How Gene Mutations Change Your Ability to Taste

Name: _____

Date: _____

Vocabulary worksheet

DNA: Abbreviation for deoxyribonucleic acid, a large chain molecule that serves as the "blueprint" for how an organism looks and how its body functions. Children inherit their DNA from their parents, which explains why biological children often look like a blend of their parents. DNA is made up of nucleotides.

Nucleotides: These smaller molecules connect to form the larger chains we call DNA. There are four different nucleotides: Adenine (A), Cytosine (C), Guanine (G), and Thymine (T). When we write out a DNA sequence, we list the nucleotides in the order they appear in the DNA chain.

Gene: A region of DNA whose nucleotide sequence codes for a protein.

Transcription: During transcription, a DNA sequence that codes for a gene is converted into an RNA sequence. RNA, like DNA, is a chain of nucleotides, except that Thymine (T) is replaced by a Uracil (U).

Translation: The next step after the transcription of the DNA sequence into RNA is called translation. During translation, the RNA is converted into a protein. Each nucleotide triplet within the RNA encodes a specific amino acid. This results in a long chain of amino acid molecules.

Protein: Proteins are made up of a long chain of amino acids and are the main building blocks of life. There are thousands of different types of proteins, each with its own function. Some proteins make the structures in your body like bones, blood, and organs while others send messages that do things in your body like fight off diseases, influence your mood, or store energy.

Amino Acid: Amino acids are the building blocks of proteins. There are 21 amino acids in total.

Allele: While everyone has the same genes (regions of DNA) for a trait, like eye color, they do not always have the same exact DNA sequence. These variations in DNA sequence for a single gene are called the gene's alleles. Every allele has both a genotype and a phenotype.

Genotype: The DNA sequence of an allele.

Phenotype: The physical trait, or characteristic, that results from an allele. For example, there are several eye color genes. Each gene has several genotypes (slightly different DNA sequences). These genotypes result in a range of eye color phenotypes including blue, green, and brown.

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Vocabulary worksheet

Homozygote: Children typically inherit two copies of every gene: one from their mother and one from their father. A person who has two identical copies of an allele for a gene is a homozygote. For example, a child who inherits an allele for blue eye color from both parents is a homozygote for that eye color gene.

Heterozygote: A person who has two different alleles for a gene is a heterozygote. For example, a child who inherits a blue eye color allele from their mother and a brown eye color allele from their father is a heterozygote for that eye color gene.

Dominant & Recessive Alleles: Whether an allele is dominant or recessive determines the phenotype of a child who inherits two different alleles (i.e. the child is a heterozygote). For example, if a child inherits one blue and one brown eye color allele, and the brown eye color allele is dominant, then the child's eye color will be brown. A dominant allele is one that requires only one copy of itself to give rise to its phenotype. The opposite of a dominant allele is a recessive allele. A recessive allele requires two copies of itself (one from each parent) to give rise to its phenotype. In our example, a child needs to inherit one blue allele from each parent in order to have blue eyes. Not all genes have dominant or recessive alleles—sometimes the relationship between alleles and phenotypes is more complicated. We call traits that are clearly dominant/recessive Mendelian traits and all other traits complex traits. For this lesson, we will stick with Mendelian traits.

Codon: In the DNA of a gene, each nucleotide triplet encodes a specific amino acid. For example, the DNA codons AAA and AAG are both instructions for putting the amino acid lysine into part of a protein. The codon AAC, however, encodes asparagine, a different amino acid.

Genetic Code Chart:

