



Silent Debate: 40-60 minutes

Objective: Capture students' attention with a [bold statement](#) related to human's relationship with the environment. Statements are based on opinions regarding our use of ecosystem services. Students will discuss the advantages and disadvantages to protecting ecosystem services.

Materials

- Self-Stick Easel Pad
- Different colored writing utensils (could be markers, crayons, pens, etc.; one per student)
- Silent Debate Statements

Explanation

- Before Class:
 - Divide students into groups of 3-4
 - Select one statement per group from the [Silent Debate Statements](#) (at the end of this document) and write at the top of one page of Self-Stick Easel Pad. Each group will get a separate page and statement.
 - Stick the pages around your classroom.
 - Facilitate a discussion by asking the students to come up with the following vocabulary definitions. These will be necessary later in your classroom discussion:
 - Ecosystem: a community of living and nonliving things that work together as a life sustaining system
 - Resource: a supply of materials that we get from the ecosystem
 - Benefit: an advantage or non-material reward we get from the ecosystem
- During class:
 - Instruct each student group to pick a uniquely colored writing utensil. **Inform students that there is no talking during the activity.**
 - Assign which student groups will have each statement (pool of statements below). You may choose to cut each statement out and pass for distribution.
 - Explain that they will read their statement **silently**. Once they have read it, each student should record their opinions of the statement on a sheet paper (as to not bias their initial response).
 - Students then respond to other group members' statements by writing individual responses on the easel paper. Allow this to generate a written conversation among each group. All communication must be in written form on the paper and pertain to the statement.
 - Let students converse silently for as long as necessary (4-8 minutes). Allow multiple easel sheets if necessary.
 - End their silent discussions by instructing them to stop writing.
 - Verbally discuss 4-6 key responses as a class.



Discuss

- Take turns discussing each group's statement using the discussion points (*) in the Silent Debate Statements. Guide the students in identifying any resources or benefits we get from an ecosystem the statement refers to.
- Discussions should connect human and ecosystem relationships, and any feedbacks that exists. At the end of your discussion, have students rephrase/rewrite their statement to best reflect any new or revised conclusions.

Supplemental Documents

- Silent Debate Statements with discussion points (included at the end of this document)

Silent Debate Statements

***Discussion Points for end of class verbal discussion**

1. Dumping trash into the ocean is a good solution to our problem of what to do with our trash.
 1. *Discussion Point: What are the consequences of throwing trash into the ocean?
2. We should deforest (cut down trees) much of South American Rainforests to make room for farmland and increase monetary profit.
 1. *Discussion Point: What is the monetary benefit of a tree?
3. We should be able to hunt endangered mammals and sell their fur.
 1. *Discussion Point: What is the value of endangered animals? Think in terms of the food chain, biodiversity, and ecosystem stability.
 2. *Discussion Point: Is hunting endangered animals for their fur a sustainable source of income? How did you reach your conclusion?
 3. *Discussion Point: What are the pros and cons of hunting endangered animals for their fur? Do the pros outweigh the cons in hunting endangered animals for their fur? How can we protect our interests?
4. Only native plants should be used for landscaping purposes.
 1. *Discussion Point: How do we differentiate between a native and a non-native plant?
 2. *Discussion Point: What is the water demand of native versus non-native plants?
 3. *Discussion Point: How are current landscaping processes regulated? Are there regulations?



4. *Discussion Point: Are there negative effects to only using native plants for landscaping purposes? Are there negative effects to using non-native plants for landscaping purposes? Are any negative effects worth _____?

5. Air/water quality can be sacrificed when we have a high demand for energy.
 1. *Discussion Point: What kinds of energy most affect air/water quality? What is the relationship between air/water quality and that kind of energy usage?
 2. *Discussion Point: What are the negative effects of poor air/water quality? Are there any upsides to poor air/water quality?
 3. *Discussion Point: Are the negative effects of poor air/water quality worth the negative tradeoffs when there is a high demand for energy?

6. Water quality can be sacrificed if mineral resources are in high demand.
 1. *Discussion Point: How can a high demand of mineral resources affect water quality?
 2. *What is the relationship between water quality and mining these mineral resources?
 3. *Discussion Point: What effects would occur if we quit mining minerals to protect water quality?
 4. *Discussion Point: Is it possible to continue extracting minerals and protect water quality?

7. There should be no concern with energy supply or distribution as rapid population growth continues.
 1. *Discussion Point: As population increases, will our demand for resources also increase? Based on your conclusion, how would you revise this statement?
 2. *Discussion Point: Where will we get these resources in the future? Will these resources ever run out?

8. It is impossible to mitigate the effects of rapid population growth.
 1. *Discussion Point: What are the pros and cons to population growth?
 2. *Discussion Point: What are some habits we can change today that may help mitigate against these effects for the future?

9. Animals used for hunting are a more important part of the ecosystem than animals not used for hunting.



1. *Discussion Point: Animals provide both resources and benefits to our ecosystem. Communities can value both for different reasons. Those animals who are not hunted may have essential roles in the food chain which sustain our ecosystem's resources such as vegetation and land
 2. *Resource: hunting populations
 3. *Benefit: biodiversity creates a variety of animals for the food chain
10. Humans could survive without nature.
1. *Discussion Point: All resources and benefits come from nature/ecosystems. Humans could not survive without it
 2. *Discussion Point: How much money is a tree worth? Could humans survive without trees?
 3. *Discussion Point: How much money is a honey bee worth? Could humans survive without bees?
11. Farming using monoculture is better than farming by planting a variety of plants.
1. *Discussion Point: What are the environmental effects of monoculture farming? What does it do to genetic variety?
12. Insects are pests to humans, and their negative effects on humans outweigh their positive effects on the environment.
1. *Discussion Point: What purpose do ants serve in nature? Do the way they build mounds help with soil production and aeration?
 2. *Discussion Point: Could we survive without pollinator insects, like bees, butterflies?
 3. *Discussion Point: If insects weren't around, what methods would humans use to decompose our compost?
13. The impacts of what we do to change a natural environment should be tested before the change is made.
1. *Discussion Point: Local, state, and/or federal governments monitor environmental impacts from human activities.
 2. *Scientists investigate these impacts to help government bodies know what is sustainable and what is not



14. Human activities that could damage crops should be stopped.
 1. *Discussion Point: Human activities can impact other resources we get from an ecosystem. For Example: the USDA is investigating the impact of increased ozone levels on crops
 2. *See the below resources if needed
 1. Effects of Ozone Air Pollution on Plants
 2. Monitoring Ground Level Ozone from Space
 3. *Resource: Crops

15. Laws should be put into place to force companies to prevent chemicals from polluting the air.
 1. *Discussion Point: Without laws or regulations, we would not be able to slow down or control the impact of human activities on the ecosystem
 2. *Benefit: Air Quality

16. Regardless of how many resources we have available, nothing should be done to stymie population growth.
 1. *Discussion Point: Population growth requires more energy resources to sustain our current way of life.
 2. *Discussion Point: The water that comes out of the faucet is almost unlimited, and we should use as much as we want since we're paying for it.

17. Stopping pollution is more important than controlling it.
 1. *Discussion Point: Human activities such as driving and using energy produce waste that can end up in the ecosystem.

18. Humans should protect the environment.
 1. *Discussion Point: We depend on the ecosystem for life, just like other animals and plants.

19. It should be illegal for people to take water from rivers.
 1. *Discussion Point: States vary in their laws on water rights. In some places you need to own water rights before taking water from rivers. Other areas only let you take from rivers when water levels are higher than the needed amount.



2. *Resource: water
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20. Residents of a city should vote on whether or not new companies are allowed to build in their area.
 1. *Discussion Point: Neighbors and residents sometimes do not get a say in what companies develop near their land or area
 2. *Discussion Point: How does this affect quality of life?

 21. A certain amount of pollution is okay, even if it negatively affects our health.
 1. *Discussion Point: What are the effects of pollution? How badly can it affect our healthy?

 22. We should build more skyscrapers, even if it we have to use the land from Zilker Park or Barton Springs.
 1. *Discussion Point: What role to parks play in an urban environment?
 2. *Discussion Point: Are skyscrapers sustainable? What are the pros and cons of building up versus out?

Sources

<https://www.airwatergas.org/resources/curriculum/ecosystem-services-in-your-community-teaching-box/engage-silent-debate/>



Texas Assessments of Academic Readiness Resources – TEKS

§112.38. Integrated Physics and Chemistry

(c) Knowledge and skills.

(7) Science concepts. The student knows that changes in matter affect everyday life. The student is expected to:

- (E) describe types of nuclear reactions such as fission and fusion and their roles in applications such as medicine and energy production; and
- (F) research and describe the environmental and economic impact of the end-products of chemical reactions such as those that may result in acid rain, degradation of water and air quality, and ozone depletion.

§112.32. Aquatic Science

(c) Knowledge and skills.

(12) Science concepts. The student understands how human activities impact aquatic environments. The student is expected to:

- (A) predict effects of chemical, organic, physical, and thermal changes from humans on the living and nonliving components of an aquatic ecosystem;
- (B) analyze the cumulative impact of human population growth on an aquatic system;
- (C) investigate the role of humans in unbalanced systems such as invasive species, fish farming, cultural eutrophication, or red tides;
- (D) analyze and discuss how human activities such as fishing, transportation, dams, and recreation influence aquatic environments; and
- (E) understand the impact of various laws and policies such as The Endangered Species Act, right of capture laws, or Clean Water Act on aquatic systems.

§112.36. Earth and Space Science

(c) Knowledge and skills.

(11) Solid Earth. The student knows that the geosphere continuously changes over a range of time scales involving dynamic and complex interactions among Earth's subsystems. The student is expected to:

- (E) evaluate the impact of changes in Earth's subsystems on humans such as earthquakes, tsunamis, volcanic eruptions, hurricanes, flooding, and storm surges and the impact of humans on Earth's subsystems such as population growth, fossil fuel burning, and use of freshwater.

(13) Fluid Earth. The student knows that the fluid Earth is composed of the hydrosphere, cryosphere, and atmosphere subsystems that interact on various time scales with the biosphere and geosphere. The student is expected to:

- (D) discuss mechanisms and causes such as selective absorbers, major volcanic eruptions, solar luminance, giant meteorite impacts, and human activities that result in significant changes in Earth's climate;

§112.37. Environmental Systems

(c) Knowledge and skills.



(5) Science concepts. The student knows the interrelationships among the resources within the local environmental system. The student is expected to:

- (A) summarize methods of land use and management and describe its effects on land fertility;
- (B) identify source, use, quality, management, and conservation of water;
- (C) document the use and conservation of both renewable and non-renewable resources as they pertain to sustainability;
- (D) identify renewable and non-renewable resources that must come from outside an ecosystem such as food, water, lumber, and energy;
- (E) analyze and evaluate the economic significance and interdependence of resources within the environmental system; and
- (F) evaluate the impact of waste management methods such as reduction, reuse, recycling, and composting on resource availability.

(9) Science concepts. The student knows the impact of human activities on the environment. The student is expected to:

- (A) identify causes of air, soil, and water pollution, including point and nonpoint sources;
- (B) investigate the types of air, soil, and water pollution such as chlorofluorocarbons, carbon dioxide, pH, pesticide runoff, thermal variations, metallic ions, heavy metals, and nuclear waste;
- (D) describe the effect of pollution on global warming, glacial and ice cap melting, greenhouse effect, ozone layer, and aquatic viability;
- (E) evaluate the effect of human activities, including habitat restoration projects, species preservation efforts, nature conservancy groups, hunting, fishing, ecotourism, all terrain vehicles, and small personal watercraft, on the environment;
- (F) evaluate cost-benefit trade-offs of commercial activities such as municipal development, farming, deforestation, over-harvesting, and mining;
- (G) analyze how ethical beliefs can be used to influence scientific practices such as methods for increasing food production;
- (H) analyze and evaluate different views on the existence of global warming;
- (I) discuss the impact of research and technology on social ethics and legal practices in situations such as the design of new buildings, recycling, or emission standards;
- (J) research the advantages and disadvantages of "going green" such as organic gardening and farming, natural methods of pest control, hydroponics, xeriscaping, energy-efficient homes and appliances, and hybrid cars;
- (K) analyze past and present local, state, and national legislation, including Texas automobile emissions regulations, the National Park Service Act, the Clean Air Act, the Clean Water Act, the Soil and Water Resources Conservation Act, and the Endangered Species Act; and



(L) analyze past and present international treaties and protocols such as the environmental Antarctic Treaty System, Montreal Protocol, and Kyoto Protocol.