

Welcome to the **DNA-o-gram** Extra Credit challenge. To earn up to 4 extra credit points (added to your daily work and EOR points), complete the following tasks, prepare a document with your answers, and then upload the file to the link on the WEEBLY class webpage.

PART 1 (2 pts) Below are 3 secret messages from Mr. Roberts coded in the DNA language. To decode each **DNA-o-gram** message, copy and paste each DNA message into the DNA decoder at the following website: <http://www.thinkBiotech.com/DNA-o-gram> . Explain what each message says in ENGLISH and respond to message 3 with your own DNA-o-gram.

Message 1:

**AAGGGCGGAGACGTACGTGTTTAAGCGCGTGTGATGGCGGAGTCATGCGCGGCTAAATGCGTGTACTTATGG
GAGGCTAGATGCGTATGGTCTAACTCCTCCTTGTCGTCGAATAAGCGATGAATATCAAAATGCTGCTTCTCGGCC
TGCTTGTAGTG**

Message 2:

**CAAGCGCTTCGTGTCCTTATGCGTGGAGTCTAGCTTGTAAATGGTTGAGCTTATGAATATCAAAATGGTACTTTAC
GATCTTTAGATGGGTTAACTTGTGCGTTGATGGCGGAATGGATGGAATGGCTCTTGTGTCGTCGACCTTATGTGC
ATGCTATCAATGCTCGTACTTCGTGTTGGAGACATGTCAGGCTAAGTAATGGGCTAGGGAATGAATATCAAAGG
CGACGTACGTGCTATGCGTGGAGTCTAGCTTGTAGTG**

Message 3:

**CCTGAGCGTGTATGGTTTAGGGCATGCTAGATGGCGCGGGCGACGATGTCGTTGTCATGTAGCTTGTACTTATG
GTTGAGCTTATGGAAGATGTAGTCGTTATGTTGGCATGCTATAAGATGCGCTGATGCGTGGAATGCGTCTCCTC
TAAGTACGTGTTCTTATGTGCAATATGGCTGGCCTGCTTGGATGGCGAAATGAATATCAAAATGGATGGAATG
TCTTTTTGTTGC**

Part 2 (2 pts) Explore the effects of various types of point mutations on your DNA-o-gram **message 1**.

A) Insert a 1 letter (A, T, C, G) **substitution** mutation somewhere in DNA message 1 (above) and then decode. Include the decoded English message after the mutation and explain if the mutation had a small or large effect on the message

B) Insert a 1 letter (A, T, C, G) **addition** mutation somewhere in DNA message 1 (above) and then decode. Include the decoded English message after the mutation and explain if the mutation had a small or large effect on the message

C) **Remove 1** letter (A, T, C, G) causing a **deletion** mutation somewhere in DNA message 1 (above) and then decode. Include the decoded English message after the mutation and explain if the mutation had a small or large effect on the message

D) **Remove 3** letters (A, T, C, G) causing a **deletion** mutation somewhere in DNA message 1 (above) and then decode. Include the decoded English message after the mutation and explain if the mutation had a small or large effect on the message