DNA Transcription

Period: 53 minutes

Subject: Biology I

Objectives:

* TSW identify the steps of DNA transcription and explain how this process is necessary to cell function (5a DOK 2).

Materials:

* PowerPoint, Promethean Board, Dry Erase Markers

Bell Work (7 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:
  + Which of the following describes the second step of DNA replication?
    - a. free DNA nucleotides pair with exposed bases
    - b. two identical strands of DNA are produced
    - c. DNA unzips as the two strands separate
    - d. sugar and phosphate join to form the backbone

Set (3 minutes):

* Have students derive the definition of transcription, the process of copying something from one form to another, by explaining the example of converting cassette tapes into CD’s. Then relate this to DNA transcription by explaining how DNA is transcribed into RNA.

Procedures (40 minutes):

1. 4 minutes. Define the process of DNA transcription, the process of copying the instructions coded for by DNA onto a strand of messenger RNA.
2. 6 minutes. Explain the differences between DNA and RNA. DNA is double stranded, contains thymine, and its sugar is deoxyribose, while RNA is single stranded, contains uracil, and its sugar is ribose.
3. 12 minutes. Have the students derive the five steps of DNA transcription through a series of leading questions and an illustration of the process, and as they derive each step, have them write down what occurs in their notes.
4. 5 minutes. A presentation will be used to illustrate the five steps of DNA transcription, and the students will draw and label these steps in their notes.
5. 4 minutes. Explain that DNA transcription is important because it ensures the preservation of the DNA in the nucleus.
6. 9 minutes. With the remaining time, have the students practice pairing RNA nucleotides with DNA strands to assess their understanding of A pairing with U, instead of A pairing with T. After completing the complementary strand sequences, students will work on a series of review questions, and if there is time this will be gone over as a class.

Closure (3 minutes):

* Orally question the students on the process of DNA transcription
* “Tomorrow we are going to be going over our final DNA process, the process of DNA translation. This is the process where we go from mRNA, which we learned about today, to proteins. The expression of these proteins is what gives us our traits.

Assessment/Evaluation:

Objective: TSW identify the steps of DNA transcription and explain how this process is necessary to cell function (5a DOK 2).

* Informal: 1. Students will be orally questioned (M) throughout the lesson, as well as at the end of the lesson, to assess their understanding of the process of DNA transcription (C). 2. While students are working on drawing the steps of DNA transcription, the teacher will be discussing the steps of the process with students (M) to assess their understanding of the DNA transcription (C).
* Formal: Students will take a written exam (M) at a later date to assess their understanding of the process of DNA transcription (C), and the grade will be recorded in a grade book (D).