

**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. They 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 must turn in a written version of the lyrics.
4. Repeat step three until all the information has been covered in class.
5. The day of the performance, students need to figure out who their proxy performer will be. 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 points off for missing terms. The three going further verses are worth 2 points each for a total of 6 extra points.

**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 any other type of music, that explains or describe the structure of DNA and how it replicates (copies two complementary strands). Your song 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. You can rhyme any word; it does not have to be the DNA vocabulary word.

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 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 sugar backbone  
                    Nitrogen bases  
                    Thymine (T)  
                    Adenine (A)  
                    Guanine (G)  
                    Cytosine (C)

Section 2.      Complimentary bases  
                    Original strand  
                    Hydrogen bonds  
                    DNA replication  
                    DNA helicase enzyme  
                    A - T and C - G  
                    DNA polymerase enzyme  
                    Leading Strand  
                    Lagging Strand

**Extra Credit** You can write the following three verses that describe the bi-directional synthesizing of the complimentary strands.

                    DNA ligase enzyme  
                    Okazaki fragments  
                    Purines and pyrimidine

## **Lyric Examples**

Bad Example: I am going to rap about DNA, of 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 it's 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 purine, while the smaller thymine and cytosine are called pyrimidine.

*Refrain.*

Complimentary bases are paired, held together by hydrogen bonds that the bases share.

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

DNA is first unwound by DNA helicase, an enzyme that unzips 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 list the lyrics.

One vocabulary term equals all the words per line. Underline each vocabulary term once.

There should be a total of 20 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. Your rap is only turned in by it being performed in front of the class. *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.  30 Points	Lyrics explain some science or 1-3 keywords are missing or some lyrics are not understandable.  40 Points	Lyrics explain science but not in detail or not underlined; all keywords are used, and are appropriate and understandable.  45 Points	Lyrics explain science in detail; all keywords are used, lyrics are appropriate, understandable, and underlined.  50 Points	
Nucleotides					
Nitrogen Bases					
Base Pairing					
Replication					
Performance	Did not perform and 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	

A zero grade will be awarded if the lyrics are not school appropriate.