**(AP) ENVIRONMENTAL SCIENCE 2022-23 April 5, 2023**

**Today’s Agenda (Day 139)**

1. Housekeeping Items

🡪 BRING:

1. Homework Check:

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1. Class Activity:

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🡪 DAY 3: Chapter 17 PPT Review

1. **Section 17.4 – Sources and impacts of principal greenhouse gases**
2. **Section 17.5 – The current state of knowledge about climate change**
3. **Section 17.6 – Consequences of climate change**
4. Section 17.7 – Addressing climate change

HOMEWORK:

* READ: Chapter 16 – Air Quality Issues
* READ: Chapter 17 – Climate Change
* COMPLETE:
* **STUDY**: Ch 16 & 17 Test

REMINDER**~~:~~**

* **TEST: Ch 16 & 17 🡪 April 6**
* **TEST: Ch 18 🡪 April 13**
* QUIZ: Ch 17 - 19 Vocabulary 🡪April 11
* **TEST: Ch 19 🡪 April 18**

Chapter 16 Vocabulary

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| --- | --- | --- | --- | --- | --- |
| Acid deposition | Acid rain | Carbon monoxide | Criteria air pollutants | Decibels | Hazardous air pollutants (air toxics) |
| Hydrocarbons | Nitrogen dioxide | Nitrogen monoxide | Nitrogen oxides | Ozone | Particulate matter |
| Photochemical smog | Primary air pollutants | Radon | Secondary air pollutants | Sulfur dioxide | Thermal inversion |
| Volatile organic compounds (VOCs) |  |  |  |  |  |

Chapter 17 Vocabulary

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| --- | --- | --- | --- | --- | --- |
| Carbon dioxide | Chlorofluorocarbons (CFCs) | Greenhouse effect | Greenhouse gases | Methane | Nitrous oxide |

Chapter 18 Vocabulary

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| --- | --- | --- | --- | --- | --- |
| Agricultural waste | Compost | Composting | Incineration | Industrial solid waste | Mass burn |
| Mining waste | Municipal solid waste (MSW) | Municipal solid waste landfill | Recycling | Solid waste | Source reduction |

Chapter 19 Vocabulary

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| ASTM International Phase I Environmental Site Assessment Standard E-1527 | chronic toxicity | Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) | Corrosiveness | Emergency Planning and Community Right-to-Know Act (EPCRA) | hazardous substances/materials |
| hazardous wastes | Ignitability | Incineration | International Organization for Standardization (ISO) | National Priorities List | nonpersistent pollutant |
| nuclear fuel cycle | persistent pollutants | pollution prevention (P2)/waste minimization | pollution-prevention hierarchy | Reactivity | Resource Conservation and Recovery Act (RCRA) |
| Superfund | Synergism | threshold level | Toxic | Toxicity |  |

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**CHAPTER 16**

**Review Questions**

1. Name the two primary gases in the atmosphere.

2. Describe two ways the gases in the troposphere differ from those in the stratosphere.

3. Describe two ways the atmosphere can get rid of pollutants.

4. List the five primary air pollutants commonly released into the atmosphere and their sources.

5. List the six criteria air pollutants, their sources, and their effects.

6. Define secondary air pollutants and give an example.

7. How is each of the following involved in the production of photochemical smog: volatile organic compounds, nitrogen oxides, thermal inversions, sunlight, automobiles, and ozone?

8. Why do some cities have greater problems with smog than others?

9. Describe three regulatory actions of the EPA that have significantly improved air quality and why they improved air quality.

10. What molecules produce acid rain and how are they produced?

11. What are the primary effects of acid rain on terrestrial and aquatic ecosystems?

12. Why is stratospheric ozone important?

13. What was done to protect stratospheric ozone?

14. What are the National Ambient Air Quality Standards?

15. Give an example of a hazardous air pollutant.

16. Explain why air pollution problems in economically developing countries are different from those in developed countries.

17. How does radon enter a home?

18. Why do buildings often have poor air quality?

19. Define noise.

**Critical Thinking Questions**

1. Why do you think air pollution is so much worse in developing countries than in developed countries? What should developed countries do about this, if anything?

2. What common indoor air pollutants are you exposed to? What can you do to limit this exposure?

3. Is it possible to have zero emissions of pollutants? What level of risk are you willing to live with?

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**CHAPTER 17**

**Review Questions**

1. Why are geologic studies important to the understanding of climate change?

2. How does each of the following help us understand climate change?

a. studies of the flowering times of plants

b. measurements of the pH of the ocean

c. satellite photos of the amount of snow in an area

d. sea level measurements

e. gas bubbles trapped in glaciers

f. migration patterns of birds

3. What are the primary greenhouse gases and how do human activities affect their concentrations?

4. How do greenhouse gases cause a warming of the Earth

5. List five changes that are likely to occur to Earth and its ecosystems as a result of global warming.

6. List three actions humans could take to reduce the release of additional greenhouse gases.

7. Describe how increased carbon dioxide in the atmosphere will alter the oceans.

8. How will climate change affect human health?

9. How effective have human efforts been at controlling carbon dioxide release?

10. List five changes likely to occur to the hydrologic cycle as a result of a warmer climate.

11. Why does a warming climate cause sea level to rise?

**Critical Thinking Questions**

1. Some developing countries argue that they should be exempt from limits on the production of greenhouse gases and that developed countries should bear the brunt of the changes that appear to be necessary to curb global climate change. What values, beliefs, and perspectives underlie this argument? What do you think about this argument?

2. China and the United States are the top two countries in terms of greenhouse gas releases. Why is this true? What could be done to change this situation?

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**CHAPTER 18**

**Review Questions**

1. How is lifestyle related to the quantity of municipal solid waste generated?

2. What conditions favor incineration over landfills?

3. Describe some of the problems associated with modern landfills.

4. What are four concerns associated with incineration?

5. Describe examples of source reduction.

6. Describe the importance of recycling household solid wastes.

7. Name several strategies that would help to encourage the growth of recycling.

8. Describe the various types of composting and the role of composting in solid waste management.

9. Describe why electronic waste is becoming a major problem.

10. Why is food waste a growing concern? Describe how some communities are addressing the food waste issue.

11. How is landfill gas turned into electricity?

**Critical Thinking Questions**

1. How can you help solve the solid waste problem?

2. Given that you have only so much time, should you spend your time acting locally, as a recycling coordinator, for example, or advocating for larger political and economic changes at the national level, changes that would solve the waste problems? Why? Or should you do nothing? Why?

3. How does your school or city deal with solid waste? Can solid waste production be limited at your institution or city? How? What barriers exist that might make it difficult to limit solid waste production?

4. It is possible to have a high standard of living, as in North America and Western Europe, and not produce large amounts of solid waste. How?

5. Incineration of solid waste is controversial. Do you support solid waste incineration in general? Would you support an incineration facility in your neighborhood?

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**CHAPTER 19**

**Review Questions**

1. List five different categories of hazardous materials.

2. What is a characteristic hazardous waste?

3. In addition to characteristic hazardous waste, how does the U.S. Environmental Protection Agency define a hazardous waste?

4. Distinguish between acute and chronic toxicity.

5. Give an example of synergism.

6. Give an example of a persistent pollutant and a nonpersistent pollutant.

7. What is a threshold level of exposure to a hazardous material and how is it determined?

8. List the three routes of entry of a hazardous material into the body.

9. List three ways hazardous wastes enter the environment to become a problem.

10. List three requirements of the Resource Conservation and Recovery Act (RCRA).

11. What are the goals of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)?

12. Why is CERCLA often known as Superfund?

13. Describe what is meant by the U.S. National Priorities List.

14. What are the goals of the Small Business Liability Relief and Brownfields Revitalization Act (SBLRBRA)?

15. List the three kinds of industries most responsible for the release of toxic materials to the environment.

16. Describe the pollution-prevention hierarchy.

17. Give three examples of how hazardous waste can be reduced at its source.

18. Give three examples of how hazardous waste can be recycled.

19. Describe five technologies for treating hazardous wastes.

20. List the two common technologies used to dispose of hazardous waste.

21. Why was the Basel Convention of the United Nations established?

22. What are the primary sources of nuclear waste?

23. What is transuranic waste and how is it disposed of?

24. What is high-level radioactive waste and how is it currently being controlled?

25. Give examples of low-level radioactive waste.

**Critical Thinking Questions**

1. Scientists at the EPA have to make decisions about thresholds in order to identify which materials are toxic. What thresholds would you establish for various toxic materials? What is your reasoning for establishing the limits you do? What, if any, type of testing might you conduct to arrive at these thresholds?

2. Look at this chapter’s section 19.6, “Hazardous-Waste Dumps—The Regulatory Response.” Do the authors present the information from a particular point of view? What other points of view might there be on this issue? What information do you think these other viewpoints would provide?

3. Many economically deprived areas, Native American reservations, and developing countries that need an influx of cash have agreed, over significant local opposition, to site hazardous-waste facilities in their areas. What do you think about this practice? Should outsiders have a say in what happens within these sovereign territories?

4. The disposal of radioactive wastes is a big problem for the nuclear energy industry. What are some of the things that need to be evaluated when considering nuclear waste disposal? What criteria would you use to judge whether a storage proposal is adequate or not?

5. Review the Issues & Analysis dealing with dioxins. How might the area be cleaned up? Who should be responsible for conducting the cleanup? To what levels would you suggest the area be remediated? Should the river water and sediments be treated as well? Should the residents in the area be consulted, and should they be compensated and given medical treatment options? Consider the plant and animal life in the floodplain—what, if anything, should be done about that?

6. Nuclear weapons testing had released nuclear radiation into the environment. These tests have always been justified as necessary for national security. Do you agree or not? What are the risks? What are the benefits?