# Heterozygous and Homozygous Encyclopedia Article

## Heterozygous and Homozygous

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# Contents

Heterozygous and Homozygous Encyclopedia Article.....1

Contents.....2

Heterozygous and Homozygous.....3

# Heterozygous and Homozygous

The term heterozygous refers to the situation where a specific gene is represented by two differing forms or alelles within the diploid nucleus. The opposite case within the cell is considered homozygous. A homozygote has both copies of the gene present in the same form, or as identical alleles. The alleles are present in the same loci, the same physical location on the chromosomes.

A heterozygote is capable of producing gametes of two different forms- -one for each allele present. This is as a result of the homologous chromosomes moving to opposite ends of the dividing cell during meiosis. Conversely, the homozygote is only capable of producing the one type of gamete because there is only one type of allele present.

Phenotypically, the heterozygote and homozygote may be indistinguishable from each other. This effect is due to the phenomenon of dominance and recessiveness. If one allele is dominant, it will mask the observable effects of the recessive allele. It will only become clear that there are two different alleles present when the offspring are observed and the genetic make-up of the gametes is inferred. The dominant allele present in the homozygous form is phenotypically indistinguishable from the heterozygote. This form is referred to as homozygous dominant. The homozygous form of the recessive allele (homozygous recessive) has the phenotype of the recessive allele and it can be easily inferred from observation if it is known that that particular characteristic is recessive. There are cases where dominance is incomplete and the heterozygote shows a blending of the two alleles.

A heterozygote need not be a diploid as described above, polyploid heterozygotes can also exist. The recognizing characteristic of a heterozygote is that it does not breed true, or in other words, it produces two (for a diploid organism) or more (for a polyploid individual) forms of gametes. Polyploid homozygotes can also occur and are recognized by their ability to produce only the one type of gamete.