

# ***Mendelian Genetics and Natural Selection***

## ***Student Guide***

### Cyanogenesis and Mendelian Genetics

1. Define the following terms:

- a. heredity
- b. gene
- c. allele
- d. linamarin
- e. linamarase
- f. petiole
- g. cyanogenesis

2. Complete the following sentences:

- a. A cross that involves only one trait with two phenotypes is called a \_\_\_\_\_
- b. A cross involving two different traits is called a \_\_\_\_\_
- c. The \_\_\_\_\_ states that the inheritance of alleles for one trait is not affected by the inheritance of alleles for a different trait if the genes for those traits are located on separate chromosomes.

### Applying Mendel's Concepts

1. There are 2 alleles of the gene that controls the ability to produce the cyanide containing sugar. In order to express this trait, the clover must have a dominant allele at the C gene. Using upper-case or lower-case letters for dominant and recessive alleles, write the allele combinations that could be found in a clover plant. Underline those that would produce the cyanogenic glucoside.

2. There are 2 alleles of the E gene which controls the production of the enzyme required to break down the cyanogenic glucosides and release cyanide. In order to express this enzyme, the clover must have a dominant allele. Using upper-case and lower-case letters, write the allele combinations that could be found in a clover plant. Underline those that would produce the cyanide-releasing enzyme.

3. Clover plants inherit the gene for the cyanogenic glucoside and the enzyme separately. Write the possible genetic combinations in the table below and indicate whether they would result in the production of cyanide. The first one is done as an example.

Genotype	Cyanide (y / n)
CCEE	Y

**Clover Genetics and Natural Selection**

1. Define the following terms:

- a. Genotype
- b. Phenotype
- c. Natural selection
- d. Evolution

2. Complete the following sentences:

- a. The ability of an individual to survive and reproduce is its \_\_\_\_\_.
- b. The sum total of the genetic material of organisms in a population that exchange genes with one another is their \_\_\_\_\_.
- c. \_\_\_\_\_ favors individuals with the average phenotype.
- d. \_\_\_\_\_ occurs when two genetically different forms of a trait are present in a population.