**NOTES 4.2: Mutation**

**What is a mutation?**

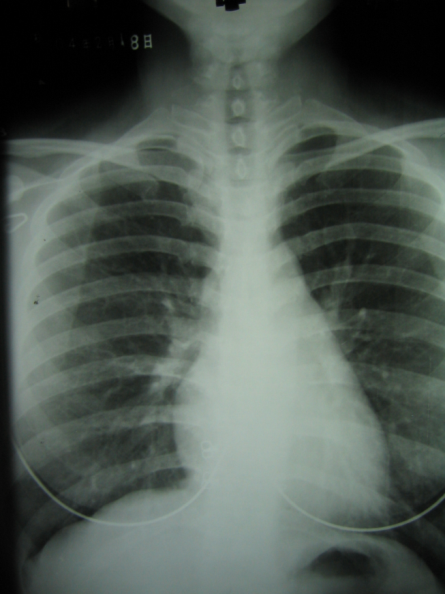
Mutations are actually quite \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (they happen all the time).

**Mutagens**



\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_



\_\_\_\_\_\_\_\_\_\_\_\_\_\_



**Mutagens** are factors that cause \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to happen. The more mutagens you are exposed to, the greater the odds of generating mutations that may be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to you.

**How gene mutations work- Gene mutations are changes in the order of the A,G,C and T bases that make up a gene**

***Original DNA Sequence***: **AAT TAC CCT TTT AAA ACT TAC CAT**

***Addition***: **AAT TAC ACC TTT TAA AAC TTT ACC AT**

***Deletion:* AAT TAC CTT TTA AAA CTA CCA T**

***Substitution***: **AAT TAC TCT TTT GAA ACT TAC AAT**

**The Effects of Mutation**

***Positive Mutation***

A mutation that BENEFITS the individual who has it.

**Examples:**

***Negative Mutation***

A mutation that is HARMFUL to the individual who has it.

**Examples:**

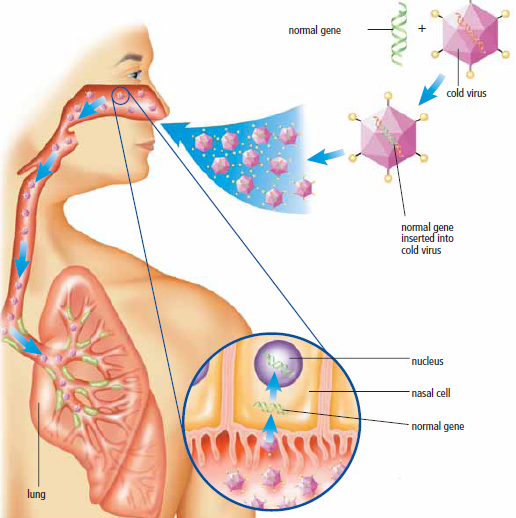
***Neutral Mutation***

A mutation that does not affect the individual. Most mutations are of this type.

**Examples:**

**Correcting Mutations**

* Is used to correct mutations that cause \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Gene therapy is risky, complicated and experimental



* + An inactive virus such as a cold virus in engineered to carry a “­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_” gene
  + The virus must somehow be targeted to the cells with the mutated gene
  + The normal gene must then \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the defective gene
  + The normal gene must then be “switched on” to produce the correct \_\_\_\_\_\_\_\_\_\_\_\_\_\_ of healthy protein

***DO THIS!***

* **Pg 145 #1-17**
* **Complete 4.1 Questions if not completed**