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| --- | --- |
| What is a **GENE MUTATION?** PointMutationGEN | A mutation which causes a change in…EX. Substitutions, insertions, and deletions |
|  | A mutation which involves changes in one or a few nucleotides. (i.e. it occurs at a SINGLE POINT in a DNA sequence) |
| **SUBSTITUTION****\*In the example to the right, draw a circle around the nucleotide where the mutation occurred.** | *
* Usually affects no more than 1 amino acid
* EX. T A C G C A T G G A A T

 T A C G T A T G G A A T |
| **INSERTION****\*In the example to the right, draw a circle around the nucleotide where the mutation occurred.** | * 1 base (nucleotide) is inserted into a DNA sequence
*
* EX. T A C G C A T G G A A T

 T A T C G C A T G G A A T |
| Briefly explain what has happened to the nucleotide sequence in the mutated strand of DNA as a result of the insertion. |  |
| **DELETION****\*In the example to the right, draw a circle around the nucleotide where the mutation occurred.** | *
* Usually has more dramatic effects
* EX. T A C G C A T G G A A T

 T \_ C G C A T G G A A T T C G C A T G G A A T |
| Briefly explain what has happened to the nucleotide sequence in the mutated strand of DNA as a result of the deletion. |  |
| **FRAMESHIFT MUTATIONS****\*Frameshift Mutations Cont.****Examples include…**1.
2.
 | * Shift the reading frame of a genetic message
*
* May make a protein unable to perform its original function…WHY?
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| CoMNov97karyo | * Involve changes in the number or structure of chromosomes
* May change the location of genes on a chromosome
* May change the number of copies of some genes
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| **gene_deletionDELETIONS** |  |
| **gene_duplicationDUPLICATIONS** |  |
| **gene_inversionINVERSIONS** |  |
| **gene_translocationTRANSLOCATIONS** |  |
| **Significance of Mutations** | * Most are neutral (i.e. they have little or no effect on gene expression or protein function)
* Some are harmful (causing genetic disorders or cancer) or lethal
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