DNA

Period: 53 minutes

Subject: Biology I

Objectives:

* TSW identify the structure and function of DNA (5a DOK 1).

Materials:

* keynote, Promethean Board, Dry Erase Markers, review worksheets

Bell Work (8 minutes):

* The following directions will be written on the white board:
  + “Using the question on the Promethean 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:
  + The stomach is located between the esophagus and the small intestine. The stomach secretes digestive enzymes and strong acids to aid in the digestion of food, playing a very important role in the process of digestion. The stomach is comprised of epithelial tissue, fibrous connective tissue, and smooth muscle tissue. Which of the following best describes the stomach?
    - a. cell
    - b. organ
    - c. tissue
    - d. organ system

Set (3 minutes):

* Have the students draw a house by instructing them to draw one simple shape at a time.
  + Draw a square, draw a triangle on top of the square and make sure that they are connected, draw a small square in the top left corner of the larger square and make sure that they are not connected, draw a small square in the top right corner of the larger square and make sure that they are not connected, draw a vertical rectangle (a rectangle that is standing up) and make sure that it touches the bottom line of the larger square.
* “Even though I was only giving you simple, step-by-step instructions most of you managed to draw roughly the same thing. DNA works in exactly the same way, in that it acts as a set of instructions that tell your cells what type of cells they are and what type of proteins they need to produce. This means that DNA is a blueprint that codes for all of your traits, everything from your hair and eye color to how tall or short you are. Today we’re going to be learning about the structure and function of DNA.”

Procedures (40 minutes):

1. 10 minutes. Present what DNA stands for, a definition of what it is, and a brief history of the discovery of its structure. Then show a video that summarizes this information, and explains how Watson and Crick deduced that a molecule of DNA was arranged in a double helical conformation.
2. 8 minutes. Describe the structure of DNA, by stating that it is made up of repeating units of nucleic acids, and then proceed by reviewing monomers and polymers, pointing out that DNA is a nucleic acid made up of many nucleotides.
3. 4 minutes. Review the fact that a nucleotide is made of three parts: a phosphate, a sugar, and a nitrogenous base.
4. 5 minutes. Discuss the four nitrogenous base pairs, and explain how purines always pair with pyrimidines.
5. 6 minutes. Discuss how DNA codes for an organism’s traits and acts as a means to transmit genetic information to new cells.
6. 7 minutes. With the remaining time have students work on a series of review questions that will be gone over at the end of class if there is time.

Closure (2 minutes):

* Orally question the students on the structure and function of DNA.  
  What is the monomer of DNA? [nucleotide]  
  Who discovered DNA? {Watson, Crick, Franklin]  
  What are the purines? [Adenine, Guanine]
* Inform them that they will be building their own models of DNA the following day, and then taking a quiz on the material covered over the last two days.

Assessment/Evaluation:

Objective: TSW identify the structure and function of DNA (5a DOK 1).

* Informal: Students will be orally questioned (M) throughout the lesson, as well as at the end of the lesson, to assess their understanding of the structure and function of DNA (C).
* Formal: TSW complete a series of review questions (M) on the structure and function of DNA (C) and the grade will be recorded in the grade book (D). Students will take a written quiz (M) tomorrow to assess their understanding of the structure and function of DNA (C), and the grade will be recorded in a grade book (D).