4.1-4.4 IB Ecology Packet!: Due Monday, April 15th!

4.1 Species, communities, and ecosystems

1. Which are characteristics of a species?
   I. The potential to interbreed to produce fertile offspring
   II. The formation of a population with members of the same species
   III. The overproduction of offspring

a) I and II only b) I and III only c) II and III only d) I, II, and III

2. Which of the following lists the organization levels in a correct order, largest to smallest?
   a) Community, Ecosystem, Biome, Species, Population,
   b) Ecosystem, Biome, Population, Species, Community
   c) Biome, Community, Ecosystem, Population Species
   d) Biome, Ecosystem, Community, Population, Species

3. What is a population?
   a) Organisms of the same genus living in an ecosystem
   b) Organisms living together and interacting in the same habitat
   c) Organisms of a species living together in the same area
   d) Organisms that can breed together

4. Matching vocab (autotroph, heterotroph, detritovore, saprotroph (example, description)

Match	*Word*	*Definition*
	AUTOTROPH	A. Organism that must consumer other organisms for food.
	HETEROTROPH	B. Organism that obtains nutrients from decaying organism material by internal digestion.
	DETRITOVORE	C. Organism that produces its own food using inorganic sources.
	SAPROTROPH	D. An organism that obtains nutrients from dead organisms by external digestion.

True or false: Saprotrophs and detritovores are also heterotrophs.

Match	*Word*	*Organism examples*
	AUTOTROPH	A. Fungi, bacteria
	HETEROTROPH	B. Plants
	DETRITOVORE	C. Cow
	SAPROTROPH	D. Clams that eat decaying plant matter.

5. Slime moulds (*Acrasiomycota*) are protoctists. They feed on decaying organic matter, bacteria, and protozoa. Which of the terms describes their nutrition?
   I. Detritovore II. Autotroph III. Heterotroph

A. I only B. I and II only C. I and III only D. I, II, and III

6. If scientists are studying the egrets, herons, marsh crabs, and cordgrass, but not the water or rocks in a salt marsh, what level of organization would they be studying?

a) species b) population c) community d) ecosystem

7. Which of the following cycle through ecosystems (choose all that apply)

a) Energy b) Water c) Carbon d) Nitrogen e) Phosphorus

8. Mesocosm virtual lab

a) Visit this virtual lab: C:\Users\Elizabeth Inman\Downloads\virtual_ecosphere.swf
You will need to open it in Internet Explorer (you can also Google "virtual ecosphere")

Mesocosm Contents (add 200cm^3 each of gravel, soil, and compost plus…)	**How did these factors change over the experiment?**				**Explanation of results**
	CO_2	***O_2***	***Light***	***Biomass***	
Three plants of your choice (no animals)					
Three animals of your choice (no plants)					
Two plants and two animals of your choice					

b) What contents (which might include combinations you did not test above) would create the most stable system that would allow the greatest/longest survival of the system?

_____
_____
_____
_____

9) To have a functioning mesocosm it is important that…

a) Light and oxygen can enter
b) Light is allowed to enter
c) Heat is allowed to leave along with CO_2
d) Nothing is allowed to enter or leave

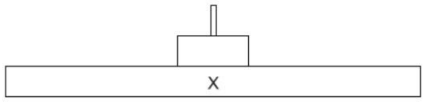
4.2 Energy Flow

1. Most energy for ecosystems comes from the _____. Light energy is converted to _____ energy in carbon compounds (like glucose!) by photosynthesis. Chemical energy in carbon compounds flows through food chains by means of _____. Energy released by _____ is used in living organisms and converted to _____.

2. **True or false**: Living organisms can convert heart to other forms of energy.

3. The diagram represents a pyramid of energy. What level does the letter X represent?

a) Light
b) Primary consumers
c) Abiotic environment
d) Producers



6. Answer questions 1-7 from page 219 of your textbook.

1. _____
_____
_____

2. _____
_____
_____

3. a) _____
_____
b) _____

4.

5.

6. _____
_____
_____
_____

7. _____
_____
_____

4.3 Carbon cycling

1. Complete/fill in the carbon cycle coloring attached to this packet.

2. More carbon is diffusing into the oceans due to increasing atmospheric carbon dioxide levels. Describe two ways this is affecting marine life and explain why increased carbon dioxide levels are causing these changes.

a)

b)

3. Read this article: https://www.llnl.gov/news/research-focus-microbes-peat-moss

a) What is peat?

b) What is peat's role in the carbon cycle?

c) Which two greenhouse gases are primarily released from peatlands?

d) What is the concern about how global warming will affect peatlands?

e) Describe the goal(s) of the research highlighted by the labs mentioned in this article.

4.4 Climate change

14. Global warming myths video with multiple choice questions
Watch the two videos below to gain a basic understanding of global warming and associated myths.
Basics: https://www.youtube.com/watch?v=oJAbATJCugs
Myths: https://www.youtube.com/watch?v=OWXoRSIxyIU&t=22s

Write a brief response to these myths about global warming:

a) Global warming wasn't happening so had to call it climate change.

b) The globe's not warming.

c) In the past, scientists warned of global cooling.

d) The Earth is cooling.

e) Arctic sea ice is increasing.

f) The sun is responsible for any warming.

g) Humans aren't the problem.

h) Water is by far the most potent greenhouse gas.

i) The Earth has warmed and cooled in the past.

j) Global warming is not bad.

15. Complete the table below: (use book and/or internet)

Greenhouse Gas	Source(s)	Type of radiation reabsorbed Short (light) or Long (heat)
Carbon dioxide		
Water vapour		
Methane		
Oxides of nitrogen		

16. Describe what the ozone layer is (what it's function is) and why the statement "Thinning of the ozone layer is causing global warming" is not entirely correct.

17. Go to http://scrippsco2.ucsd.edu/data/atmospheric_co2/primary_mlo_co2_record
Choose two consecutive years (from the Mauna Loa data) to graph the CO_2 level for each month (Jan-Dec). Attach your graph to this packet. On the same sheet where you have your graph, explain why carbon dioxide levels predictably fluctuate (go up and down) throughout the year.