

Name: \_\_\_\_\_

Blk: \_\_\_\_\_ Date: \_\_\_\_\_

### **Science 9** **Notes on 4.2 Mutation**

A gene mutation involves a change in the order of **bases** (A,C,T,G) that make up the gene. There are several types of gene mutation:

- 1.** \_\_\_\_\_ (base missing)
- 2.** \_\_\_\_\_ (extra base added)
- 3.** \_\_\_\_\_ (one base substituted for another)

Gene mutations may produce \_\_\_\_\_ that are beneficial or harmful to the organism, or may have no effect at all.

**Example:** a particular mutated gene produces \_\_\_\_\_  
Kermode bears - they occur as only a small percentage of the population (they are normally **black** in colour).

### **Effects of Mutations:**

1. Positive Mutations

When a gene mutation \_\_\_\_\_ the individual.

Example: \_\_\_\_\_  
\_\_\_\_\_

2. Negative Mutations

When a gene mutation \_\_\_\_\_ the individual

Example: \_\_\_\_\_  
\_\_\_\_\_

3. Neutral Mutation

When a gene mutation has \_\_\_\_\_ on the individual

Example: \_\_\_\_\_



## Mutagens & Mutation Repair:

Mutagens are substances or factors that cause \_\_\_\_\_

Environmental mutagens such as \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_  
and \_\_\_\_\_, and certain \_\_\_\_\_ can cause mutations.

Correcting mutations is difficult, but new techniques such as \_\_\_\_\_  
\_\_\_\_\_ offer hope.

Gene therapy is \_\_\_\_\_ and \_\_\_\_\_:

1. A virus is engineered to carry a \_\_\_\_\_
2. The virus is somehow targeted to the cells with the \_\_\_\_\_  
\_\_\_\_\_
3. The normal gene must then \_\_\_\_\_ the defective gene
4. The normal gene must then be " \_\_\_\_\_ " so that the replacement normal gene produces the proper healthy proteins.
5. It is also important that the normal gene make the correct \_\_\_\_\_ of healthy protein.