PROJECT: THE INHERITANCE OF GENETIC DISORDERS

Background:

How do genetic disorders or conditions occur? Does a single mutation, a mutation in one gene, or even a whole chromosome cause the disorder? Genetic disorders can affect many different aspects of human development: mental or intellectual development, height, the nervous system, and even gender!

Sometimes during meiosis, there is an error called nondisjunction, in which the chromosomes fail to separate properly. Nondisjunction can result in other combinations of an individual's chromosomes, including the sex chromosomes. If the autosomes are affected (pairs #1-22) disorders such as Down Syndrome may result. When the sex chromosomes are involved, the new combinations can affect gender development in a variety of ways.

Purpose:

In this activity, you will be exploring the process of how genetic disorders are inherited and how they develop. You will focus on a specific genetic condition and research how that particular condition shapes an individual.

Procedure:

Here is the list to choose from on a First come. First serve basis

1) XO female (Turner's syndrome)
2) XXY male (Klinefelter's syndrome)
3) Charcot-Marie-Tooth
4) Down Syndrome
5) Achondroplasia (dwarfism)
6) Sickle-cell anemia
7) Cystic Fibrosis
8) Tay Sachs
9) Osteogenesis Imperfecta
10) Phenylketonuria (PKU)
11) Huntington's disease
12) Marfan Syndrome
13) Hemophilia
14) Neurofibromatosis
15) Thalassemia
16) Hemochromatosis
17) Fragile X Syndrome
18) Myotonic Dystrophy
19) Ataxia telangiectasia
20) Albinism
21) Alzheimer’s
22) Wilson’s Disease
23) Bubble Boy (Severe Combined Immunodeficiency)
24) Progeria
25) Patau Syndrome (Trisomy 13)
26) Galactosemia
27) Gaucher’s Disease
28) Craniosynostosis
29) LHON – Leber’s
30) Pyruvate Dehydrogenase Deficiency
31) Prader-Willi Syndrome
32) Retinoblastoma
33) Celiac Disease
34) Rett Syndrome
35) Colorblindness
36) Polydactyly
37) Hyperthyroidism

B. Research your particular genetic disorder

- Use Biology textbooks
- pamphlets, articles, and assorted information provided in class
- Internet (a list of helpful websites is provided below)

C. Design a Poster on your disorder in which you address the following questions:

1) How would you recognize this condition? (What physical & psychological characteristics are associated with this genetic condition?) **(SYMPTOMS)**

2) What is the "cause" of this disorder? (sex-linked, Autosomal, recessive, dominant, mutation, chromosomal abnormality, etc.) **(CAUSE)**

3) Is there any treatment for this condition? Is there a way to prevent this condition? **(TREATMENT AND Prevention)**

4) Is there a way to **screen individuals** for this condition?

5) What **percentage** of the population is thought to have this condition? Is it more common in certain populations (ethnicity, region of the world)?

Include a Bibliography

Some helpful websites:

1) March of Dimes (Health Library; Fact Sheets) www.modimes.org

2) http://mcrcr2.med.nyu.edu/murphp01/dist_z.htm

3) http://www.healthweb.org/search.cfm

4) https://www.genome.gov/10001204/specific-genetic-disorders/