Meiosis

Meiosis is a type of cell division

Takes place in the reproductive organs

Cells that divide are **Diploid** to start with

Cells formed from meiosis are **Haploid**

These cells have **Half** the chromosome number

Daughter Cells **Genetically Different**

Before the Start of Meiosis

DNA unravels and Replicates two Chromosomes called **Chromatids**

2 Sister Chromatids are joined in the center by the **Centromere**

Meiosis 1 - the chromosomes arrange into **Homologous Pairs**

Homologous Pairs Seperate halving the Chromosome number

This is **Meiosis 1**

Meiosis II

Sister Chromatids are separated

The **Centomere** is divided

Chromatids are now chromosomes

4 Haploid cells are produced

Homologous Chromosomes

Maternal and Paternal Chromosomes

Paired together

chromosomes are same size and carry same genes

The Different versions of those genes called **Alleles**

These pairs of Chromosomes are called **Homologous Chromosomes**

Gametes

Meiosis is used to produce **Gametes**

Sex Cells, Sperm or Egg cells

These Cells fuse in **fertilization** to form a **Zygote**

Needs **Half** as many Chromosomes as normal Cell

Diploid cell --- Haploid Cell

How DNA is passed on to generation

Phases of Meiosis

Interphase 1

Prophase 1

Metaphase 1

Anaphase 1

Telophase 1

Prophase 2

Metaphase 2

Anaphase 2

Telophase 2

2 Main Events that lead to genetic variation

Crossing over chromatids	Independent segregation of chromosomes

Crossing over Chromatids

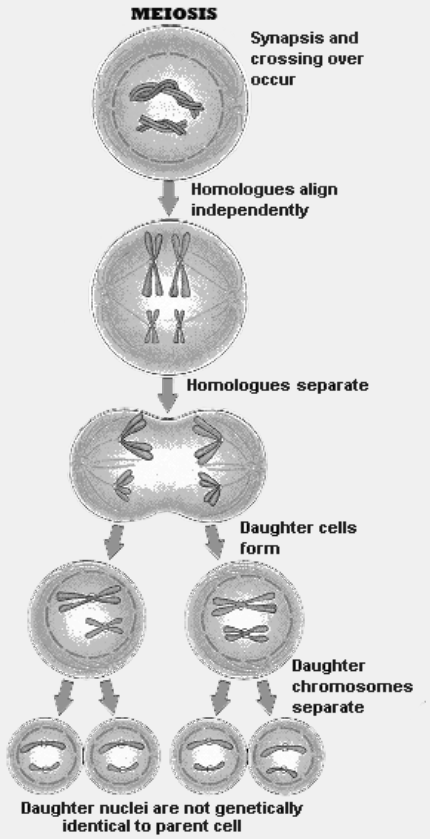
In meiosis 1 homologous pair of chromosomes pair up

Bits of Chromatids swap over

Chromatids swap alleles

Different sets of alleles increase genetic variation

Meiosis II Image



Independent segregation of Chromosomes

Homologous pairs of chromosomes, one from mother, one from father

Maternal and Paternal Chromosomes

Homologous pairs are sepereated, its random which chromosome end up in each daughter cell

Potential for different combinations

Independent Segregation of Chromosomes

Genetic Variation in offspring

2^{23} Potential variation for human chromosomes