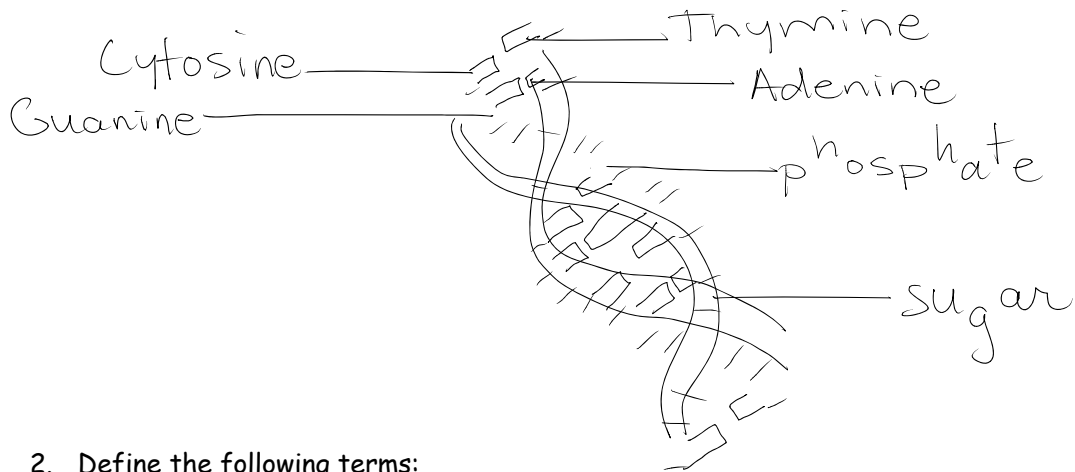


## Genetics Review

1. Identify the 2 mistakes made in the following diagram of DNA:



2. Define the following terms:

- |              |                 |
|--------------|-----------------|
| a. Allele    | g. Homozygous   |
| b. Trait     | h. Heterozygous |
| c. Gene      | i. Offspring    |
| d. Recessive | j. Phenotype    |
| e. Dominant  | k. Genotype     |
| f. Heredity  |                 |

3. If a chicken's DNA is composed of 26% guanine, what percentage will be cytosine?

4. What is the relationship between a trait, a gene, and a chromosome?

5. a. What is a mutation?

b. Describe the 3 types of mutations.

c. Identify the 3 potential types of mutations.

6. In dogs, the gene for fur color has two alleles. The dominant allele (F) codes for grey fur and the recessive allele (f) codes for black fur.

a. The female dog is heterozygous. The male dog is homozygous recessive. If these two dogs reproduce, what percentage of their offspring will be grey?

- b. The female dog is heterozygous. The male dog is heterozygous. If these dogs reproduce what percentage of their offspring will be homozygous dominant?
7. Cystic fibrosis is a recessive genetic disorder. Ron is homozygous dominant and Nancy is a carrier of cystic fibrosis. What is the probability that one of their children will have cystic fibrosis?
8. Patty is homozygous dominant for freckles, while Charlie is homozygous for no freckles. What is the probability of their children having freckles?
9. Eddie has brown eyes, while Cybil has blue. Brown eyes are known to be dominant. None of Eddie and Cybil's children have blue eyes. What must Eddie's genotype be?
10. Larry and Lola Little have achondroplasia, a dominant form of dwarfism. Both are heterozygotes. Their son, Big Bob Little, is 7'1". What is the probability of Larry and Lola having a child without achondroplasia?

### Patenting of Genes

Dr. Lydia Mendoza and her company, *Genmania*, have spent years working to identify how the gene for albinism works. The mutation in this gene causes no pigment to be produced in the hair, skin or eyes. Identifying the gene would open the door to curing the condition. Finally, her team succeeds.

But the years spent on research were expensive. One way to make back that money is to patent the gene that team members just identified. Then, anyone who wanted to develop either treatments or tests would have to pay a fee to use the gene.

When a patent is submitted to the government, the company must prove that the item to be patented is original and patentable.

11. a. What do you think about patenting a gene that already exists in the human body?
- b. Should the government allow this gene to be patented? Why or why not?
- c. Some think that genes should not be patented because they are a medical discovery and not an invention, and everyone should be allowed to use the information without paying. What do you think?
- d. If, in the future, *Genmania* develops a test for this gene, should they be allowed to patent the test? Why or why not?