

What is Meiosis (Part I)?

Meiosis is broken into two distinct stages, the goal of which is to ultimately create 4 genetically distinct sex cells, each of which only contains half of the information necessary for the creation of an offspring. This first page will focus primarily upon Meiosis I.

What happens at these stages?

1. Interphase

DNA has replicated, but has not formed the condensed structure of chromosome. They remain as loosely coiled chromatin.

The nuclear membrane is still intact to protect the DNA molecules from undergoing mutation.

2. Prophase I

The DNA molecules progressively shorten and condense by coiling, to form chromosomes. The nuclear membrane and nucleolus are no longer visible.

It is during this stage that "Crossing Over" occurs. During this process, chromosomes exchange genetic information to create chromosomes now genetically distinct from the original parent. The spindle apparatus has migrated to opposite poles of the cell.

3. Metaphase I

The spindle fibers attach themselves to the centromeres of the chromosomes and align the chromosomes at the equatorial plate.

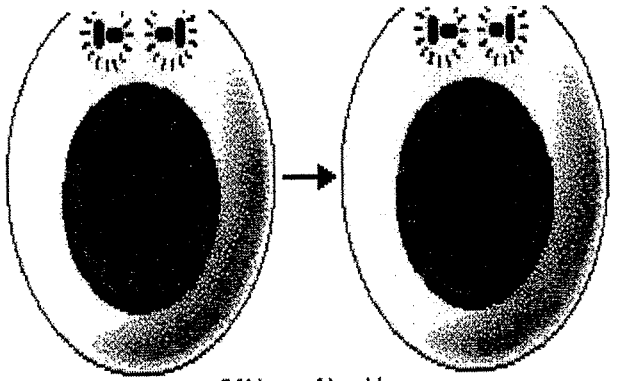
4. Anaphase I

The spindle fibers shorten and the centromere splits, separated sister chromatids are pulled along behind the centromeres.

5. Telophase I

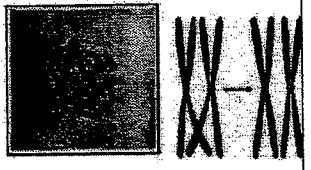
The chromosomes reach the poles of their respective spindles. Nuclear envelope reforms before the chromosomes uncoil. The spindle fibers disintegrate, and the cell becomes two.

To be continued.... (Meiosis II)

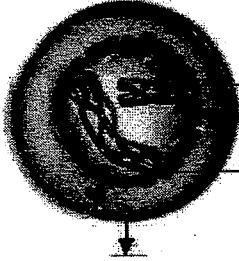


DNA replication

Crossing Over

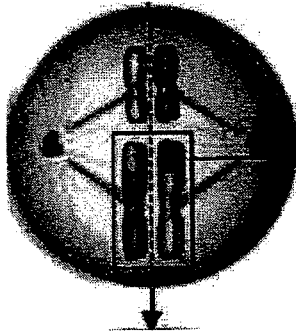


One pair of homologous chromosomes (homologues) condenses and crosses over



Prophase I

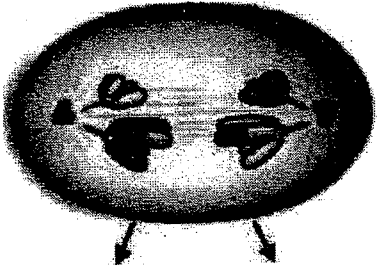
What Happens:



Homologues Align

Metaphase I

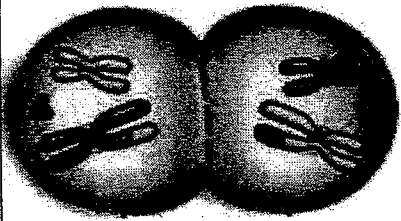
What Happens:



Homologues Separate

Anaphase I

What Happens:



Meiosis I results: homologues separated into 2 cells

Telophase I

What Happens:

Interphase

What Happens:

What Happens:

What Happens:

What Happens:

What Happens:

What is Meiosis (Part II)?

Meiosis is broken into two distinct stages, the goal of which is to ultimately create 4 genetically distinct sex cells, each of which only contains half of the information necessary for the creation of an offspring. This second page will focus primarily upon Meiosis II.

What happens at these stages?

1. Prophase II

The DNA molecules progressively shorten and condense by coiling, to form chromosomes. The nuclear membrane and nucleolus are no longer visible.

The spindle apparatus has migrated to opposite poles of the cell. Note: At this point there is only one complete set of DNA per cell at this point, and two cells. No copying of the DNA occurs during Meiosis II.

3. Metaphase II

The spindle fibers attach themselves to the centromeres of the chromosomes and align the chromosomes at the equatorial plate.

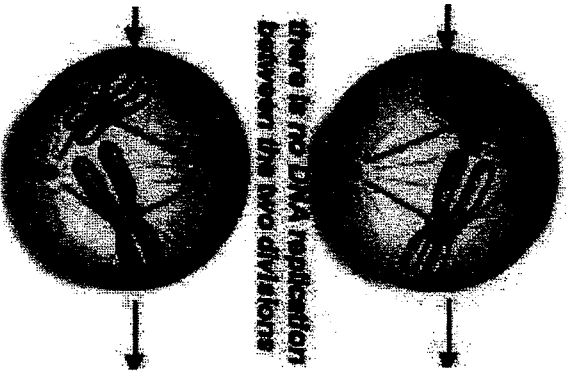
4. Anaphase II

The spindle fibers shorten and the centromere splits, separated sister chromatids are pulled along behind the centromeres.

5. Telophase II

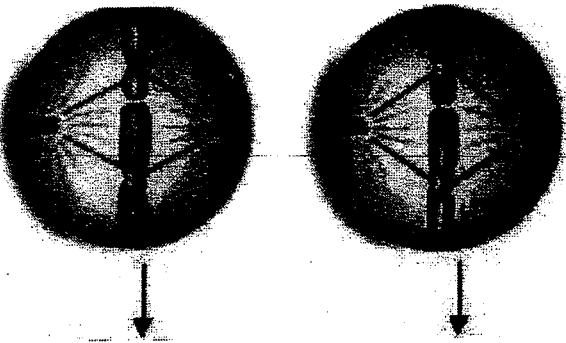
The chromosomes reach the poles of their respective spindles. Nuclear envelope reforms before the chromosomes uncoil. The spindle fibers disintegrate, and the resulting cells fully separate, with each cell now containing HALF of the genetic material necessary to ultimately create a complete organism.

Final Result: We started with ONE cell with a complete set of information (diploid), and by the end had FOUR genetically distinct (different) cells, each with only half of the genetic information to make a new organism (haploid).



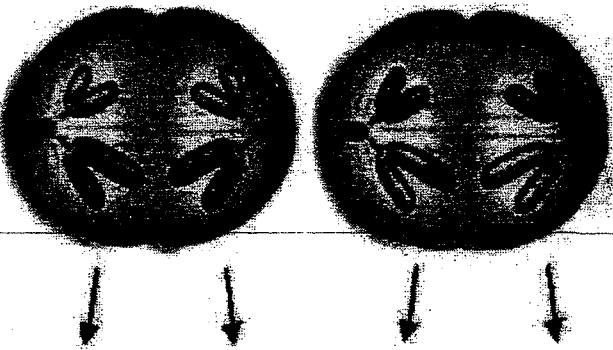
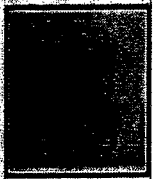
Prophase II

What Happens:



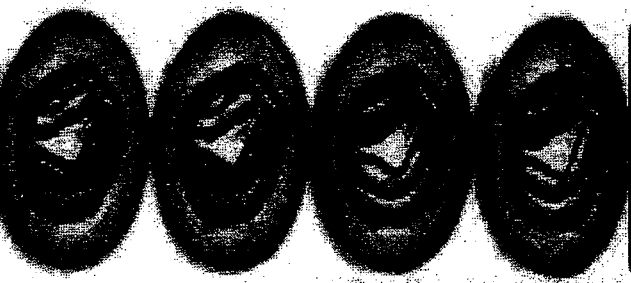
Metaphase II

What Happens:



Anaphase II

What Happens:



Telophase II

What Happens: