BIO 184 - PAL Problem Set Lecture 10 (Brooker Chapter 8)
Variation in Chromosome Structure and Number

Section A. Chromosome mutations (rearrangements)

Describe and draw an example of the following chromosome mutations:

Deletion

Duplication

Translocation

Inversion

Gene amplification

Of the mutations listed above, which has the greatest chance of lethality? Why?

How could each of these chromosome mutations cause a fitness cost?

How could each of these chromosome mutations provide a fitness advantage?

Which type(s) of chromosome mutation increases the total amount of genomic material?

The production of gene families, such as the globin genes is the result of what type of chromosomal mutation?

Which type(s) of chromosome mutation changes the position of the DNA sequences without changing the total amount of genomic material?

When during the cell cycle do these chromosome mutations arise most frequently? By what mechanism?

Section B. Genome mutations

Describe and draw an example of the following genome mutations:

Aneuploidy

Monosomy

Trisomy

Triploid

Polyploid

Which type(s) of genome mutation increases the total amount of genomic material?

List three examples of aneuploidy

Which type of genome and/or chromosome mutation(s) could lead to Down's syndrome?

When during the cell cycle do these chromosome mutations arise most frequently?

As a result of what type of event?

What is nondisjunction?

When two homologs end up in the same gamete, when has nondisjunction occurred?

When two sister chromatids end up in the same gamete, when has nondisjunction occurred?

Do nondisjunction events only occur in meiosis and not mitosis? Explain.

For a female with Turner's syndrome (X0), did the non-disjunction event occur in the mother or father?

Did the nondisjunction event occur in the first or at the second meiotic division (or is impossible to distinguish given the information)?

For a male with Klinefelter's syndrome (XXY), did the non-disjunction event occur in the mother or father?

Did the nondisjunction event occur in the first or at the second meiotic division (or is impossible to distinguish given the information)?