How Gene Mutations Change Your Ability to Taste

Name: _____

Date: _____

Student quiz —Answer key

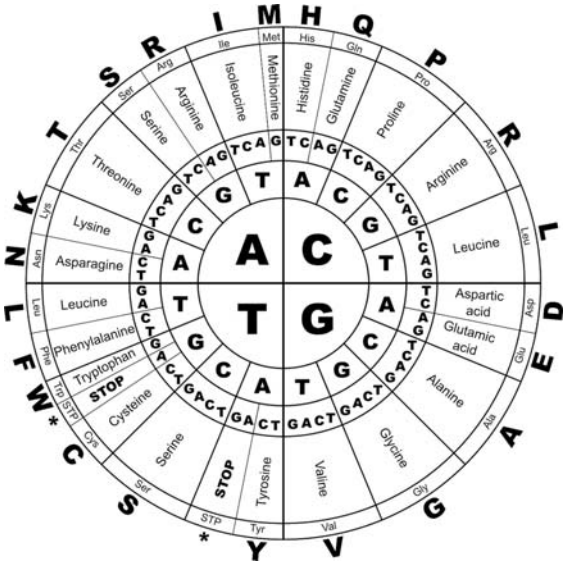
Directions: Circle the best answer for the multiple-choice question(s) below. Write your answer for the other question(s).

1. If an allergy to dust is a recessive trait ("a"), which genotypes could a person who is NOT allergic to dust have?
   a. AA or Aa
   b. Only aa
   c. AA or aa
   d. Only AA
   e. AA, Aa, or aa

2. Below is a random gene sequence with the resulting protein sequence as well as a mutated DNA sequence. Using the genetic code chart below, which mutations cause a changed amino acid sequence in the resulting protein?

Codon #	1	2	3	4	5	6	7	8	9	10	11	12
DNA	ATG	GCA	ACT	TGC	TTA	CCG	CAG	GAT	TCC	AAG	AGT	TAA
Protein	Met	Ala	Thr	Cys	Leu	Pro	Gln	Asp	Ser	Lys	Ser	Stop
Mutated DNA	ATG	GCC	ACT	TAC	TTA	CCA	CAG	GAT	GCC	AAG	AGC	TAA

   a. Codons 2, 6, and 11
   b. Codons 2, 4, and 11
   c. Codons 4 and 9
   d. All mutated codons



How Gene Mutations

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Directions: Circle the best answer for the multiple-choice question(s) below. Write your answer for the other question(s).

3. Explain in your own words how mutations contribute to genetic variation.

Mutations can alter the DNA sequence that encodes for a specific protein, and therefore creates a new version of the same gene. If the DNA mutation causes an altered amino acid sequence of the protein, the resulting protein might have different properties, a different function, or might not be functional at all. If the mutation is not harmful or even beneficial, it can be passed onto the next generation and propagate through a population.

4. If your mom is a taster with the genotype "Tt," and your dad is a non-taster with the genotype "tt," how high are your chances of being a non-taster, assuming that the taster allele is dominant? Use the Punnett Square below to answer this question.

	T	t
t	tT	tt
t	tT	tt

a. 0%
b. 25%
c. 50%
d. 100%

5. Are all DNA mutations "bad mutations"? In your own words, explain why or why not.

DNA mutations are "bad" if…
- They cause a change in the amino acid sequence of the resulting protein AND
- The caused change in the amino acid has a negative effect on protein function.

DNA mutations are "not bad" if…
- They do not cause a change in the amino acid sequence of the resulting protein OR
- The caused change in the amino acid has a neutral or even beneficial effect on the protein function