**Lesson Plan 3: Mendelian Genetics**

Kevin Hixon

**Introduction:** This lesson will focus on the basic principles of Mendel’s laws and genetics. The class will take pea plants and grow one generation of offspring of the plant in order to try and determine the genotype based on the phenotypes of the offspring. The teacher must understand how to take care of the plants and determine the genotypes of the initial plants.

**Group Size:** Two students per group

**Learning Objectives:** 1.The students will be able to correctly create and explain Punnett squares for their plants.
 2. Students will be able to explain the laws of independent assortment and segregation using examples from the class’s plants in a short paragraph.

**Guiding Question:** How do the laws of genetics affect the phenotype and genotype of the plant’s offspring?

**Materials:** Pea Plant Seeds, Computers

**Procedures:** 1. Students will be asked to discuss their opinions in a 5 minute debate asking what they think of eugenics, or the selection and “improvement” of certain genetic factors of living things at the beginning of class

2. Students will each have two seeds and determine the phenotype for the seed color and seed shape.

3. Each pair of students will grow their seeds and allow their pea plants to pollinate with one another to produce more seeds.

4. The students will record the phenotype of the offspring’s seeds the same way that the parent’s phenotype was recorded.

5. The students will then collaborate their data with the rest of the class using a table in a Google Doc so that all students can access and upload their own information.

6. Using all of this data students will try to determine the genotype of the parents and the offspring as well as which one of each trait is dominant and recessive.

7. Students will be given a Punnett square calculator online to determine whether or not their ideas actually work.

Once students have determined the genotypes and which traits are dominant and recessive they will write a short paragraph explaining why their conclusions are correct and include a Punnett square of at least one of their plants.

**Assessment:** Students will be assessed based on if their Punnett square is correct, if their conclusions are accurate, and if their explanations include the laws of segregation and independent assortment.

**Benchmark or Standards:** SC.912.L.16.1: Use Mendel's laws of segregation and independent assortment to analyze patterns of inheritance.