Name: _____ Period: _____ Date: _____

DNA: Snorks Transcription and Translation Lab

Objective / CA Standards: BI 5.b Students know how to apply base-pairing rules to explain precise copying of DNA during semi-conservative replication and transcription of information from DNA to mRNA. BI 4.a Students know the general pathway by which ribosomes synthesize proteins, using tRNA to translate genetic information in mRNA.

Introduction In this simulation, you will examine how DNA determines an organism's traits by transcribing and translating the DNA sequence of a fictitious organism - the Snork. Snorks were discovered deep in the rainforest. Snorks only have one chromosome with 10 genes on it. For simplicity, the gene sequences are much smaller than real gene sequences found in living organisms. Each gene has various versions that result in a different protein, which then is expressed as a trait in the snork as shown in the table below:

Genes	Amino Acid Sequence	Protein	Description
Gene 1 - body covering	val - ser - leu	Protein A	hairless
	val - ser - lys	Protein B	hairy
Gene 2 - body style	tyr - pro - gln - gln - lys	Protein C	plump
	val - pro - thr - glu - lys	Protein D	skinny
Gene 3 - legs	leu - leu - leu - pro	Protein E	3 legged
	leu - leu - ser - ala	Protein F	2 legged
Gene 4 - head shape	ala - val - val	Protein G	round head
	val - ala - ala	Protein H	square head
Gene 5 - tails	his - ile	Protein I	tail
	his - his	Protein J	no tail
Gene 6 – body color	ser - pro - val	Protein K	blue pigment (hair/skin)
	val - phe - tyr	Protein L	red/pink pigment (hair/skin)
	ser – gly - val	Protein M	green pigment (hair/skin)
	val – phe - asp	Protein N	orange pigment (hair/skin)
Gene 7 - eyes	asp - ile - leu - leu - pro - thr	Protein O	small slanted eyes
	asp - ile - pro - pro - pro - thr	Protein P	large round eyes
Gene 8 - mouth	val - asp - asp - ala	Protein Q	circular mouth
	asp - asp - asp - ala	Protein R	rectangular mouth
Gene 9 - ears	phe - ser - gly	Protein S	pointed standing-up ears
	phe - phe - gly	Protein T	rounded floppy ears
Gene 10 - arms	arg - tyr - cys - lys	Protein U	long spaghetti like arms
	arg - arg - asp - thr	Protein V	short stumpy arms

Name: _____ Period: _____ Date: _____

Your Snork:

The Snork you will make depends upon the month of your birthday, as follows:

January-March: Snicker Snork

April-June: Snuffle Snork

July-September: Snapple Snork

October-December: Snoopy Snork

DNA Sequences:
Each of the following DNA samples was taken from volunteer snorks. Your job is to analyze each DNA sample and determine the phenotype (how the organism looks) based on the sequence.

Note- Each line represents a new gene. **Remember that AUG is a start codon, and it signifies the beginning of the protein sequence. UAA is a stop codon and signifies the end of a gene.**

Snicker Snork

5' TAC | CAG TCG TTT | ATG GGG GTT GTC TTT | GAG AAT TCA CGC| CGA CAA CAC | GTA GTA | CAA AAA ATG | CTA TAG AAT GAC GGG TGG | CAA CTA CTA CGG | AAA AGA CCT | GCA ATG ACA TTT | ATT 3'

Snuffle Snork

5' TAC | CAT AGA TTT | CAA GGA TGA CTC TTC | GAA GAG GAG GGG | CAA CGC CGA | GTA GTG | CAT AAA TTA | CTA TAA GAA GAC GGG TGT | CTA CTA CTA CGT | AAG AGC CCT | GCC GCA CTG TGT | ATT 3'

Snapple Snork

5' TAC | CAG TCG TTT | ATG GGG GTT GTC TTT | GAG AAT TCA CGC| CAA CGC CGA| GTG TAA | AGA CCC CAT | CTA TAA GGA GGC GGG TGG| CAA CTA CTA CGT | AAG AAA CCT | GCG GCA CTG TGT| ATT 3'

Snoopy Snork
5' TAC | CAT AGG GAG| ATG GGG GTT GTC TTT | AAT AAT GAC GGG | CAC CGT CGA| GTA TAA| AGA GGG CAT | CTG TAA GGA GGC GGG TGT | CTA CTA CTA CGG| AAA AGA CCT | GCA ATG ACA TTT | ATT 3'

Name: _____ Period: _____ Date: _____

Your job is to:

1. Write the name of the Snork you have been assigned.

2. Transcribe the DNA. Write the mRNA strand here:

3. Translate the mRNA strand. Write the amino acid sequence here:

4. Use the chart to determine the proteins the amino acids make. List the proteins here:

5. Circle the phenotypes (physical appearances) in the chart above that correspond to the protein sequence.

6. List the traits the Snork has and create the organism on the next page. Be creative and have fun with it! Your organism must be a ½ page to a full page in size. Your organisms will be posted on the class wall.

Name: _____ Period: _____ Date: _____

My Snork's Traits

Name the 10 proteins your DNA codes for and the 10 traits your Snork expresses.

Protein	Trait

Draw your Snork below. Be sure to include all traits listed.