

Fall Final Study Guide

BIOLOGY: Units 1 - 4

1. List the steps of the **scientific method**.

2. What is a scientific **hypothesis**?

3. What is and a scientific **theory**?

4. What is the difference between a **hypothesis** and a **theory**?

5. Complete the table:

Bond	Description	Weak? Strong?	Example of Molecule
Covalent			
Ionic			
Hydrogen			

6. Draw the **pH scale** from **0-14**. Label the sections of the scale as acid, neutral, and base. Place the following on the pH scale: vinegar, water, oven cleaner.

7. Complete the table:

Process	Chemical Equation	Description of Process	Location in Cell
Photosynthesis			
Cellular Respiration			

8. Complete the table:

Macromolecule	Example	Function	Monomer
lipid			
carbohydrate			
nucleic acid			
Protein			

9. List and describe the following **levels of organization** from simple to complex:

10. Define the terms:

Isotonic-

Hypertonic-

Hypotonic-

- a. Which solution will cause a cell to shrink?
- b. Which solution will cause a cell to swell?
- c. Which solution will cause a cell to stay the same size?

11. Draw a simplified image of a prokaryote and label the **cell membrane**, **free floating DNA**, and **ribosomes**.

12. Draw a simplified image of a **eukaryotic cell** and label: **cell membrane, nucleus, DNA, Rough ER, golgi apparatus, ribosomes, and mitochondria**. *You may add more organelles if you wish.*

13. Complete the table:

Organelle	Function	Picture
Ribosome		
Chloroplast		
Mitochondrion		
Rough Endoplasmic Reticulum		

Smooth Endoplasmic Reticulum		
Nucleus		

14. What is **surface area to volume ratio**? Which grows faster as a cell grows? (**surface area** or **volume**)

15. Draw a simplified diagram of the carbon cycle. Use **arrows** to show the direction of carbon flow between the **atmosphere**, **fossil fuel combustion**, **photosynthesis**, and **cellular respiration**.

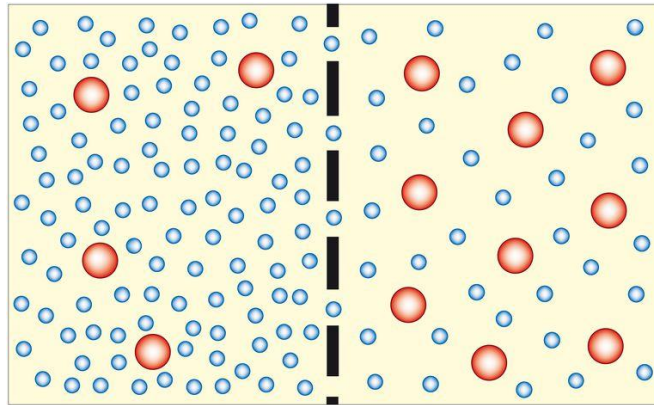
16. Describe the path of a protein once it has been made using the words **endoplasmic reticulum**, **Golgi apparatus**, **ribosome**, and **outside of cell**.

17. What happens to **starch** when iodine is added to it?

18. Complete the table:

Cell Transport	Description	Needs Energy?	Picture
Diffusion			
Osmosis			
Facilitated Diffusion			
Active Transport			
Endocytosis			
Exocytosis			

19. In the diagram below the small dots represent water; the large dots represent a large molecule that can't pass through the cell membrane which is represented by the dashed line. Label the diagram with the words **solvent**, **solute**, **solution**, **high water concentration**, **low water concentration**, high solute concentration, low solute concentration, and draw an **arrow** showing the direction of water flow. Label the arrow **osmosis**.



20. Complete the **complementary strands**. How many **codons** are represented in each strand?

DNA: A T C G G A T A A T C G

DNA: A T C G G A T A A T C G

DNA:

mRNA:

21. Use the **codon** table to identify the amino acid sequence for **mRNA** sequence **C G U G U A C U A**

Codons Found in Messenger RNA

		Second Base				
		U	C	A	G	
First Base	U	Phe Phe Leu Leu	Ser Ser Ser Ser	Tyr Tyr Stop Stop	Cys Cys Stop Trp	U C A G
	C	Leu Leu Leu Leu	Pro Pro Pro Pro	His His Gln Gln	Arg Arg Arg Arg	U C A G
	A	Ile Ile Ile Met	Thr Thr Thr Thr	Asn Asn Lys Lys	Ser Ser Arg Arg	U C A G
	G	Val Val Val Val	Ala Ala Ala Ala	Asp Asp Glu Glu	Gly Gly Gly Gly	U C A G
						Third Base

22. Complete a Punnett square for the cross **Tt x Tt**. Give the genotype and phenotype ratios if "**T**" is **dominant** for tall and "**t**" is **recessive** for short.

23. Complete the table:

Process	Purpose	Location In Cell	Molecules/Organelles Involved
Replication			
Transcription			
Translation			

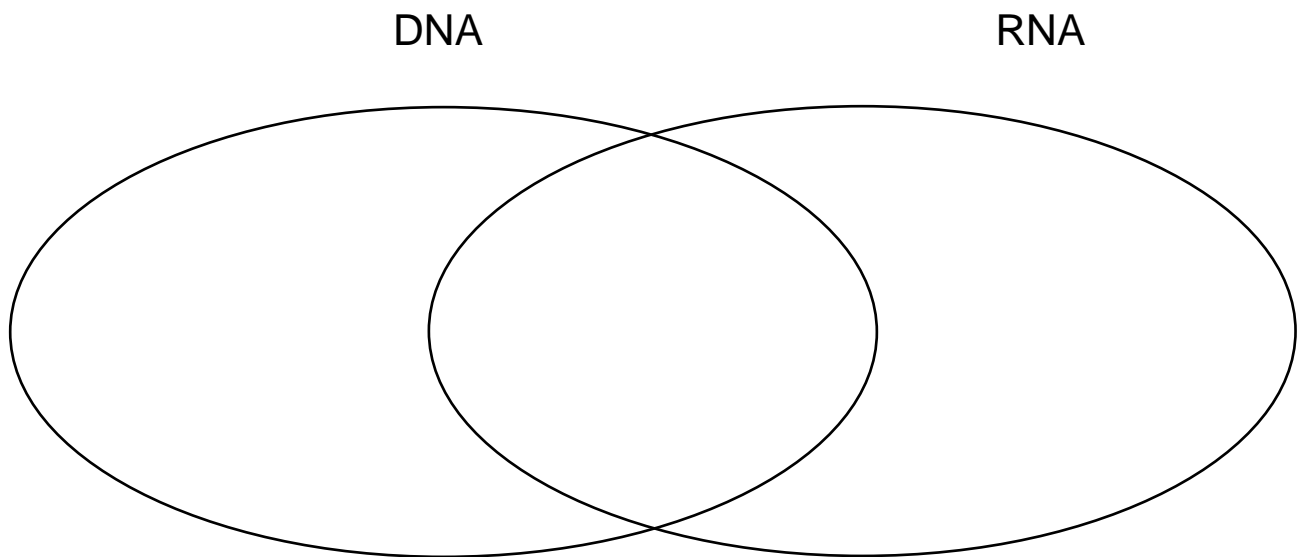
24. What is the source of **genetic variation**?

25. Complete the table:

Cell Division	Purpose	# of divisions	# daughter cells	Picture
Mitosis				

Meiosis				
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26. Complete the **Venn diagram** for characteristics of **RNA** and **DNA**.



Define the following terms:

Activation Energy-

Autosome-

Catalyst-

Chemosynthesis-

Chlorophyll-

Crossing Over-

Diploid-

Enzyme-

Gamete-

Haploid-

Homeostasis-

Karyotype-

Phospholipid-

Semi permeable membrane-