Name: Student Number/Homeroom:

The Genetic Code: Mathematical Clues

LO: Get clues to the genetic code, based on math. SLE: Work collaboratively.

As you know, RNA consists of a sequence of 4 bases:

1-letter abbreviation:	A	C	G	U
Full name:	Adenine	Cytosine	Guanine	Uracil

You are also learning that proteins are made up of amino acids, of which there are 20 (they have both 1-letter and 3-letter abbreviations):

1-letter:	A	C	D	E	F	G	H	I	K	L
3-letter:	Ala	Cys	Asp	Glu	Phe	Gly	His	Ile	Lys	Leu
Full:	Alanine	Cysteine	Aspartate	Glutamate	Phenyl-alanine	Glycine	Histidine	Isoleucine	Lysine	Leucine

1-letter:	M	N	P	Q	R	S	T	V	W	Y
3-letter:	Met	Asn	Pro	Gln	Arg	Ser	Thr	Val	Trp	Tyr
Full:	Methionine	Asparagine	Proline	Glutamine	Arginine	Serine	Threonine	Valine	Tryptophan	Tyrosine

As of about 1960, the big question was, how does the genetic code works?

(1) In your own words, please elaborate on this question. What does the phrase "genetic code" really mean?

Let us now consider some possible relationships between bases and amino acids.

(2a) If each individual base coded for one amino acid, how many different amino acids could be coded for altogether?

(2b) Would a system of "1 base codes for 1 amino acid" allow all 20 amino acids to be represented?

(3a) Next, consider the possibility that each set of TWO bases could code for one amino acid. How many different 2-base sequences are there? Write them all out below.

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(3b) Would a system of "2 bases code for 1 amino acid" allow all 20 amino acids to be represented?

(3c) What, then, is the minimum number of bases that could be used to represent 1 amino acid?