Name PD: DUE: \_\_\_\_\_\_\_\_\_\_\_\_\_ **ES9 Unit 9: Sustainability & Natural Resources**

**Essential Standards:**

2.2.1 Explain the consequences of human activities on the lithosphere.

2.2.2 Compare the various methods humans use to acquire traditional energy resources.

2.6.4 Attribute changes to Earth’s systems to global climate change.

2.8.1 Evaluate alternative energy technologies for use in North Carolina.

2.8.2 Critique conventional and sustainable agriculture and aquaculture practices.

2.8.3 Explain the effects of uncontrolled population growth on Earth’s resources.

2.8.4 Evaluate the concept of ‘Reduce, Reuse, Recycle’ in terms of impact on natural resources.

**Unit Reading Material:**

* + - * Hardcopy Textbook: Ch. 4
      * Digital Textbook: Ch. 5.26-5.30, 8.9-8.31
      * Class notes and handouts

**Students Will Be Able To:**

* Explain the need for and consequences of various types of land use; urbanization, deforestation and agriculture
* Explain ways to mitigate detrimental human impacts on the lithosphere and maximize sustainability
* Compare methods of fossil fuel harvesting, mining, drilling and the effect of the activities on the environment
* Critique the benefits, costs and environmental impact of various alternative sources of energy
* Evaluate which sources of alternative energy may work best in different parts of the state and why
* Examine alternative resources regionally, nationally and globally
* Critique the advantages and disadvantages of traditional agriculture and aquaculture techniques
* Judge potential impact of sustainable techniques on environmental quality
* Summarize the impacts of a growing population on the natural resources of North Carolina
* Evaluate availability of natural resources and environmental footprints on various scales

**Vocabulary—Define, know, and be able to apply the following terms:**

1. Ecological Footprint
2. Fossil fuel
3. Sustainability
4. Deforestation
5. Urbanization
6. Ore
7. Overgrazing
8. Aquaculture
9. Overharvesting

**Study Guide—Answer, know, and understand the following concepts:**

1. Compare renewable and nonrenewable natural resources including rates of use vs. replenishment and examples.
2. Identify both benefits and consequences of using fossil fuels.
3. Identify which energy source(s) (oil, coal, natural gas, nuclear, geothermal, hydroelectric, biofuels, solar, tidal, and/or wind) is described by each of the statements below:
   1. Least expensive overall
   2. Most polluting
   3. Has NO carbon emissions
   4. Only useful near coastlines
   5. Used for heating
   6. Used for transportation
   7. Least polluting fossil fuel
   8. Renewable
   9. Nonrenewable
   10. Causes noise pollution
   11. Used to produce electricity
   12. Waste can be used in weapons
   13. Causes increase in food prices
   14. Requires major changes to ecosystem
   15. Most usable sites are already in use
   16. Movement of water to spin turbines
   17. Uses harvested plant materials as a source of fuel
   18. Produces waste that lasts for thousands of years
   19. Most expensive per unit of energy obtained
   20. Cannot produce energy all day/every day
4. Identify 3 alternative energy sources that may be useful in North Carolina, AND explain why you chose each one.
5. Make a table for topic listed below that includes: **benefits**, **consequences**, & **ways to increase sustainability**.
6. Urbanization
7. Deforestation
8. Aquaculture
9. Agriculture
10. Describe the process of
11. Nuclear fission
12. Heat island formation
13. Aquaponics
14. Identify 3 impacts on the environment from each of the following:
    1. Open pit mining
    2. Mountaintop removal
    3. Mine Shafts
    4. Strip Mining
    5. Oil Drilling
15. Identify which type of mining is most dangerous to people and why.
16. Explain the effects on the environment from each of following:
    1. Clear-cutting
    2. Selective cutting (in general—not specific to each type)
17. Describe each of the following AND give an example:
18. Conservation
19. Mitigation
20. Restoration
21. Preservation
22. Reduce
23. Reuse
24. Recycle
25. Explain how a growing human population impacts natural resources based on
26. Loss of habitat
27. Pollution
28. Overharvesting

**Supplemental--Do practice the following activities as you work through the unit:**

1. Create a chart to organize your information on all of the different energy generation methods
2. Calculate / reflect on your personal ecological footprint.

**Unit 9—Natural Resources—Calendar**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|  |  |  | 12/11 | 12/12 | 12/13 | 12/14 |
|  |  |  | Natural Resources  Ecological Footprints | Mining  Energy Resources | Urbanization  Energy Resources |  |
| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
| 12/15 | 12/16 | 12/17 | 12/18 | 12/19 | 12/20 | 12/21 |
|  | Deforestation & Sustainability  Formal Lab | Habitat Loss & Conservation | Agriculture  Aquaculture | **Unit 9 Sheet Due**  Review | **Unit 9 TEST**  FINISH FORMAL LAB |  |
| Winter Break 12/21-1/5 | | | | | | |
| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
| 1/5 | 1/6 | 1/7 | 1/8 |  |  |  |
|  |  |  | **FORMAL LAB REPORT DUE TO TURNITIN.COM** |  |  |  |

**Unit 9 TEST Analysis**

1. My test grade was \_\_\_\_\_\_\_\_\_%.
2. I am \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ with this grade because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. I studied all/most/some/a few/no days this unit (circle one).
4. I studied by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
5. I asked for help at \_\_\_\_ SMART lunches.
6. I missed the following questions:

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| Question # | Question Topic | Study Guide #/Notes | I missed this question because . . . |
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**Unit 9—Sustainability & Natural Resources—Outline**

**Day 1—**Natural Resources

**Day 2—**Mining & Energy Sources

**Day 3—**Energy Sources

**Day 4—**Deforestation & Urbanization

**Day 5—**Habitat Loss/Conservation

**Day 6—**Agriculture & Aquaculture

**Day 7—Unit 9 Sheet Due;** Review

**Day 8—Unit 9 TEST; Work on Formal Lab Report**

**Unit 9 TEST Analysis**

1. My test grade was \_\_\_\_\_\_\_\_\_%.
2. I am \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ with this grade because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. I studied all/most/some/a few/no days this unit (circle one).
4. I studied by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
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