

## AP Environmental Science Summer Assignments

Ms. Murray and Ms. Praesel

Please complete the two assignments below for the first day of school. Please email [rmurray@eccrsd.us](mailto:rmurray@eccrsd.us) or [lprael@eccrsd.us](mailto:lprael@eccrsd.us) if you have any questions about the assignments or about the course in general.

### I. The Tragedy of the Commons

Environmental Science is an interdisciplinary science, which incorporates aspects of economics, politics, ethics, and philosophy into our understanding of scientific topics. For example, an answer to the question of whether or not to drill for oil in a specific area would include both scientific and non-scientific arguments. Scientifically, we could examine the oil itself and how it exists in the earth, or the impact that the drilling might create on the ecosystem, or the possible impact on local water quality as a result of the drilling. But, we also should examine the economic benefits that drilling for oil provides, or the political influence of capturing domestic energy resources. As an introduction to the course and the logic required for examining many environmental issues, I would like you to read “The Tragedy of the Commons,” which can be found using the link below.

[http://www.garretthardinsociety.org/articles/art\\_tragedy\\_of\\_the\\_commons.html](http://www.garretthardinsociety.org/articles/art_tragedy_of_the_commons.html)

The Tragedy of the Commons is a famous environmental and philosophical essay, written in 1968 by Garrett Hardin. In the essay, Hardin makes a number of thought provoking arguments about how human nature influences the impact of a population on the environment. Please read the essay thoughtfully and reflect on the message being presented by the author. After reading the essay, write paragraph responses to each of the questions below. The responses should be ready for submission on the first day of school.

1. In his first few paragraphs, Garrett Hardin states that there are a class of problems for which there is no technical solution. What does he mean by a technical solution? What are some examples other than nuclear warfare (his example) that might fit this class?
2. The author references a population problem throughout the essay. What is the population problem he is referring to? What issues might be created by this population problem?
3. To address the question “what shall we maximize?” Hardin gives examples of conflicting variables such as the greatest number vs. the greatest good, maintenance calories vs. work calories, and individual decision vs. common good. Discuss how one of these pairs relates to the population problem.
4. The section entitled “Tragedy of Freedom in a Commons” lays out the concept on which the essay is titled. What is a “commons”, and how does it end in tragedy? Give an example of something that may be a “commons” that is not discussed in the essay and explain how it could be abused.
5. The author uses the quote “the morality of an act is a function of the state of the system at the time it is performed” to argue that laws which expressly prohibit certain behaviors in all situations may not be optimal. He gives a bison hunter, trash burning, and cars without smog control as examples (note that the essay was written in 1968). Why might these or other

environmental infractions not be equally offensive in all “systems?”

6. Beginning in the section “Freedom to Breed is Intolerable” and continuing through the end of the essay, the author discusses the issue of human reproduction and population growth. He believes that continuing to allow all humans the right to breed in whatever numbers they choose will lead to a tragic end. Do you believe that humans around the world should have the freedom to reproduce as they choose, or should government have some input in how many children are ideal for a given family? Discuss the ethical arguments that could be made on either side.
7. Assuming the government decided to enact a program that coerced citizens to reproduce less (as the author would be in favor of), what might be a reasonable law? Would the policy be enforceable? Do you think a policy like this could work?
8. In a later publication, this author argued against sending emergency food aid to places around the world experiencing famine, stating that it only exacerbated the problem. He believed that sending aid allowed these populations to continue to grow larger, even though they had already surpassed their sustainable population size. This in turn would only lead to further reliance on aid and an intensification of the problem. What do you think about this argument? Does the argument make logical sense? Is it ethically justifiable?

## II. APES Vocabulary

Define each of the following terms in the context of environmental science.

- |                                   |                               |
|-----------------------------------|-------------------------------|
| 1. Anthropogenic                  | 15. Dependent variable        |
| 2. Ecocentric                     | 16. Runoff                    |
| 3. Biomass                        | 17. Impervious                |
| 4. Producers                      | 18. Impermeable               |
| 5. Consumers                      | 19. Porous vs permeable rock  |
| 6. Autotrophs                     | 20. Arid                      |
| 7. Detritivorous                  | 21. Per capita                |
| 8. Organic vs inorganic chemicals | 22. Terrestrial               |
| 9. Chemical reservoir/sink        | 23. Aquatic                   |
| 10. Trophic level                 | 24. Subsidies                 |
| 11. Sequestration                 | 25. Catalytic converter       |
| 12. Sustainability                | 26. Buffer zone               |
| 13. Experimental control          | 27. Flat fee vs variable rate |
| 14. Independent variable          | 28. Brackish                  |

29. Hectare
30. Adjacent
31. Abiotic
32. Biotic
33. Externalities
34. Municipality
35. Domestic vs Industrial
36. Uptake
37. Influent vs Effluent
38. Reclamation
39. Turbidity
40. Remediation
41. Leaching
42. Tax levy
43. Pulverize
44. Saturate
45. By-product
46. Dredging
47. Aesthetic degradation
48. Pathogens
49. Glacier vs Iceberg
50. Refuse

### III. Current Events

Over the course of the summer, find *two* articles that relate to environmental science. These should be from credible sources and pertain to events that have taken place over the last three years (the article should not be a general description of an environmental topic). Events may pertain to, but are not limited to: climate change, energy sources, human population growth, air quality, water quality, soil quality, biodiversity/ecology, food production, and other human impacts on the environment.

Summarize each article and identify potential preventative or remedial actions that could be taken to resolve the main issue. The proposed actions should be feasible (write up should include a discussion on feasibility). Each write-up should be at least 400 words. Be sure to include either a print up of the article itself or a link to the article for reference.