- Chromosome pairs are aligned at the central plane of the cell by spindle microtubules (SM)
- Orientation of homologous pairs is random

Anaphase 1

- SM pull homologues apart
- Chiasmata resolve towards the ends of the chromosomes
- At the end, homologous pairs have segregated

Telophase 1

- At the end of meiosis 1, the original diploid cell nucleus has given rise to two haploid nuclei
- However, the chromosomes still have two chromatids and must go through second division to complete the process

Metaphase 2

- V similar to mitosis, the SM align al chromosomes at the central plane

Anaphase 2

- Sister chromatids are segregated, if crossing over has occurred, they're no longer identical
- Ploidy is not changed, but each chromosome has only a single chromatid

Telophase 2

- At telophase 2, nuclear envelopes reform around the four haploid groups of chromosomes and the chromatin decondenses

Sex Determination

- Most animal species and many plant species have distinct male and female forms
- Some reptiles and fish show environmental sex determination
- But genetic sex determination mechanisms are more common
- The simplest mechanism for genetic sex determination is found in some mosquitoes
- The sex is determined by a single gene locus "M" (Mm = male, mm = female)
- Note that this system automatically generates equal numbers of each sex

- In many organisms, the two sexes have different chromosome complements – Karyotypes
- Most of the chromosomes occur in pairs, and are physically indistinguishable from their partners – autosomes
- One pair of chromosomes are often visibly different from each other – sex chromosomes
- How do sex chromosomes determine sex in mammals? All gametes carry one X, half will have another X and the rest will have a Y
- During meiosis in females, errors in sex chromosome segregation can lead to abnormal gametes
- A small number of phenotypic males have an XX genotype & vice versa
- Shown to be due to the transfer of a small region of the Y chromosome to the X
- This region contains a single gene that has since been shown to confer maleness (the SRY gene)
- In mice, the transfer of the SRY gene to an autosome by genetic manipulation results in XX males, phenotypically normal, but they're sterile