**APES Study Guide**

**Unit 8: GLOBAL CHANGE**

***DUE****: Due on day of unit test.*

*Directions:**Answer each question in complete sentences.* ***Must be handwritten in order to receive credit.***

**Textbook Reference:**

Chapter 19 – Climate Disruption and Ozone Depletion

Chapter 23 – Economics, Environment, & Sustainability

Chapter 24 – Politics, Environment, & Sustainability

**Vocabulary:**

*Directions: Review key vocabulary, words may appear in quizzes and/or tests. You are not required to write the definitions but are encouraged to review.*

Chapter 19

carbon capturing and storage (CCS)

ozone

global cooling

global warming

greenhouse effect

Chapter 23

economic system

natural capital

human capital

human resources

manufactured capital

manufactured resources

high-throughput economy

discount rate

cost-benefit analysis

matter recycling

reuse economies

low-throughput economy

Chapter 24

policies

politics

environmental policy

democracy

lobbying

environmental law

statutory laws

administrative laws

common law

civil suit

plaintiff

defendant

arbitration

mediation

green planning

*Choose one of the two options below to complete.*

**Study Guide Questions (SGQ):**

*Directions:**Answer each question in your own words as you read through the text. Answers must be in* ***complete handwritten sentences.***

Chapter 19

1. Describe atmospheric warming and cooling over the past 900,000 years and during the last century.
2. How do scientists get information about past temperatures and climates?
3. What is the greenhouse effect and why is it so important to life on the earth?
4. How have human activities affected atmospheric greenhouse gas levels during the last 275 years and especially in the last 30 years?
5. List the major human activities that add CO2, CH4, and N2O to the atmosphere.
6. After studying past climate change and the nature of the earth’s climate system for almost three decades, what two general conclusions did most of the world’s climate scientists agree on about atmospheric warming over the past 30 years? How did scientists arrive at these two general conclusions, and why was this such a rare event?
7. How do scientists use models to make projections about future temperature changes?
8. How can positive feedback loops affect future temperature changes and thus global climate? Give two examples of such loops.
9. Describe the contribution of waste heat from energy conversion devises to projected climate disruption.
10. Describe how each of the following might contribute to projected atmospheric warming and resulting global climate disruption: (a) CO2 emissions, (b) a hotter sun, (c) the oceans, (d) cloud cover and (e) air pollution. What are three effects of increasing atmospheric CO2 levels on the oceans?
11. Briefly describe how projected climate disruption is likely to affect: (a) drought, (b) ice cover, (c) permafrost, (d) sea levels, (e) extreme weather, (f) biodiversity, (g) crop yields, and (e) human health during this century.
12. List seven examples of climate tipping points we could be approaching.
13. What are five factors that make it difficult to deal with the problem of projected climate disruption?
14. Describe the interactions among science, politics and climate.
15. Describe John Sterman’s bathtub analogy as it applies to CO2 emissions.
16. What are three major prevention strategies and three major cleanup strategies for dealing with projected climate disruption?
17. List six steps that governments could take to help slow projected climate disruption.
18. What is a pollutant and why is CO2 being classified as a pollutant?
19. What are the advantages and disadvantages of using taxes on carbon emissions or energy use to help reduce greenhouse gas emissions?
20. What is cap-and-trade and what are the advantages and disadvantages of using it to help reduce greenhouse gas emissions?
21. What are the pros and cons of developing an international treaty to help deal with the threat of projected climate disruption?
22. What is the U. S. city of Portland, Oregon, doing to help reduce its greenhouse gas emissions?
23. What is China doing to help reduce its contribution to the climate disruption?
24. What is the United States doing to help reduce its contribution to this problem?
25. List five ways in which you can reduce your carbon footprint.
26. List five ways in which we can prepare for the possible long- term harmful effects of climate change.
27. Describe how human activities have depleted ozone in the stratosphere, and list five harmful effects of such depletion.
28. How are the problems of atmospheric warming and ozone depletion connected?

Chapter 23

1. Compare and contrast microloans and traditional bank loans.
2. Why are microloans more effective at helping people in poverty than traditional loans?
3. Identify and then compare and contrast the three types of capital (resources) that are used to produce goods and services.
4. Compare and contrast the beliefs of Neoclassical economists and Ecological economists and how they view natural capital and sustainable economic growth.
5. Describe how the economic tool known as ”the discount rate” is used by economists, businesses and investors.
6. Explain why total cleanup of pollution is not considered the best way to deal with pollution problems.
7. Draw a graph that could represent the optimum level for pollution cleanup for a possible project. Make sure your graph shows a line representing the marginal benefit of pollution cleanup and a line representing the marginal cost of pollution cleanup.
8. What is included in full-cost pricing that is not included in current market prices?
9. Compare and contrast the economic indicators gross domestic product (GDP) and genuine progress indicator (GPI).
10. What is green washing and why do some companies practice it?
11. Explain how using green taxes and ecotaxes can decrease pollution and resource waste.
12. Compare and contrast the following three approaches to environmental regulations: command and control approach, incentive-based environmental regulations and innovation-friendly environmental regulation.
13. Explain why reducing poverty is an important part of the strategy for moving toward a more sustainable and future.
14. List the Millennium Development Goals.
15. Compare and contrast a material-flow economy to a service-flow economy.
16. Describe the cap-and-trade approach to pollution reduction.
17. How is a mater recycling and reuse economy different from our current linear high-throughput economy?
18. Draw a flow chart that represents inputs and outputs in a high-waste economy.
19. Draw a flow chart that represents inputs and outputs a low-waste economy.
20. Compare and contrast ecological succession and economic succession. How do these concepts relate to the struggle to make the transition toward environmental and economic sustainability?

Chapter 24

1. Some economic and political issues discussed in the textbook are listed below. Find and discuss a specific example of each and how government policy has affected the environment.
   1. Full-cost pricing
   2. Market failures
   3. Tragedy of the Commons
2. Explain the two reasons why democratic governments hinder their ability to deal with environmental problems.
3. What forms can government policy be? Find an example of each related to environmental policy.
4. Describe how lobbyists can have an impact on government policy.
5. Passing a law is not enough to make policy. What other steps must be taken to successfully implement policy? What potential problems can result from implementing environmental policy?
6. Figure 24-5 depicts the distribution of some US natural capital – reserves, national forests, and national wildlife refuges. What is natural capital? What policy designated these areas as US government managed areas? What can the lands/areas be used for?
7. Give examples of grassroot political actions that can have an impact on government environmental policy. Do you practice any of these actions?
8. List and describe the six reasons why environmental lawsuits are difficult to win.
9. What type of civil suits can a plaintiff seek?
10. Below are the US environmental policy matched to a description of the type legislation. Research other environmental legislation that fit in each category.

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| **Category of Legislation** | **Environmental Policy** |
| *Sets standards for pollution levels* | 1. Clean Air Act 2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| *Screens new substances for safety and sets standards* | 1. Safe Water Drinking Act 2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| *Encourages resource conservation* | 1. RCRA 2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| *Sets aside or protects certain species, resources, and ecosystems* | 1. Endangered Species Act 2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| *Requires evaluation of environmental impact of an activity* | 1. NEPA 2. \_\_X\_\_ |

1. Define NGO and give a specific example of one. Research the NGO that you chose and summarize its mission/purpose.
2. Explain the roles of the NRDC in protecting the habitat of the spirit bear.
3. Describe the trends of educational institutions in the global sustainability movement. Cite specific examples. Does our school participate in any of these activities? What kind of program could be put in place in our school in efforts of being more “green”?
4. Explain the significance of the concept map below:
5. Why is it difficult to solve environmental problems at a global level? What types of environmental effort occur at the global level? What organizations are involved?
6. What obstacles must be tackled to create a more environmentally sustainable society?