**Introduction:**

This assignment comprises a parenthetical, a sentence, and an expanded definition of the term *phenotype*. This assignment is an exercise to be able to effectively communicate and understand the varying amount of details we as technical writers should disclose depending on our intended readers. This assignment is to help non-technical readers with little to no scientific background understand the word “phenotype.”

**Parenthetical Definition:**  
A random genetic mutation gave rise to the sandy-colored phenotype (observable trait) of beach mice.

**Sentence Definition:**

A phenotype is an observable or measurable trait of an organism. A phenotype may relate to physical appearance (e.g. antlers, muscles), behavior (e.g. increased aggression), a developmental process (e.g. learning), or a performance trait (e.g. running speed). These traits are largely determined by an individual’s genotype (genetic composition) and its environment.

**Expanded Definition:**

**How did its name originate?**

The word *phenotype* comes from the Greek Word *Phainein****,*** which means “to display” and typos meaning “type” or “general form”. It was coined in 1905 by Wilhelm Johannsen in 1905, who also created the terms “genes” and “genotype.”

**How does it relate to Genotype?**

An individual’s genotype is the entire set of genes in its DNA. Depending on which genes (alleles) were inherited, expressed and the interaction between those genes, ultimately these determines the phenotype of an organism. Basically, genotype contributes to the traits and the phenotype is the observable expression of the genes. Although genotype is a major factor that determines phenotype, the environment also influences an individual’s phenotype. Therefore, the interaction between genotype and phenotype is often conceptualized by the following equation:

Genotype (G) + Environment (E) 🡪 Phenotype (P)

**How is phenotype important?**

Variations in phenotypes allows some individuals to survive better than others. Some variation leads to the development of adaptive characteristics that become essential for an organism’s survival. Natural selection eliminates individuals with inferior traits and preserves those with superior traits. Phenotypic variation is the basis of evolution and adaptation.

**Examples of different phenotypes?**

Since phenotype is an observable trait, examples of phenotypes can be any visible characteristic, such as:

* Eye color
* Hair color
* Height
* Certain types of disease
* Certain behaviors
* Size of a bird’s beak
* Length of a bird’s tail
* Color of the stripes on a cat
* Size and shape of the spots on a dog’s back
* Flower colour
* Design of shells



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Figure 1: Examples of varying phenotypes; different mice coat color, different flower petal color, and different colored irises.

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