

Name:

Date:

Period:

Genotypes and Phenotypes: Understanding Scientific Terms

Genetics is the study of how traits are passed from parents to offspring. Genes are pieces of DNA that carry instructions for traits, and they come in pairs. Each form of a gene is called an allele. The combination of alleles an organism has is called its genotype. The way those genes are expressed in the organism (what you can see) is called its phenotype.

Genotypes can be:

- **Homozygous:** Two of the same alleles (ex: TT or tt)
- **Homozygous dominant:** Two dominant alleles (ex: TT)
- **Homozygous recessive:** Two recessive alleles (ex: tt)
- **Heterozygous:** Two different alleles (ex: Tt)

Phenotypes are what you see, like tall or short plants, based on their genotype.

Fill in the Blank: Fill in the blank with the correct words.

1. A genotype with two different alleles is called _____.
2. If an organism has two dominant alleles, its genotype is _____.
3. The physical trait that is observed is called the _____.
4. A genotype with two recessive alleles is referred to as _____.
5. The combination of alleles that an organism has is called its _____.

Word Bank: phenotype, heterozygous, genotype, homozygous dominant, homozygous recessive

Multiple Choice Questions: Choose the correct answer from the choices for each question.

6. Which genotype is heterozygous?
 - ☐ A) TT
 - ☐ B) Tt
 - ☐ C) tt
 - ☐ D) TTt
7. What do you call an organism with the genotype "tt"?
 - ☐ A) Homozygous dominant
 - ☐ B) Heterozygous
 - ☐ C) Homozygous recessive
 - ☐ D) Phenotype
8. If "T" stands for tall and is dominant, and "t" stands for short and is recessive, what is the phenotype for a plant with genotype "Tt"?
 - ☐ A) Short
 - ☐ B) Tall
 - ☐ C) Medium
 - ☐ D) Unknown
9. Which of these is a genotype?
 - ☐ A) Tall
 - ☐ B) Short
 - ☐ C) Tt
 - ☐ D) Leafy

10. An organism shows the recessive trait only if its genotype is:

- ☐ A) Heterozygous
- ☐ B) Homozygous dominant
- ☐ C) Homozygous recessive
- ☐ D) All of the above

Open-Ended Questions: Answer the following questions in complete sentences.

11. Explain the difference between genotype and phenotype.

12. Describe what it means if a plant is homozygous dominant for height.

13. Give an example of a heterozygous genotype and describe what phenotype it would have if the dominant allele is for brown eyes.