Lesson Plan

Name: Sara Ruddock-Harris Subject: Biology I- Genetics Period: 4th- Approximately 50 minutes Date: 6/23/2009

Bell Work:

Define: Allele, Gene, Heterozygous, and Homozygous

Objectives: The students will explain genetic phenomena using the concepts of incomplete dominance and codominance. (DOK 3)

Set:

1. The teacher will ask a student to pour red skittles into a clear receptacle.

- 2. The teacher will ask a student to pour blue skittles into the container with red receptacles.
- 3. The teacher will explain:

a. "Yesterday in the first demonstration, we saw the blue powerade dominate over the water. In the second demonstration, we saw the red and blue powerade blend. Today, we see that the red and blue skittles both dominate. Both red and blue are expressed in the container. This demonstration symbolizes codominance, another addition to the simple Mendelian genetics that we have been looking."

b. The teacher will present the day's objective: The students will explain genetic phenomena using the concepts of incomplete dominance and codominance.

Materials: Skittles, clear receptacle, dry-erase markers, markers, butcher paper, transparency, and overhead projector.

Procedures:

1. The teacher will incorporate the bell work in a review of the terms and definitions explored in the previous lecture.

a. "Lets go over the fundamentals of Mendelian genetics that we need to explore further. Can someone raise their hand and define the terms in the bell work?

- i. Allele: Different forms of the same gene
- ii. Gene: A piece of DNA that gives information for a specific trait
- iii. Heterozygous: Two different alleles for a given trait
- iv. Homozygous: Two of the same alleles for a given trait

b. The teacher will review additional vocabulary words.

i. Now, can someone define genotype for me. Genotype: The combination of genes in an organism.

ii. How about phenotype. Phenotype: The physical characteristics

2. The teacher will introduce the law of segregation.

a. All along we have been talking about the fact that we get on allele for each of our genes from each of our parents. How does this work? Our parents have 2 alleles for every gene, so how do they manage to only pass on one of each to us. The law of segregation tells us that our 2 alleles for every gene separate in the preparation steps for sexual reproduction. Ms. Self will delve more into this in her lessons on mitosis and meiosis.

3. The teacher will introduce the concept of incomplete dominance.

a. The teacher will remind the students of the blending demonstration from the previous lesson.

i. In the example with the red and the blue powerade, which color dominated. Neither. The colors mixed to come up with an altogether new color, purple. This is similar to what happens genetically in the phenomenon of incomplete dominance. Unlike in the examples we have looked at so far, in incomplete dominance neither alleles is dominant. Heterozygous offspring show a blending of the two alleles.

ii. Example: In the snap dragon plant, the flowers can come in white, red, and pink. The white and red flowers are homozygous and the pink flowers are heterozygous, a blending of red and white.

b. The teacher will explain punnet squares with incomplete dominance.

ii. When doing a punnet square for incomplete dominance, we use two different capital letters for each allele. In the example of the snap drag flowers write down the alleles for the white, red, and pink flowers.

iii. The teacher will lead the students in one punnet square example with incomplete dominance.

4. The teacher will introduce codominance.

a. Unlike in incomplete dominance, where neither allele is dominant, in codominance both alleles are dominant.

i. The teacher will remind the students on the example in the set.

1. "Like with the skittles earlier we did not see the mix of red and blue skittles turn purple. Instead, we saw both red and blue expressed in the mix. In codominance the same things happen each trait is expressed.

ii. Example: If the feather color follows codominance, a cross between a black and a white chicken will yield a chicken with both black and white feathers.

iii. The teacher will explain punnet squares with codominance.

1. In codominance, we use the same capital letter for both alleles with different superscripts to distinguish them.

iv. The teacher will lead the students in one punnet square example with codominance.

5. The teacher will underscore the differences between incomplete and codominance.

a. In incomplete dominance, we see a blending of the traits to create a brand new trait.

b. In codominance, each trait is expressed independently of the other trait.

c. In incomplete dominance, neither trait is dominant.

d. In codominance, both traits are dominant.

e. In incomplete dominance, we use two different capital letters in our punnet square.

6. The students will complete punnet square posters based on the concepts of incomplete dominance and codominance.

Closure:

1. The teacher will restate the objective: The students will explain genetic phenomena using the concepts of incomplete dominance and codominance.

- 2. The teacher will review the concepts of the day's lesson
 - a. Incomplete dominance: neither allele is dominant. When crossed we see a blend.
 - b. Codominance: both alleles are dominant. When crossed each allele is equally expressed.
- 3. The teacher will preview the next day's lesson.
- a. Tomorrow, we will look at more additions to simple Mendelian genetics. We will look at crosses with multiple alleles and linkage.

Assessment:

Informal: The students will answer questions through out the lesson (M). The students will explain genetic phenomena using the concepts of incomplete dominance and codominance (C).

Informal: The students complete an in-class poster assignment (M). The students will explain genetic phenomena using the concepts of incomplete dominance and codominance (C).

Formal: The students will take a test in the future reviewing the material (M). The students will explain genetic phenomena using the concepts of incomplete dominance and codominance (C). The grade will be recorded in the grade book (D).