(KEY)

3rd Quarter Review

1. Define <u>and give examples</u> for the following vocabulary terms:

   a. Law of segregation

   alleles sep. during gamete formation

   b. Recombination

   egg + sperm → zygote (unique genetic combo)

   c. Law of independent assortment

   alleles assort ind. during gamete form.

   d. Dominant

   expressed over recessive

   e. Recessive

   not expressed when dominant gene is present

   f. Homozygous

   two of the same alleles

   g. Heterozygous

   two diff. alleles

   h. Genotype

   allele combo

   i. Phenotype

   what is expressed, what you see

   j. Alleles

   versions of genes

   k. Genes

   traits (found on chromosomes)

   l. Chromosomes

   contains genes

   m. Linked genes

   on same chromosome

   n. Sex linked traits

   gene on x-chromosome

   o. Co-dominance

   more than one dominant allele ex. blood type

   p. Incomplete dominance

   heterozygote = blended phenotype

   q. Blood types *A (AA or Ao), B (BB, Bo) AB (AB), O (oo)*

   r. Autosomal

   non sex-chromosomes

   s. Crossing over

   synapsis during meiosis

   t. Antibiotic resistance *by variation*

   u. Binomial nomenclature

   two part naming system

   v. Scientific name

   Genus species

   w. Variation

   x. Mutation

   y. Natural selection

   z. Evolution

   aa. Reproductive isolation

   when a group gets separated + no longer reprod.

   bb. Artificial selection *human selection ex. dog breeds*

   cc. Speciation *Creating a new species by the rest of the pop.*

   dd. Homologous structures

   structures common due to common ancestry

   ee. Classification

2. In humans, hair type is an example of incomplete dominance. For this trait curly hair is dominant (C allele) and straight hair is recessive (c allele). Individuals that are heterozygous for this trait have wavy hair.

   a. Make a Punnett square to show the cross between two individuals that are heterozygous for this trait.

   CC = curly   Cc = wavy   cc = straight

	C	c
C	CC	Cc
c	Cc	cc

   b. What are the expected percentages of phenotypes of the offspring?

   curly : wavy : straight
   1 : 2 : 1

   c. What is the genotypic ratio for this cross?

   CC : Cc : cc
   1 : 2 : 1

   hom. dominant : heterozygous : hom. recessive
   1 : 2 : 1

   d. Would the phenotypic ratio differ? Why or why not?

   In this case no b/c it is incomplete dominance. In this situation the heterozygote has a different phenotype.

3. When a tall plant and a short plant are crossed 100% of their offspring were tall.
   a. Which trait is dominant?

   tall

   b. What letter would you most likely use to represent this trait?

   (T)

   *(handwritten: Parents
   T T
   t Tt Tt ← F1
   t Tt Tt)*

   c. Make a Punnett square to show the cross between two F1 individuals (offspring from the original cross).
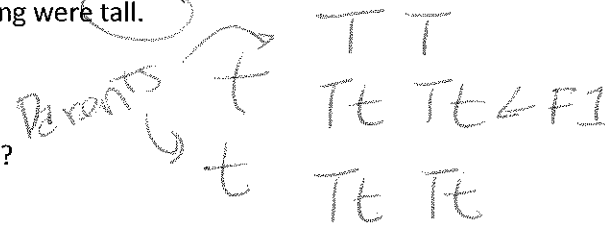
   (handwritten Punnett square)

   *TT : Tt : tt
   1 : 2 : 1*

   d. What is the phenotypic ratio for this cross?

   *Tall : short
   3 : 1*

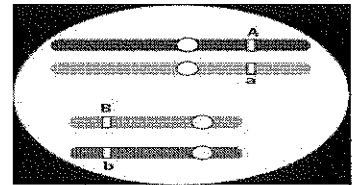   e. What is the chances that this cross would yield a short plant?

   25% chance

4. Who is Mendel? *Gregor Mendel funded*

   Law of dominance, Law of Segregation +
   a. What did he work with? *Ind. Assort*

   Peas

   b. How does his work relate to evolution?

   Evolution refers to the change in heritable (genetic) traits

5. What are the possible allele combinations for gametes produced by this cell.

   (A + a   B + b)   AB, Ab, aB, ab (4)

6. How is variation introduced into a population?

   *- mutations
   - Sexual reproduction (crossing over → unique gametes*

   a. Why is variation important for evolution? *recombination of genes in*
   Variation is needed for evolution   sex - making a unique zygote)

7. Explain how cytology, biochemistry, anatomy, and embryology can be used to find evolutionary connections between organisms. *→ cells → proteins → physical → embryos*

   Evidence in Evolution

8. Give an example of how natural selection can lead to an increase in biodiversity.

   → speciation

9. Blood types

   *A
   B
   AB
   O*

Blood Type	Genotype		Can Receive Blood From:
A	$i^A i$ $i^A i^A$	AA AO	A or O
B	$i^B i$ $i^B i^B$	BB BO	B or O
AB	$i^A i^B$	AB	A, B, AB, O
O	$i i$	OO	O

   a. What is the genotype of someone with type A blood?

   AA or Ao

b. What is the genotype of someone with type AB blood?

AB

c. What is the genotype of someone with type O blood?

OO

d. Make the punnett square for the cross between a person that has type AB blood and type O blood.

AO : BO
1 2 : 2 1

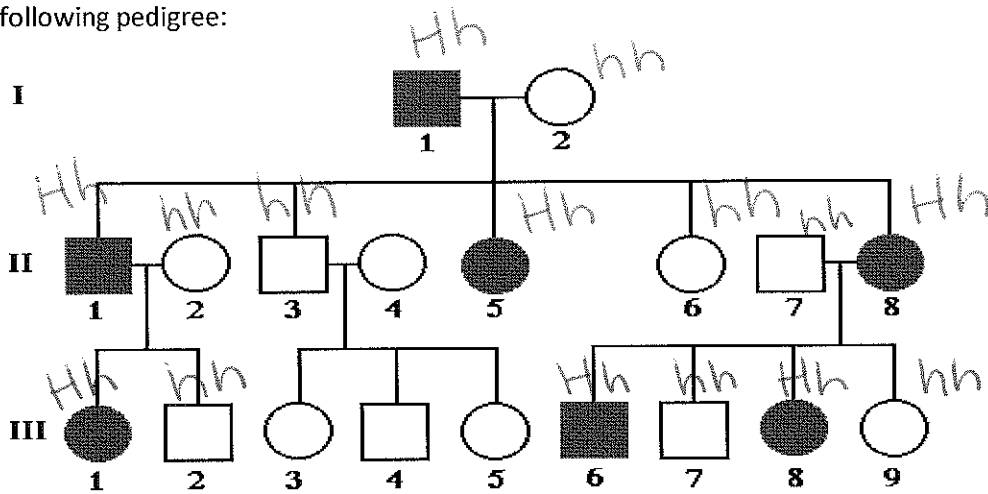|	A	B
O	Ao	Bo
O	Ao	Bo

e. Who can receive blood from any other blood type?

AB

f. What type of blood is considered to be the universal donor?

O

10. Examine the following pedigree:

H = hyperch.
h = normal

Pedigree 1. An idealized pedigree of a family with hypercholesterolemia, an autosomal dominant disease where the heterozygote has a reduced number of functional low density lipoprotein receptors.

a. What are the genotypes for individuals I.1 and I. 2?

↑ Hh ↖ hh

b. What shape represents a male on the pedigree?

■

c. What are the chances that individuals I.1 and I.2 have a child with hypercholesterolemia?

50% chance

	H	h
h	Hh	hh
h	Hh	hh

d. What is the phenotype of individual III.8?
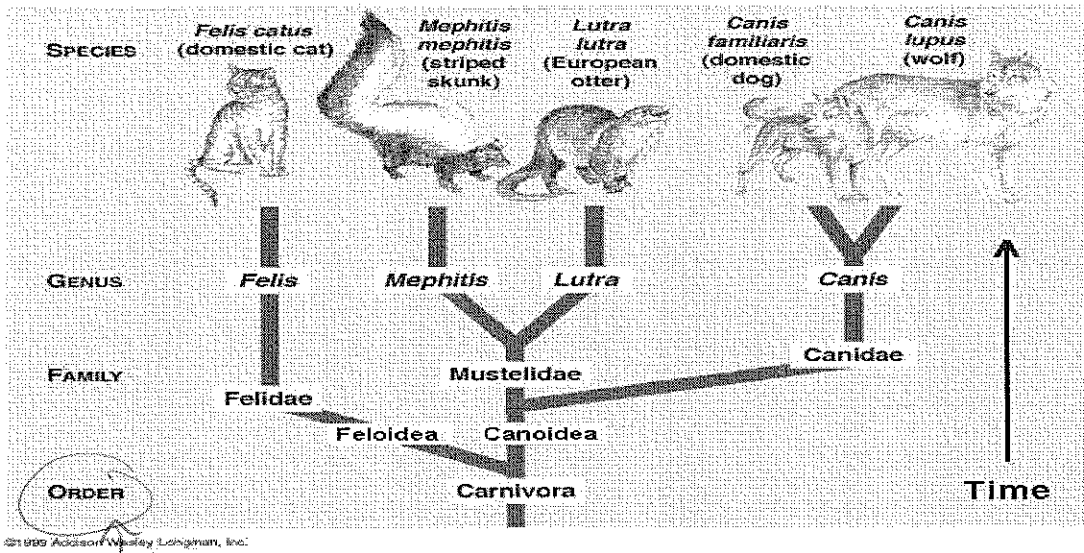
Hh (heterozygous) ← Genotype

Individual w/ hypercholesterolemia

e. Can individual II.8 be homozygous dominant? Why/why not?

No, b/c her father was hom. recessive + had to give her a recessive allele

11. Classification

a. What order to all of these animals belong to?

    Carnivora

b. Write the scientific name for the wolf:

    Canis lupis

c. What is the common name for *Mephitis mephitis*?

    Striped skunk

d. Which two organisms are classified under the same genus?

    domestic dog + wolf > both genus Canis

e. List the order of terms from most general to most specific: genus, family, kingdom, species, class, phylum, order

    K, P, C, O, F, G, S

    more specific