Bio 1-Level Midterm Review Sheet

Name: _____ **Date:** _____

I. Lab Safety: Review the lab safety rules.

Directions: Read the passage below and find examples of rules followed and broken. Do #1-3 on notebook paper.

Tyler and Jessica rushed to Biology class knowing that they would be doing the biggest lab of the year, the unknown organic compound lab.

Tyler was excited to see all the equipment displayed on the lab tables. He hurried over to his table and his backpack accidentally brushed against the lab desk behind him knocking the iodine indicator bottle to the floor.

Working together to clean-up the mess, Tyler picked up the large pieces of broken glass and threw them in the trash can. Jessica ran to the paper towel dispenser and used yards of paper towels to mop up the spilled chemicals and small pieces of broken glass. While she threw them in the trash can, Tyler snuck into the stock room to find another bottle of iodine to replace the broken one.

Jessica noticed that her hand was bleeding from cleaning-up the mess but wanted to wait until the next class period to go to the clinic.

When the teacher arrived in the classroom, she gave instructions to the students; they put on their goggles, and began the lab.

While heating a test tube in a hot water bath, Tyler took off his goggles because he was wearing eye glasses and could see more clearly without them. It seemed to be taking a long time to heat, so he cranked-up the hot plate to the highest setting, #10. It quickly began to heat and vapor was rising from the test tube. He wanted to watch the vapor rise, so he pointed the test tube at his face to get a better view. The liquid began spurting and bubbling from superheating. It splattered onto his face and hands causing him to wince with pain. He managed to keep from crying out and returned to his desk without attracting any attention.

After cooling the contents of the test tube in a test tube rack, the sweet scent rising from it was enticing to Jessica so she picked up the test tube and placed it under her nose drawing a long, deep breath. The smell was overwhelming causing her to cough and gag and lose her grip on the test tube. It crashed to the floor spilling the contents and breaking the glassware,

Tyler called out to the teacher who immediately responded with the proper action.

After the clean-up was completed, Tyler and Jessica finished the lab. They ran out of time, however, so they decided to leave the dirty glassware for the next group to clean.

1. Jessica and Tyler broke several lab safety rules. On notebook paper, list at least **ten** things they did to violate lab safety and **state the correct** procedure for each offense.

2. List at least **three** things they did correctly.

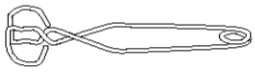
Use lab safety rules to answer questions 1 & 2 on your own.

3. Using your knowledge of proper lab safety, list **four** things the teacher did to properly clean the broken glass and spilled chemicals. Include the names of equipment used to clean the mess.

II. Lab equipment: Label the following pieces of lab equipment. Write the **letter and the name** of the equipment under each diagram. Know the proper use of each item in the word bank.

Word Bank

a. beaker	**d**. Erlenmeyer flask	**g**. inoculating loop	**j**.test tube clamp
b. dissecting probe	**e**. forceps	**h**. scalpel	**k**.Bunsen burner
c. dropping pipette	**f**. graduated cylinder	**i**. test tube	**l**. tongs



1. ***j. Test tube clamp***

6. ***A. beaker***

2. ***c. dropping pipette***

7. **E. forceps**

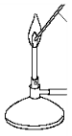
3. ***g. inoculating loop***

8. ***H. scalpel***

4. ***l. tongs***

9. ***F. graduated cylinder***

5. ***D. Erlenmeyer flask***



10. ***K. Bunsen burner***

Directions: Use the information and table below to answer the questions that follow.
Vitamin C Lab: Vitamin C is known to "bleach" an iodine/starch solution. To test different brands of OJ to see which one had the most amount of Vit C, students added 1 mL starch and four drops of iodine to each of 5 test tubes that were labeled A - E. The starch and iodine solution turned dark purple. Each of the first four test tubes, A – D, then had a different brand of orange juice added to it drop-by-drop until there was no shade of purple left in the test tube. The number of drops of orange juice needed to "bleach" the color was recorded in a data table. Test Tube E received water drop-by-drop instead of orange juice.

Table #1: The number of drops of different brands of orange juice needed to bleach an iodine/starch solution.

Brand of Orange Juice	Test Tube A **Kroger**	Test Tube B **Hill Country**	Test Tube C **Schepp's**	Test Tube D **Ocean Spray**	Test Tube E **Water**
% of Vit C on the food label	85	100	120	110	N/A
# of drops to bleach solution	18	17	12	8	28+

1. Using the table above, which brand of orange juice has the greatest amount of Vit C listed on the food label? ***Schepp's***
2. Which brand has the most Vit C using the bleaching method? ***Ocean Spray***
3. What is the problem in this lab? ***Which OJ contains the most vitamin C?***
4. What is the experimental variable? ***Type of OJ***
5. List 3 control variables: ***iodine strength, test tubes, amt. of OJ***
6. What is the experimental group? ***all test tube with OJ (A-D)***
7. What is the control group? ***Test tube E with water***
8. What is the independent variable and on which axis is it graphed? ***Type of OJ (x-axis)***
9. What is the dependent variable and on which axis is it graphed? ***# of drops it took to bleach (y-axis)***
10. Write a conclusion for this experiment: ***Ocean Sprayhad the highest amount of Vit. C b/c it took the least amt. of drops to bleach the starch/iodine solution.***

*Know how to pull apart an experiment like shown in this example!

11. Write an inference for the Vit C lab: ***The fewer drops it takes of OJ to bleach solution, the more Vit. C in that OJ.***

12. Define hypothesis: ***testable statement; educated guess***
13. Define theory: ***hypothesis that has been proven over & over agai; broad unifying statement***

III. Ecology

1. Define ecology ***study of organism in relation to their environment***

2. Compare biotic and abiotic factors. ***Biotic=living; abiotic=non-living***

3. Fill in the missing **Levels of Organization**: Organism, ***Population***, Community, ***Ecosystem***, ***Biome***, Biosphere.

4. Compare niche and habitat. ***Niche- role in ecosystem; habitat- home***

5. What do the following eat? Carnivores: ***animals*** Omnivores:***plants & animals*** Herbivores:***plants***
Scavengers: ***dead stuff***.

6. Define the following terms **and** give an example of each:
Producer-***autotroph at base of food chain ex. grass***

Consumer- ***heterotroph that feeds on other organisms ex. rabbit***

Primary consumer- ***heterotroph that feeds on producers ex. mouse***

Secondary consumer- ***heterotroph that feeds on primary consumers ex. snake***

Tertiary consumer- ***heterotroph that feeds on secondary consumers ex. hawk***

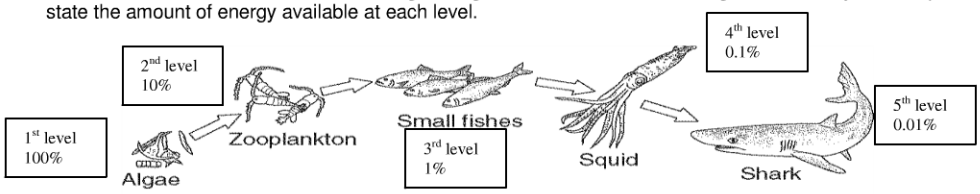
Decomposer- ***breaks down dead organisms ex. Bacteria & fungus***

Trophic level- ***feeding position***

Food chain- ***linear representation of energy flow within an ecosystem***

Food web- ***all of the possible food chains within an ecosytem***

7. In the food chain below, do the following 3 things: label the niche of each organism, identify each trophic level, and state the amount of energy available at each level.

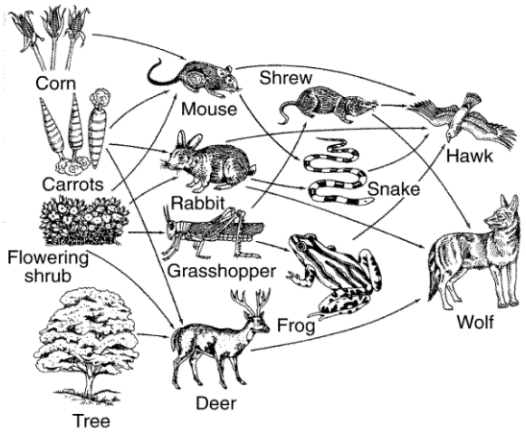


8. If there is a sudden population explosion of small fishes, what will happen to the population of zooplankton?
It will decrease.

9. **Directions:** Match the terms on the left with the definitions on the right.

F	**Organism**	**a.** all biotic and abiotic factors in an area
E	**Population**	**b.** all of the biomes
D	**Community**	**c.** geographical area that has a certain amount of rainfall, temperature, plants and animals
A	**Ecosystem**	**d.** all of the living organisms in an area
C	**Biomes**	**e.** a group of organisms of the same species
B	**Biosphere**	**f.** one member of a species

Use the below food web to answer questions 10-14



10. List four producers shown in the food web above.
Tree, flowering shrubs, carrots, corn

11. List four primary consumers shown in the food web above. ***Mouse, rabbit, grasshopper, deer***

12. List five secondary consumers shown in the food web above. ***Hawk, shrew, snake, frog, wolf***

13. List two tertiary (third-level) consumers shown in the food we above. ***Hawk, wolf***

14. What is the niche of the wolf when he eats a rabbit? ***Predator; 2ndary consumer***

15. Using the diagram to your right, which trophic level should have the greatest number of organisms to create a balanced food web? ***Bottom level; producers***

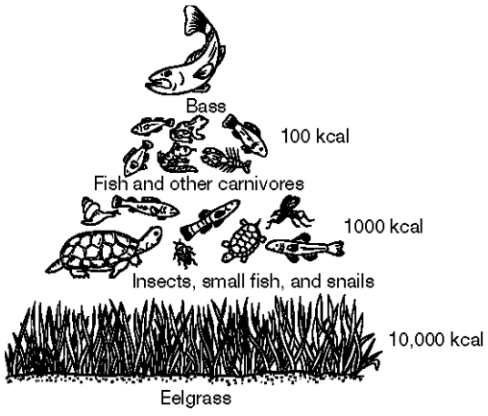


Diagram I

16. ~~Which sample contains the greatest number of decomposers?~~ _____
17. ~~Which sample contains the least number of producers?~~ _____
18. ~~Which sample has the greatest number of primary consumers?~~ _____
19. What is the energy level of the Bass? ***10***kcal

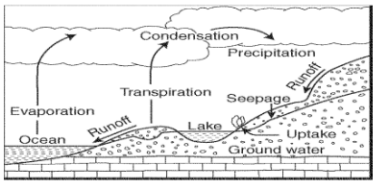
20. In a well-balanced ecosystem, which organism should have the greatest population size? ***Eelgrass (producers)***
22. Which population should have the fewest members? ***Bass (high level consumers)***

23. Create a food chain using the organisms from the Diagram 1. (add Bacteria)

eelgrass ⇨ ***insects*** ⇨ ***fish*** ⇨ ***bass*** ⇨ ***decomposers***

IV. Biochemical Cycles (Review the following cycles: carbon, nitrogen, water)

24. Which cycle is shown in the diagram below? ***water***



25. Which cycle involves the processes of respiration and photosynthesis? ***Carbon cycle***

26. Which cycle involves lightning and bacteria in the soil? ***Nitrogen cycle***

27. Certain bacteria that live in the soil and in the roots of plants are able to take N_2 gas from the air and change it into ***nitrates & nitrites*** that is then used by plants to make proteins. This process is called ***nitrogen fixation***

Biomes

Directions: Fill-in the table below with the name of the correct biome.

Biome	**Plants**	**Animals**	**Temperature (or climate)**
28. ***Taiga***	Mainly evergreen trees	Elk, moose, fox, beaver, porcupine	Winters long and cold
29. ***Tropical rainforest***	Diverse plants; upper and lower canopy	Monkeys, parrots, frogs, snakes, insects	Constant warm temperature
30. ***Tundra***	Flowering plants, ferns, lichen	Polar bear, arctic fox	Permafrost
31. ***Desert***	Cacti and succulents	Owl, coyote, lizards, snakes, mice, rabbits	Hot or Cold; extreme temperature changes between day and night.
32. ***Temperate deciduous forest***	Many deciduous trees	Raccoons, deer, birds, squirrels,	Change of seasons
33. ***Temperate grassland***	Grasses: wheat, rye, oat	Bison, mice, rabbits	Distinct seasons

V. Organic Compounds

1. Organic compounds are at the ***lowest*** level of organization.
2. Organic compounds contain the element ***carbon*** except CO and ***carbon dioxide***.

Table #2: Characteristics of four organic compounds. (**complete this chart**)

	Carbohydrates end in "ose"	**Lipids**	**Proteins** (end in "ine")	**Nucleic Acids**
Atoms	***CHO***	***CHO***	***CHON***	***CHONP***
Building Blocks	***monosaccharides***	***Glycerol & fatty acids***	***Amino acids***	***nucleotides***
Types	1. ***monosaccharides*** 2. ***disaccharides*** 3. ***polysaccharides***	***1. saturated*** ***2. unsaturated*** ***3. polyunsaturated***	***1. enzymes*** ***2. structural*** ***3. muscles***	***1. DNA*** ***2. RNA***
Function in Body	1. ***quick energy***	1. ***long term energy storage***	1. ***make structures in body*** 2. ***catalysts*** 3. ***hormones***	1. ***transmit heredity*** 2. ***make proteins***
Examples	1. ***glucose*** ***2. sucrose*** ***3. starch***	***1. fats*** ***2. oils*** ***3. waxes***	***1. meat*** ***2. eggs*** ***3. dairy***	***1. DNA*** ***2. RNA***

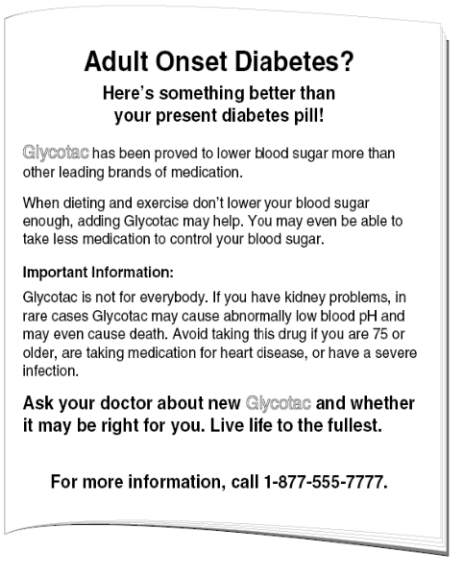
3. List 3 monosaccharides and 3 disaccharides: ***mono- glucose, fructose, galactose; di- sucrose, maltose, lactose***

4. Are monosaccharides simple sugars or complex sugars? Polysaccharides? ***Mono=simple Poly= complex***

5. Which type of sugar stores more energy, simple or complex? ***complex***
6. Your body breaks down carbohydrates, fat, and protein to release energy when you need it. Place them in the order in which they are broken-down: ***carbs →fats→proteins***
7. Define dehydration synthesis: ***storing food energy by creating complex molecules bonding thru the removal of water***
8. When is dehydration synthesis used by your body? ***To store unused food energy***
9. Does the process of dehydration synthesis store energy or release it? ***stores***
10. Define hydrolysis: ***breaking of bonds between complex molecules thru the addition of water***
11. What is the commonly used name for hydrolysis? ***digestion***
12. Does the process of hydrolysis store energy or release it? ***releases***

13. Where is energy stored within a compound? ***In the chemical bonds***
14. What process is indicated by the following chemical reaction? ***Dehydration synthesis***
    glycerol + 3 fatty acids ⟶ lipid + 3 waters
15. What are the reactants in the reaction indicated in #14? ***Glycerol and fatty acids***
16. What are the products of that reaction? ***Lipid & water***
17. Is energy stored or released during this process? ***stored***
18. What role do the proteins Enzymes play in chemical reactions? ***Biological catalysts***

19. How does an enzyme work? ***Speed up chemical reactions by binding w/ substrate at active site***
20. What is a catalyst? Does it speed up or slow down chemical reactions? ***Speeds up reaction***
21. How do enzymes affect the rate of reactions in the human body? ***Lower temperatures needed for reactions to occur***
22. ~~What does polar mean when talking about a water molecule?~~



Adult Onset Diabetes?

Here's something better than your present diabetes pill!

Glycotac has been proved to lower blood sugar more than other leading brands of medication.

When dieting and exercise don't lower your blood sugar enough, adding Glycotac may help. You may even be able to take less medication to control your blood sugar.

Important Information:

Glycotac is not for everybody. If you have kidney problems, in rare cases Glycotac may cause abnormally low blood pH and may even cause death. Avoid taking this drug if you are 75 or older, are taking medication for heart disease, or have a severe infection.

Ask your doctor about new Glycotac and whether it may be right for you. Live life to the fullest.

For more information, call 1-877-555-7777.

1. **Who is making the claim? Is this a reliable source?** ***The company that created Glycotac***
2. **What are the claimant's interests**? ***They want to make money by getting you to buy their drug.***
3. **What evidence supports the claim?** ***Lowers blood sugar***
4. **Does the claim make sense?**
5. **Look for asterisks (*) or fine print. Why is this important?**

The asterisks show other important information.

VI. The Cell

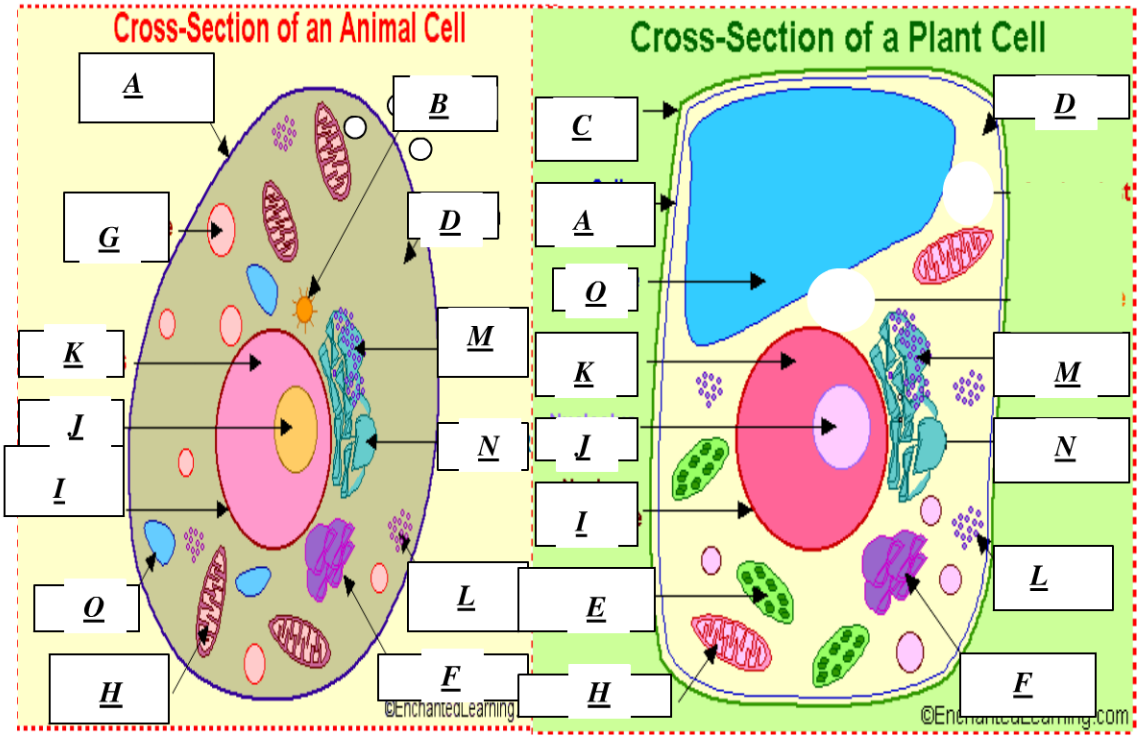
1. Identify the cell organelle that has the function listed below: a – m.

Lysosome	**a.** digests molecules for breaking down food, cellular debris, and foreign invaders; suicide sac
nuclear membrane	**b**. isolates liquids and solids from the rest of the cell
cell membrane	**c.** regulates what gets in and out of the cell
mitochondria	**d.** gives the cell its energy
Golgi complex	**e.** packages molecules to be sent out to other cells
Ribosomes	**f.** makes proteins
Nucleus	**g.** controls the cell by controlling protein production
Nucleolus	**h.** stores molecules to repair the ribosome
Cytoplasm	**i.** gel-like substance that suspends the cell organelles
Cell wall	**j.** protects and supports the plant cell
Nucleus	**k**. control center where chromatin and nucleolus are located
Endoplasmic reticulum	**l.** transports molecules around the cell
Chloroplast	**m.** transforms light energy into chemical energy (glucose)

2. **Directions:** Fill in the space with the name of the type of cell. Then, use the following word bank to label the cell organelles in the diagrams below.

Word Bank

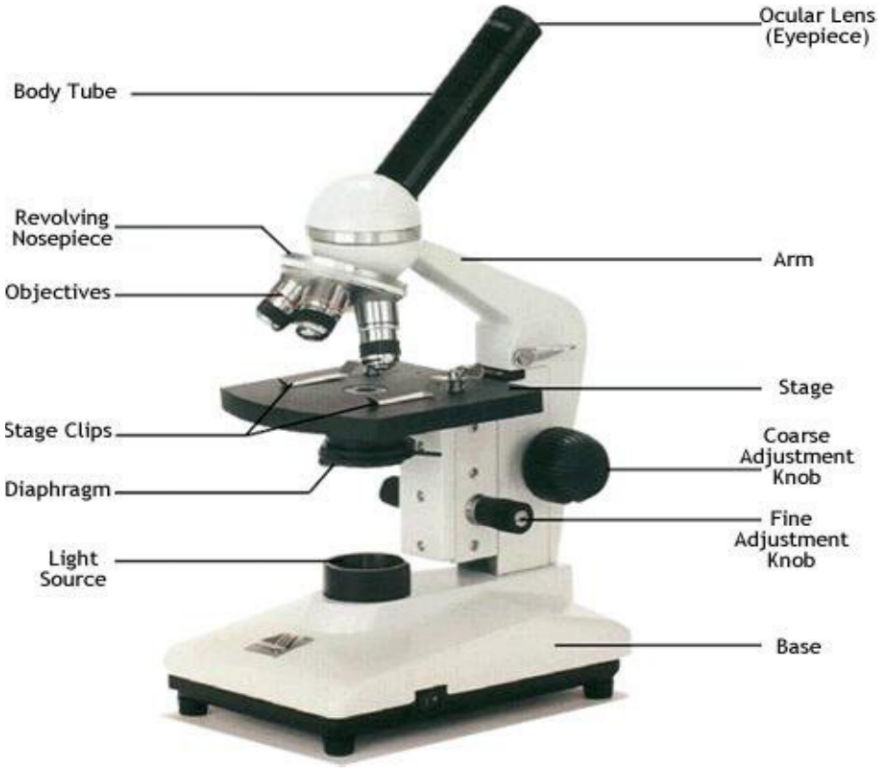
a. Cell Membrane
b. Centriole
c. Cell Wall
d. Cytoplasm
e. Chloroplast
f. Golgi Body
g. Lysosome
h. Mitochondrion
i. Nuclear Envelope
j. Nucleolus
k. Nucleus
l. Ribosome
m. Rough Endoplasmic Reticulum
n. Smooth Endoplasmic Reticulum
o. Vacuole
Chromatin (Draw it in)



3. Are the above diagrams prokaryotic or eukaryotic cells? ***eukaryotic***
4. Define prokaryotic and eukaryotic: ***pro- no nucleus*** ***eu- true nucleus***
5. List two organelles that are in animal cells but not in plants: ***lysosomes & centrioles***
6. List two organelles that are in plant cells but not in animals: ***cell wall & chloroplasts***
7. Compare shape, size, and color of plant and animal cells:
Animal cells irregular in shape & transparent ***Plant cells normally green & square***
8. In what type of environment do cells live? ***Isotonic liquid environment***
9. List the three statements that comprise the Cell Theory.
Cells come from other cells. ***All living things made of cells.*** ***Basic unit of life.***

10. Directions: Use the microscope diagram and the word bank below to label the parts of the microscope. Write the **letter and the name** of each part, not just the letter.
Word Bank

a. arm
b. base
c. body tube
d. coarse adjustment knob
e. diaphragm
f. eyepiece (ocular)
g. fine adjustment knob
h. high power objective
i. illuminator (light source)
j. low power objective
k. pillar
l. revolving nosepiece
m. stage
n. stage clips



11. In the letter e lab, describe how the "e" looked under the microscope. ***Upside down & backwards***

12. Using the microscope, what is the actual movement of a specimen if it appears to move up and to the left? ***Down & to the right***
13. What is the total magnification power using the scanning objective? ***40x***
14. What is the total magnification power using the low power objective? ***100x***
15. What is the total magnification power using the high power objective? ***400x***

Crossword Puzzle: Microscope Parts and Functions

				10.C							11 I				
1.L	O	W	P	O	W	E	R				L				
				A							L				
				R		2.B	O	D	Y	T	U	B	E		
				S		A					M				
				E		S					I				
				A		E					N				
				D					3.S	T	A	G	E		
				J							T		Y		
				U		4.H	I	G	H	P	O	W	E	R	
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				E									C		
		6.F	I	N	E	A	D	J	U	S	T	M	E	N	T
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					7.S	T	A	G	E	C	L	I	P		
							P								
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						8.A	R	M							
							A								
9.S	C	A	N	N	I	N	G	P	O	W	E	R			
							M								

Bio 1-Level Midterm Review Sheet

Name: _____ **Date:** _____

Across

1. magnifies 10X; _____ _____ objective
2. contains mirrors and connects the eyepiece to the nosepiece
3. microscope slide sets on
4. magnifies 40X; _____ _____ objective
5. suspends the objectives
6. completely focuses the object
7. holds the microscope slide in place
8. used to carry the microscope
9. magnifies 4X; _____ _____ objective

Down

2. bottom of the microscope
10. focuses the object in scanning power only
11. provides a light source
12. magnifies 10X; allows you to view object
13. adjusts the amount of light allowed through object

VII. Energy in a Cell

1. What organelle provides a cell with energy? ***mitochondria***
2. What molecule gets broken down to provide energy to the cell? ***ATP***
3. ADP is the abbreviation for which molecule? ***Adenosine diphosphate***
4. ATP is the abbreviation for which molecule? ***Adenosine triphosphate***
5. Which molecule stores more energy, ADP or ATP? ***ATP***
6. Does the following reaction store energy or release energy? ***stores***
   ADP + P + energy ⟶ ATP
7. Write the reaction that occurs when a phosphate is released from ATP.
   ATP → ADP + P + energy
8. Does the reaction in #7 release energy or store it? ***release***

VIII. Cell Processes

1. **Directions:** Match the term on the left with its definition from the right column.

__d___ impermeable	**a.** pressure inside the cell
__e___ diffusion	**b.** animals only; cell explodes due to too much pressure
__a___ turgor pressure	**c.** diffusion of water molecules through membrane
__b___ cytolysis	**d**. membrane that doesn't allow anything in or out of cell
__f___ equilibrium	**e**. goes from higher concentration to lower concentration
__c___ osmosis	**f.** equal movement of molecules in and out of a cell

Directions: Use the following table to answer the questions below it**.**

Table #3: RESULTS OF THE INCREDIBLE EGG LAB

Day Environment	**Mass of Cup**	**Mass of Cup and Egg**	**Appearance of Egg after soaking for 1 day**
Day #1 NOTHING	3.0 grams	65.0 grams	A normal white egg with shell.
Day #2 VINEGAR	3.4 grams	73.4 grams	An egg without the shell.
Day #3 SYRUP	4.0 grams	69.2 grams	An egg that is shriveled up.
Day #4 WATER	3.4 grams	85.3 grams	An egg that is about to pop.

2. What is the mass of the egg on Day #1? 62 g. Day #4? 81.9 g. 3. Compared to the egg, the Syrup is a (hypotonic, **hypertonic**) environment.
4. Compared to the egg, the Water a (**hypotonic**, hypertonic) environment.
5. In which direction did osmosis occur when the egg was in syrup? Out of the egg Water? Into the egg

6. What happened to the mass of the egg after soaking in syrup? Few grams Water? More grams

7. What happened to the turgor pressure of the egg in syrup? Went down (less) Water? Went up (more)

8. What was the final result of the egg (animal cell) after soaking in syrup? Flaccid Water? Cytolysis

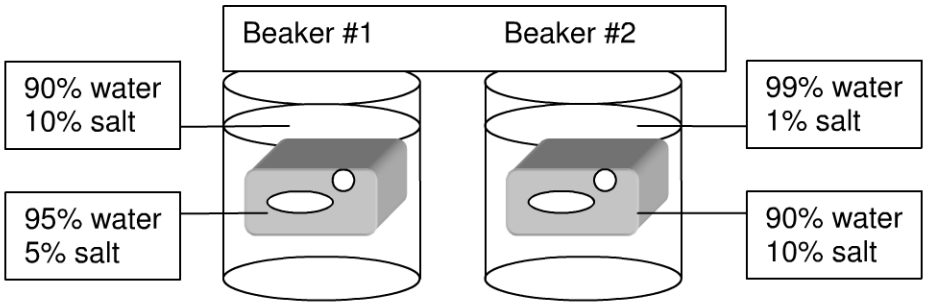
Potato Lab

9. Compared to the potato slice, was the salt water a (hypotonic, **hypertonic**) environment?
10. Compared to the potato slice, was the water a (**hypotonic**, hypertonic) environment?
11. In which direction did osmosis occur when the potato was in salt water? Out of the potato
    Water? Into the potato
12. What is the term that describes a plant cell that loses turgor pressure? Plasmolysis
13. What is the term that describes a plant cell that gains turgor pressure? Turgid

Dialysis Tubing Lab

14. What term describes dialysis tubing because it allows only certain substances to travel through the bag? Semi or selectively permeable
15. Which molecule is much larger than the other? (iodine or **starch**)
16. Which molecule was able to travel through the tiny holes in the bag? (**iodine** or starch)
17. What color results when iodine and starch mix together? Black or dark purple
18. Describe what happened at the end of the experiment. All of the iodine traveled into starch filled bag until equilibrium was reached.

Directions: The diagrams below represent a cell within a beaker filled with a liquid. Use the diagrams to answer the questions that follow. Write the **word** from the word bank, **not the letter**. **Draw arrows** to show the direction of osmosis.



19. In beaker #1, the environment inside the cell is__b__.
    The environment outside the cell is ____a_____.
    Water will move ____e____ the cell.
    In an animal cell, what is the final result?___i____
    In a plant cell, what is the final result?____g_____

20. In beaker #2, the environment inside the cell is__a__.
    The environment outside the cell is ____b_____.
    Water will move ___d____ the cell.
    In an animal cell, what is the final result? ___h____
    In a plant cell, what is the final result?____j_____

a. hypertonic
b. hypotonic
c. isotonic
d. into
e. out of
f. into/out of
g. plasmolysis
h. cytolysis
i flaccid
j. turgid
k. equilibrium

21. Define:

Equilibrium- **the concentration of a substance is the same throughout a space.**

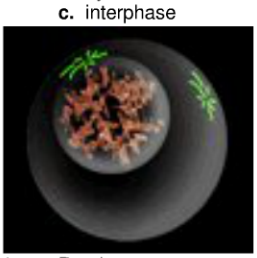
Homeostasis- **process of maintaining a relatively constant internal environment despite changing external conditions**

IX. Cell Reproduction

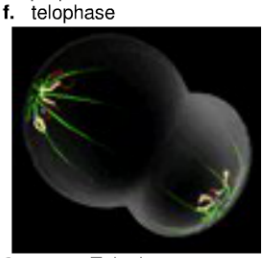
Directions: Use the following word bank to label the correct phase with the diagrams 1. – 6. and answer questions 9 – 18.

Word Bank

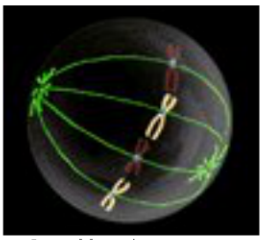
a. anaphase
b. cytokinesis
c. interphase
d. metaphase
e. prophase
f. telophase



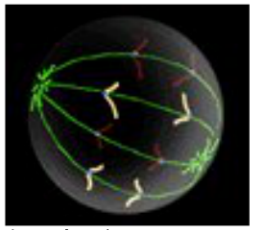
1. Prophase



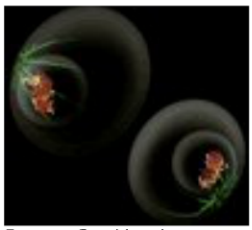
2. Telophase



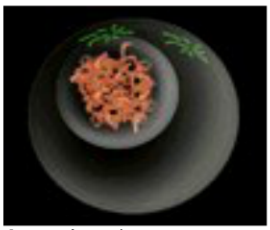
3. Metaphase



4. Anaphase



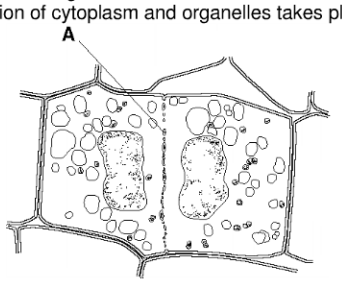
5. Cytokinesis



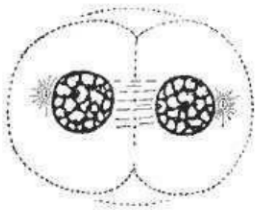
6. Interphase

Matching: **Responses may be used more than once.**

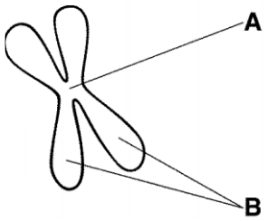
9.____c_____ First and longest phase of the cell cycle
10.___e_____ Chromosomes become visible
11.___a_____ Sister chromatids move away from each other
12.___f_____ The spindle fibers disappear
13.___f_____ The nucleolus and nuclear membrane reform
14.___f_____ The cleavage furrow appears in an animal cell.
15.___d_____ Chromosomes line up in the middle of the cell
16.___b_____ Mitosis is complete
17.___c_____ DNA is replicated and proteins are made
18. .__b_____ Two new daughter cells are formed.
19. .__f_____ Division of cytoplasm and organelles takes place.



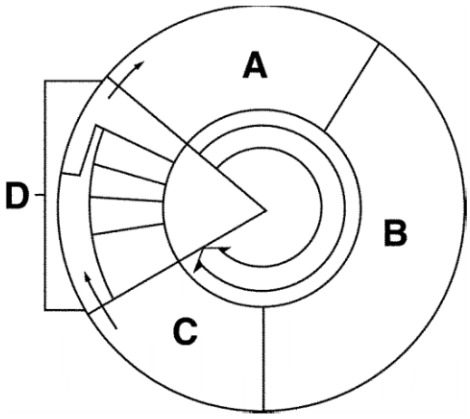
20. Is the diagram a plant or an animal cell? Plant
21. In the diagram above, what is the structure labeled **A**? cell plate 22. Which phase of the cell cycle is the above diagram? Telophase



23. Is the diagram a plant or an animal cell? animal
24. In the diagram above, what is the name of the structure that divides the cell? Cleavage furrow
25. Which phase of the cell cycle is indicated by the diagram? Telophase



26. In the diagram above, what is the structure labeled **A**? Centromere
27. In the diagram above, what are the structures labeled **B**? Sister Chromatid
28. What is the name of the organelle shown above? Chromosome
29. How many of these organelles are found in the nucleus of human cells? 46



30. Label the stages of the cell cycle, **A – D**, shown in the diagram on the left. Tell what happens at each stage. G1, S, G2, Mitosis

31. Collectively, **A – C** is known as Interphase.
32. Stage D is known as Mitosis
33. What are the four phases that occur in **D**? List them in order. Prophase, Metaphase, Anaphase, Telophase

X. DNA and RNA

1. What is the purpose of DNA? Contains the genetic heredity for each individual
2. What are the building blocks of DNA? Nucleotides
3. What 4 bases are found in DNA? Adenine, Thymine, Guanine, and Cytosine
4. List the 3 parts of a nucleotide. Sugar, Phosphate, and Nitrogen Base
5. Draw a segment of DNA with 3 nucleotides.
6. Explain the process of DNA replication in four steps:
    a. DNA unwinds/ uncoils
    b. Hydrogen bonds break between the bases
    c. Corresponding nucleotides come and match to their complimentary bases
    d. New Hydrogen bonds form between bases and DNA winds back up
7. Fill-in the missing nucleotides: .DNA 1: CTA GCC AGC GGT
   DNA 2: GAT CGG TCG CCA
8. Name the 3 types of RNA molecules. mRNA, tRNA, rRNA

9. Which nucleic acids are involved in transcription? (Hint: There are two!) mRNA and DNA

10. Which nucleic acids are directly involved in translation? (Hint: There are 3!) mRNA, tRNA, rRNA

11. Which nucleic acid is indirectly involved in translation? DNA

12. Proteins are composed of amino acids.
13. Fill-in the missing nucleotides and amino acids. (**See amino acid chart**)

DNA:	**TAT**	**CGG**	**CTG**	**ATC**
mRNA:	**AUA**	**GCC**	**GAC**	**UAG**
tRNA:	**UAU**	**CGG**	**CUG**	**AUC**
Amino Acid:	Isoleucine	Alanine	Aspartic Acid	Stop

14. Using the mRNA sequence from above complete the following:
    a. A codon is located on mRNA strand. List 1 example from question 13. AUA
    b. An anticodon is located on tRNA strand. List 1 example from question 13. UAU

15. When does protein synthesis terminate? When the ribosome reaches a stop codon

16. **Explain the steps of transcription.**

DNA unwinds, unzips

m-RNA enters the nucleus and free m-RNA nucleotides pair up with open bases on DNA strand.

After bases pair, mRNA breaks away. DNA strands rejoin and recoil.

m-RNA leaves the nucleus and enters the cytoplasm to carry information to the ribosome.

17. **Explain the steps of translation.**

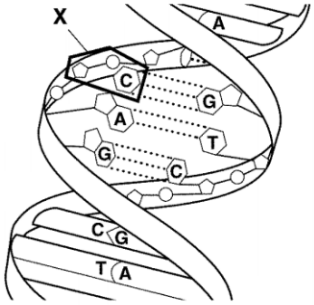
1. mRNA arrives at the ribosome. 2. tRNA's anticodon matches up with mRNA's first codon (strand begins when it locates AUG). 3. mRNA slides along the ribosome to the next codon. Each anticodon is bringing in an amino acid to match the mRNA codon. 4. Amino acids join by peptide bonds. 5. Once a stop codon is reached, mRNA, tRNA and the amino acid chains (protein) leave the ribosome

18. **Directions:** Using the word bank below to complete the chart. **Write the words** in the correct responses. Answers can be used more than once.

Word Bank:

a. yes **b**. no **c**. ribose **d**. deoxyribose **e.** one **f.** two

	DNA	RNA
Number of strands	two	one
Type of Sugar	Deoxyribose	Ribose
Involved in transcription	Yes	Yes
Involved in replication	Yes	No
Involved in translation	No	Yes
Contains Thymine	Yes	No
Contains Uracil	No	Yes



19. What is the portion of the DNA diagram labeled **X**? Nucleotide

XI. Protein Synthesis

Directions: Label the **#1 – 11** in the diagrams shown below. Use the **amino acid chart** on the **next page** to answer **#12 – 16**.

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NUCLEUS

TAC CAT TCC GAT ACT **DNA** (molecule)
AUGGUAAGG CUA UGA **mRNA** (molecule)

3. Process shown in diagram? Transcription

4. Nucleus (organelle)

4. **Ribosome (**Organelle)

5. Process? Translation

9. (molecule) mRNA
10. (molecule) tRNA

11. Protein

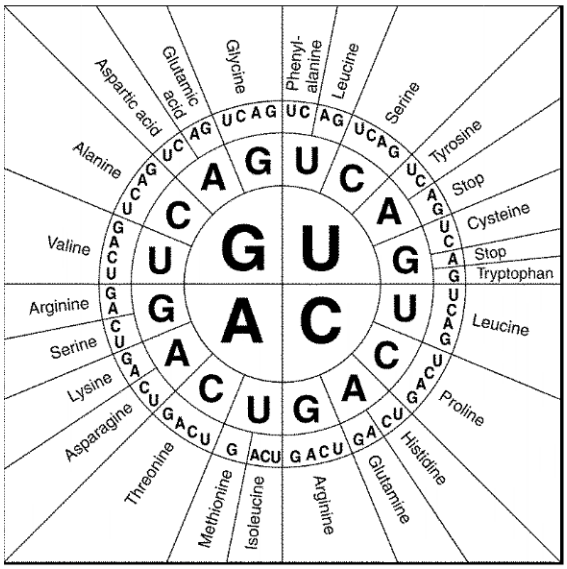
(general term for molecules)

A	U	G	G	U	A	A	G	G	C	U	A	U	G	A	
U	A	C	**6. C**	**7. A**	**8. U**	U	C	C	G	A	U	A	C	U	

12. Met **13. Val** **14. Arg** **15. Leu** **16. Stop**

17. What molecule is produced by bonding together 12 –16?
Protein or Polypeptide Chain

Directions: Use the amino acid chart below to determine the amino acids which are being coded in the diagram on the previous page, #12 -16. **Remember to use mRNA codons with the chart!**



XII. Who am I???

Use the name bank to match the person with the proper description.

A. Watson and Crick	C. Anton Leeuwenhoek	E. Robert Hooke
B. Theodor Schwann	D. Rudolph Virchow	F. Matthias Schleiden

__A___ I am known for proposal of the model of DNA which referred to its shape as a double helix.

__C___ One of the things I am famous for is looking at pond water under the microscope?

__E___ I am the first to invent the Microscope and coined the term "Cell".

__F___ I found plants are made of cells.

__B___ I concluded animals are made of cells.

__D___ I concluded that all cells come from existing cells.

XIII. Mutations

1. Define a "Point Mutation". A change in one point of a DNA strand

2. What are the three main types of "point mutations" (write the names in the blanks below)? Give an example of each and "mutate" the following DNA strand: **LEVEL terms used in class !!!!!**

a. AATCGGTACTG-	AAT**G**GGTACTG	Substitution
b. AATCGGTACTG-	AA**A**TCGGTACTG	Insertion
c. AATCGGTACTG-	A_TCGGTACTG	Deletion

3. What is the difference between "point mutations" and "chromosomal mutations?" A point mutation is a change in one segment of DNA, chromosomal mutation is a mutation that affects a larger portion of DNA

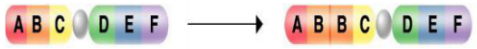
4. Using the following chromosome describe and match the following:

Translocation: D

A>

Duplication: B

B>



Inversion: C

C>

Deletion: A

D>