**Gene Expression Notes Guide: - General Biology B**

You are responsible not only for the material in this guide but the diagrams and pictures on the notes. The notes can be found on Mr. Walkers website: [www.walkersclass.com](http://www.walkersclass.com).

**Objective 8: Explain how the environment can influence the expression of traits.**

Students will be able to:

1) Explain how and why genes are expressed.

2) Provide examples of internal factors which can influence gene expression.

3) Provide examples of external factors which can influence gene expression.

4) Describe how a cell uses different genes to function.

5) Describe how one gene can produce several different types of proteins.

## **Genes**

## Can be dominant or recessive

### Not always this simple

## Why do muscle cells differ from skin cells?

### Each cell reads the DNA code \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Each mRNA codon can produce different amino acids in a protein. Thus, cells differ in form and function.

## Homozygous, heterozygous

## Can have the trait even though it is not being expressed.

# **Incomplete dominance**

* The phenotype of the offspring is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ between the two genotypes of the parents.
  + Example: a red flower x a white flower= a pink flower

# **Codominant Alleles**

* Causes the offspring to have both genotypes which are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ expressed.
  + Example: a Black rooster x a white chicken= a checkered rooster.

# **Polygenic Inheritance**

## The pattern controlled by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or more genes.

### Example: height in humans, Skin color.

# **Influences in Gene Expression**

* Internal Factors:
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, mRNA, organelles, and other substances are not evenly distributed in cells. These regulate gene expression differently and can create different types of cells.
  + Cells communicate with each other by sending/receiving messages in the form of molecules. These molecules can turn genes on and off.
* External Factors:
  + -The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ around the organism can influence the genotype. Example: Arctic Fox
  + -The presence of drugs and chemicals can change gene expression (depression medicines etc)
  + -The amount of light can affect the color of butterflies when they develop as caterpillars