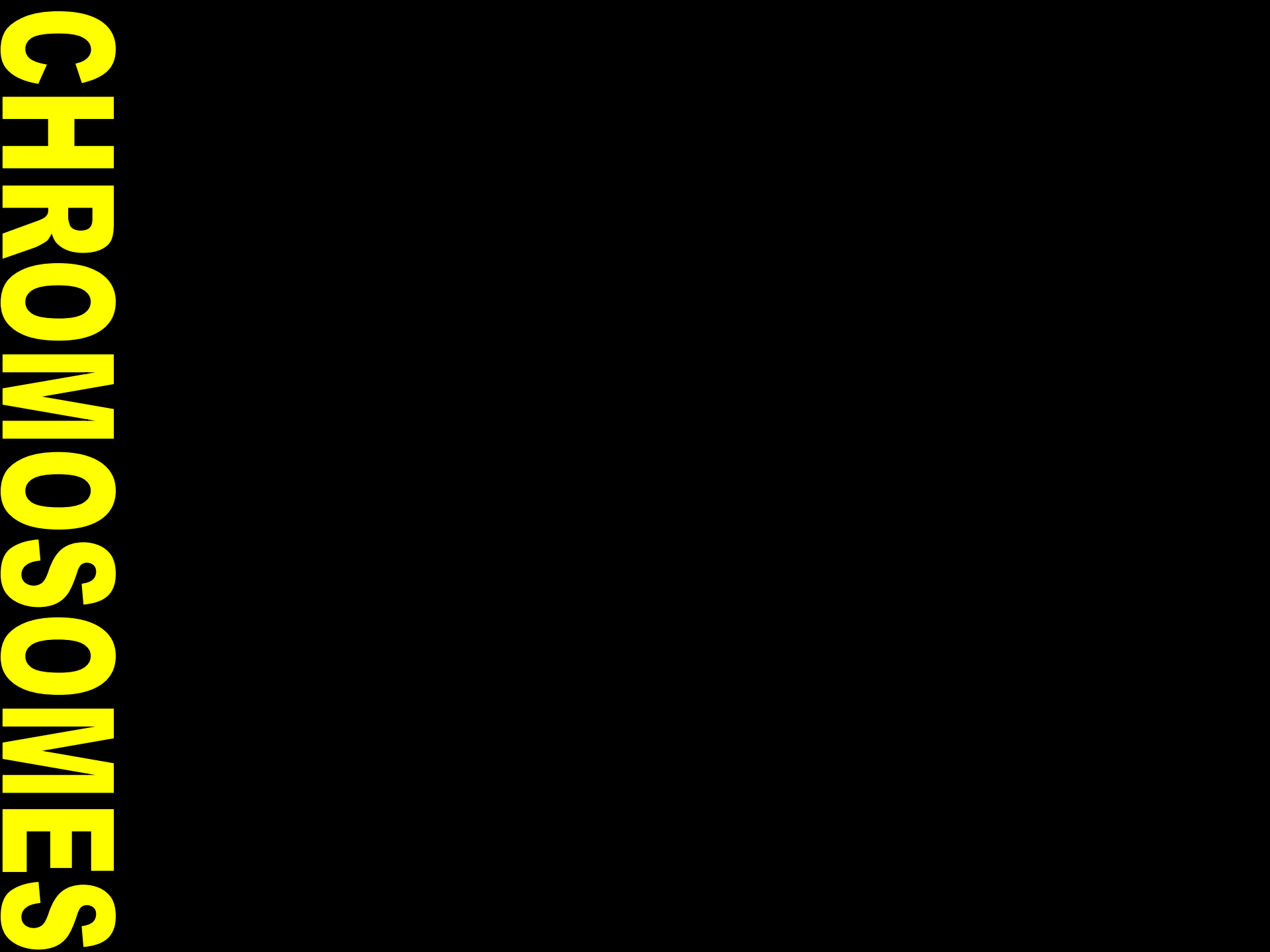




MEIOSIS

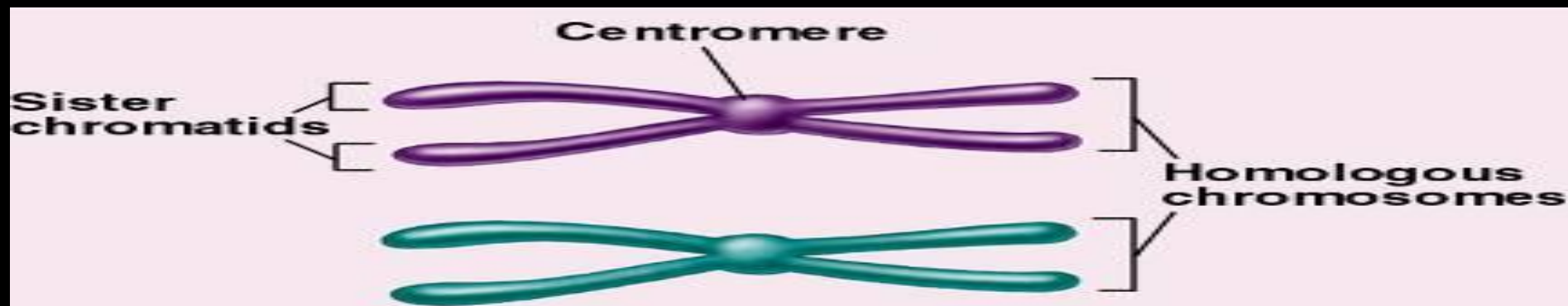
Boarding Schools of Tatarstan R.F.

- Cell division to form the gametes, sperm (male gamete) and egg (female gamete).
- Normal cells are diploid: 2 copies of every gene.
- Gametes are haploid: 1 copy of every gene
- Need to choose 1 copy of each gene randomly.



CHROMOSOMES

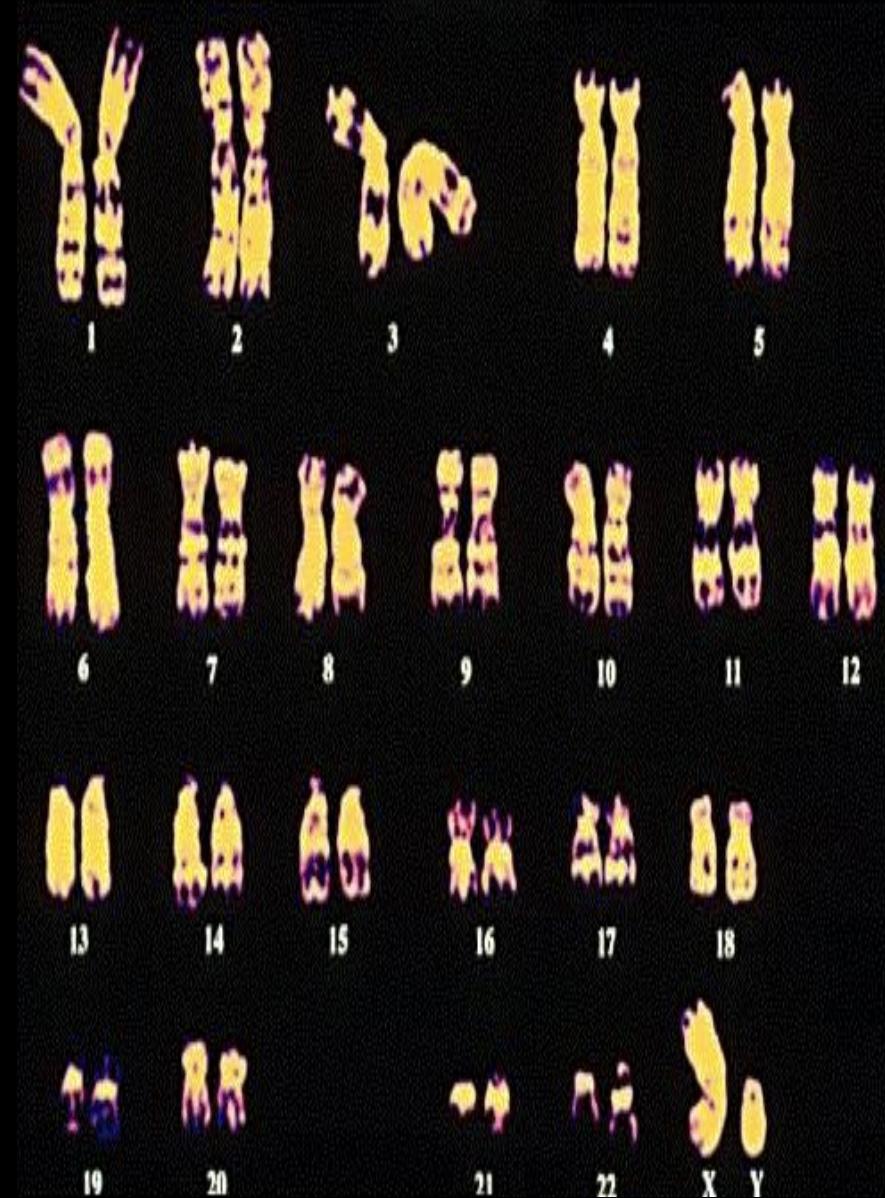
- Characters of living things are carried by means of a pair of chromosomes. One of them comes from father and other comes from mother.
- These pair of chromosomes is called **homologous chromosomes**.
- Homologous chromosomes carries similar characters in same order.

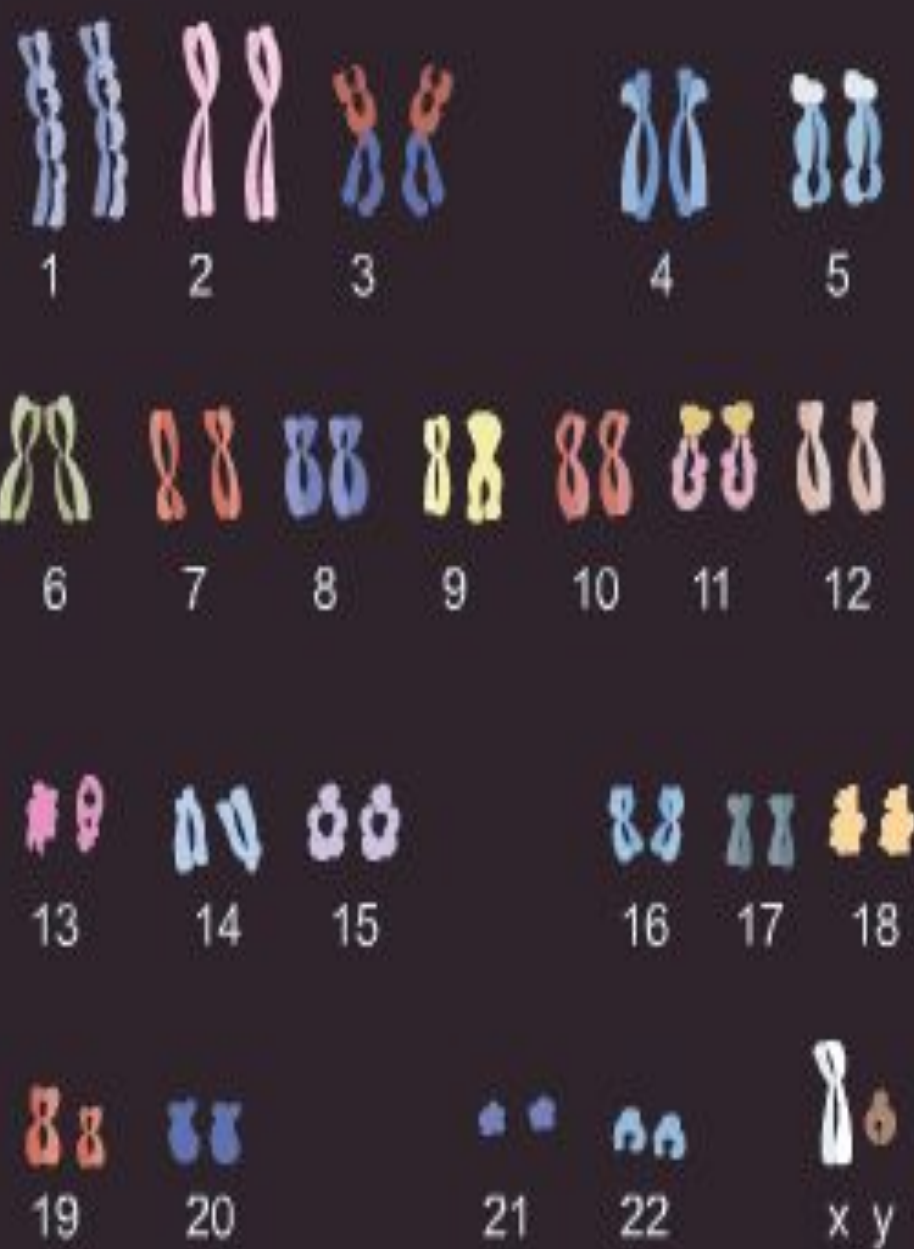


CHROMOSOME

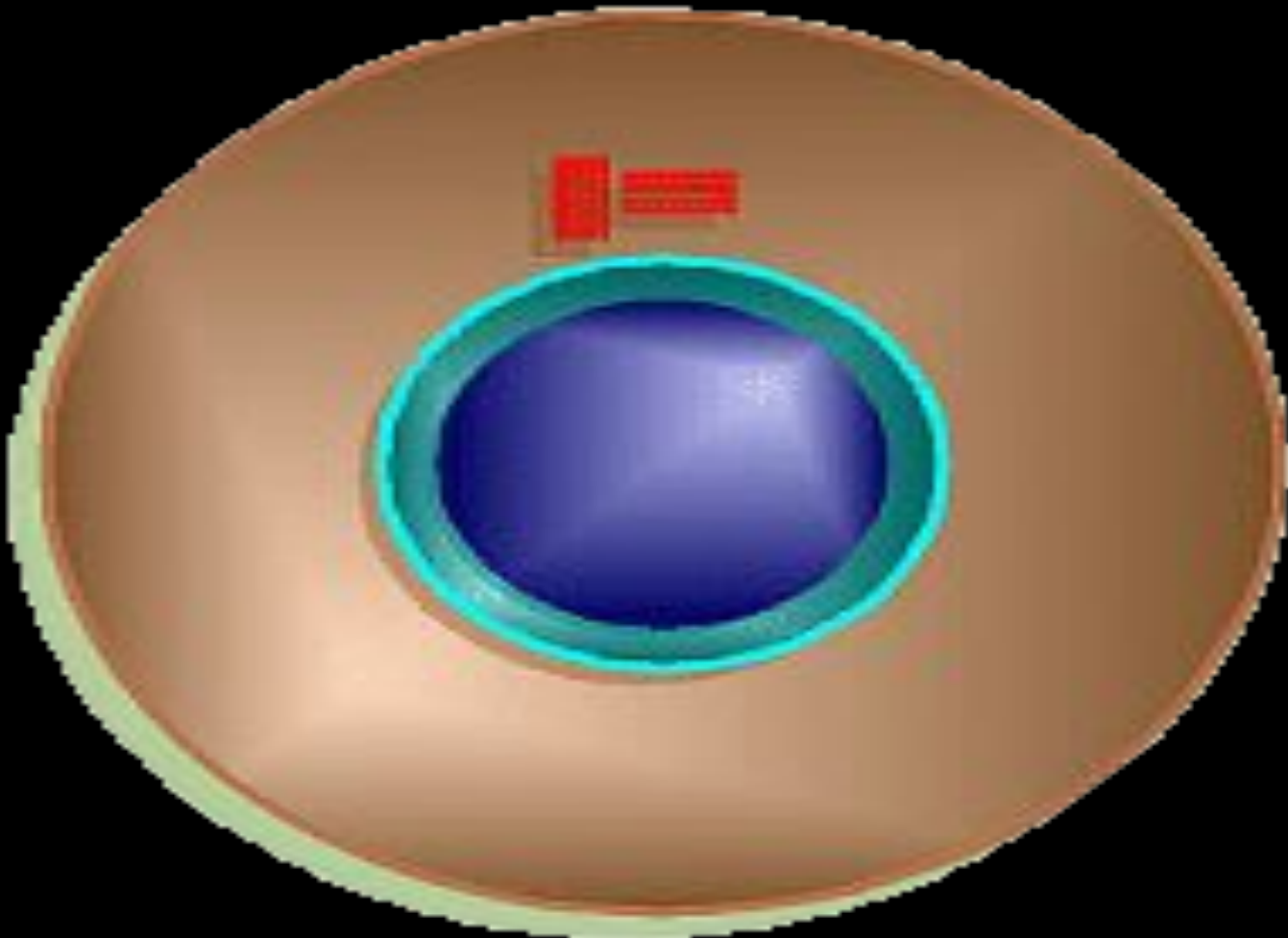
Chromosome Number

- **Homologous Chromosomes** are the sets of each pair
 - 1 pair from mother
 - 1 pair from father
 - Humans= 23 pairs or 46 total chromosome

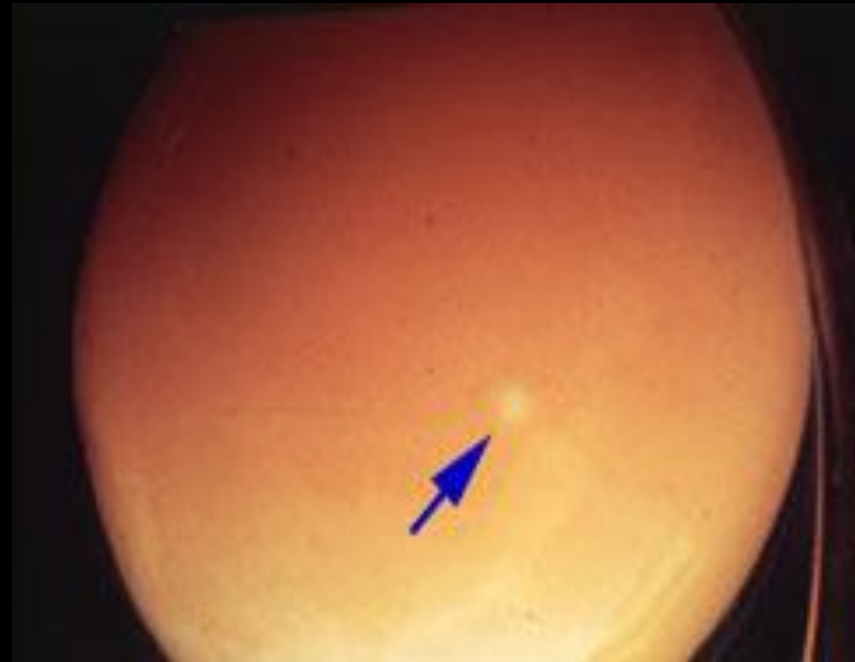
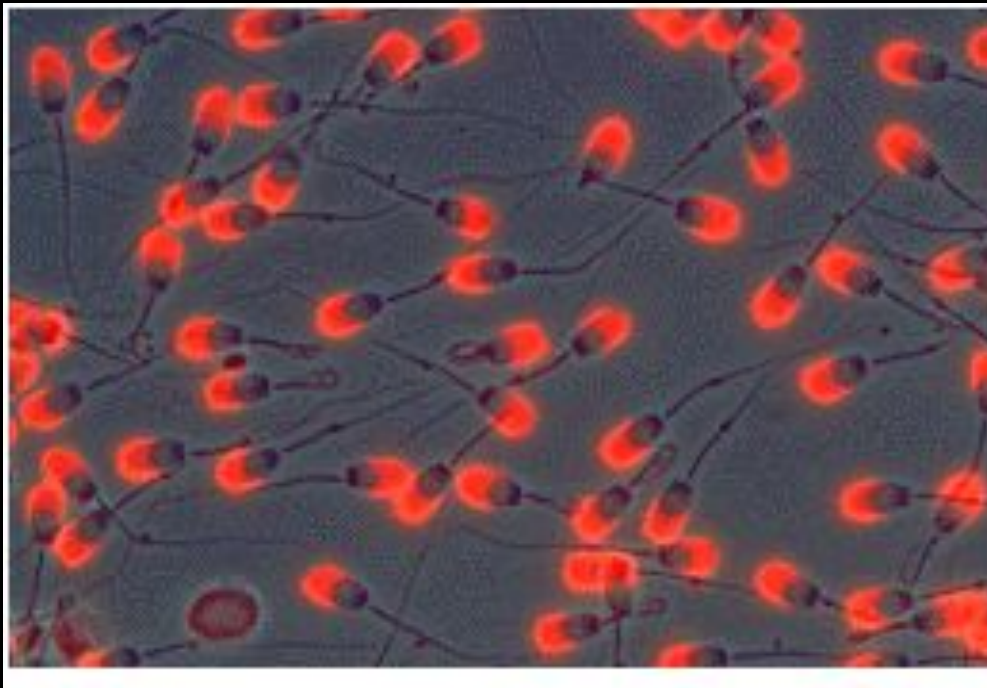




- **Meiosis** is a special cell division which takes place in reproductive organs such as gametes or spores of living things .



- **Meiosis needs two sex cells**
 - a. **Sperm: male sex cell**
 - b. **Egg: female sex cell**



MEIOSIS

Meiosis I

$2n$



n

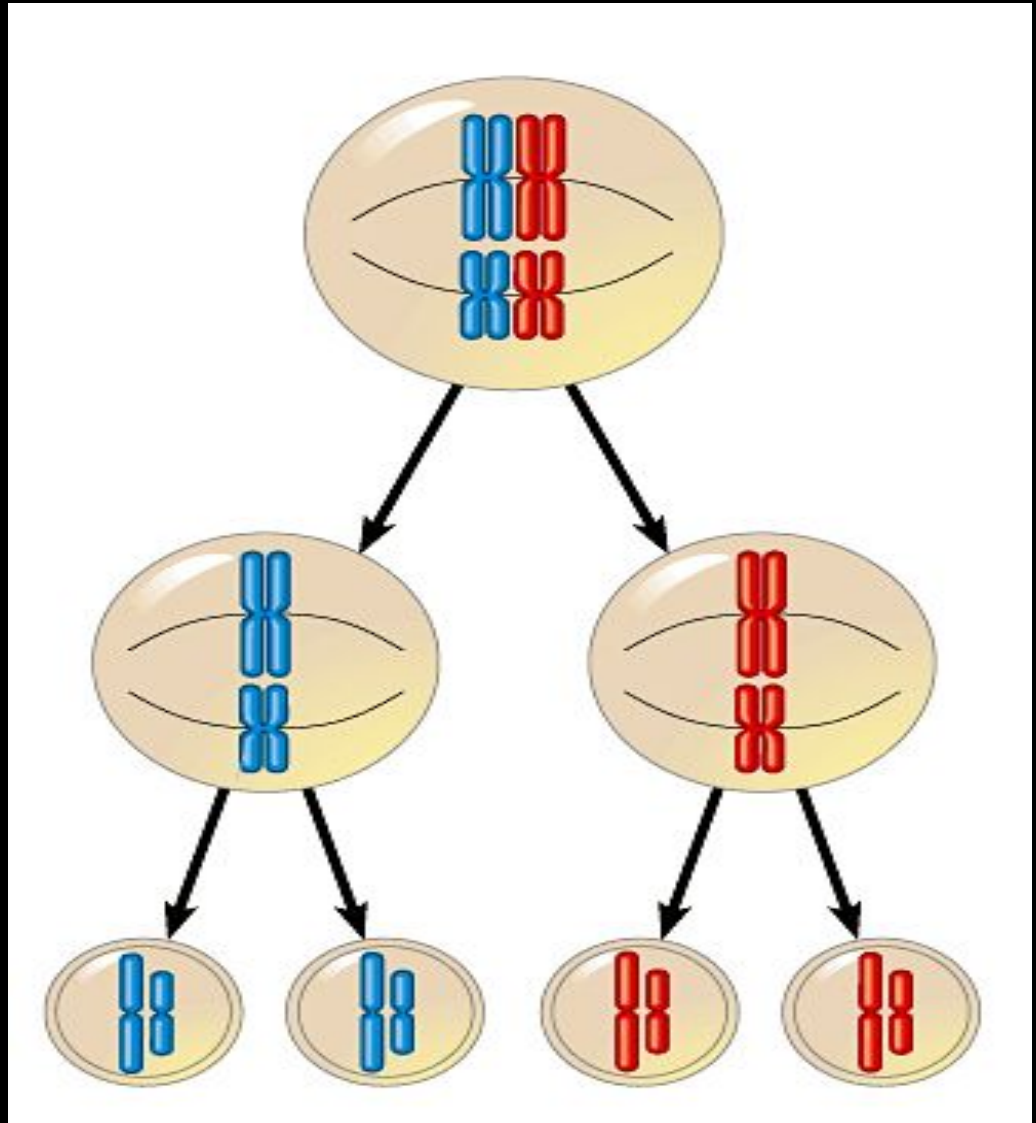
n

STAGES OF MEIOSIS

- The Meiosis consists of two cell divisions:

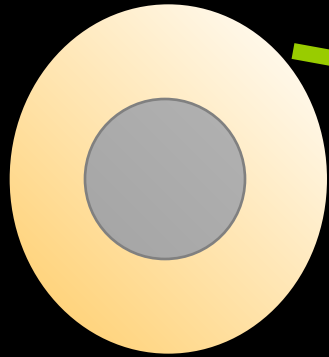
- MEIOSIS-I

- MEIOSIS-II

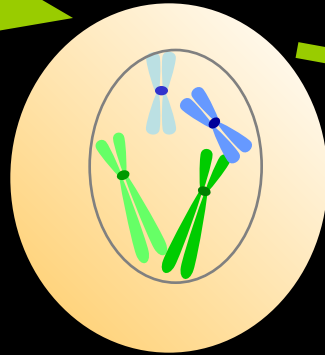


Stages Of Meiosis:

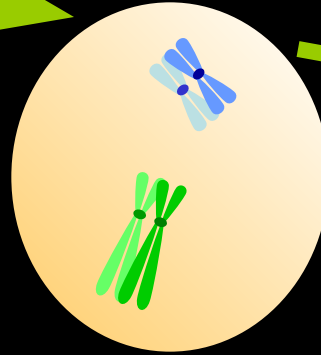
Mother cell



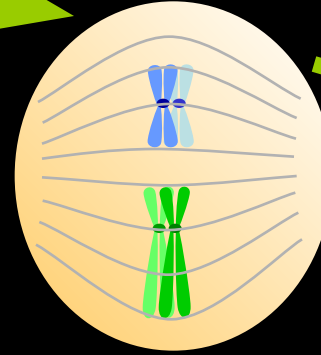
Interphase



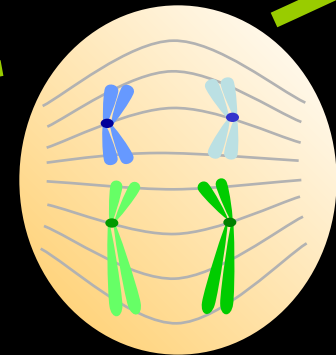
Prophase I:
Condensing
Chromosomes



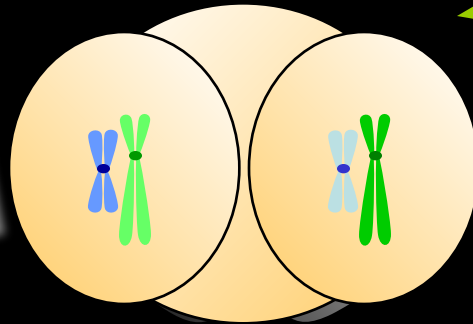
Prophase I:
Tetrad formation/
crossing over



Metaphase I



Anaphase I



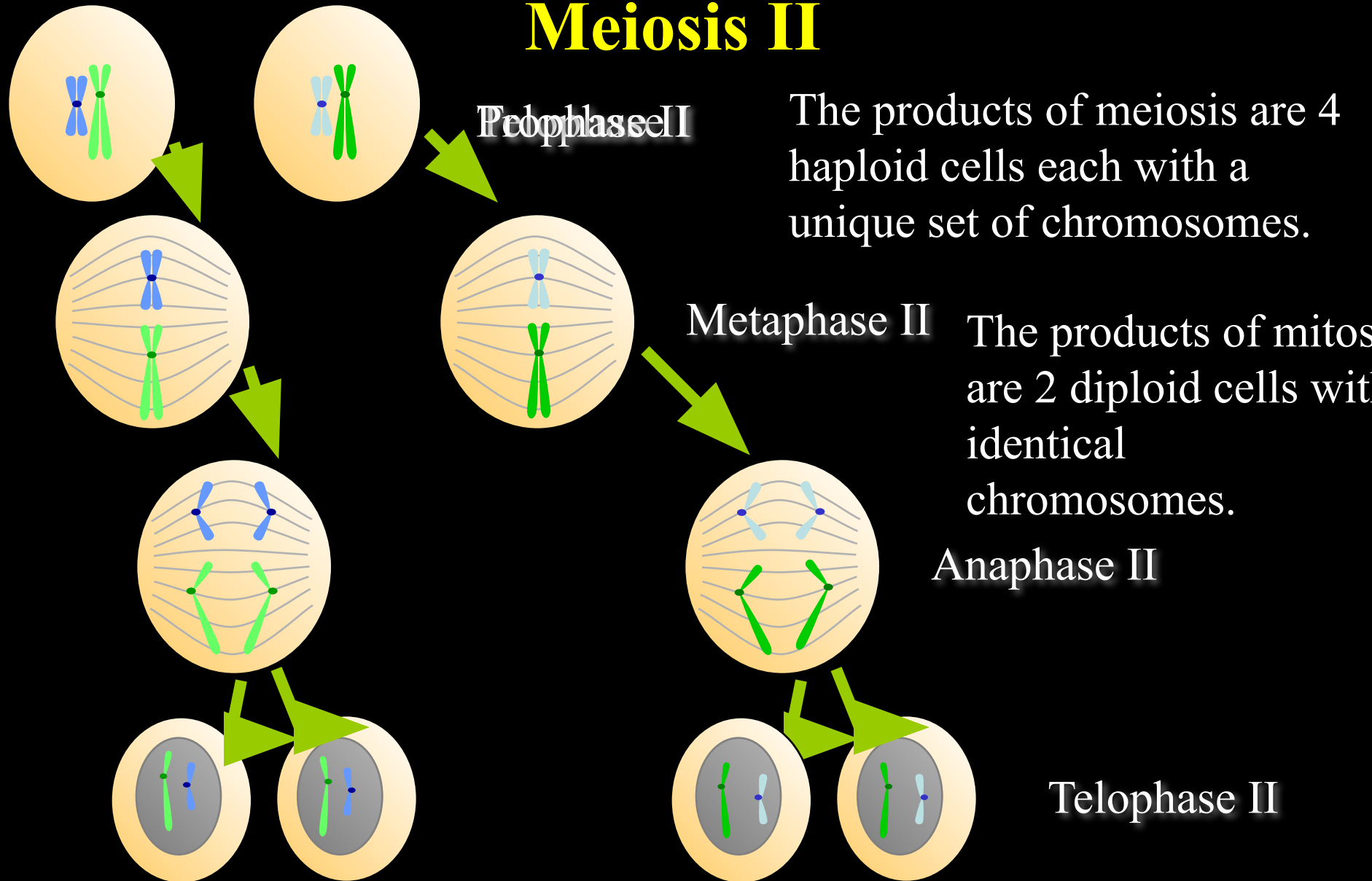
Telophase I

Meiosis II

Meiosis I

Stages Of Meiosis:

Meiosis II



MEIOSIS-I

- **At the start of meiosis, cells have the diploid number of chromosomes.**
- **There is interphase before start the first meiotic division.**
- **DNA is replicated in interphase.**

INTERPHASE

PROPHASE-I

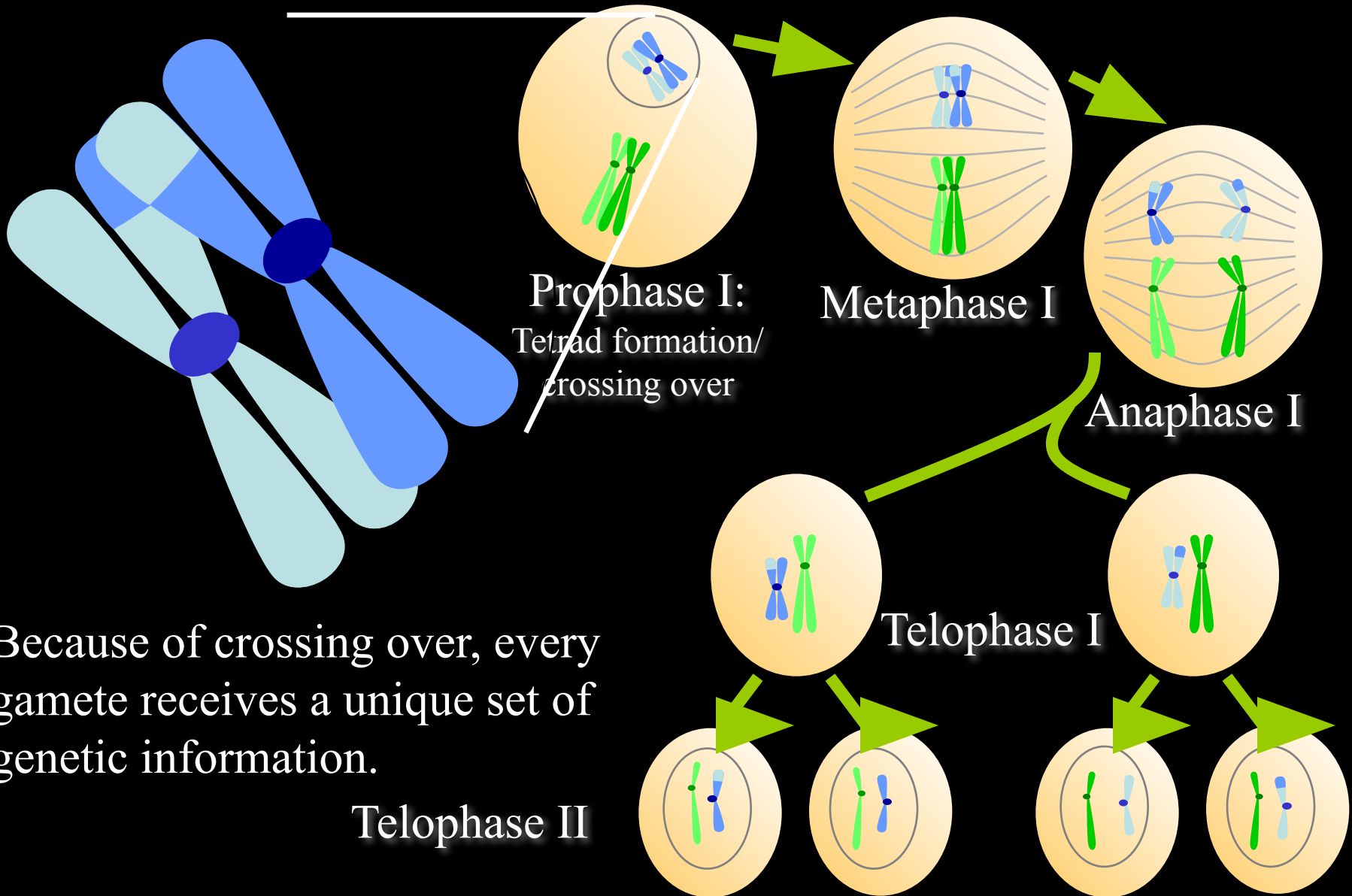
- **Spindle fibers are formed by centrioles.**
- **Nuclear membrane and nucleolus disappear.**
- **DNA are shortened and thickened and to form chromosomes.**
- **Each chromosome lines up exactly with its homologous chromosome.**
- **Homologous chromosomes attach to their pairs and tetrads are formed.**

PROPHASE 1

CROSSING-OVER

- Pairs of homologous chromosomes forms the **TETRADS**.
- The gen exchange between chromatids of homologous chromosomes pairs is called **crossing-over**.
- Crossing-over provide the variaty of species.

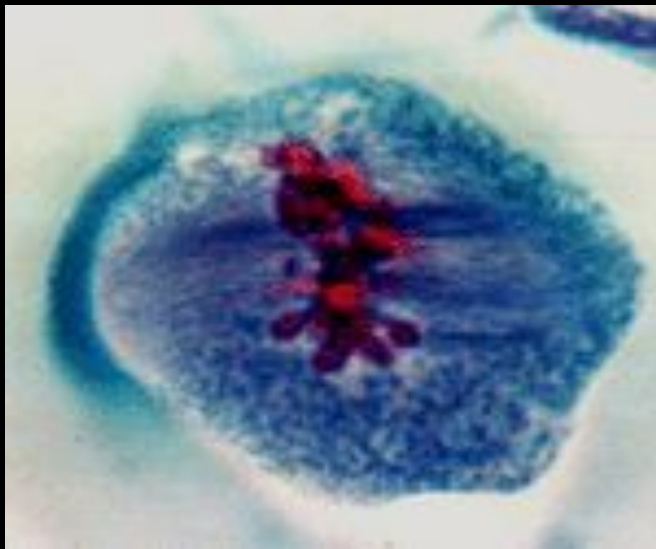
Crossing Over



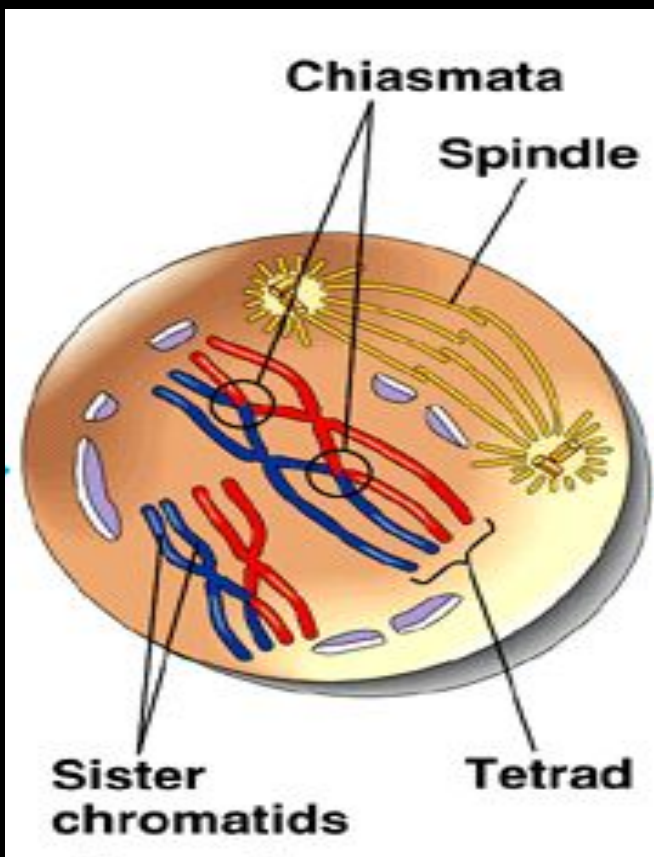
CROSSING-OVER

CROSSING-OVER

METAPHASE-I



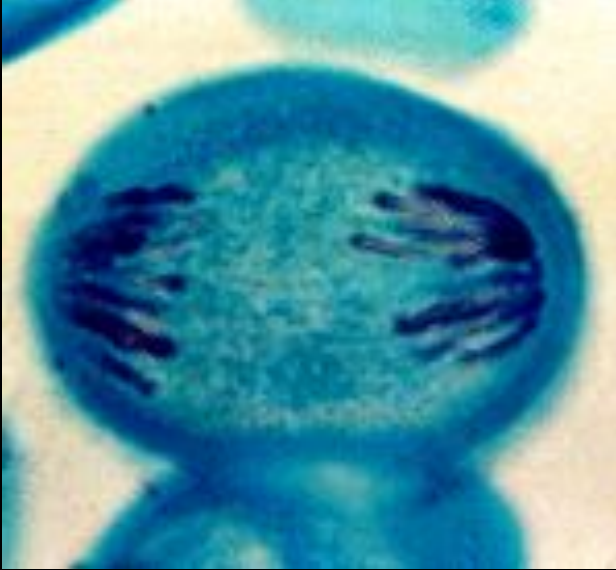
- Homologous chromosomes pairs line up on the equator.
- The chromosomes attach to the spindle fibers at their centromeres.



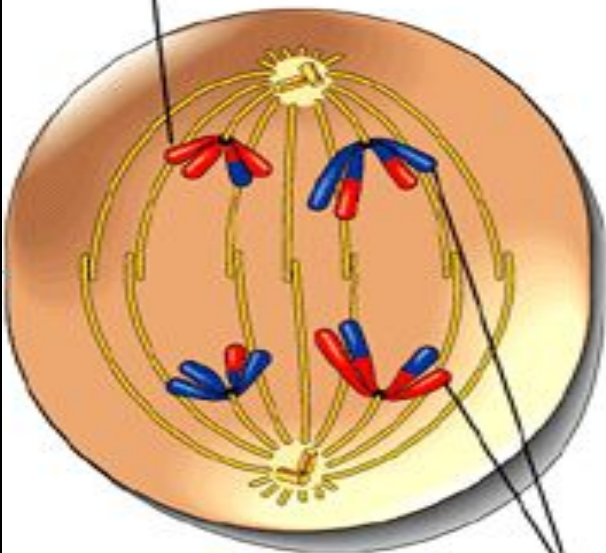
METAPHASE 1

ANAPHASE-I

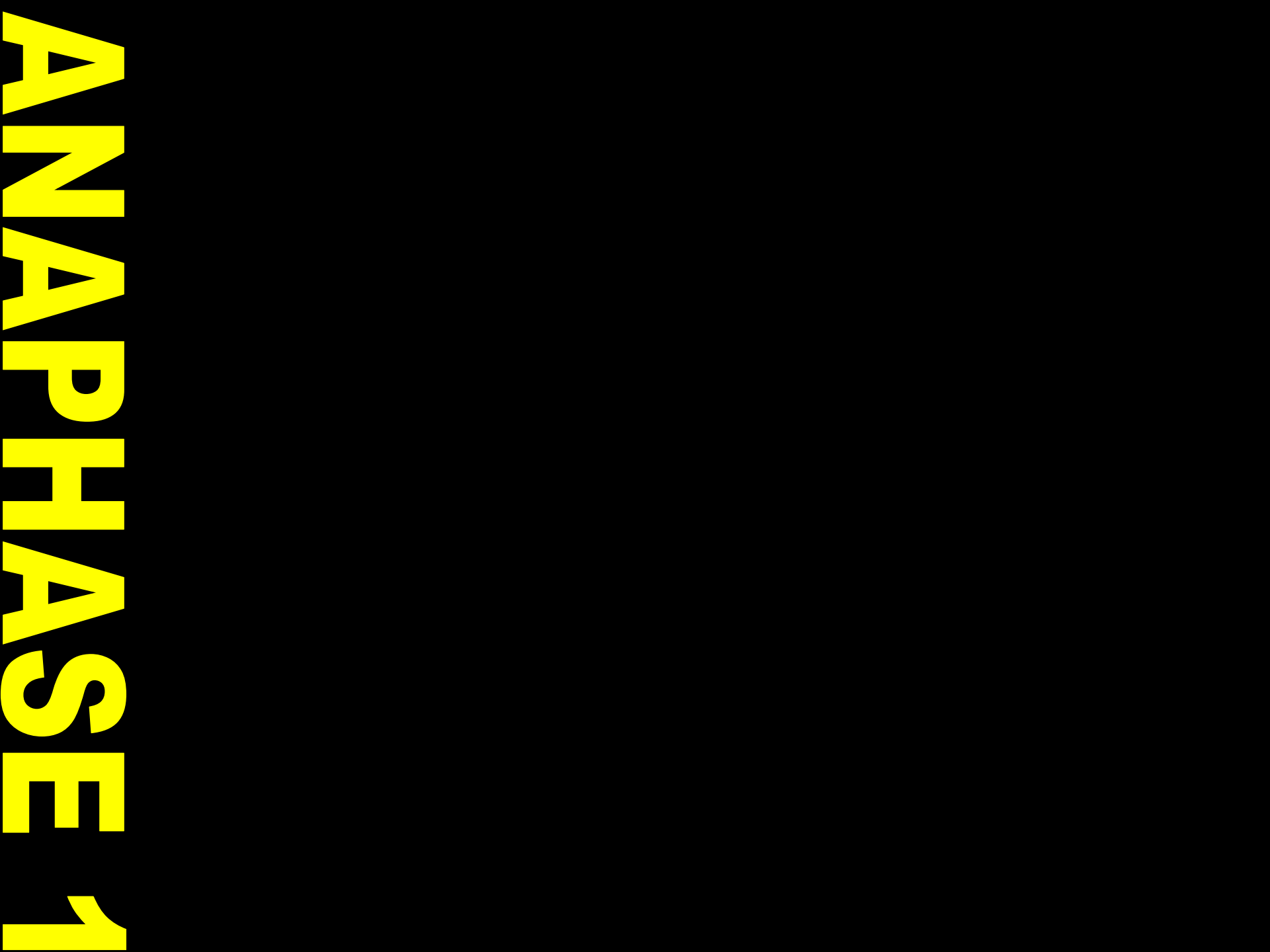
- The homologous chromosomes of each tetrad separate from each other.
- They move to opposite poles of the cell.
- The set of chromosomes around each pole is haploid.



Sister chromatids remain attached



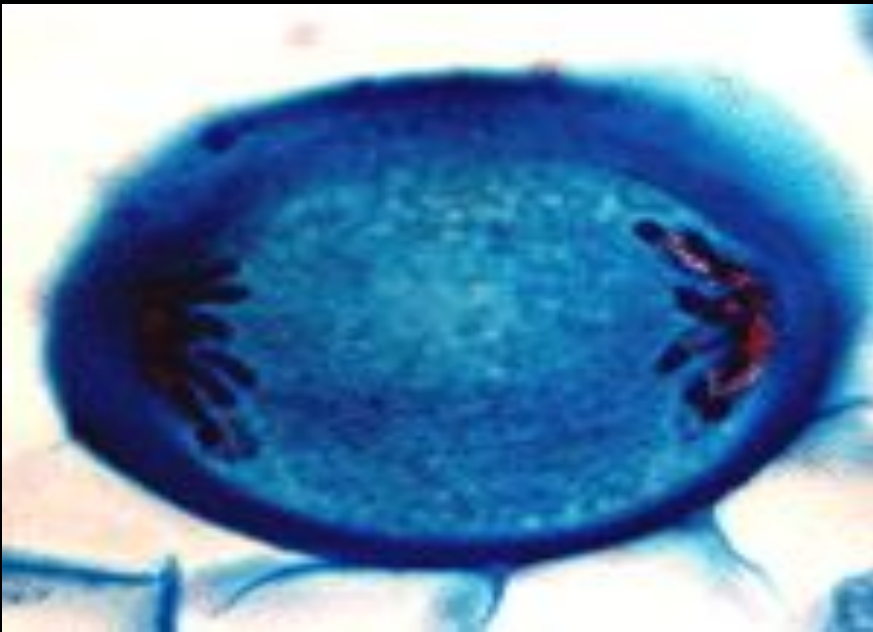
Homologous chromosomes separate



ANAPHASE 1

TELOPHASE-I

- Nuclear membranes are formed. The cytoplasm divides forming two daughter cells.



TELOPHASE 1

The interphase between meiosis I and meiosis II is called **interkinesis**.

- How does interkinesis differ from the mitotic interphase in terms of S phase?
- **Interkinesis has no S phase**
 - After meiosis I, each **homologous chromosomes separate**.
 - After meiosis II, each **sister chromatids separate**.

PROPHASE-II

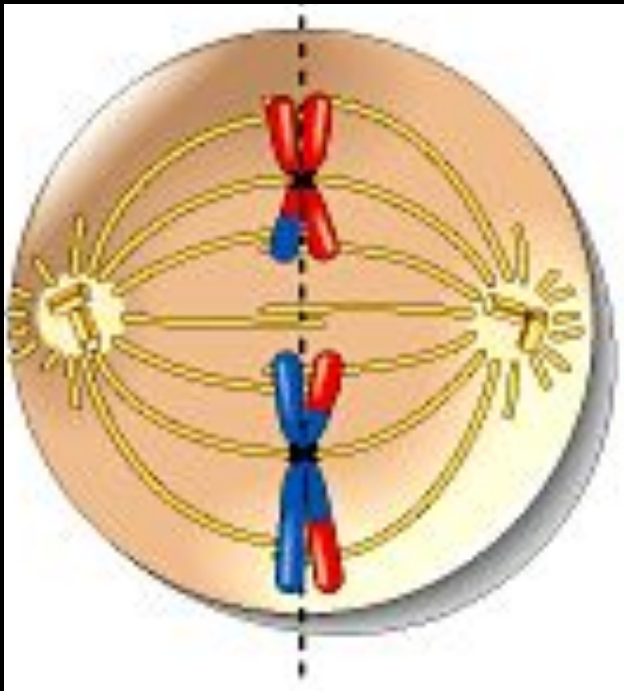
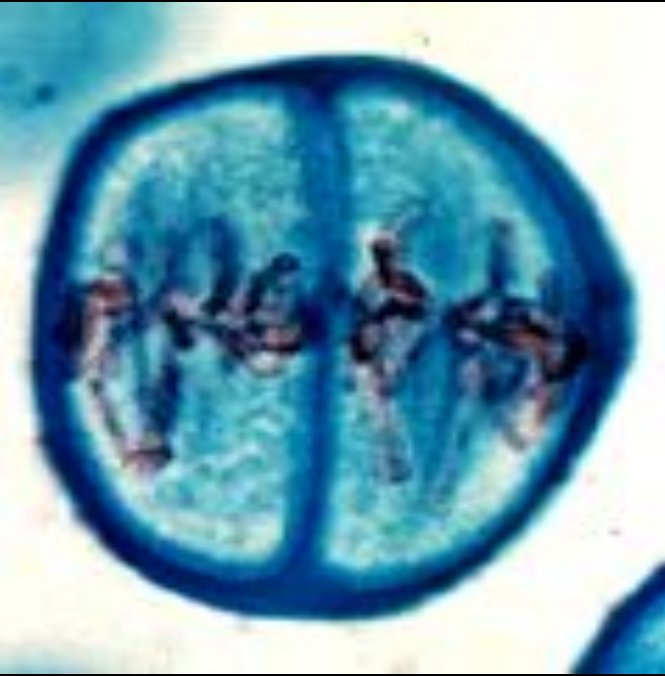
- Each of the daughter cells forms a spindle and the double stranded.
- Chromosomes move toward the middle of the cell.



PROPHASE 2

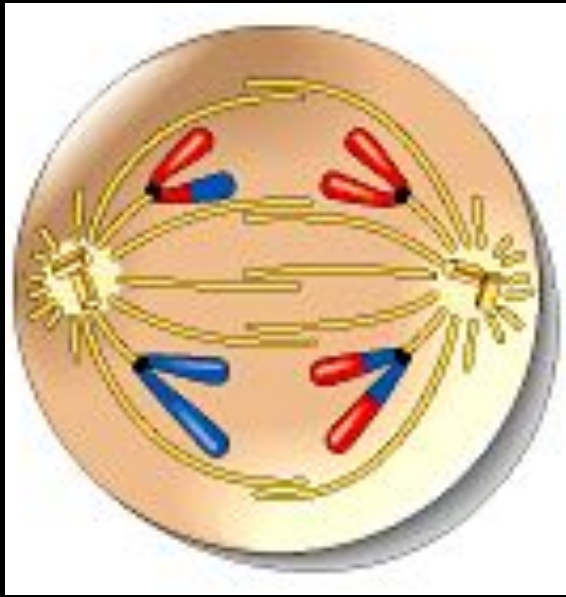
METAPHASE-II

- The chromosomes become attached to the spindle fibers at their centromers.
- And the chromosomes line up on the equator.

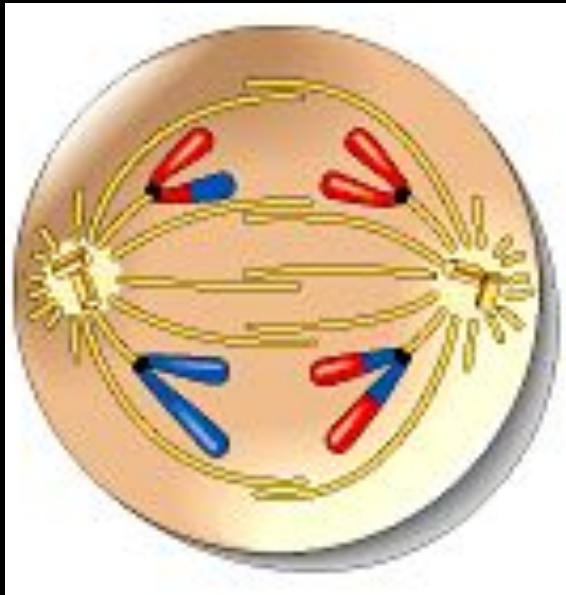


METAPHASE 2

ANAPHASE-II



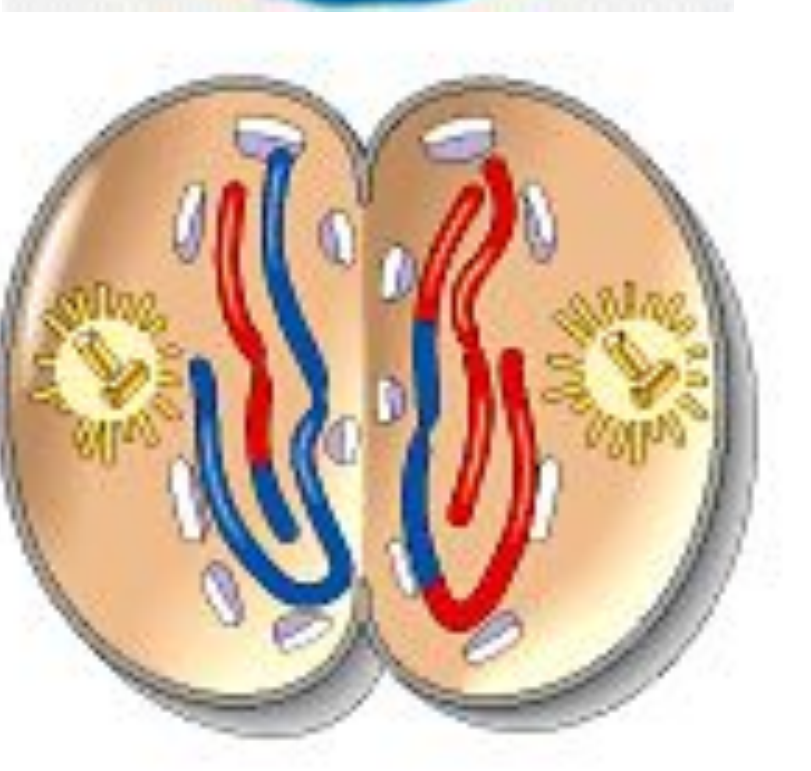
- The Centromeres divide and the sister chromatids separate.
- The chromatids move toward the opposite poles of the cells.



ANAPHASE 2

TELOPHASE-II

- Both daughter cells divide forming 4 haploid cells.
- The nuclear membrane reforms.



TELOPHASE 2

ACTIVITY

ACTIVITY

ACTIVITY

ACTIVITY

SUMMARY