Unit 5: Meiosis and Genetics Review **Name _____**
Biology **Date _____ Block ___**

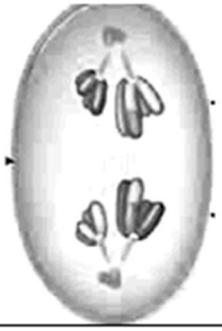
Meiosis Word Bank (some may be used more than once): *gametes, 1, the same, 46, 23, eggs, sperm, zygote, homologous, diploid, half, 2, haploid, prophase, fertilization*

1. Meiosis is a type of cell division that makes sex cells or _____.
2. The two types of sex cells are _____and _____.
3. Mitosis consists of _____ division(s), while meiosis consists of _____ division(s).
4. Mitosis makes cells with _____number of chromosomes as the parent cell, but meiosis produces cells with _____ the number of chromosomes as the parent cell.
5. A human's body cells have _____chromosomes; sex cells or gametes have _____.
6. For every chromosome your mother gave you, there is a _____ chromosome from your father with information regarding the same trait(s).
7. When a cell has a full complement of homologous chromosomes from each parent (2 complete sets of chromosomes), the cell is said to be _____.
8. Sex cells have only ONE set of chromosomes, they are called _____.
9. When an egg and a sperm combine during _____, the _____ that is formed has the normal _____ number of chromosomes.
10. _____ chromosomes exchange information during crossing over in _____ which adds to diversity

Phases of Meiosis. Match the phase of meiosis correctly with the description (each will only be used once): *Prophase I, Metaphase I, Anaphase I, Telophase I, Metaphase II, Anaphase II, Telophase II*

1. _____ Homologous chromosomes pair up and form a tetrad; crossing over occurs
2. _____ Spindle fibers move **homologous chromosomes** to opposite sides of the cell
3. _____ Nuclear membrane reforms, cytoplasm divides; 4 haploid daughter cells are formed
4. _____ Single chromosomes line up along the equator (middle) of the cell
5. _____ **Sister chromatids** separate to opposite sides of the cell
6. _____ Homologous chromosomes line up along the equator.
7. _____ Cytoplasm divides; 2 haploid daughter cells are formed.

Label each cell drawing with the phase of meiosis that is being depicted.



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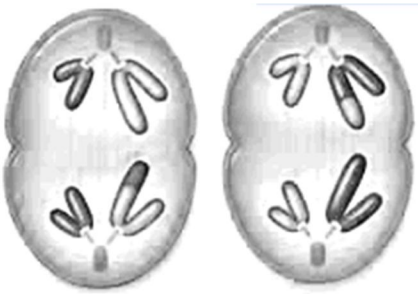

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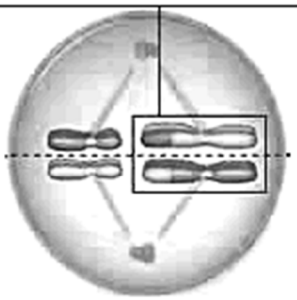

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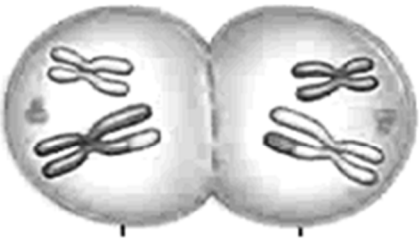

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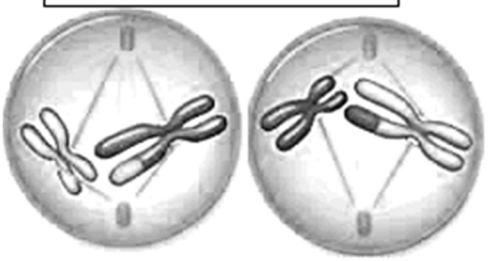


7.

8.

Genetics Vocabulary Word Bank (some may be used more than once): *phenotype, gene, heredity, genetics, genome, recessive, dominant, Gregor Mendel, trait, genotype, alleles, homozygous, heterozygous*

1. _____- two different alleles, a hybrid (Tt)
2. _____- is the passing of characteristics from parent to offspring
3. _____- is the type of genes or alleles present in an organism's genome
4. _____- form of gene that always shows even in the presence of a recessive allele.
5. _____- all of the genes in an organism
6. _____- are different forms of the same gene (ex: tall vs. short)
7. _____- two alleles of the same form that make up a genotype, pure breed (TT or tt)
8. _____ is the Father of Modern Genetics
9. _____- form of a gene only expressed in a homozygous state
10. _____- is an inherited characteristic
11. _____- is an organism 's physical appearance
12. _____- is the study of heredity
13. _____- is a segment of DNA located on a chromosome that codes for a particular protein

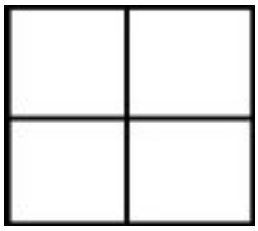
Mendelian Genetics: Word Bank (some may be used more than once): *monohybrid, dihybrid, Independent Assortment, Segregation, Punnett square, P, F1 , F2, incomplete dominance, codominance, sex-linked traits*

1. _____- table used to diagram the probability of getting certain genotypes
2. A _____ cross looks at only one trait
3. A _____ cross looks at two traits at a time
4. The first generation of a 'cross ' is the _____ or parental generation
5. The offspring of the _____ generation is the F1 generation
6. The offspring of the _____ generation is the F2 generation
7. The Law of _____ states that each gene is inherited separately from others if they are on different chromosomes
8. The Law of _____ states the 2 alleles for each trait separate as gametes form
9. _____ is blending of traits; red flowers + white flowers = pink
10. _____- both alleles are expressed equally, as in blood typing (A+B = AB)
11. _____- controlled by genes on sex chromosomes and are often more common in males than in females; colorblindness, hemophilia

Punnett Squares: Monohybrid and Dihybrid Crosses

1. The Allegheny Woodrat (Neotoma magister) is a threatened species found in Virginia. You may know of them as packrats. In addition to storing quantities of food, they also will collect and store small strange objects such as bottle caps, bones, coins, shotgun shells, or rings. Suppose the trait for bringing home shiny objects (H) is controlled by a single gene and is dominant to the trait of only carrying home dull objects (h)

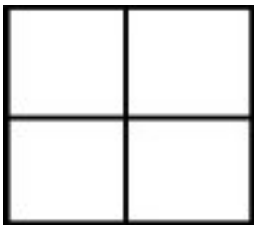
   a. Suppose two heterozygous individuals are crossed. What percentage of expected offspring would only bring home dull objects?



   b. What cross or crosses would allow for all rats to bring home shiny objects?

2. In pea plants, yellow seeds (Y) are dominant and green seeds (y) are recessive. A pea plant with yellow seeds is crossed with a pea plant with green seeds. The resulting offspring have about equal numbers of yellow and green seeded plants. What are the genotypes of the parents?

3. In humans, acondroplasia "dwarfism" (D) is dominant over normal (d). A homozygous dominant (DD) person dies before the age of one. A heterozygous (Dd) person is dwarfed. A homozygous recessive individual is normal. A heterozygous dwarf man marries a dwarf heterozygous woman



a. What is the probability of having a normal child? _____

b. What is the probability that the next child will **also** be normal? _____

c. What is the probability of having a child that is a dwarf? _____

d. What is the probability of having a child that dies at one from this disorder? _____

4. Fur color in cats is controlled by an autosomal gene that can occur in the dominant form, (B), or the recessive form, (b). The length of the cat's fur is controlled by another autosomal gene that occurs in the dominant form, (S), or the recessive form, (s). The table below shows the traits for these allele codes.

Gene	Trait
B	black fur
b	white fur
S	short-haired fur
s	long-haired fur

The following genotypes were found in a male cat and a female cat.
BbSs (male) bbSS(female).

a. Describe the phenotypes of the parents.

b. What are the expected phenotypes of the offspring of this cross?

Multiple Alleles and Codominance

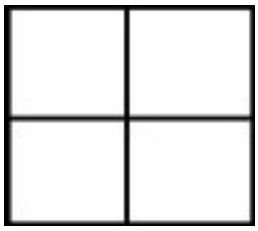
5. A woman with type A blood whose mother was type O marries a man with type O blood. What are the possible blood types of their children?
   a. Genotype of Parents: _____ x _____

b. Phenotypic Ratio of Offspring?

Incomplete Dominance

6. The Andalusian breed has one allele for black feathers (F^B) and one for white feathers (F^W). Since neither allele is dominant, the heterozygous condition (F^BF^W) causes the chickens to appear "blue" or "blue-gray". Suppose a Blue Chicken was mated with a white rooster. What would be the expected phenotypes of the offpring?

   a. Genotype of Parents: _____ x _____

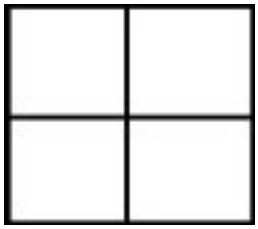


   b. Phenotypic Ratio of offspring?

Sex-Linked Inheritance

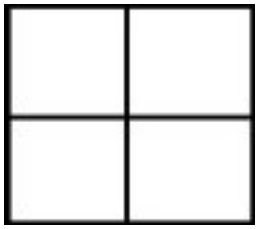
7. A man is diagnosed to have a genetic disease that is X-linked and dominant(X^D). He marries a woman who does not have the disease

   a. Genotype of Parents: _____ x _____



   b. What is the chance for any of his children to inherit the disease? _____

8. Red-green color blindness is an X-linked recessive trait in humans. A color-blind woman and a man with normal vision have a son.
   a. Genotype of Parents: _____ x _____



   b. What is the probability that the son is color blind? _____