Honors Biology Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
NDHS Per: \_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_

**Linked Genes and Crossing Over**

1. How does the inheritance of two genes on the same chromosome differ from the inheritance of two genes on separate chromosomes?
2. How does this affect the genetic diversity of the offspring?
3. If two genes are linked on the same chromosome, how can diversity in the gametes increase?

Use the following Key for problems 4 - 7.

 T = tall B = Blue

 T= short b = red

The genes for height and color are on the same chromosome.

A male that is homozygous dominant mates with a female that is homozygous recessive.

1. Draw the chromosome structure of the male, the female and the offspring.

Male Female Offspring

1. If the genes cross over with a frequency of 10%, predict the type and frequency of the gametes produced by the offspring.
2. A male that is homozygous for the tall trait and homozygous for the red trait is crossed with a female that is homozygous for the short trait and homozygous for the blue trait.

What is the chromosome structure of the Male, Female, and Offspring?

Male Female Offspring

1. If the genes cross over with a frequency of 10%, predict the type and frequency of the gametes produced by the offspring.
2. The genes for fur color and wing type are linked on the same chromosome in hattinpoots. Orange fur is dominant over blue fur. Feather wings is dominant over leather wings. A pure bred orange, feather winged male mates with a pure bred blue leather winged female resulting in an orange, feather winged hattinpootette (a baby hattinpoot). If this offspring breeds with a blue, leather winged individual, what is the probability a blue, feather winged offspring will be produced if the genes cross over 40% of the time?