13. In humans a straight thumb in dominant to a curved thumb. Fred has a curved thumb and marries Edna, who has a straight thumb and is heterozygous for the trait. What is the probability of Fred and Edna having children with curved thumbs?

Edna \ Fred	+	+
T	T+	T+
+	++	++

50% curved thumbs

++

Incomplete dominance:

14. In Andalusian birds, there are three colors of feathers that are possible. Black (BB), White (WW), and blue (BW). What is the expected outcome of a black and a blue bird? (Show all steps)

	B	B
B	BB	BB
W	BW	BW

50% BB black

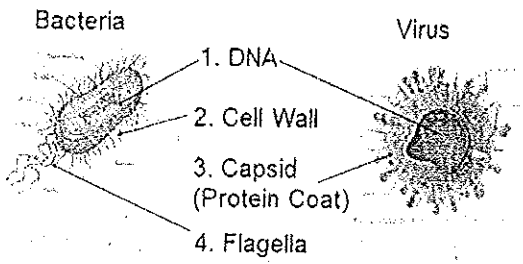
50% BW blue

15. Carnation flowers are either colored (red) or lack coloring, and are white. The coloring in carnations is an example of incomplete dominance. A scientist wanted to produce a new color of carnation. She took a red carnation and crossed it with a non-colored (white) carnation. Show the offspring produced from this cross. (Show all steps.) R = red W = white

	R	R
W	RW	RW
W	RW	RW

100% RW = pink flowers

Microorganisms



Would you classify both of these as being living? Why or why not?

1. Bacteria → living bc can reproduce on their own
Viruses → non-living bc cannot reproduce w/o a host cell.

2. Which of the following is one important difference between a virus and a bacterial cell?

A. A virus is much larger in size than a bacterial cell.

B. A virus always causes more severe disease than a bacterial cell.

C. A virus can never reproduce on its own, but a bacterial cell can.

D. A virus does not contain genetic material, but a bacterial cell does.

3. A biologist looks at an organism through a microscope. Which of the following observations tells the biologist that the organism is eukaryotic?

A. The organism is unicellular. B. The organism moves with flagella.

C. The organism has a cell membrane. D. The organism has membrane-bound organelles.

11. True or (False) Viruses can grow and move without assistance

12. True or (False) The cell does not burst during the lytic cycle

13. True or (False) You can catch the HIV virus by sitting next to an infected person

14. True or (False) Antibiotics can help cure viruses

CELL STRUCTURE AND FUNCTION

1-8. Matching: Next to each organelle, write the letter of its function

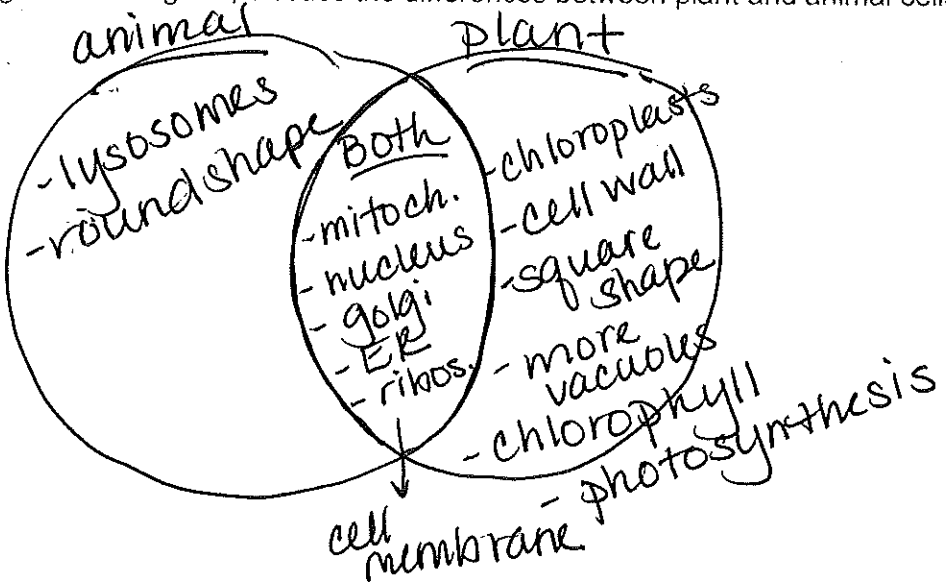
f mitochondria	a. where proteins are made
i cell membrane	b. site of photosynthesis in plants, contain chlorophyll
d cell wall	c. transport system of the cell
c endoplasmic reticulum	d. provides support and protection for plant cell
h nucleus	e. storage area for the cells
e vacuole	f. powerhouse of the cell, makes energy
b chloroplasts	h. control center of the cell, contains the genetic Information
a ribosome	i. Is selectively permeable, controls what goes in and out of the cell

9. Compare and contrast the functions of lysosomes and vacuoles in eukaryotic cells.

only in animal cells
Lysosomes contain enzymes to break down & recycle materials no longer needed. Vacuoles store food & water for the cells.

10. Using a Venn diagram, discuss the differences between plant and animal cells.

more prominent in plant cells



ENZYMES

1. Define the following two terms: enzyme, catalyst.

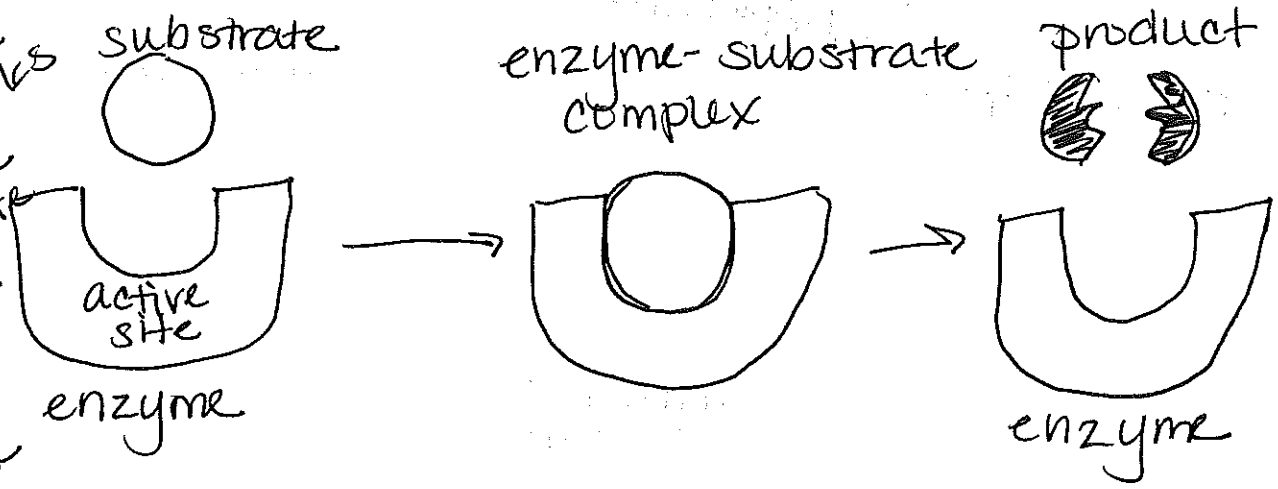
enzyme = protein catalyst that speeds up the rate of specific reactions

catalyst = substance that speeds up the rate of a chemical reaction

2. Explain the lock and key model of enzyme activity by drawing and labeling a diagram.

Use the following terms in your description (active site, enzyme, products, substrate).

Enzyme only works with one substrate because of their shape. Like one key for one lock.



3--11. For each of the following statements, label as true or false. Correct any false answers.

T a. Enzymes are types of proteins

F b. Enzymes ~~slow down~~ speed up the rate of chemical reactions

T c. Each enzyme is specific; it only works on one type of substance

T d. Enzymes become denatured (melt) at high temperatures

T e. Enzymes work best at a narrow pH range

F f. Enzymes can ~~not~~ be reused.

T g. Proteins are made of building blocks called amino acids

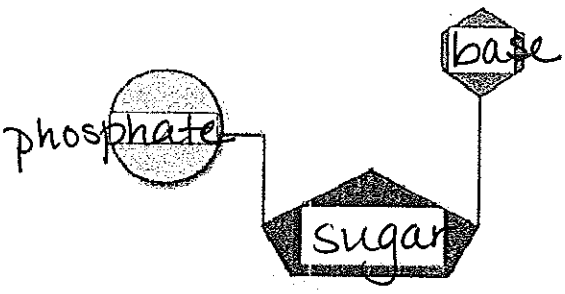
F h. Proteins are made in the ~~mitochondria~~ ribosomes of cells

T i. Proteins make up our blood, hair, skin, heart, muscles, and bones

DNA AND RNA

1. Two scientists are given credit for discovering the structure of DNA. What is the name of those two scientists? Watson and Crick.

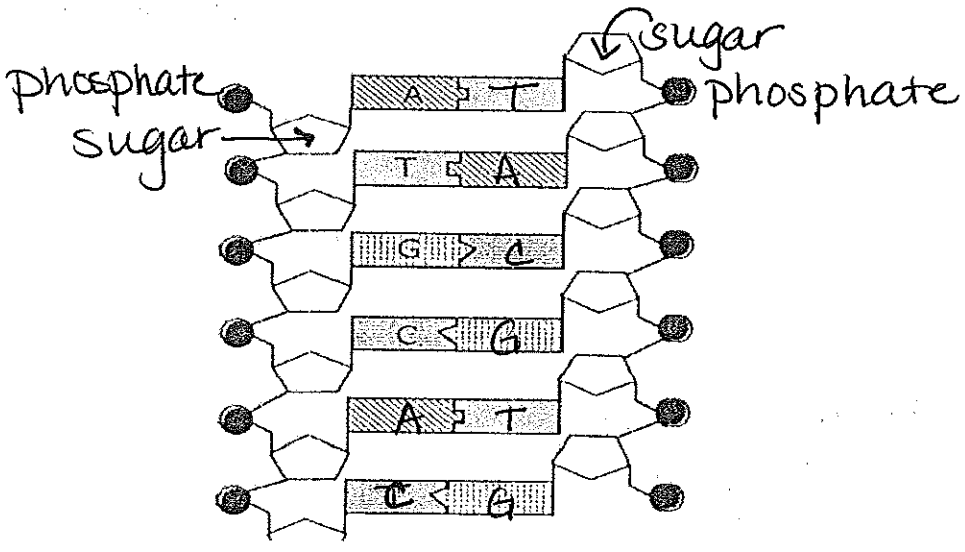
2. Label the nucleotide diagram.



3. The bond formed between nitrogen bases in a molecule of DNA is called a hydrogen bond.

4. Chargaff's rule states that the DNA of any species contains equal amounts of adenine and thymine and also equal amounts of guanine and cytosine. Based on this information, scientist could predict that the base adenine pairs with thymine and the base guanine pairs with cytosine in the formation of the DNA molecule.

5.. Use the image below to complete the following: Circle a nucleotide. Label the sugar and phosphate. Label the bases that are not already labeled.

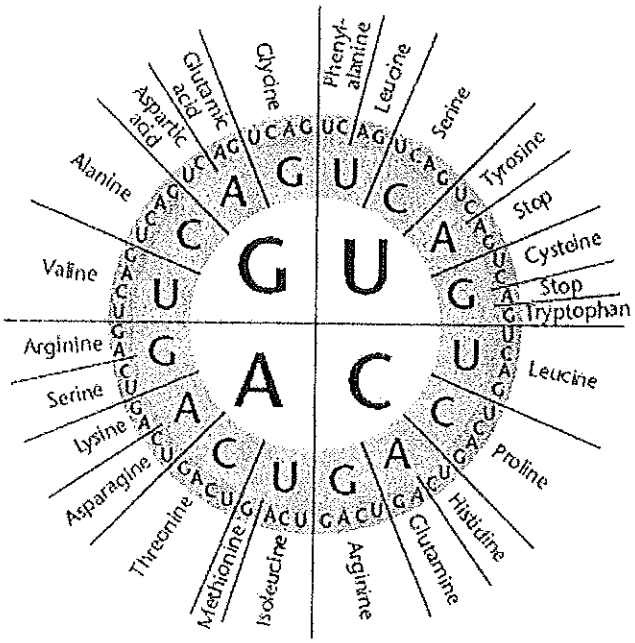


10. Replication, transcription and translation are terms that describe what process that occurs in all living cells? protein synthesis.

TRANSLATION:

11. USE the DECODING WHEEL to DETERMINE the AMINO ACID that corresponds to the m-RNA CODE GIVEN:

mRNA CODE	AMINO ACID
AAA	lysine
GCG	alanine
GAU	aspartic acid
CAA	glutamine
CAC	histidine
UUU	phenylalanine



12. What if a mutation caused a change in the code so the message read UGG instead of UGC? How would this affect the protein produced?

Tryptophan would be used instead of cysteine & protein wouldn't work.

13. What if a mutation caused a change in the code so the message read GGA instead of GGC? How would this affect the protein produced?

Nothing, same a.a. glycine

14 For each of the units below, name one type of protein that we have talked about this semester and describe its function in a living organism.

a. Cell Transport Unit integral / channel protein

b. Enzyme Unit enzymes – catalysts

c. Protein Synthesis Unit - all / polymerase (enzyme)

15. Proteins are essential to living organisms. Why is it important that they function properly? Give 2 specific examples and describe the consequence of a protein malfunction.

- without enzymes rxns would not occur fast enough to keep us alive
- proteins give us our traits
- transport in cells wouldn't work
  → cells would die