

Name: _____ Period: _____

Gene Mutations Activity

Background: There are two types of mutations, small-scale gene mutations and large-scale chromosomal mutations. In this activity you will be learning about gene mutations. There are two basic types of gene mutations, point (base substitution) and frameshift (insertions and deletions). In frameshift mutations, an insertion or deletion of a base changes the reading frame of the sequence since mRNA is read in groups of three nitrogen bases (codons). This causes several amino acids to be affected unless the deletion or insertion is a group of three. There are very few examples of frameshift mutations in nature, but they do occur.

_____	Tt _____	pp _____
_____	tt _____	_____
dominant to	Round seeds are dominant to wrinkled seeds	Brown eyes are dominant to blue eyes
_____	RR _____	BB _____
_____	Rr _____	Bb _____
_____	rr _____	bb _____

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base, so only one amino acid is affected unless there are several base substitutions.

Part 1: Frameshift Mutations

Example 1: Insertion Frameshift

DNA Sequence Sentence: THE BOY CUT HIS LIP AND ATE THE HOT DOG

Affect of Insertion: THE BOY CUT HIS SLI PAN DAT ETH EHO TDO

↑
Insert a nitrogen base

Example 2: Deletion Frameshift

DNA Sequence Sentence: THE BOY CUT HIS LIP AND ATE THE HOT DOG

Affect of Deletion: THE BOY CUT HIS LIP ANA TET HEH QTD OG

↓
Delete a nitrogen base

Students must show the lineage for at least 4 different generations.

Character Traits: attached earlobes (recessive), roll one's tongue, eye color (Brown: dominant), left-handedness (recessive)

Pictures, relationships, genotypes, and phenotypes

Instructional Activities

Lesson 1: Difference between mitosis and meiosis