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

**Today’s Agenda (Day 81)**

1. Housekeeping Items

🡪 BRING: cabbage x 2 heads; cupcakes (or other cream-filled center cake); molasses; corn syrup, condensed milk; honey; artificial sweetener

1. Homework Check:

🡪

1. Class Activity:

🡪 Day 3: Science Fair

 \*Update template – Complete and get approval

\*Begin literature review – Make a list of topic headings and subheadings that will help you and the reader to know what your project and experimental design/prototype is about.

\*Begin and provide the "Reference" Page that cites the prospective resources/websites you will/may be using to learn about your topic and to create your literature review.

🡪 **BEGIN: Lab - Yeast and Fermentation - see p. 2 of document**

🡪BEGIN: Chapter 10 PPT Review

1. **Section 10.1 – The status of renewable energy**
2. Section 9.10.2 – Major kinds of renewable energy
3. Section 10.3 – Energy Conservation

HOMEWORK:

* READ: Chapter 10 – Renewable Energy Sources
* COMPLETE: Chapter 10 Vocabulary & Reading Guide
* **STUDY**: Chapter 10 Vocabulary Quiz & Test

Chapter 10 Vocabulary

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Active solar system | Anaerobic Bioreactor | Anaerobic digestion | Biofuels | Biomass | Clerestory |
| Crop residues | Daylighting | Desertification | Fuelwood | Gasification | Geothermal energy |
| Methane Digester | Passive solar system | Photovoltaics | Pyrolysis | Renewable energy | Solar power tower |
| Sunspace | Tidal Power | Trombe wall |  |  |  |

REMINDER

* Chapter 10 Vocabulary **-** Jan. 8
* Chapter 10 Reading Guide – Jan. 10
* **QUIZ:** Ch 10 Vocabulary **🡪 Tues., Jan. 10**
* **TEST: Ch 10🡪 Thursday, Jan. 12**

**(AP) ENVIRONMENTAL SCIENCE 2022-23 LAB**

 LAB: Yeast Fermentation

Use the following lab to compare fermentation of various ingredients.

Choose two of the sugars as your independent variables. Compare with your control of NO sugar.

 Corn syrup

 Molasses

 Honey

 Condensed Milk

 Splenda

**HYPOTHESIS**: Which ingredient do you think will produce the most CO2? And why?

**PROCEDURES:**

For this experiment use the temperature that the instructor has prepared.

1. Record the Temperature: Beginning \_\_\_\_\_ °C Ending \_\_\_\_\_ °C
2. Observe height of foam formed/size of balloon, as per time period.

|  |  |  |  |
| --- | --- | --- | --- |
| **Time** | **Sugar 1** | **Sugar 2** | **Control (no sugar)** |
| **5 minutes** |  |  |  |
| **10 minutes** |  |  |  |
| **15 minutes**  |  |  |  |
| **20 minutes** |  |  |  |

**POST-LAB QUESTIONS:**

1. Are the results what you expected?
2. Do you think an increase in temperature would have increased CO2 production? Why?
3. What other ingredients could you use?
4. Design another experiment you could run. Choose a different factor of growth to observe.
5. Graph the CO2 production from the classes’ experiments. (Use time as x-axis and y-axis as CO2 production in mL.)



**(AP) ENVIRONMENTAL SCIENCE 2022-23 READING GUIDECHAPTER 10**

REVIEW QUESTIONS

1. What are the general characteristics of renewable energy sources?

2. What percent of world energy comes from renewable energy sources?

3. What renewable energy source provides the majority of renewable energy?

4. List industries that typically make use of the waste they produce to provide themselves with energy.

5. Why is burning of municipal waste to produce energy more common in Europe than in North America?

6. How is the biofuel ethanol produced?

7. List three negative environmental impacts of using biomass to provide energy.

8. What are negative environmental impacts of developing hydroelectric power?

9. Compare a passive solar heating system with an active solar heating system.

10. Describe two different ways sunlight is used to make electricity.

11. List two reasons people oppose additional wind energy development.

12. List three energy conservation techniques.

CRITICAL THINKING QUESTIONS [for APES students only]

1. Imagine you are an official with the Department of Energy and are in the budgeting process for alternative energy research. Decide where you would invest money and explain why you made your choice. What do you think the political repercussions of your decision would be? Why?

2. Do you believe that large dam projects like the Three Gorges Dam project in China are, on the whole, beneficial? Do you believe they are not beneficial? What alternatives would you recommend? Why?

3. Energy conservation is one way to decrease dependence on fossil fuels. What are some things you can do at home, work, or school that would reduce fossil-fuel use and save money?

4. What alternative energy resources that the text has outlined are most useful in your area? How might these be implemented?