**APES Chapter 19: Climate Disruption**

**Note Taking Focus Questions**

**Directions:** Use the Cornell Method of note taking as you answer the questions below. Your notes must be **hand written** to receive credit for them. Within your notes, use the title for each subsection of notes which is *in italics and underlined.*

**Core Case Study: Melting Ice in Greenland**

1. What is happening to Greenland’s glaciers? Why is this a threat?

2. What are the 3 major conclusions reached by the IPCC and other major scientific groups?

**Section 19-1**

*How is the Earth’s Climate Changing*

1. How do scientists estimate past temperature changes?

2. What is the IPCC? What conclusion have they reached based on the evidence?

**Section 19-2**

*Greenhouse Effect*

1. What is the greenhouse effect?

2. List the greenhouse gases. What % of the atmosphere to they make up? Describe how they help to warm the lower atmosphere.

3. Why do scientists consider carbon dioxide to be the main engine of atmospheric warming even though water vapor is a more plentiful greenhouse gas?

4. Carbon dioxide: Why have the levels increased? How much have they increased in last 275 years?

5. Methane: Why have levels increased? How much has it increased? Amount it warms (compared to CO2)?

6. N2O: Why have levels increased? How much has it increased? Amount it warms (compared to CO2)?

*Factors that Amplify or Dampen Changes in Earth’s Temperature*

1. What has happened to energy output of the sun? How do they know?

2. How do ocean impact CO2 levels? What has happened to surface ocean temperatures?

3. Explain how clouds could both warm or cool the atmosphere.

4. Explain how aerosols could both warm or cool the atmosphere.

**Section 19-3**

*Consequences of Rapid Atmospheric Warming*

1. Atmospheric temperatures have fluctuated in the past. What makes the current trends problematic?

2. What is meant by a climate change tipping point? What two tipping elements are mentioned in the book?

3. Melting Ice & Snow: Why does the sea ice melt? How is this an example of a positive feedback loop?

 What are some of the consequences of less sea ice – both positive & negative?

 What are the consequences of melting mountain glaciers?

4. Thawing Permafrost: How would thawing permafrost contribute to climate change?

5. Rising Sea Levels: How much do they estimate that sea levels will rise by the end of the century?

 What 2 things would make the sea level rise?

 What would be the effects of rising sea level?

6. Ocean Acidification: What is causing the acidification? What 2 problems will it cause?

7. Severe Drought: How does increased severity of droughts cause a positive feedback loop?

8. Extreme Weather More Likely: How else will weather patterns be impacted by atmospheric warming?

9. Biodiversity: Describe several ways that atmospheric warming would impact biodiversity.

10. Decline in Food Production: Why is food production likely to decline?

11. Human Health: How is human health threatened by atmospheric warming?

12. Read the science focus on p. 526. Answer the critical thinking question at the end.

**Section 19-4**

*Dealing with Climate Disruption is Difficult*

1. Discuss some reasons why this complex problem is difficult to tackle.

2. List and explain the two basic approaches to dealing with global climate change.

*Methods to Slow Projected Climate Change*

3. Controlling/Preventing Greenhouse Gas Emissions: List some ways this can be done.

4. Cleaning Up Greenhouse Gas Emissions: What is meant by the term “sequestering”?

 List some ways that carbon could be sequestered.

5. Geoengineering Schemes: Use figure 19-23 and the information on p. 529-531 to list some of the various

 proposed solutions. What are some problems with these solutions?

6. Read the science focus on p. 530. What is CCS? What are some of the problems associated with it?

7. Regulate Greenhouse Gas Emissions: Do you think that CO2 and other greenhouse gas emissions should

be regulated under the Clean Air Act? Why or why not?

8. Put a Price on Carbon Emissions: What is the goal of putting a price on carbon emitters?

9. Governments: What can governments do to reduce carbon emissions?

10. Summarize how cities, companies, and colleges are reducing their carbon footprints.

11. How can individuals reduce their carbon footprints?

**Section 19-5**

*Adapting to Climate Change*

1. What are some strategies that countries or cities are using to adapt to the consequences of climate change?

2. What is meant by a “no-regrets strategy”? What are the advantages to this type of strategy?