Name: _____ Date: _____ Period: _____
Biology Level 1- Ms. Strang Genetics Challenge Questions

1. Red-green color blindness is inherited as a sex-linked recessive. If a color-blind woman marries a man who has normal vision, what would be the expected phenotypes of their children with reference to color-blindness?

2. If a man with blood type B, one of whose parents had blood type O, marries a woman with blood type AB, what will be the theoretical percentage of their children with blood type B?

3. Suppose that gene b is sex-linked, recessive, and lethal (bb=death). A man marries a woman who is heterozygous for this gene. If this couple had many normal children, what would be the predicted sex ratio of these children?

4. In cats short hair is dominant over long hair; the gene involved is autosomal. Another gene, $B^1$, which is sex-linked, produces yellow coat color; its allele $B^2$ produces black coat color; and the heterozygous combination $B^1/B^2$ produces tortoise-shell coat color. If a long-haired black male is mated with a tortoise-shell female homozygous for short hair, what kind of kittens will be produced in the $F_1$? If the $F_1$ cats are allowed to interbreed freely, what are the chances of obtaining a long-haired yellow male?

5. In some breeds of dogs a dominant gene controls the characteristic of barking while trailing. In these dogs another independent gene produces erect ears; it is dominant over its allele for drooping ears. Suppose a dog breeder wants to produce a pure-breeding strain of droop-eared barkers, but he knows that the genes for silent trailing and erect ears are present in his kennels. How should he proceed?