

## Science 10 – Review for Test on Genetics

In order to do well on the Genetics test, you should:

Know and be able to explain the following terms:

Genotype	Offspring	Hemophilia
Phenotype	Incomplete dominance	Positive mutation
Homozygous	Codominance	Negative mutation
Heterozygous	Antigen	Neutral mutation
Dominant	Antibody	Antibiotic resistance
Recessive	Multiple alleles	Birth defects
Hidden trait	Blood Types A, B, AB & O	Downs Syndrome
Expressed trait	Universal donor	Trisomy 21
Purebred	Universal recipient	Mutagen
Hybrid	Mutation	Ultraviolet (UV) light
Selective breeding	Heredity	Ionizing radiation
Homologous chromosomes	Sex-linked traits	
Alleles	Female carrier	

Be able to recognize homozygous and heterozygous genotypes

Be able to determine the phenotype of an individual given its genotype and which allele is dominant.

Be able to draw a Punnett square for crosses where one dominant and one recessive allele is present for a gene.

Be able to use a Punnett square to predict the fractions of different genotypes and phenotypes for any cross.

Be able to determine the genotypes of parents, given the approximate fractions of different genotypes and phenotypes in offspring.

Be able to determine the fractions of phenotypes and genotypes of offspring resulting from crosses in which there is incomplete dominance.

Know that a population that always produces a certain phenotype must be purebred (all individuals are homozygous eg. TT or tt etc. )

Know what is meant by "Parent Generation" , "F1 generation" and "F2 generation".

Know that in codominance, the phenotype of an offspring displays characteristics of both alleleles (not a blend as in incomplete dominance)

Given the genotypes of red blood cells, be able to determine whether a person has type A, B, AB or O blood.

Know the 3 different possible alleles in human red blood cells.  $I^A$ ,  $I^B$  and  $i$ .

Know the blood types of universal recipients and universal donor and be able to explain why this is so.

Know how to predict the phenotypes of genes with multiple alleles.

Be able to determine the sex of an individual by the X and Y chromosomes present

Know what is meant by a sex-linked gene and be able to explain why males have a greater chance of inheriting disorders carried by a sex-linked gene.

Be able to determine whether a mutation is positive, negative and neutral for a certain organism.

Be able to determine characteristics of an individual when genotypes are given and there is more than one gene involved. (eg. BbEe, Bbee etc.)

Be able to list and recognize some contributions made by Gregor Mendel.

Recognize that a mutation can be a change (or substitution) in a single base, an omission or insertion of a single base or a change in a large number of bases in DNA. It can also cause variations in whole chromosomes including deformed chromosomes or extra chromosomes.

Know that the major causes of mutations are errors in duplication of chromosomes, exposure to chemical substances (mutagens) like PCB's, dioxin, asbestos, tobacco tar, etc. and exposure to Ultraviolet or ionizing radiation.

Know that UV radiation can cause melanomas

Be aware that some inherited genes increase a person's chances of getting certain types of cancer.

Be aware that mutations can cause disorders (like the inability to produce vital proteins), birth defects, and cancer (malignant tumors)

Know that individuals with Down's Syndrome have an extra 21<sup>st</sup> chromosome.

Be aware that there are other genetic disorders which result from abnormal chromosomes.

Be aware that many characteristics are the result of the combined effects of many genes and the environment.