

# What are Genes and Alleles?

## Worksheet

A gene is a segment of DNA that codes for a specific trait, while an allele is one of the alternative versions of that gene. Every individual carries two alleles for each gene, one from each parent.

## Questions

1. What best describes a gene?

- A) A DNA segment coding for a trait
- B) A physical trait itself
- C) A type of chromosome
- D) A protein molecule

2. An organism with two different alleles for a gene is called

- A) Homozygous
- B) Heterozygous
- C) Haploid
- D) Diploid

3. Where do an organism's two alleles for a gene come from?

- A) Both from the mother
- B) Both from the father
- C) One from each parent
- D) They appear randomly

4. Which pair below represents alleles of the same gene?

- A) Brown-eye allele and tallness gene
- B) Yellow-seed allele and green-seed allele
- C) Chromosome 1 and chromosome 2
- D) DNA and RNA

5. Pea plants have a gene for seed color. One plant has two 'yellow' alleles, another has one 'yellow' and one 'green' allele. Identify the genotypes.

6. A human has the gene for eye color with alleles B (brown) and b (blue). If both alleles are B, what is the genotype and is it homo- or heterozygous?

7. How many alleles does a diploid organism carry for a single gene, and where do they come from?

8. Define: What is a gene?

9. Define: What is an allele?

10. Define: How many alleles does an organism have per gene?

## Answer Key

1. A) A DNA segment coding for a trait - A gene is the DNA segment that codes for a trait; the observable trait itself is the phenotype.
2. B) Heterozygous - Two different alleles = heterozygous genotype.
3. C) One from each parent - Diploid organisms inherit one allele per gene from each parent.
4. B) Yellow-seed allele and green-seed allele - Yellow and green are alternative versions (alleles) of the seed-color gene.
5. The gene is seed color. Alleles are the versions: yellow (Y) and green (y). Plant 1 genotype: YY (homozygous). Plant 2 genotype: Yy (heterozygous).
6. Genotype = BB. Both alleles are identical, so it is homozygous. Since B is typically dominant, the eye color trait expressed is brown.
7. Diploid organisms carry two alleles per gene. One allele is inherited from the mother. The other allele is inherited from the father. Together they form the genotype for that gene.
8. A segment of DNA that codes for a specific trait and occupies a fixed location on a chromosome.
9. One of two or more alternative versions of a gene that produce different trait variations.
10. Two - one inherited from each parent (in diploid organisms).

### **Bounlu**

All cards, step-by-step solutions and an AI tutor are in the Notek app.  
Promy turns exam dates into automatic reminders.