

Topic: DNA Rap Lyrics

Summary: Students will write lyrics about DNA and DNA replication to their own made up rap song.

Goals & Objectives: Students will be able to explain the structure of DNA. Students will be able to explain how DNA replicates.

Standards: CA Biology *5a. Students know* the general structures and functions of DNA, RNA, and protein. *5b. Students know* how to apply base-pairing rules to explain precise copying of DNA during semiconservative replication and transcription of information from DNA into mRNA.

Time Length: 1 week supplemented with other curriculum about nucleotides, base pairing and replication.

Prerequisite Knowledge: Students already know the double helix structure and nucleotides and are learning concurrently about base pairing and replication.

Materials:

- Paper and pencils
- Dictionaries
- Optional - Example rap songs
- Optional - CD player and background instrumental music for performance

Procedures:

1. Group the students into pairs of two.
2. Once the class has been introduced to a topic, they should write lyrics about that topic.
3. Students should work together on the rap lyrics, coming up with rhymes and explanations. Students should first come up with a first rough draft using keywords for the current topic. Then students should revise their lyrics so that it has more explanation of the scientific terms. All students turn in a written version of the lyrics, not by group.
4. Repeat step three until all the information has been covered in class.
5. The day of the performance, students who do not want to perform need to figure out who will be their proxy before the start of the performance. Make sure the optional music and CD player are setup before the performance.

Grading:

60 point project, see rubric. An easy way to grade the lyrics is to count the number of underlined vocabulary terms and mark off for missing terms. The four going further verses are worth 2 points each for a total of 8 points extra.

Accommodations:

Students with an IEP can be partnered with two other students. Students with an IEP can help with lyrics but not write down the lyrics. Students with an anxiety of public performance can use a proxy with no point reductions.

DNA Rap

Your group is going to write the music lyrics for a rap or “other types of music” that explains or describe the structure of DNA and how it replicates (copies two complementary strands). Your story has to be appropriate for school, may not contain double meaning words, and no negative / derogatory symbolism.

Lyrics

Raps are talk songs with a lot of rhyme. Most raps rhyme two lines at a time. Line one and line two rhymes with each other but not with other lines in the song. The two lines that rhyme are called a couplet.

Your rap will have two different sections that are separated with a refrain. A refrain is a repeated chorus. Your rap lyrics needs to include the all of the words below and must explain each of the phrases. The goal of the lyrics is to be educational and to explain or describe the meaning of the keywords, not just use them. You can put the keywords in any order but they must be in their corresponding section.

- Section 1. Deoxyribose nucleic acid
 DNA
 Nucleic acids
 Double helix
 Nucleotides
 Phosphate group
 Deoxyribose sugar
 Nitrogen bases
 Backbone
 Prymidines
 single ring
 Thymine
 Cytosine
 Purines
 double ring
 Adenine
 Guanine
- Section 2. Complimentary base pairs
 Template strand
 Hydrogen bonds
 A-T
 G-C
 DNA replication
 DNA helicase enzyme
 Replication fork
 DNA polymerase enzyme

Going Further. You can write both of the two verses for extra points. The following verses describe the bi-directional synthesizing of the complimentary strands.

Leading Strand - 3 prime
Lagging Strand - 5 prime
Okazaki fragments
DNA ligase enzyme

Lyric Examples

Bad Example: I am going to rap about DNA, at which I know nothing about.

The reason why the above example is bad is that it did not rhyme and did not explain about DNA.

Good Example:

Refrain.

I am going to rap about DNA, an educational lesson I will teach you today.
Please lend us your ear, and you will learn without shedding a tear.

Deoxyribose nucleic acid is its name; just say, DNA its the same.

Nucleic acids are a type of macromolecule; this is what I have learned in school.

The double helix looks like a spiral staircase, made of nucleotides attached at the nitrogen base.

DNA and RNA make up nucleic acids, with a phosphate-sugar backbone that is not too flaccid.

The larger adenine and guanine are called purines, while the smaller thymine and cytosine are called pyrimidines.

Refrain.

Complimentary bases are paired, held together by hydrogen bonds that the bases share.
A is paired with T, as G is with C.

DNA is copied through replication, a complex process we will provide some simplification.

DNA is first unwound by DNA helicase, an enzyme that unzip the DNA at a fast pace.
With the two complimentary strands separated, a structure called replication fork is created.

DNA polymerase then attaches complimentary bases, an enzyme that makes sure the letters are in the right places.

Refrain.

Paper Format

When writing your lyrics, place your refrain first and title it refrain. Then put the lyrics. One vocabulary term equals all the words per line. Underline each vocabulary term once. There should be a total of 26 underlined vocabulary terms. Do not underline a term more than once.

Class Performance

You will perform your rap to the class. You must say the rap to a beat with your partner. You can also synchronize dance moves while delivering your rap. You can use background music but the volume must be low so everyone can concentrate on your lyrics. If you choose not to rap or sing your lyrics to the class, you may select a proxy to rap for you. There will be a 10-point reduction for the person not performing. Limitations: The same proxy may only rap for one other group besides their own in the class.

Grading

	Beginning	Novice	Proficient	Advanced	Points
DNA	Lyrics explain very little science in detail or 4+ more keywords are missing, or some lyrics are not appropriate.	Lyrics explains some science or 1-3 keywords are missing or some lyrics are not understandable.	Lyrics explain science but not in detail; all keywords are used, and are appropriate and understandable.	Lyrics explain science in detail; all keywords are used, and are appropriate and understandable.	
Nucleotides					
Nitrogen Bases					
Base Pairing					
Replication	30 Points	40 Points	45 Points	50 Points	
Performance	Did not perform, used a proxy. 0 Points	Hard to hear voice or not rapped to a beat. 6 Points	Rapped to a beat but with little enthusiasm. 8 Points	Projected voice, rapped to a beat with enthusiasm. 10 Points	