Lesson Plan Incorporating Technology

Course Name: Introduction to Biological Chemistry

Lesson Topic: Nucleic Acids: Structure and Function

1. List the goals and objectives for this lesson.

Goal 1:
To provide students with the understanding and appreciation of the main differences between DNA and RNA and how the differences influence their respective functions

Learning objectives: students will be able to;
- identify and explain how nucleotides are linked together to form nucleic acids
- recognize the difference between RNA and DNA and draw structures of a ribonucleotide and deoxyribonucleotide

Goal 2:
To understand the concept of the central dogma of molecular biology

Learning objectives: students will be able to;
- understand and explain the terms “replication”, “transcription” and “translation” as related to the central dogma of molecular biology
- explain how the structure of nucleic acids relate to their function, and also describe the process of protein synthesis

2. What activities will be required for this lesson? (Discussion, readings, specific group activity, etc.)

- students will be required to listen to my previously recorded video lecture on the topic of the day prior to attending the class
- Depending on the size of the class, individual students or groups of 2-3 students will be tasked to present to the class within 10-15 mins about the salient points they captured from the recorded lecture
- Remaining students will share their views and mention other areas they thought the presenter(s) missed
- Based on the outcome of the presentation and discussion I will tailor the rest of my lecture to focus on where I feel the students need further understanding
- For deeper understanding and appreciation of this topic I will reserve some 5 min towards the end of the class for students to test their understanding of the lesson by playing some online educational games. A very important one that I found and which will be extremely helpful for this lesson is provided below. This game
provides an appreciation of the process of DNA replication while enjoying yourself and scoring points.

http://www.nobelprize.org/educational/medicine/dna_double_helix/dnahelix.html

3. How will you assess the lesson?

- First of all, the level of knowledge the students demonstrate in the pre-lecture presentation and discussions will enable me assess their strengths and where they need further assistance
- “Poll everywhere” surveys will occasionally be used in class for students to answer some short questions. This will help assess their engagement and whether they are following what I’m teaching.
- At the end of the lesson, students’ understanding will be tested by answering questions (in class) that exploits their level of achievement of the learning objectives

4. What resources (lecture, websites, text book chapters, articles, video clip, exams, etc.) do you need to assemble for the lesson? Which already exist and which will you need to develop?

<table>
<thead>
<tr>
<th>Item</th>
<th>Available at:</th>
<th>Need to develop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-recorded video lecture</td>
<td>Blackboard</td>
<td>Yes (but only for the first time I’m teaching this class; the same video can be used for subsequent years)</td>
</tr>
<tr>
<td>Text book chapter</td>
<td>Student will be required to buy the book</td>
<td>No</td>
</tr>
<tr>
<td>Powerpoint slides</td>
<td>Blackboard</td>
<td>Yes</td>
</tr>
<tr>
<td>Online games</td>
<td><a href="http://www.nobelprize.org">http://www.nobelprize.org</a></td>
<td>No</td>
</tr>
<tr>
<td>Lecture</td>
<td>In class</td>
<td>Yes</td>
</tr>
<tr>
<td>Exams</td>
<td>In class (at end of lesson)</td>
<td>Yes</td>
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