**Wednesday - Mendelian Genetics 2**

Period: 55 minutes

Subject: Intro to Biology Date: January 2014

Objectives:

* TSW identify Mendel’s Laws, as well as the terminology commonly used in the study of genetics (5b DOK 1).

Materials:

* PowerPoint, Dry Erase Markers, colored paper and flash cards

Bell Work (7 minutes):

* The following directions will be written on the white board:
  + “Using the question on the board, explain why all **three** of the incorrect choices are wrong, and explain why the correct answer is right.”
* The following state test style question will be displayed on the Promethean board:
  + Which of the following correctly provides a definition for crossbreeding?
    - a. the process by which two organisms are mated to produced offspring
    - b. the process by which plants make their own food using energy from the sun
    - c. the process by which cells divide to produce two identical diploid cells
    - d. the process by which DNA is encoded onto a strand of messenger RNA

Set (5 minutes):

* TTW show a short video of 18 facts on genetics
* Show the students a picture of two pea plants, and have them describe each plant. Plant A is a tall pea plant with purple flowers that are located in the terminal position, while Plant B is a dwarf pea plant with white flowers that are located in the axial position.
* “First we identified the traits being displayed. Traits are things like height, flower color, and flower position. Then we identified what is known as the phenotype. The phenotype is the physical characteristic of the organism, such as Plant A being tall or Plant B having white flowers.”
* “Today we’re going to learn the terminology used when discussing genetics so that we can start sounding like real scientists, and we’re also going to continue talking about Mendel by examining his laws.”

**Key Question/Big Picture Question: How are traits passed down from one generation to another? How can we predict what children/offspring will look like? Why don’t I look exactly like my mom/dad?**

Procedures:

1. 12 minutes. Define the terms commonly associated with the study of genetics.
   * **Gene**: a piece of DNA that gives information about a trait
   * **Allele**: different forms of the same gene
   * **Genotype**: combination of alleles for a trait
   * **Phenotype**: physical characteristic of an organism
2. 5 minutes. Review the different between genotype and phenotype. Genotype is the combination of alleles, while the phenotype is the actual physical manifestation of the trait being coded for.
3. 10 minutes. Explain Mendel’s Laws of Inheritance. Provide examples of each using pictures and text.
   * **Law of Segregation**: alleles separate during meiosis
   * **Law of Independent Assortment**: alleles separate independently
   * **Law of Dominance**: If a dominant allele is present, it will be reflected in the phenotype of the organism
4. 4 minutes. Have the students differentiate between genes, alleles, genotypes, and phenotypes. Then go over this independent practice as a class.
5. 7 minutes. Have students work on a series of review questions and begin flash cards for genetics terms.
6. 30 minutes. Spongebob genetics worksheet
7. Early finishers will work on
   * Meeting new vocabulary
   * Biology daily journal

Closure (5 minutes):

* “Today we learned all of the terminology used by scientists in the study of genetics. Then we took a look at Mendel’s Laws of Inheritance.”
* The teacher will choose a word from today’s lesson, and ask for a volunteer to define the word. The student will then define the word chosen by the teacher, and upon completing that definition, the student will then chose a word of their own. The teacher will call on someone to define the word chosen by the previous student. This will continue until the end of the period, ensuring that all students have a good understanding of the terms learned in today’s lesson.
* “Using the terms and the laws that we learned today, we’re actually going to start predicting inheritance patterns tomorrow, just like Mendel did with his pea plants. One really good method of making these predictions is to use a Punnett square, and that’s exactly what we’ll be working with tomorrow.”

Assessment/Evaluation:

Objective: TSW identify Mendel’s Laws, as well as the terminology commonly used in the study of genetics (5b DOK 1).

* Informal: 1. Oral questioning will be done throughout the lesson (M) to assess the students’ understanding of the terminology and laws that had been covered (C). 2. Students will review the terminology covered in the lesson (C) by creating flash cards and choosing words for their classmates to define (M).
* Formal: A test will be given at a later date (M) that covers the terminology commonly used in the study of genetics and Mendel’s Laws of Inheritance (C). The grade will be recorded in a grade book (D).

**Intervention:**

* Students may complete independent work in their assigned cooperative learning groups
* SpEd students may complete the assignment with their SpEd teacher and submit it the following day