Name: _____ Test date: _____

CCHS Fall 2019 Biology Semester Exam Review

Biomolecule – General Knowledge (9A) – 5 questions

Macromolecule	Function
Carbohydrate	
Lipid	
Protein	
Nucleic Acid	

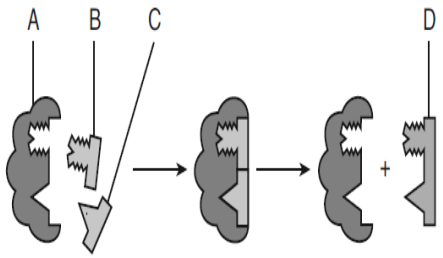
1. What type of biomolecule is made by photosynthesis and used for cellular respiration?

2. Where are phospholipids found?

3. Which of the macromolecule groups include enzymes?

Match molecule on left with example on right	
Carbohydrate ____	**A** DNA, RNA
Lipid ____	**B** cellulose, starch, glucose
Protein ____	**C** wax, fats, oils
Nucleic Acids ____	**D** Enzymes

Enzyme Reactions (9C) – 3 questions



1. What is the function of an enzyme?

2. What is occurring in the image to the left? Explain what is happening.

$$2H_2O_2 \xrightarrow{\text{catalase}} 2H_2O + O_2$$

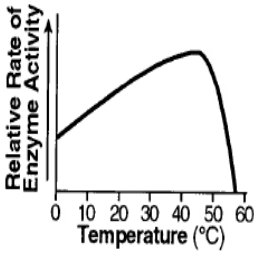
3. What is the function of the catalase in this reaction?

5. List 2 factors that could denature the catalase enzyme in this reaction.

1

2

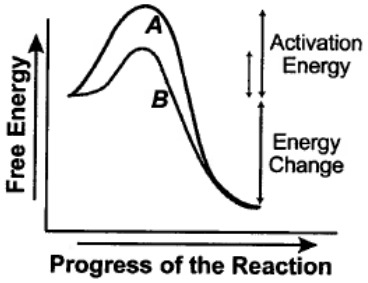
Enzyme-Graph Interpretation



1. What is a valid conclusion based on the information in the graph?

2. How does temperature affect enzyme activity?

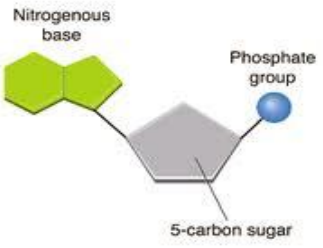
3. At what temperature has the enzyme begun to denature?



6. What happens to activation energy when an enzyme is present?

7. What happens to the speed of the reaction when an enzyme is present?

DNA Structure (6A) – 6 questions



1. The structure to the right depicts a _____.

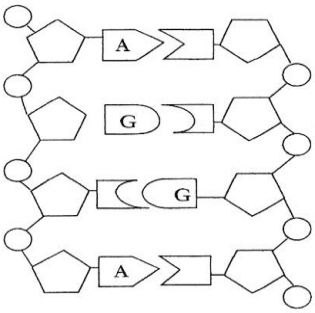
2. The "backbone" or sides of the DNA double helix are made up of alternating _____and _____.

3. _____ is the sugar of DNA.

4. The genetic information is stored in the _____ of the DNA nucleotide.

5. How does DNA compare in all living organisms?

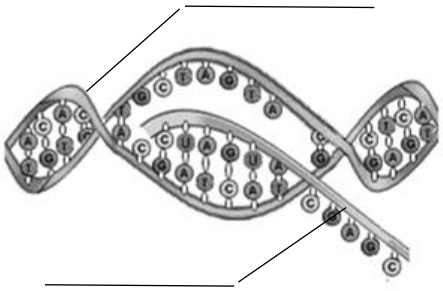
6. If the amount of cytosine equals 35%, what percentage of the bases is guanine? _____



7. Label the following on the DNA strand to the left.

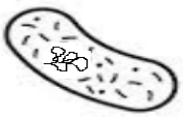
- put a P on the phosphates
- put a S on the sugars
- put a ☆ on the hydrogen bonds
- circle ONE nucleotide
- label all the missing bases

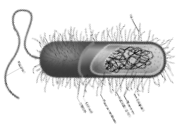
DNA vs RNA



1. Label mRNA and DNA on the image to the left.
2. What base does DNA have that RNA does not?
3. What base does RNA have that DNA does not?
4. Why can't DNA leave the nucleus but mRNA can?

Prokaryotic vs Eukaryotic Cells (4A) – 3 questions





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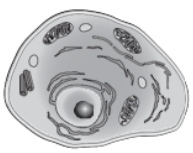
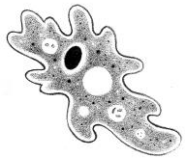
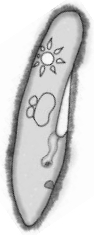






_____ _____ _____

1. Label the cells to the left as Eukaryote (E) or Prokaryote (P).
2. List three structures found in both types of cells.

2. Where is DNA found in each type of cell?

4. Which biomolecule contains the information needed for protein synthesis in both cells?

5. Which organelle is found in both types of cells and make proteins?

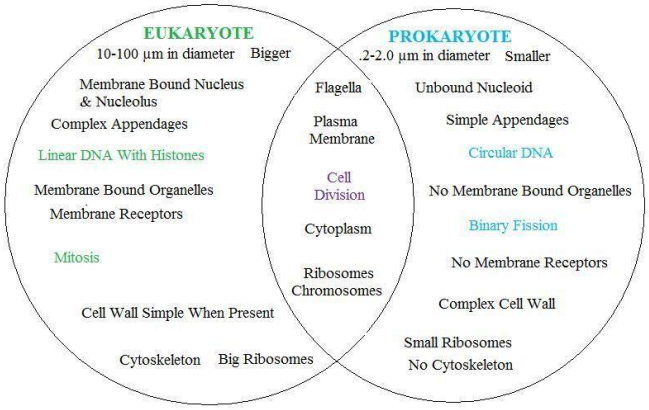
2. In the space next to Cell Type, label the cells below as prokaryote or eukaryote.

2. Cell Type:		
Characteristic	**Present**	**Not Present**
Free floating genetic material	**X**	
Ribosome	**X**	
Cytoplasm	**X**	
Cell Membrane	**X**	

3. Cell Type:		
Characteristic	**Present**	**Not Present**
Nucleus	**X**	
Ribosome	**X**	
Cytoplasm	**X**	
Cell Membrane	**X**	

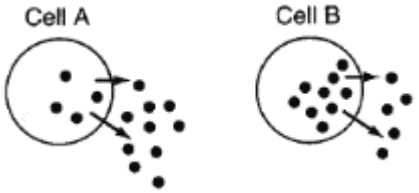
4. Cell Type:		
Characteristic	**Present**	**Not Present**
Mitochondria	**X**	
Vacuole	**X**	
Endoplasmic Reticulum	**X**	
Ribosome	**X**	

5. Cell Type:		
Characteristic	**Present**	**Not Present**
Nucleus		**X**
Cell Membrane	**X**	



Cell Transport and Homeostasis (4B) – 6 questions

Transport

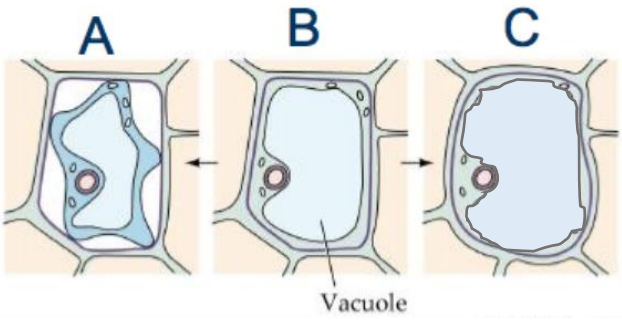


1. ATP would be used in which of these cells to transport the molecules?

2. Identify the type of transport as active or passive.

Cell A= _____ Cell B= _____

3. Based on your previous knowledge, where is ATP manufactured within the cell?



_____ _____ _____

1. Which illustration on the left would best represent what would happen to a fresh water plant cell placed in a 25% salt solution?

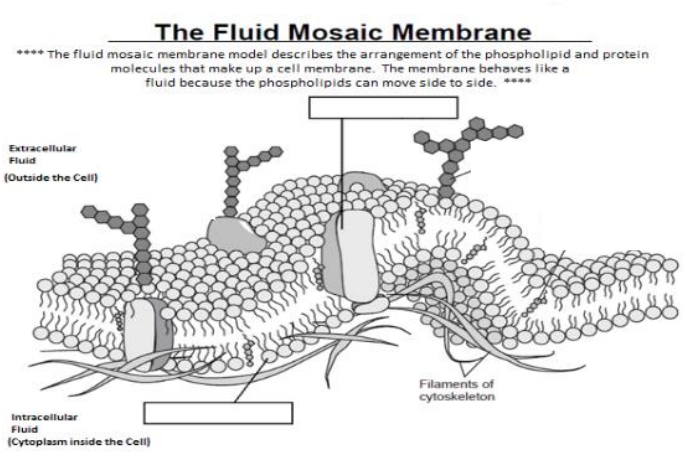
2. Which illustration to the left would best represent what would happen to a 2% salt water plant cell placed in fresh water (0% salt)?

4. What plant cell structure most likely prevents a plant cell from bursting open?

5. Underneath each cell, write: **into** cell, **out of** cell or **no change** to describe direction of water flow.

3. How does the cell membrane help maintain homeostasis?

Label the phospholipids and proteins below:



Which biomolecule is the main component of the cell membrane? _____

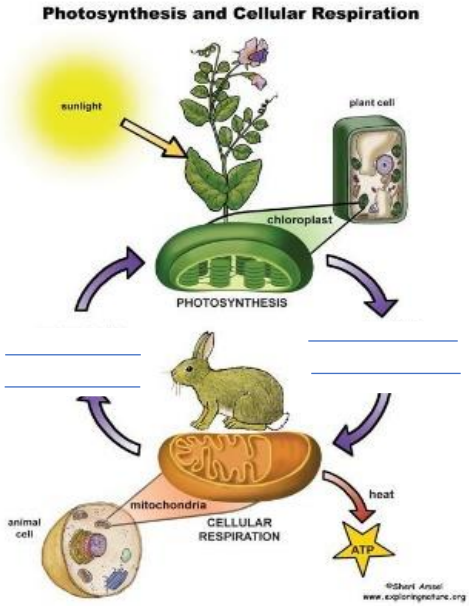
The cell membrane is a bilayer. How many layers is it? _____

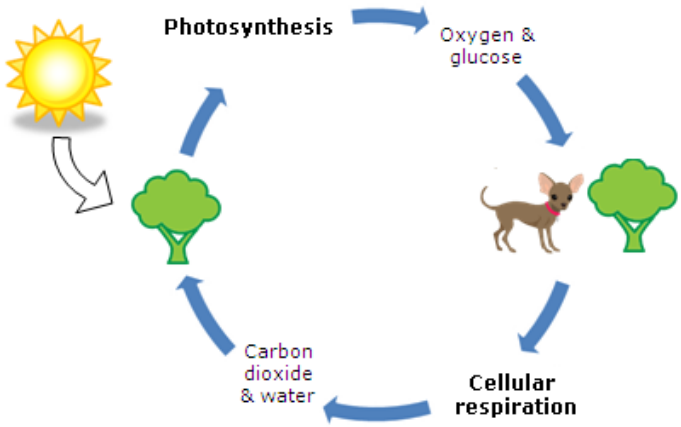
Explain why phospholipids form a bilayer.

Why is the cell membrane considered selectively permeable?

Cell Processes/Energy (9B) – 3 questions

- **Fill in the products and reactants in the diagram on the left.**





1. How do the products of photosynthesis and the reactants of cellular respiration relate?

2. What organelle is involved in cellular respiration?

3. What organelle is involved in photosynthesis?

Match the following:

1. _____Sun	A. Chemical energy
2. _____Glucose	B. Mechanical energy
3. _____ATP	C. Radiant energy

Protein Synthesis (6C) – 3 questions

1. The purpose of transcription is to make _____. This process occurs only in the _____ of a cell.

2. The purpose of translation is to make _____ using amino acids.

This process occurs only in the _____ of the cell.

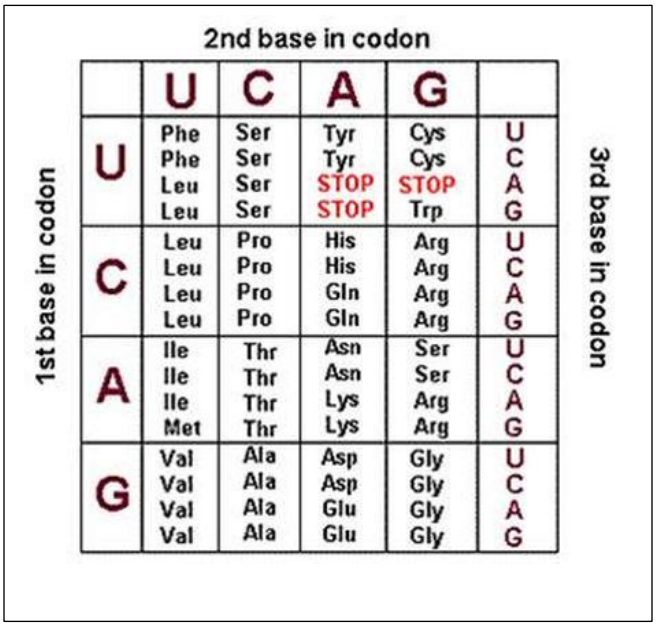
3. The building block of a protein is a(n) _____ _____.

4. In what cellular organelle does protein synthesis occur?

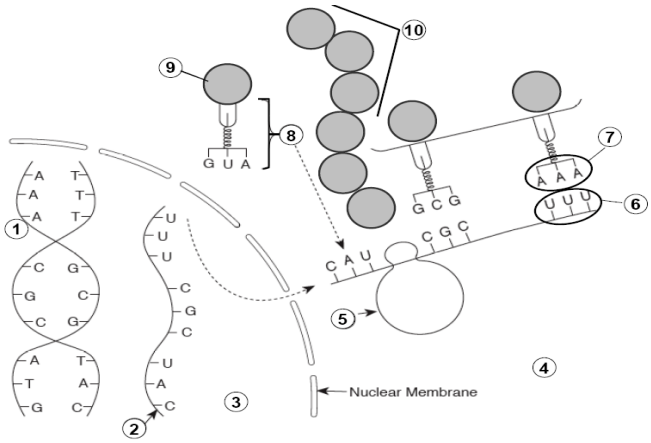
5. What 3 organelles are involved in making and distributing proteins?

5. Complete the following table. Use the codon chart to determine the amino acid.

DNA	ATC		TAT
mRNA		CCC	
Amino Acid			



Protein Synthesis Labeling



Label each number in the diagram

1. _____ 6. _____

2. _____ 7. _____

3. _____ 8. _____

4. _____ 9. _____

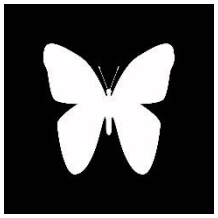
5. _____ 10. _____

Cytoplasm	DNA	Ribosome	Anticodon
tRNA	Codon	Amino acid	mRNA
Protein	Nucleus		

1. What cellular process is illustrated between numbers 1 and 2?
2. What cellular process is illustrated from numbers 6 through 10?
3. Which of the following sequence best represents the relationship between DNA and traits?

Gene Regulation (6D) and Cell Differentiation (5B) – 4 questions



1. What two environmental factors affect gene expression in some organisms by "triggering" the activation of genes?

2. Why do cells look and function differently if DNA is the same in every cell of an organism?

3. What is meant by genes being "turned on" or "turned off"?

4. What portion of a DNA strand is copied by mRNA and expressed through the proteins that are made?

Mutations (6E) – 6 questions

For each of the following scenarios locate and circle the mutation and then answer the questions.

Original DNA	ATC	TTT	GCG	CAA	TGT
Mutation 1	ATC	TTT	GCG	GAA	TGT

Mutation Type: _____

Original DNA	ATC	TTT	GCG	CAA	AGT
Mutation 2	ATC	TTT	CGC	GCA	ATG T

Mutation Type: _____

Original DNA	ATC	TTT	GCG	CAA	AGT
Mutation 3	ATC	TTG	GCG	AAT	GT

1st Mutation Type: _____ *2nd Mutation Type:* _____

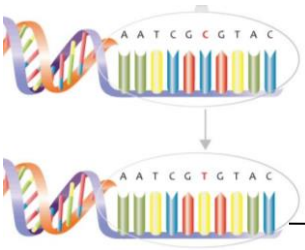
1. What type(s) of mutation would be the least harmful to an organism?
_____Why?

2. What type(s) of mutation would be the most detrimental to an organism?
_____Why?

3. Are mutations always bad? Why or why not?

Label the following mutations Insertion, Deletion or Substitution

1.

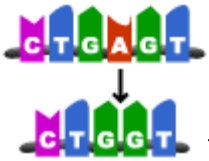


_____

2.

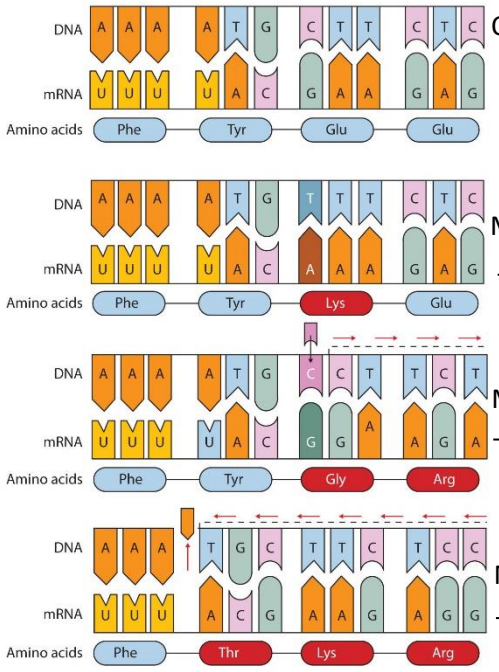
_____

3.

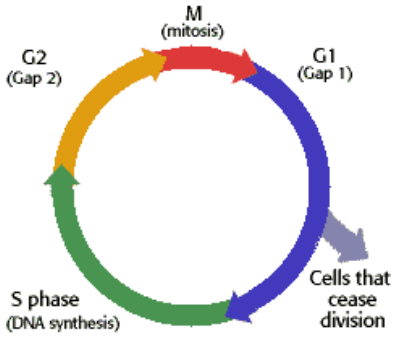


_____

4.



Cell Cycle (5A) – 6 questions



Explain what occurs in the missing stages of the cell cycle:

a. G1- growth and Go

b. S –

c. G2- repair and final preparation for division

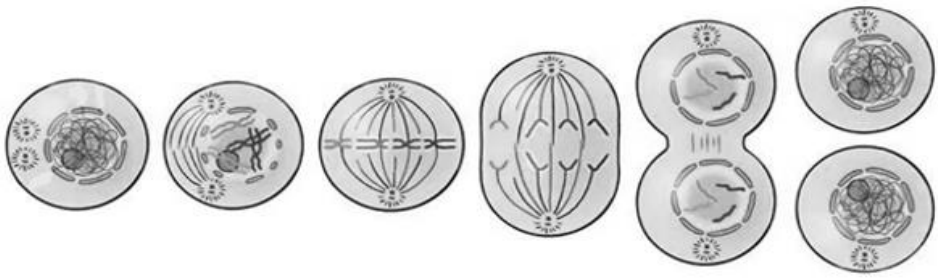
d. M (mitosis)–

e. cytokinesis –

1. How many cells are produced at the end of mitosis? _____

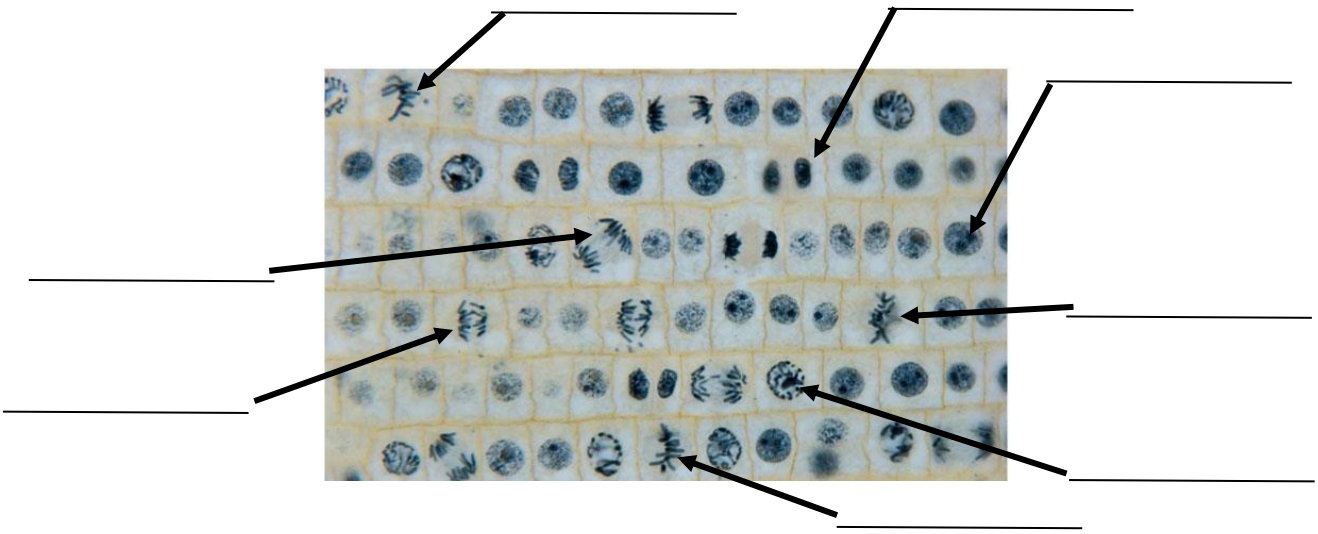
2. How do these new cells compare to each other? _____

3. Label the diagram below with the phases of the cell cycle.



4. What happens during S phase of Interphase? _____

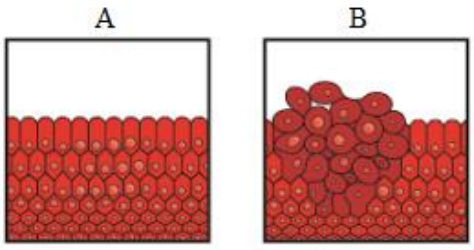
Identify the Cell Cycle phases:



Why is the cell cycle important, what is it for?

Changes in the Cell Cycle

Circle which diagram best depicts a group of cancerous cells.



Explain your choice.

2. What does uncontrolled cell growth lead to?

3. What is the resting stage in Interphase that cancer cells do not enter?

REFLECTION:

What sections of the review do you feel the most confident about?

What sections of the review do you need to spend more time studying?

What day is your final? _____