Learn genomics and bioinformatics through scientific thinking, creation and analysis (virtual and hands-on)

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**Learning Objective**

* Students will learn how to create a gene.
* Students will also learn how to identify a gene.
* Students will also learn how to analyze a gene.

**Teaching**

* Students will be taught what is structure, composition and function of nucleic acid. Also, the transcription and translation.

**Learning**

1. Students will use hands on or virtual dice to create a gene with dice number coding for a nucleotide
2. Students will then create a 200 base pair gene and its complementary DNA strand on Google doc.
3. Students will then create a graph on Google sheet to represent the gene nucleotide diversity in gene(s).
4. Students will then copy the gene to NCBI Blast to identify its homology.
5. Students will then construct the RNA transcript on Google doc.
6. Students will then create a graph on Google sheet to represent the nucleotide diversity in RNA transcript.
7. Students will then use Google doc to develop the protein sequence using the codon table.
8. Students then use google sheet to analyze the protein diversity.

**Assessment**

* Students will be asked to use the NCBI PubMed to search for research articles and then read the article to identify a gene of interest. Then write a scientific summary about the gene.
* Students will identify the gene of interest DNA sequence through the NCBI BLAST and then construct its RNA sequence and finally the protein sequence.
* Students will then select a part of gene of interest, construct the RNA transcript, protein transcript and further then analyze the homology between the DNA, RNA and Protein sequence of all the genes found in different organisms – present all the results on Google power point.