

APPENDIX ONE: Biology 104/114 Genetics Pre-lab Assignment

In the next lab you will be studying the inheritance of two visible characters in *Drosophila* (the common fruit fly): body color and eye color. In each case there are two alternate phenotypes: wild-type *Drosophila* have red eyes and tan bodies, however, mutants have been found that alter these characters. Mutants for the *white* gene have white eyes, and mutants for the *black* gene have black bodies. Your goals are twofold: to determine if these mutations are recessive or dominant to their corresponding wild-type allele, and to determine if the *white* and *black* loci are on autosomal chromosomes or on the X chromosome. You will be performing a cross between females from a pure-breeding {*white*, *black*} stock and males from a pure-breeding wild-type (i.e red, tan) stock to form an F1 generation. In preparation for interpreting the outcome of this cross, answer the following questions:

Possible inheritance modes for eye color:

If the mutant *white* allele is **dominant** to its corresponding wild-type allele and present on an **autosome**, what eye color phenotype(s) will the F1 have?

If the mutant *white* allele is **recessive** to its corresponding wild-type allele and present on an **autosome**, what eye color phenotype(s) will the F1 have?

If the mutant *white* allele is **dominant** to its corresponding wild-type allele and present on the **X chromosome**, what eye color phenotype(s) will the F1 have? Will there be a difference between F1 males and females?

If the mutant *white* allele is **recessive** to its corresponding wild-type allele and present on the **X chromosome**, what eye color phenotype(s) will the F1 have? Will there be a difference between F1 males and females?

Possible inheritance modes for body color:

If the mutant *black* allele is **dominant** to its corresponding wild-type allele and present on an **autosome**, what body color phenotype(s) will the F1 have?

If the mutant *black* allele is **recessive** to its corresponding wild-type allele and present on an **autosome**, what body color phenotype(s) will the F1 have?

If the mutant *black* allele is **dominant** to its corresponding wild-type allele and present on the **X chromosome**, what body color phenotype(s) will the F1 have? Will there be a difference between F1 males and females?

If the mutant *black* allele is **recessive** to its corresponding wild-type allele and present on the **X chromosome**, what body color phenotype(s) will the F1 have? Will there be a difference between F1 males and females?