

AP Biology Ecology Project: Can We Interact for Good?

Driving Question:

How have the interactions of humans with their environment upset the balance of nature on Planet Earth? What are the possible consequences?

Background:

A basic tenet of the science of the environment is that all living and nonliving things in the biosphere interact and affect each other. Scientists tell us that humans have had a disproportionate effect on the health of various compartments within the biosphere, primarily through upsetting the balance of these interactions. Many people have a hard time understanding how and why that is. As the best and brightest of our High School students, I feel that you can learn and understand the complex scientific principles that help to define a “healthy” ecosystem, and help us to know that there are enormous environmental problems that we face. Further, I believe that you, as teenagers, know the best way to communicate information about these problems to other teenagers.

I am asking you to learn all that you can about the interactions between living and nonliving parts of the environment, and then to choose a specific environmental issue of interest to you. I would like you to research that issue, and **develop a public service advertising campaign to educate other teenagers**. There are several issues that are our priorities; you are welcome to select one of these issues to research. They include but are not limited to:

- [Curbing Global Warming and Creating the Clean Energy Future](#)
- [Reviving the World's Oceans](#)
- [Defending Endangered Wildlife and Wild Places](#)
- [Protecting Our Health by Preventing Pollution](#)
- [Ensuring Safe and Sufficient Water](#)
- [Fostering Sustainable Communities](#)

You will see in your study of environmental interactions that there are also many other issues that you could research. For example, introduced and invasive species are a huge problem in many areas, and research into the causes and possible solutions to this problem would be an additional area that we be of great use to us. In any case, we'd like you to use your interests and your imagination to guide your selection. Make sure that you look carefully at all

scientific evidence related to your topic; do not fall into the trap of only using one or two sources to inform your advertising campaign. We want all information to be accurate and of the highest quality.

We will expect you to use whatever media you believe will most effectively communicate with your fellow teenagers for your advertising campaign. This may include, but is not restricted to, audio recordings, collages, comics, eBooks, narrated slideshows, videos, or animations.

Project Basics:

Working in groups of 4 (maximum number), students will develop a public service advertising campaign on one environmental problem to communicate to teenagers the importance of that problem to the health of Planet Earth. They will be able to use their media of choice, but they must use at least two different media to get their message across. Examples of possible media include audio recordings, collages, comics, eBooks, narrated slideshows, videos, animations, etc. Culminating event will be a presentation of their advertising campaign to the class and a panel of judges.

Individually: This is not a group task; it will be completed by all students:

After reading and learning about how living and nonliving components of ecosystems interact, and choosing a current environmental problem to analyze, write a 2 page essay, 12 pt with 1.5 spacing, that identifies the causes of and defines the effects of the problem, and argues for a solution. Support your position with evidence from your research.

Key Vocabulary: Homeostasis, population, community, ecosystem, biosphere, interactions, matter, energy, diversity, species, biodiversity.

CRITERIA	EMERGING (Below Performance Standards)	DEVELOPING (Proficient Criteria)	MASTERING (High Performance)
CONTENT LITERACY	<ul style="list-style-type: none"> ▪ Irrelevant topic ▪ Less than 3 appropriate media developed for ad campaign ▪ Does not cover appropriate ecological content. ▪ Does not make appropriate connections between ecological concepts, environmental issues, and/or human activity. 	<ul style="list-style-type: none"> ▪ Selected relevant environmental issue to research. ▪ Developed 3 appropriate/high quality media for ad campaign. ▪ The following ecological vocabulary words are used correctly somewhere in the media developed: <ul style="list-style-type: none"> ✓ Homeostasis ✓ Population ✓ Community ✓ Ecosystem ✓ Biosphere ✓ Interactions ✓ Matter ✓ Energy ✓ Diversity ✓ Species ✓ Biodiversity ▪ Connections between ecological concepts and environmental issue are made correctly. ▪ Connections between human activity and environmental issue are highlighted. 	<p>In addition to the “Proficient” criteria...</p> <ul style="list-style-type: none"> ▪ Complex and/or high stakes environmental issue selected for research. ▪ More than 3 appropriate/high quality media are developed. ▪ Ecological concepts are described clearly and correctly. ▪ Logical, clear connections are made between ecological concepts, environmental issues, and human activity.
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WRITTEN COMMUNICATION	<ul style="list-style-type: none"> ▪ Communicates poorly with little or no awareness of audience or purpose ▪ Disorganized content; difficult to follow ▪ Provides little or irrelevant evidence to support claims ▪ Demonstrates inadequate control of sentence structure ▪ Uses inappropriate language, slang, or spelling ▪ Shows numerous errors in spelling, capitalization, punctuation, grammar some of which may obscure meaning ▪ Does not use specified format ▪ If hand written, product is messy or illegible 	<ul style="list-style-type: none"> ▪ Communicates effectively with awareness of audience and purpose ▪ Organization of content shows some logic and generally “flows” ▪ Provides details to support claimss ▪ Demonstrates adequate control of sentence structure (grammatically correct writing) ▪ Uses appropriate diction ▪ Shows evidence of proofreading; the writing displays fundamental control of written English, some errors but none that obscure meaning ▪ Uses format specified by assignment ▪ If handwritten, product is neat and legible 	<p>In addition to the “Proficient” criteria...</p> <ul style="list-style-type: none"> ▪ Communicates insightfully with consistent awareness of audience and purpose ▪ Product consistently organized in a logical manner with effective use of transitions ▪ Provides a variety of well-chosen details or examples to support claims ▪ Demonstrates exceptional control of sentence structure ▪ Uses precise language and sophisticated word choice ▪ Is virtually free of errors ▪ The product is neat and correctly formatted
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CRITERIA	EMERGING (Below Performance Standards)	DEVELOPING (Proficient Criteria)	MASTERING (High Performance)
CRITICAL THINKING & PROBLEM SOLVING	<ul style="list-style-type: none"> ▪ Student selects tools, techniques, or structures that do not necessarily achieve the desired goal as defined in the project or course guidelines ▪ Student demonstrates some understanding of the concepts, theories, relationships, and/or principles of topic or skill under study, but struggles to apply and/or modify ▪ Student misinterprets evidence, statements, graphics, questions, etc. ▪ Student may justify a few results or procedures, but justification is based on incomplete or irrelevant data 	<ul style="list-style-type: none"> ▪ Student selects an effective tool, technique, or structure to achieve the desired goal as defined in the project or course guidelines ▪ Student demonstrates an ability to apply and/or modify theories, principles, and/or skills to new situations, settings, or problems ▪ Student analyzes concepts, theories, relationships, and/or principles of topic or skill under study through a step-by-step, logical progression ▪ Student accurately interprets evidence, statements, graphics, and questions ▪ Student synthesizes ideas, images, and/or objects to form a cohesive whole 	<p>In addition to the “Proficient” criteria, the student...</p> <ul style="list-style-type: none"> ▪ Objectively draws conclusions based on data and evidence ▪ Generates an evaluation that is supportable based on the established criteria ▪ Includes comparison and contrast to other ideas in his/her evaluation
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