciting mission to create a city like no other.  The city will be the greenest and most advance city on the planet.  Your goal is to create a city that is fully sustainable and where the citizens are fully aware of their mission.  If you fail the world may never know that a sustainable city is in their grasp, and the lives of lives of 10,000 citizens may be lost forever.  Keep in mind you must provide basic necessities of life, and if you do it correctly not only will they have the necessities, but also a very fruitful existence.

Purpose: To evaluate different components of a city through development of a comprehensive city plan. Students will also discover aspects of different biomes as they research the most suitable place on Earth for their city’s location. Students will analyze and determine the types of developments as well as components of smart city planning including transportation, housing, commercial development, green space, etc. Students will also learn about energy production, renewable energy, energy conservation, water treatment, water purification, ground water, surface water, water conservation, gray water systems, irrigation techniques, habitat conservation, green building practices, leed building, etc. The project is based on a city with a population of 10,000 residence that exist in a city that is “off the grid and must create its own energy, provide water for the community’s needs through rain water only, and produce its own food.

Procedure:

Class will determine groups that will research different components of the city plan. They will also determine the “City Planner” that will organize, keep the project moving, and assist groups when necessary.

Part 1 – Biomes

Each group will be assigned a biome to research for livability. The area must provide sufficient water for the community including residential consumption, commercial, industrial, and agricultural. The area must also supply energy in some capacity whether it be solar, wind, tidal, etc. There must be sufficient ability to grow crops and/or livestock. Students will give a brief presentation with their findings and must be able to discuss why it is a good or bad location. After discussion each student will research the biome chosen and look at specific areas and gather specific climate data to determine the best location in the specific biome (sunlight, rainfall, growing season, wind, tides, etc.). Results will then be submitted to determine an exact latitude and longitude.

Part 2 – Type of Development

Each group is responsible for researching 2-3 different types of development plans. From the plans researched, each group will narrow down their development types to the one best to present to the class for a vote. Each group must keep in mind how the development will impact life in that specific community and how each development impacts footprint within the ecosystem. Convenience, workability, sustainability should all be concepts addressed.

Part 3 – Your group’s role in City Development

Your first major role as your group starts to develop your community is to teach your citizens about the general importance of your group’s mission.  What makes your group special to the community, and why is your group of upmost importance?  You need to provide background information on what your group is and your responsibility to the city.  What is your job and what role does your group play in the day to day functions of a sustainable city.  You will accomplish this task with a Power Point presentation.  If you wish you can have additional resources such as display boards, posters, models, etc.

 This part of the project is your mission and a test grade.  This is a great opportunity to get your group and your grade off to a great start!

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| --- | --- | --- | --- | --- |
| Number of slides | Contains all 15 slides with information related to topic on all slides.  20 points | Contains at least 10 slides with information related to topic on all slides.  17 points | Contains at least 7 slides with information related to topic on all slides.  13 points | Has some slides but very poorly put together.    10 points |
| Introduction to topic | Full explanation of your topic (importance, what is it, what is your job, how does your topic impact your current community, interesting facts, How will you group impact the community, etc.)  20 points | Partial explanation of your topic, contains most components.              15 points | Incomplete explanation of the topic.                12 points | Minimal effort put into this portion of the project.              8 points |
| Research Notes | Extensive notes are taken in preparation for presentation.  20 points | Good notes, but more needed for extent of presentation.  15 points | Some notes, but more needed.    10 points | Minimal notes taken.      0 points |
| Pictures | Contains 8 or more pictures related to the choices.  10 points | Contains 5 or pictures related to the choices.    7 points | Contains 1 or 2 pictures.    4 points | No pictures.      0 points |
| Explanation of Pictures | Contains explanations of all pictures and are easy to understand.  10 points | Contains explanations of all pic’s, but do not understand.  8 points | Contains explanations of some pictures.    5 points | No explanations.      0 points |
| Time | At least 7 minutes.  10 points | At least 5 minutes.  8 points | At least 3 minutes.  5 points. | Less than 3 minutes.  0 points |
| Bibliography | At least 5 sources.  10 points | At least 4 sources.  8 points | At least 3 sources.  5 points | Less than 3 sources.  0 points |

**City Planning Choices Rubric**

Each group must present a Power Point presentation for the second test grade of the “City Planning” project. The presentation must contain a minimum of 15 slides. The slides should contain at least three choices from each aspect of the project (ex. transportation, residential, commercial/industrial, city planning, etc.). Explain all of your choices thoroughly, even if you think there is no need for explanation. Your plan may include multiple-use planning (ex. Energy production may include, solar, wind, geothermal, etc. to be used together or just one type). The presentation should include pictures of each choice and an explanation. You should also include the pro’s and con’s of each of the choices. All presentations should be a minimum of 7 minutes long. Each group should assign each group member task to be completed. The task assigned should be turned in the day you receive the rubric and each group member will assess the completion of the task.

**City Planner/Blueprint/Model:** The city planner must provide the following information to your team: all environmental elements of your area (average annual temperature, average annual rainfall, average number of sunlight hours, etc.), number of people per household, number of school age children per school, number of working citizens, and number of retired. You must work with blueprint and model to determine what kind of layout your city will follow (circular, square, etc.). All three groups will present a plan with different ideas of locations of different things in the community and why. Your presentation will be the most involved of all of the presentations.

**Commercial/Industrial:** You must find different commercial and industrial businesses which use minimal water to help sustain your community. Water is your biggest issue and reusing it will be one of your biggest tasks within industry. Keep in mind a large part of your industry will be processing food for preservation. What are the needs of your community and how will you provide those through your industry and your commercial businesses. I would also put some thought into ecotourism as a commercial business.

**Transportation:** Remember your community is very small, so your transportation needs will be minimal, but also keep in mind you need to have access out of the community as well. How will you link your community with the rest of the world and how do you keep it eco-friendly?

**Residential:** You need to house 10,000 people, but keep in mind some of these people will share spaces (families, roommates, etc.). Get that information from your city planner. What types of housing are you going to have and what kind of space are you going to need? You may want to take a look at Atlantic Station, Ponce City Market, Aeropolis, Glenwood Park and Serenbe’s plans (communities located in Atlanta). There plan is on a smaller scale, but should give you some good ideas.

**Green space:** The need for green space is going to be very important, but you are going to have to figure out how to incorporate food production into much of your green space throughout the community. You may be very involved with transportation and agriculture.

**Agriculture:** How are you going to produce the amount of food needed for your residents? You need to figure out land needs by acre and how can you best utilize your space (rooftops, parks, community gardens, etc.). What crops can be grown at what times of the year, and how do you get what is grown to the community? How many people will your farms employ (work with commercial/industrial for this).

**Water/Water Treatment/Water Conservation:** Water and water treatment need to think about water conservation and need to find out how much rain can be collected with the amount of rainfall in your area. What will the water be stored in, how can you reuse water, and how can you treat the water naturally or as eco-friendly as possible. Bottom line, you have a fixed amount of a resource and if your plan fails, everyone in your community dies. Try looking at water treatment and conservation plans at Serenbe, Glenwood Park, and Las Vegas.

**Solid Waste:** How do you handle all of the waste in a community? Think of all the things in your house, at school, restaurants, industry, agriculture, and even using the bathroom. All that waste has to go somewhere and it is your job to figure it out. Think the three R’s, and then start researching what is happening in communities around the world. Poop for instance, can be made into soil or burned for energy.

**Energy/Energy Conservation:** How do you supply power for the needs of 10,000 people? Will it be one source, or a combination of sources? Also when thinking about the needs of your citizens, you need to consider all facets of your community such as commercial, industrial, government and schools, etc. Our school alone uses over $800 in a single weekend with no one here. You also need to be concerned with conservation. What will give the most bang for the buck and be good to Mother Earth?

**Schools and Government:** Think about how many different parts of your schools and government buildings can be housed in one central location. You want everything convenient to the residence to reduce transportation needs and also for safety (fire and police). The entire class will work on this as a group.

**Comprehensive City Plan Booklet, Model, and Blueprint**

The comprehensive city plan booklet, model, and blueprint is the final aspect of your city planning project. This is the portion of the project that will be examined by all the judges (including two city planners), and all parts of the plan should be represented in the plan as well as a complete model and blueprint.

I will not be assessing this part of the project. This will all be done by the judging team and they will follow the rubric. So, each group member needs to make sure they follow the rubric precisely.

Each group is responsible for the follow:

* City Planner
  + Introduction
    - Table of Contents
    - Abstract
    - [What is a comprehensive community plan?](http://www.ainc-inac.gc.ca/ai/scr/bc/proser/fna/ccp/ccphb/pub/ccphb-eng.asp#wccp#wccp)
    - [Benefits of planning to your community](http://www.ainc-inac.gc.ca/ai/scr/bc/proser/fna/ccp/ccphb/pub/ccphb-eng.asp#bpyc#bpyc)
    - What's needed to make planning work?
  + Power Point – optional, but might be what puts your group over the other groups.
* Blueprint/Model
  + Have scale correct.
  + Key
  + Have all aspects of your project labeled as much as possible.
  + Model group should be as creative as possible in coming up with materials and possibly try and get classmates to bring in certain items to help create the model.
* All other sections (minimum 4 pages)
  + Any (rules, guidelines, and regulations) dictated by the planning committee (you). For example, low flow shower heads, Energy Star appliances, etc.
  + Logistics of your plan.
  + How will your plan be implemented?
  + Detailed description of your part (s) of the plan.
* All written information should be turned in with the following format:
  + Times New Roman
  + 12 pt. font
  + Double Spaced
  + 1 inch margins

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| Number of slides | Contains all 15 slides with information related to topic on all slides.  15 points | Contains at least 10 slides with information related to topic on all slides.  12 points | Contains at least 7 slides with information related to topic on all slides.  8 points | Has some slides but very poorly put together.  5 points |
| Choices | Contains at least 3 choices and is easy to understand and well explained.  15 points | Contains less than 3 choices, but choices given are well thought out and easy to understand.  10 points | Contains at least 3 choices but not well explained or informative  7 points | Minimal effort put into this portion of the project.  3 points |
| Planning (how do you recommend the choices be implemented) | Has put together a well thought-out plan for the community.  15 points | Has put together a plan, but needs more planning.  10 points | Has a plan, but very limited thought went into the plan, and doesn’t seem workable.  5 points | No plan.  0 points |
| Pictures | Contains multiple pictures related to the choices.  10 points | Contains a few pictures related to the choices.  7 points | Contains 1 or 2 pictures.  4 points | No pictures.  0 points |
| Explanation of Pictures | Contains explanations of all pictures and are easy to understand.  10 points | Contains explanations of all pic’s, but do not understand.  8 points | Contains explanations of some pictures.  5 points | No explanations.  0 points |
| Pro’s | Gives full list of pro’s of the choice.  10 points | Gives a partial list of the pro’s of the choice.  7 points | Gives some pro’s of the choice.  4 points | Gives no pro’s.  0 points |
| Con’s | Gives extensive con’s of topic or confirmation of no con’s.  10 points | Gives a partial list of the con’s of the choice.  7 points | Gives some con’s of the choice.  4 points | Gives no con’s.  0 points |
| Time | At least 7 minutes.  10 points | At least 5 minutes.  8 points | At least 3 minutes.  5 points. | Less than 3 minutes.  0 points |
| Bibliography | At least 5 sources.  10 points | At least 4 sources.  8 points | At least 3 sources.  5 points | Less than 3 sources.  0 points |

**City Planning Assessment Sheet**

**Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Date \_\_\_\_\_\_\_\_\_\_\_\_**

1) What have you contributed to your group thus far throughout the project?

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2) Name some specific task you have been responsible for completing: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3) Who in the group is clearly the most responsible and gets the most accomplished in the group? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4) Thus far, what would you rate your contributions to the group on a scale from 1 – 10? \_\_\_\_\_\_\_\_\_\_\_ Each of your group members: \_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_

5) List 5 specific things you have learned while doing this project (can be from class presentations, your research, and/or guest speakers).

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6) Which guest speaker has been the most informative for your group during the project?

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7) List three websites you would recommend to someone else doing this project in the future:

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8) What specific things should you personally be assessed on with the second power point presentation?

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9) List specific things each of your group members have contributed to the project as of today (first and second parts of project):

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10) If you had to rate your partner(s) on a scale of 1 – 10 what would it be?

\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_