

**Biology**  
**Semester 2 Final Exam Review**

**Cell Reproduction**

1. Define the following terms:

Haploid

Diploid

Crossing Over

Somatic Cell

Gamete

Tetrad

Karyotype

2. Explain the chromosomes that are in body and sex cells.

3. A diploid cell has 24 chromosomes. How many chromosomes will a sperm cell have?

4. Explain the major function of each process:

a. meiosis

b. mitosis

**Genetics**

1. Who is Gregor Mendel and why is he important?

2. Define the following words:

a. homozygous

b. heterozygous

- c. allele
- d. dominant
- e. recessive
- f. phenotype
- g. genotype
- h. punnett square
- i. parental generation
- j. F1 generation

3. Write the following genotypes for the phenotypes. Green is dominant over yellow.

Homozygous green \_\_\_\_\_ Heterozygous \_\_\_\_\_ Yellow \_\_\_\_\_

4. If a female has blue eyes and a male is heterozygous brown eyed, what will be the phenotypes and genotypes of their offspring?

5. Complete the dihybrid below.

R=green                      Y=smooth  
 r=yellow                    y=wrinkled

	RY	Ry	rY	ry
RY				
Ry				
rY				
ry				

What is the genotypic ratio?

What is the phenotypic ratio?

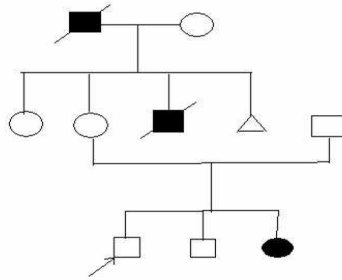
- 6. What is a sex-linked trait?
- 7. Give an example of a sex-linked trait.

8. What is the purpose of a pedigree?

A circle represents a \_\_\_\_\_. A square represents a \_\_\_\_\_.

E=not having dimples    e=dimples

FILL OUT THE PEDIGREE.



9. Explain incomplete dominance and codominance.

10. What is the difference between genetics and heredity?

### **DNA and protein synthesis**

1. Define the following words:

- a. Nucleotide
- b. DNA
- c. mRNA
- d. tRNA
- e. rRNA
- f. polypeptide
- g. DNA replication
- h. Transcription
- i. Translation
- j. Codon and Anticodon
- k. Mutation

2. Replicate the DNA strand below.

A T G G C A T T C G G

Transcribe the strand you just created.

Translate the strand.

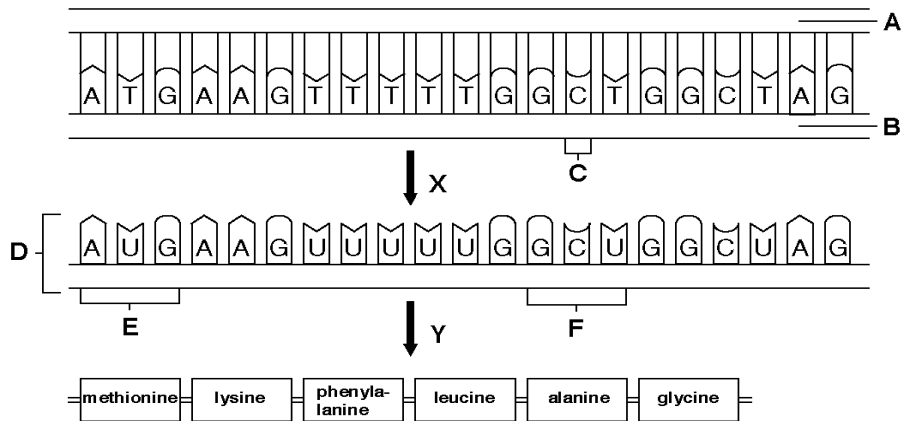
		Second Position					
		U	C	A	G		
First Position (5' end)	U	UUU } Phe UUC } UUA } Leu UUG }	UCU } Ser UCC } UCA } UCG }	UAU } Tyr UAC } UAA } Stop UAG } Stop	UGU } Cys UGC } UGA } Stop UGG } Trp	U C A G	
	C	CUU } Leu CUC } CUA } CUG }	CCU } Pro CCC } CCA } CCG }	CAU } His CAC } CAA } Gln CAG }	CGU } Arg CGC } CGA } CGG }	U C A G	
	A	AUU } Ile AUC } AUA } AUG } Met	ACU } Thr ACC } ACA } ACG }	AAU } Asn AAC } AAA } Lys AAG }	AGU } Ser AGC } AGA } Arg AGG }	U C A G	
	G	GUU } Val GUC } GUA } GUG }	GCU } Ala GCC } GCA } GCG }	GAU } Asp GAC } GAA } Glu GAG }	GGU } Gly GGC } GGA } GGG }	U C A G	
						Third Position (3' end)	

3. Name 2 similarities between DNA and RNA.

Name 2 differences between DNA and RNA.

4. Draw a nucleotide and label it with its 3 parts.

Describe the structure of DNA in detail!



5. Explain what is taking place in the picture. Make sure to describe each letter.

### **Evolution and Taxonomy**

1. Explain Miller and Urey's experiment.

2. Who is Charles Darwin?

Where did he do most of his work?

What did he mostly study here and what was its significance?

3. Describe natural selection.

4. Define adaptation.

Give an example of an adaptation.

5. Define and give two examples of each word.
  - a. vestigial structure
  - b. homologous structure
6. Why does natural selection take place?
7. List the types of evidence that support the theory of evolution.
8. What is evolution?
9. What is a fossil?

Give 3 examples.

Explain their formation.

### **Classification**

1. Define taxonomy.
2. Describe Linnaeus' contribution to classification.
3. Write the classification table from the largest category to the smallest category.
4. Describe how to write a scientific name. Give an example.
5. What is a cladogram? Draw an example.
6. List the 3 domains and the kingdoms that would be placed in each one.

7. Fill out the chart below for the six kingdoms.

KINGDOM	EUKARYOTIC/ PROKARYOTIC	UNICELLULAR OR MULTICELLULAR	FEEDING PATTERN Autotrophic/heterotrophic
Animalia			
Plantae			
Protista			
Fungi			
Eubacteria			
Archaeobacteria			

### **Ecology**

1. Define the following words.

- a. ecosystem
- b. population
- c. community
- d. biosphere
- e. abiotic factor
- f. biotic factor
- g. population density
- h. trophic level
- i. biomass pyramid
- j. herbivore
- k. carnivore
- l. producer
- m. consumer
- n. omnivore
- o. habitat

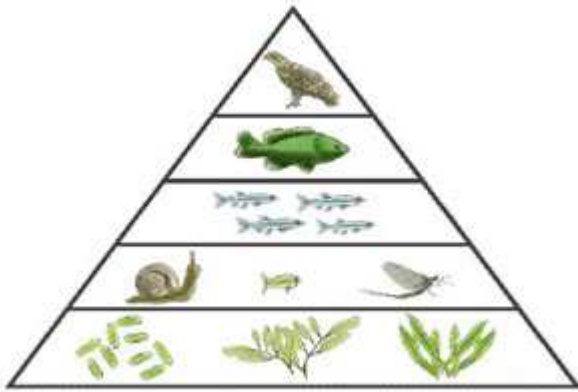
2. What is in a niche?

3. What would be some of the possible limiting factors of an animal population?

4. Create a food chain with the following animals: bird, grass, insect, and dog

Circle the producer. Star the primary consumer.

5. What is the difference between a food chain and food web?



6. Above is an energy pyramid. How much energy is available to be passed on from:

Producers to primary consumers?

Primary consumers to secondary consumers?

Secondary consumers to tertiary consumers?

7. List the different types of biomes. Circle Illinois' biome.