

Ms. Lux's website:

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Date

Period

Biology Fall Final Exam Review

(4) The student knows that cells are the basic structures of all living things with specialized parts that perform specific functions and that viruses are different from cells. The student is expected to:

(A) Compare and contrast prokaryotic and eukaryotic cells;

1. Put a check mark for each type of cell that has the structure listed below:

	All Cells	Prokaryotes	All Eukaryotes	Plants	Animals
Golgi bodies			✓		
Endoplasmic reticulum			✓		
Cell membrane	✓				
Chloroplasts				✓	
Mitochondria			✓		
Ribosomes	✓				
Nucleus			✓		
DNA	✓				
Cell wall				✓	
Cytoplasm	✓				

2. Why are viruses not included on the list of cell types above?

Viruses aren't cells, ~~because~~ and therefore aren't living. They cannot replicate w/o a host.

3. How do we distinguish between prokaryotic cells and eukaryotic cells?

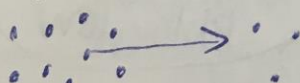
Prokaryotic: simple, older, no nucleus, bacteria, single-celled

Eukaryotic: complex, newer, NUCLEUS, unicellular OR multicellular; animal & plant

(4) The student knows that cells are the basic structures of all living things with specialized parts that perform specific functions and that viruses are different from cells. The student is expected to:

(B) Investigate and explain cellular processes, including homeostasis, energy conversions, transport of molecules, and synthesis of new molecules; and

4. Explain how diffusion works, include the word concentration gradient and the direction particles will move.



Low concentration to high concentration
no ATP required.

5. Fill in the chart below:

Type of Transport	Facilitated diffusion	Osmosis	Active Transport	Endocytosis & Exocytosis
Type of molecules moved	large	H ₂ O	large small/large	large
Is there energy required?	NO	NO	YES	YES
Pathway through cell membrane (type of protein or phospholipids)	membrane protein	NONE	membrane protein	forms vesicle
Does this process go with or against the concentration gradient?	with	with	against	against

6. Explain why solute particles and water molecules will move in opposite directions across cell membranes if a cell is in a hypertonic or hypotonic solution.



H₂O goes out } both go from high to low conc.
solute goes in }

7. Explain the mechanism of endocytosis and exocytosis in your own words. Include a way to help you remember which one brings materials in, and which one takes materials out.

Endo: in

exo: out

8. Explain phagocytosis in your own words.

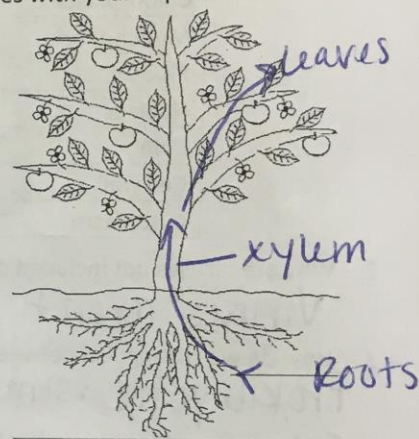
(5) The student knows how an organism grows & the importance of cell differentiation. The student is expected to:

(B) Examine specialized cells, including roots, stems, and leaves of plants; and animal cells such as blood, muscle, and epithelium;

9. Explain how water moves through a plant, and draw arrows in the diagram that agrees with your explanation.

enters through roots,
moves \uparrow up through xylem,
moves to leaves & is used in

PHOTOSYNTHESIS



10. What are the functions of the roots of plants?

- absorb nutrients
- absorb H_2O (water)
- anchor to surface

11. Briefly compare & contrast xylem and phloem

Xylem: \uparrow brings up H_2O (water)

Phloem: \downarrow brings down Glucose ($C_6H_{12}O_6$)

Xy - high
Phlo - low

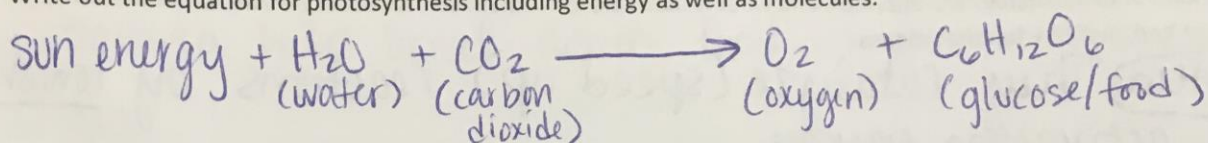
12. What specialized cells in animals help to achieve the following tasks:

- Structural support bone cells
- Movement muscle cells
- Protection from diseases white blood cells
- Nutrient absorption cells in intestine
- Transportation of nutrients throughout the body ^{red} blood cells
- Gas exchange lung cells

(9) Science concepts. The student knows the significance of various molecules involved in metabolic processes and energy conversions that occur in living organisms. The student is expected to:

(B) Compare the reactants and products of photosynthesis and cellular respiration in terms of energy and matter;

13. Write out the equation for photosynthesis including energy as well as molecules.



~~14.~~ Write out the equation for cellular respiration including energy as well as molecules.

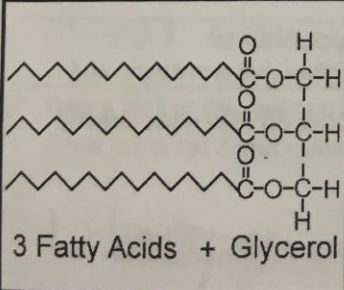
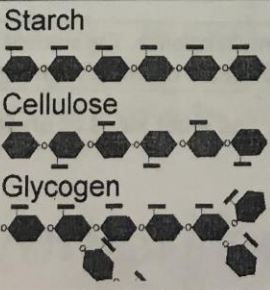
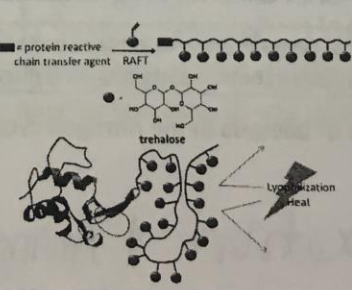
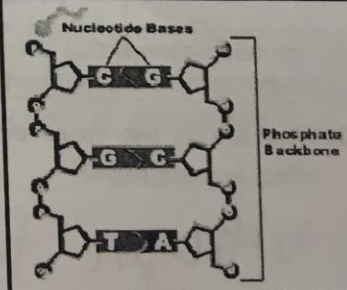
(9) Science concepts. The student knows the significance of various molecules involved in metabolic processes and energy conversions that occur in living organisms. The student is expected to:

(A) compare the structures and functions of different types of biomolecules, including carbohydrates, lipids, proteins, and nucleic acids

15. Label the chart below with information about the four biomolecules.

	Carbohydrates	Lipids	Proteins	Nucleic Acids
Monomer	monosaccharide	glycerol/fatty acid	amino acid	nucleotide
Function	Quick energy! Primary source of energy!	Long-term energy storage	carries out processes in body	carries/stores genetic information
Example	bread, sugar, fruit, cellulose, anything that ends w/ -OSE CHO	Oily, waxy, substances, cell membrane CHO	ENZYMES! muscle, meat, eggs CHON	DNA, RNA, ATP CHONPS

16. Label which image is associated with which of the four biomolecules

 <p>3 Fatty Acids + Glycerol</p>	 <p>Starch Cellulose Glycogen</p>	 <p>protein reactive chain transfer agent trehalose</p>	 <p>Nucleotide Bases Phosphate Backbone</p>
LIPID	CARBOHYDRATE	PROTEIN	NUCLEIC ACID

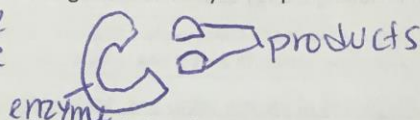
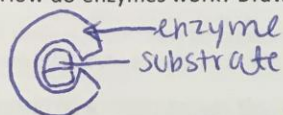
(9) The student knows the significance of various molecules involved in metabolic processes and energy conversions that occur in living organisms. The student is expected to:

(C) identify and investigate the role of enzymes; and

17. What kind of biomolecules are enzymes, and what is their role in biochemical reactions? Be sure to use the word catalyst and explain what that means.

Protein They catalyze (speed up) reactions by lowering the activation energy.

18. How do enzymes work? Draw a diagram to aid in your explanation.

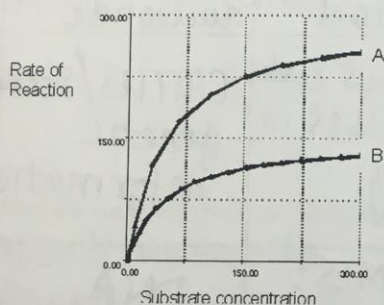


break things up
or put them back
together

19. What kinds of conditions can affect the ability of an enzyme to do its job, and why?

Temperature, concentration, & pH

20. In the graph below, many different enzymes are represented?



21. Using the same graph as the question above, as the substrate concentration increases, what happens to the rate of reaction?

it decreases ↓

22. Explain what biomolecules are (include what they have in common, use the word polymer and what types of things biomolecules are found in)?

polymers made up of smaller subunits called monomers

(11). The student knows that biological systems work to achieve and maintain balance. The student is expected to:

(C) Summarize the role of microorganisms in both maintaining and disrupting the health of both organisms and ecosystems; and

23. What are the two major roles of bacteria in the nitrogen cycle, and what kinds of organisms do they most directly affect in these roles?

Nitrogen fixation & Ammonification in plants!
Nitrogen-fixing bacteria change atmospheric nitrogen into something useable for proteins & nucleic acids

24. How do microorganisms (like bacteria) harm humans, and how do they benefit humans? Do you think this is possible that there are microorganisms that can benefit other types of organisms, too? **ANSWER ALL THREE PARTS.**

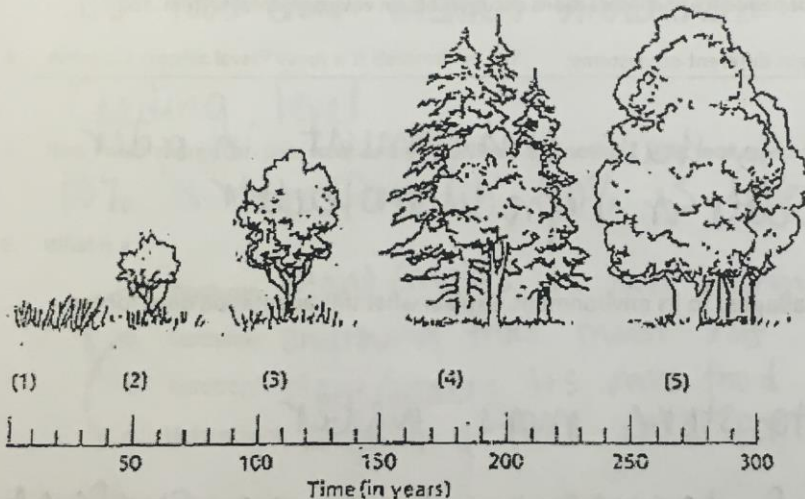
1. bacterial infections like staph, and pneumonia
2. bacteria help break down food in our intestine
3. Yes

(11) Science concepts. The student knows that biological systems work to achieve and maintain balance. The student is expected to: (D) describe how events and processes that occur during ecological succession can change populations and species diversity.

25. Compare and contrast primary and secondary succession.

Primary: everything is wiped out including soil (volcano)
 Secondary: Soil still remains (tsunami, fire, etc.)

26. Look at the image below to answer the following question:



What would you call the organisms marked by the spot marked (1)? Give a brief definition.

Pioneer species: 1st species to colonize an area after a disaster

What would you call the organisms marked by the spot marked (5)? Give a brief definition.

Climax community: populations have increased to the point where the community cannot support itself

27. Take a look at the diagram from the previous question. Roughly how long do you think it takes for primary species to move in? What about climax species?

~~100 years~~ 300 years

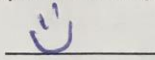
(12) Science concepts. The student knows that interdependence and interactions occur within an environmental system. The student is expected to:

(A) interpret relationships, including predation, parasitism, commensalism, mutualism, and competition among organisms

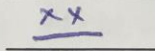
28. Fill in the chart with your desired symbols for:

(this is your key, fill in your symbols here)

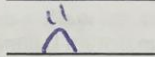
a. Benefited



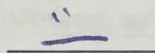
b. Killed



c. Harmed



d. Not affected



=P

=C

M

	Species 1	Species 2
Predation	☺	xx
Parasitism	☺	☹
Commensalism	☺	—
Mutualism	☺	☺
Competition	☹	☹

(12) Science concepts. The student knows that interdependence and interactions occur within an environmental system. The student is expected to:

(B) compare variations and adaptations of organisms in different ecosystems;

29. What is an adaptation?

organisms adapt to their environment in order to survive better or reproduce better

30. Given an example of how a desert cactus is adapted to its environment. Explain what this adaptation does for the cactus' survival

Large vacuoles to store more water

Spines instead of leaves to decrease surface area, which reduces transpiration (loss of water through stoma)

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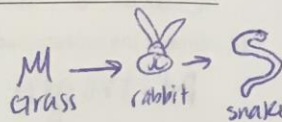
Biology Fall Final Exam Review

(12) The student knows that interdependence and interactions occur within an environmental system. The student is expected to:
(C) analyze the flow of matter and energy through trophic levels using various models, including food chains, food webs, and ecological pyramids;

1. What is a:

a. Food chain:

chain of organism that eat each other



b. Food web:

multiple food chains in an ~~an~~ ecosystem

2. Where does the matter and energy go when an organism is eaten by another?

It's transferred to the next trophic level. (10%) goes up (90%) is lost as heat

3. What happens if an organism's from the food chain died off? What about a food web?

The food chain becomes unbalanced

4. What is a trophic level? What is it determined by?

Feeding level

5. How much energy can pass from one trophic level to another? Hint: look at ecological pyramids.

10% is transferred; 90% is lost as heat

6. What is a:

a. Producer

plant/makes its own energy

b. Consumer

anything that must eat for energy

c. Autotroph

plant/makes its own food

d. Heterotroph

anything that eats for energy

(12) The student knows that interdependence and interactions occur within an environmental system. The student is expected to:
(D) Describe how environmental change can impact ecosystem stability;

7. What are possible consequences of overpopulation of an area by a species?

Eating up all the food, resulting in starvation

8. What are possible consequences of removal of a species of an area?

Overpopulation of whatever their food source is.

9. What are abiotic factors?

non-living (rocks, climate, soil)

10. Put an **A** next to the word that are abiotic, and a **B** next to words that are biotic:Wind **A**Birds **B**Water **A**Fish **B**Heat **A**Bacteria **B**Minerals **A**Trees **B**

11. If a natural disaster occurred, what process will occur afterward? Explain what will happen during this process.

Secondary Succession; grasses would come in first (pioneer species)

12. What do growing trees add to the atmosphere? What can deforestation lead to?

Add O₂ (oxygen) ~~Deforestation~~ Deforestation would mean less O₂ in atmosphere and more CO₂ since trees absorb CO₂
Causes increase in temperature

13. What affect does increasing levels of carbon being released into the air have on atmospheric temperature?

Nitrogen fixation

(10) Science concepts. The student knows that biological systems are composed of multiple levels. The student is expected to:
(A) Describe the interactions that occur among systems that perform the functions of regulation, nutrient absorption, reproduction, and defense from injury or illness in animals;

15. Explain how the body of pregnant woman could affect the health of her unborn fetus.

Everything she puts in her body gets shared with the baby

16. Explain the path of nutrients from food to all the cells in a body. Reference what body systems are in use.

Mouth (digestive, muscular, skeletal) → esophagus (muscular, digestive)
→ intestines (digestive) → into blood stream (circulatory)

17. What does your body do when you exercise, and why?

Sweat to maintain temperature

(10) Science concepts. The student knows that biological systems are composed of multiple levels. The student is expected to:
(B) describe the interactions that occur among systems that perform the functions of transport, reproduction, & response in plants;

18. Transpiration happens when water in the roots is pulled through the plant by loss of water vapor through the stomata of the leaves. What comes up the roots along with the water? What tissue of the plant is in use?

Nutrients & H₂O go up the xylem

19. How do you think transpiration aids the plant in fighting gravity?

Transpiration pushes water up the plant creating enough pressure to stand up

(10) Science concepts. The student knows that biological systems are composed of multiple levels. The student is expected to:
(C) analyze the levels of organization in biological systems and relate the levels to each other and to the whole system.

20. Put the following words in order from smallest to largest: **organ system; tissue; community; organ; cell; organelle; ecosystem;**
biosphere; biome; organism; organ; population

organelle → cell → tissue → organ → organ system → organism → ^{population} community → ecosystem → biome → biosphere

21. What is a tissue?

collection of same cells

22. What makes up an organ?

collection of same tissues

23. What is a population?

24. What is a community?

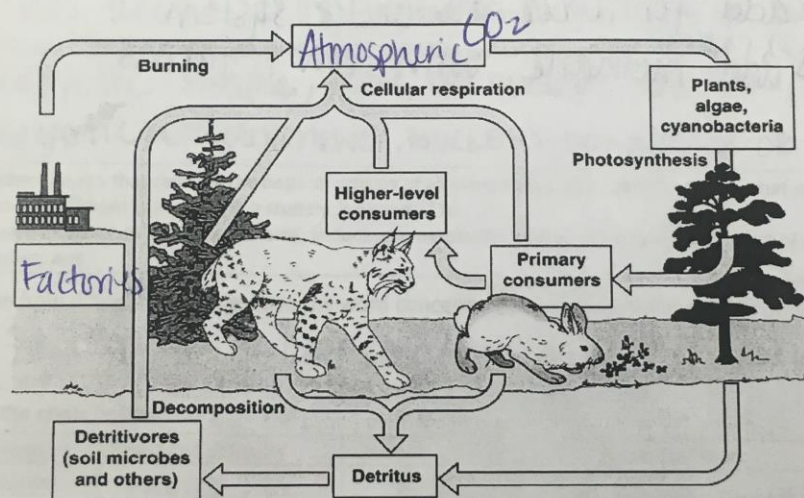
25. What is an ecosystem?

26. What is a biome?

27. What is a biosphere?

(12) The student knows that interdependence and interactions occur within an environmental system. The student is expected to:
(E) describe the flow of matter through the carbon cycle and nitrogen cycles and explain the consequences of disrupting these cycles

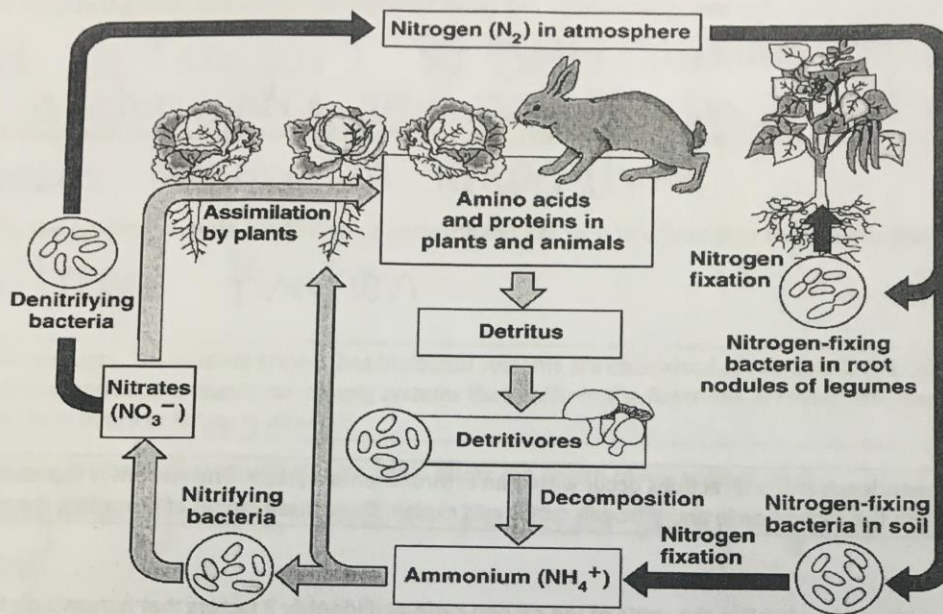
28. Fill the Carbon Cycle chart below. Then Explain the steps of the carbon cycle and identify 3 factors that human's do to increase carbon levels.



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Humans → Deforestation
→ burning of fossil fuels
→ human development

29. Fill in the nitrogen cycle chart below. Explain the role of bacteria in the nitrogen cycle. Identify 2 factors that humans do to increase nitrogen levels



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Humans → add fertilizer to water system
 → add methane with cow farms

