

AP BIOLOGY



EXAM DAY

Units

	Units
8-11%	1. Chemistry of Life
10-13%	2. Cells
12-16%	3. Cellular Energetics
10-15%	4. Cell Communication/Cell Cycle
8-11%	5. Heredity
12-16%	6. Gene Expression and Regulation
13-20%	7. Natural Selection
10-15%	8. Ecology

Science Practices



- 1 Concept Explanation 25-33%
- 2 Visual Representation 16-24%
- 3 Questions and Methods 8-14%
- 4 Representing and Describing Data 8-14%
- 5 Statistical Test/Data Analysis 8-14%
- 6 Argumentation 20-26%

Exam Format

60 MULTIPLE CHOICE QUESTIONS 90 MINUTES



50 %

6 FREE RESPONSE QUESTIONS 90 MINUTES

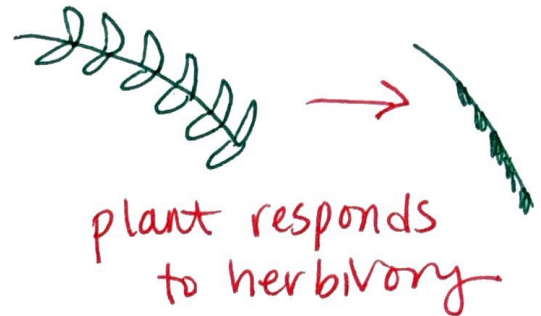
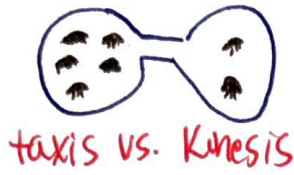
50 %

FRQ TOPICS:

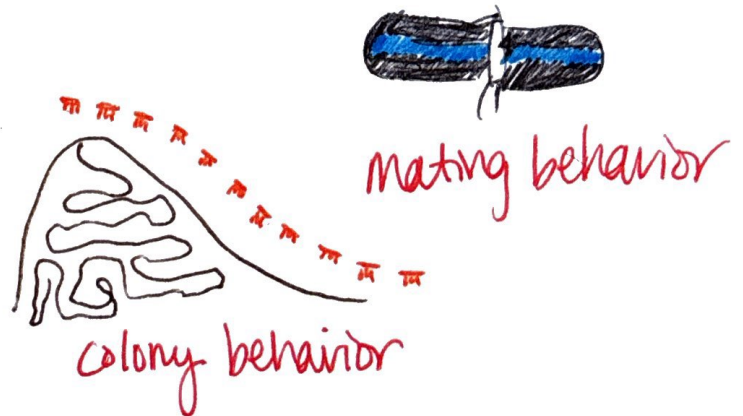
- 1- Interpret/Evaluate Experimental Results
- 2- same as #1 includes graphing
- 3- Scientific Investigation
- 4- Conceptual Analysis
- 5- Analyze Model or Visual Representation
- 6- Analyze Data

8.1 Responses to the Environment - 8.1

L.O. Explain how the behavioral and physiological response of an organism is related to changes in internal or external environment.



L.O. Explain how the behavioral responses of organisms affect their overall fitness and may contribute to the success of a population.

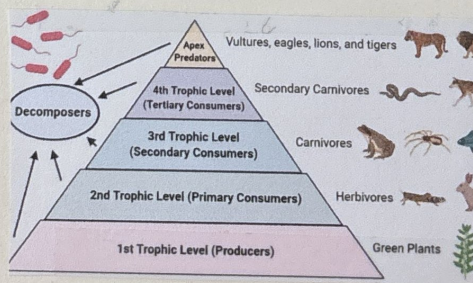
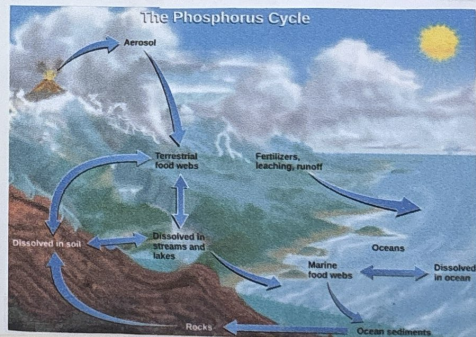
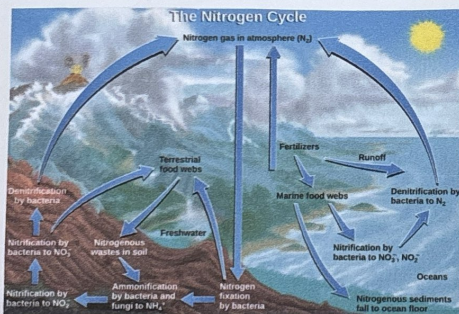
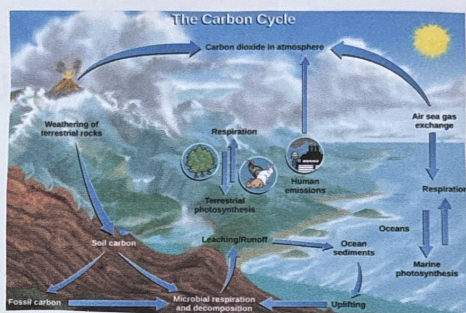


8.2 Energy Flow Through Ecosystems-8.2

L.O. Describe the strategies organisms use to acquire and use energy.



L.O. Explain how energy flows and matter cycles through trophic levels.



8.3 Population Ecology 8.3

L.O. Describe factors that influence growth dynamics of populations.

Population Growth

$$\frac{dN}{dt} = B - D$$

dN = change in population size

dt = change in time

B = birth rate

D = death rate

N = population size

Exponential Growth

$$\frac{dN}{dt} = r_{\max} N$$

dN = change in population size

dt = change in time

$r_{\max}$ = maximum per capita growth rate of population

N = population size



8.4 Effect of Density on Populations 8.4

L.O. Explain how the density of a population affects and is determined by resource availability in the environment.

Logistical Growth

$$\frac{dN}{dt} = r_{\max} N \left(\frac{K - N}{K} \right)$$

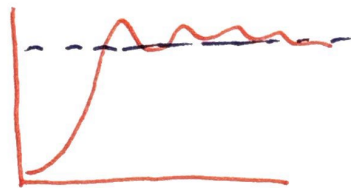
dN = change in population size

dt = change in time

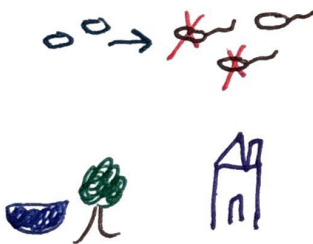
$r_{\max}$ = maximum per capita growth rate of population

N = population size

K = carrying capacity



density-dependent



density-independent



8.5 Community Ecology 8.5

L.O. Describe the structure of a community according to its species composition and diversity.



Simpson's Diversity Index

$$= 1 - \sum \left(\frac{n}{N} \right)^2$$

n = total number of org. of a particular species

N = total number of org. of all species

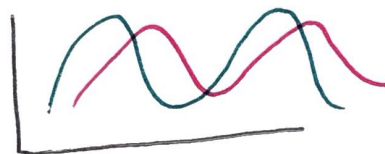
L.O. Explain how interactions within and among populations influence community structure.

competition



niche partitioning

predation



SYMBIOSIS

mutualism

+/+



Commensalism

+ / 0



parasitism

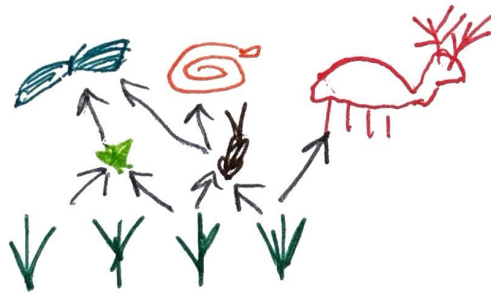
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L.O. Describe the relationship between ecosystem diversity and its resilience to changes in the environment.



L.O. Explain how the addition or removal of any component of an ecosystem will affect its overall short-term and long-term structure.



8.7 Disruptions in Ecosystems — 8.7

L.O. Explain the interaction between the environment and random or preexisting variations in populations.

ATCGGCTAATCG

ATGGGCTATTTCG

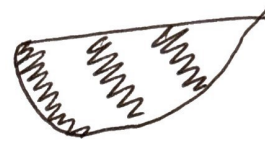


heterozygote advantage

Explain how invasive species affect ecosystem dynamics



Kudzu
natural predators
✓ outcompete
native



Zebra mussel

L.O. Describe human activities that lead to changes in ecosystem structure and dynamics.



fertilizer

logging

fossil fuel burning

Explain how geological and meteorological activity leads to changes in ecosystem structure and dynamics.



Lab 12: Animal Behavior — LAB

Post lab questions:

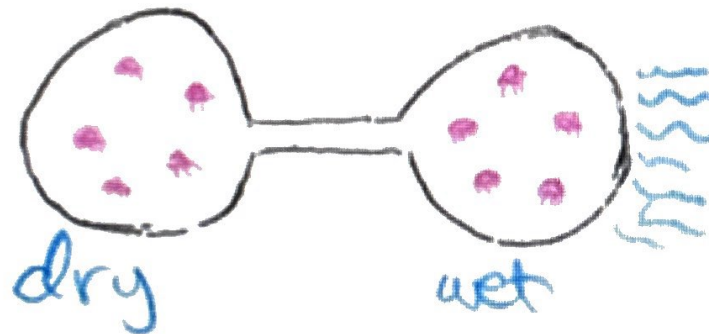
- 1) What concepts from the unit did this lab illustrate?
- 2) Explain what happened in the lab using this unit's vocabulary.
- 3) How did this lab contribute to your learning in this unit?

Lab 12: Animal Behavior

What page
is this?

Experimental Setup:

isopod
@ 10 min



also part B

HCl vs NaOH
light vs. dark
salt vs. sugar

Concepts:

experimental design: IV, DV, controls

color of paper
of bugs
on each
slide

sunlight, temperature,
air quality, etc.

hypothesis: null vs. alternative
animal behavior: innate vs. learned
taxis vs. kinesis

S ← R

S → R

→ H₀: The type of environment will have no effect on pillbug movement.

H_a: The type of environment will affect pillbug movement.