**BIOLOGY 2022-23 September 19, 2022**

**Today’s Agenda (Day 23)**

1. HOUSEKEEPING ITEMS

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1. Homework Check:

🡪 Chapter 4 Vocabulary

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1. Class Activity:

🡪OBSERVATION: Design your own Biome – Day 11

🡪DAY 1: Chapter 4 PPT Review

1. **Section 4.1 – Population Dynamics**
2. Section 4.2 – Human Population

HOMEWORK:

* READ: Chapter 4 – Population Ecology
* COMPLETE: Chapter 4 Vocabulary [abridged template]
* STUDY: Ch 3 & 4 Vocabulary, Chapter 4 Test

CHAPTER 3

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Abyssal zone | Aphotic zone | Benthic zone | Boreal forest | Climate | Climax community |
| Community | Desert  | ecological succession | Estuary | Grassland | Intertidal zone |
| Limiting factor | Limnetic zone | Littoral zone | Photic zone | Plankton | Primary succession |
| Profundal zone | Secondary succession | Sediment | Temperate forest | Tolerance | Tropical rain forest |
| Tropical savanna | Tropical seasonal forest | Tundra | Weather | Wetlands | woodland |

CHAPTER 4 – Population Ecology

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| --- | --- | --- | --- | --- | --- |
| Age structure | Carrying capacity | Demographic transition | Demography | Density-dependent factor | Density-independent factor |
| Dispersion | Emigration | Immigration | Population growth rate | Population density | Zero population growth |

REMINDERS:

* QUIZ: Chapter 3 and 4 Vocabulary **🡪Sept. 20**
* Chapter 4 Reading Guide Questions – Sept. 22
* LAB: Design your own Biome [final] – Sept. 23
* **TEST: Ch 4 🡪 ~~Sept. 22~~ Sept. 27**

**BIOLOGY 2022-23 READING GUIDE**

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| --- | --- |
| **Chapter 4 Population Ecology Reading Guide**

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| Review pages 92 – 105 in the Glencoe Science *Biology*Textbookand answer the following questions.1. Describe how **population density** and **dispersion** are related.
2. What is **uniform dispersion**.  Give an example of an organism that is found in this pattern.
3. What is **clumped dispersion**.  Give an example of an organism that is found in this pattern.
4. What is **random dispersion**.  Give an example of an organism that is found in this pattern.
5. What can limit the population range of a species (describe at least two factors).
6. What is a **limiting factor**?
7. How are **density independent factors** and **density dependent factors** different.
8. Give two examples of density independent factors and density dependent factors.
9. What can be concluded about the relationships between wolves and moose, based on this graph?

Chart, line chart, histogram  Description automatically generated1. Why does the moose population rise when the wolf population is low, and sink when the wolf population rises?
2. Compare and contrast **emigration** and **immigration**.
3. Why don’t mice in the wild reproduce at the rate shown in the graph below?

Chart  Description automatically generated1. Why is the type of growth shown in the graph above?  What would cause this graph to level off?
2. When does a population exhibit **logistic growth**?
3. What is **carrying capacity**?  How does this cause population size to stabilize?
4. Compare and contrast ***r*-strategist** and ***k*-strategist** reproductive patterns.
5. What kind of population growth is shown in humans between 1000 AD and the present?

Table  Description automatically generated with medium confidence1. What does the graph below indicate?

Chart, line chart  Description automatically generated1. Compare the population growth rate in the following countries:

A - BrazilB - GermanyC - KenyaD - United States 1. What types of populations (think age structure not organism type) have a greater potential for rapid growth.

Use the diagram below and describe each of the countries in terms of age structure and in terms of potential for growth.  (You don’t have to draw this, just use a, b, c to distinguish)                                 **A                                                      B                                            C** |

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**BIOLOGY 2022-23 LAB ACTIVITY**

*DESIGN YOUR OWN*  How Does Your Biome Grow

The environmental factors that affect the growth of an organism can be grouped into two categories—biotic and abiotic. Biotic factors are living organisms in the environment. Abiotic factors include naturally occurring substances in the soil, such as chemicals and nutrients, as well as water, sunlight, and temperature. In this lab, you will create a model biome and study the effects of abiotic factors on germinating plants.

Problem

What impact do abiotic factors have on biomes?

Objectives

• Form a hypothesis about the impact of abiotic factors on a biome.

• Design an experiment to test your hypothesis.

• Identify a control to the experiment.

• Make a model of a biome.

• Create a data table.

• Draw conclusions.

Safety Precautions 

Wash your hands thoroughly with soap and water after handling the soil.

Possible Materials

bicarbonate of soda tablets

clear plastic bottles (2-L soda bottles)

clear plastic wrap

colored gels or mylar

electric fan

flower seeds

grass seeds

lima bean seeds

index cards

lamps

masking tape

sterile potting soil

alternative soil types (sand, clay, loam)

scissors

small rocks

small beaker or test tubes

tape

water

Hypothesis

Use what you know about ecosystems and ecology to write a hypothesis indicating the effect of an abiotic factor of your choice on the germination of plants in a model biome.

Plan the Experiment

1. Read and complete the lab safety form.

2. Choose which biome you wish to simulate. Be sure that your biome is indicated in your hypothesis.

3. Decide on a procedure to use to test the impact of an abiotic factor on your simulated biome.

4. Identify the independent variable, dependent variable, constants, and control group.

5. Describe how you will measure and record your data.

Check the Plan

1. Make sure your teacher has approved your experimental plan before you proceed.

2. Be sure that a control group is included in your experiment and that the experimental group varies in only one way.

3. Observe and record the impact of abiotic factors on the biotic components of your simulated biome. Be sure to make sketches each day of your biome and the changes you observe. Be detailed in your drawings. Provide quantitative observations (using measurements).

4. When you have completed the experiment, ask your teacher whether you should continue to make long-term observations or dispose of the organisms as he or she directs.

Record the Plan

In the space below, write your experimental procedure and make a sketch of your experimental design.

Data and Observations

1. Use the space below to create a data table of your findings.

Analyze and Conclude

1. On which abiotic factor did you focus? Why?

2. Did this abiotic factor seem to have a significant impact on the dependent variable in your simulated ecosystem? Explain.

3. Describe the control in your experiment. What was held constant in the control? Why was it set up that way?

4. How does your experiment relate to biomes and abiotic factors in nature?

5. Error Analysis What are some possible sources of error in your experiment?

6. Exchange your procedure and data with another group in your class. What do their data show about the biome they chose to simulate? What conclusions can you draw about the abiotic factors in a biome?

7. What are the limitations of the design of this experiment? Are there additional factors at work?

Write and Discuss

Write a short paragraph describing your findings and indicating whether or not they support your hypothesis. Discuss any questions your results have raised.

Inquiry Extensions

1. Describe the rainfall pattern and abiotic factors that make up the biome you live in. How do these factors impact the plants, animals, and agriculture in your area?

2. If you were to maintain your biomes in the classroom or at home, what abiotic factors would you change from your original model? Make a prediction about what you would observe under the new conditions