Study Guide - Genetics Unit Test

Biology

Questions and Definitions

1. Vocabulary: know, understand, and be able to use the following terms:
    a. Genetics
    b. Heredity
    c. Gene
    d. Allele
    e. Trait
    f. Genotype
    g. Phenotype
    h. Dominant
    i. Recessive
    j. Homozygous
    k. Heterozygous
    l. Wild type
    m. Mutant
    n. Cross
    o. Sex-linked
    p. Autosomal

2. What are Punnett squares used for?

3. What two processes do Punnett squares model? (Hint – where do the parental alleles come from? What are we illustrating when we combine these alleles in a Punnett square?)

4. What are alleles?
    a) genes for different traits, such as hair color or eye color.
    b) alternative forms of a gene for a single trait, such as blue eyes or brown eyes.
    c) the location of genes on a chromosome
    d) recessive forms of a kind of characteristic carried by genes.
    e) dominant forms of a kind of characteristic carried by genes.

5. If a pea plant shows a recessive phenotype?
    a) it can be either TT or tt.
    b) it can be either Tt or tt.
    c) it can only be TT.
    d) it can only be tt.
    e) it can be TT, Tt, or tt.

Applications

1. Given parental genotypes, you should be able to determine the possible alleles those parents could contribute to their offspring.

2. You should be able to complete simple single trait Punnett squares.

3. You should be able to interpret a Punnett square to predict:
    a. The probability of offspring phenotypes
    b. The probability of offspring genotypes
    c. The appearance (phenotypes) of the parents
    d. The genotypes of the parents

4. Be able to solve a genetic mystery (like the Virtual Drosophila Lab):
    a. You will be given information about parental phenotypes
    b. You will be told the proportion of offspring that show certain traits
    c. You will be given information about a second cross (including parental phenotypes and offspring proportions)
    d. You will need to determine if a trait is sex-linked or autosomal, if it is dominant or recessive, and what the genotypes of all the individual organisms were

5. You should be able to use appropriate vocabulary to describe the situations we've been studying (such as the Alien Genetics Activity and the Virtual Drosophila Lab) – including any related Punnett Squares.