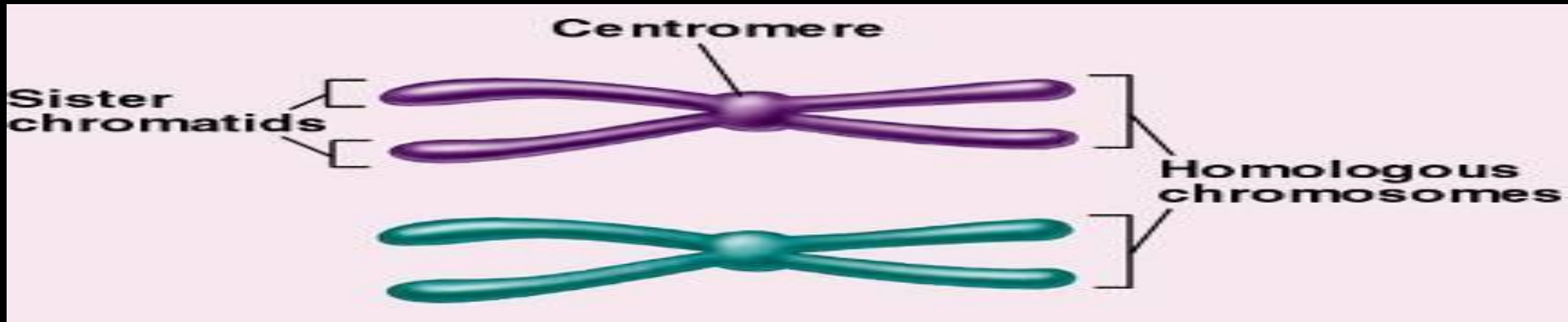
MEIOSIS

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

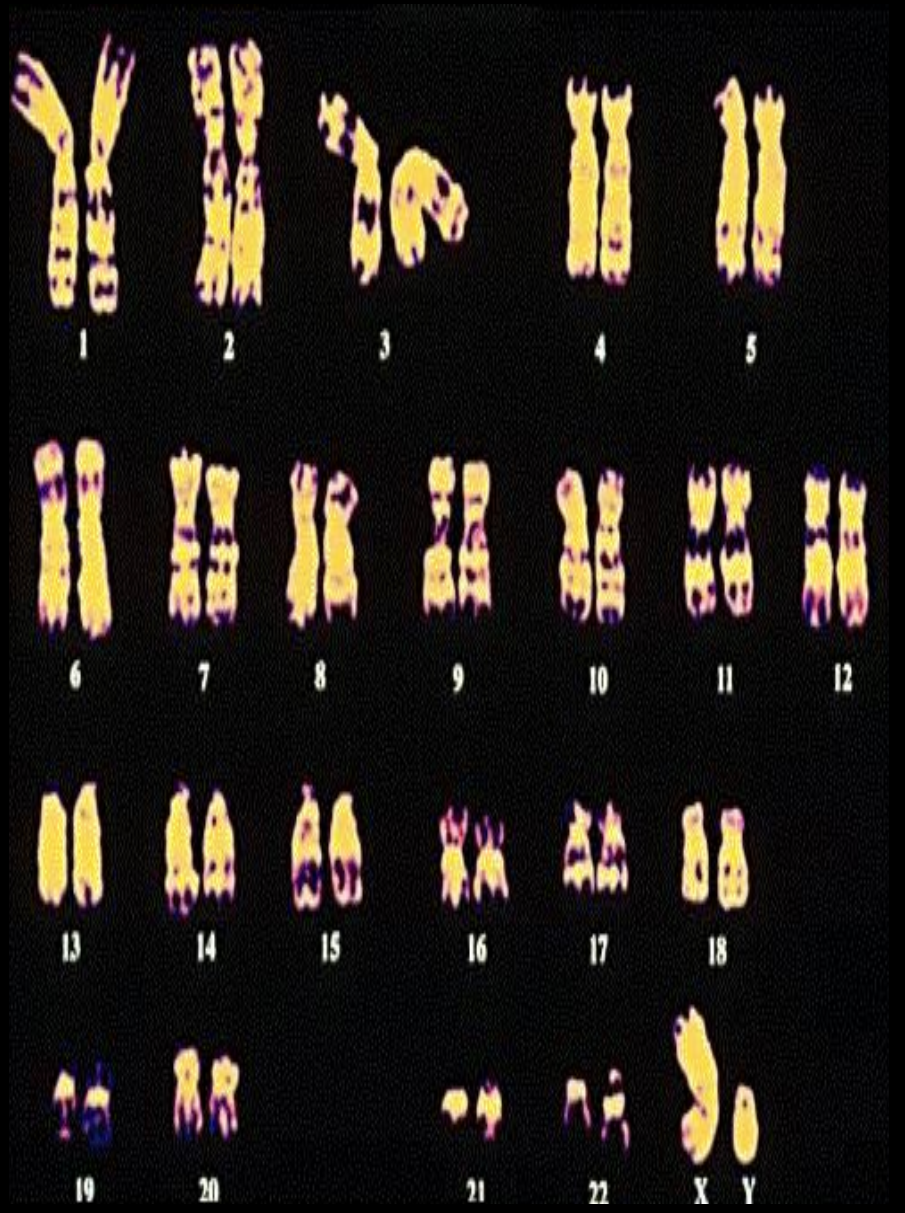
- Characters of living things are carried by means of a pair of chromosomes. One of them comes from father and other comes from mother.
- These pair of chromosomes is called **homologous chromosomes**.
- Homologous chromosomes carries similar characters in same order.

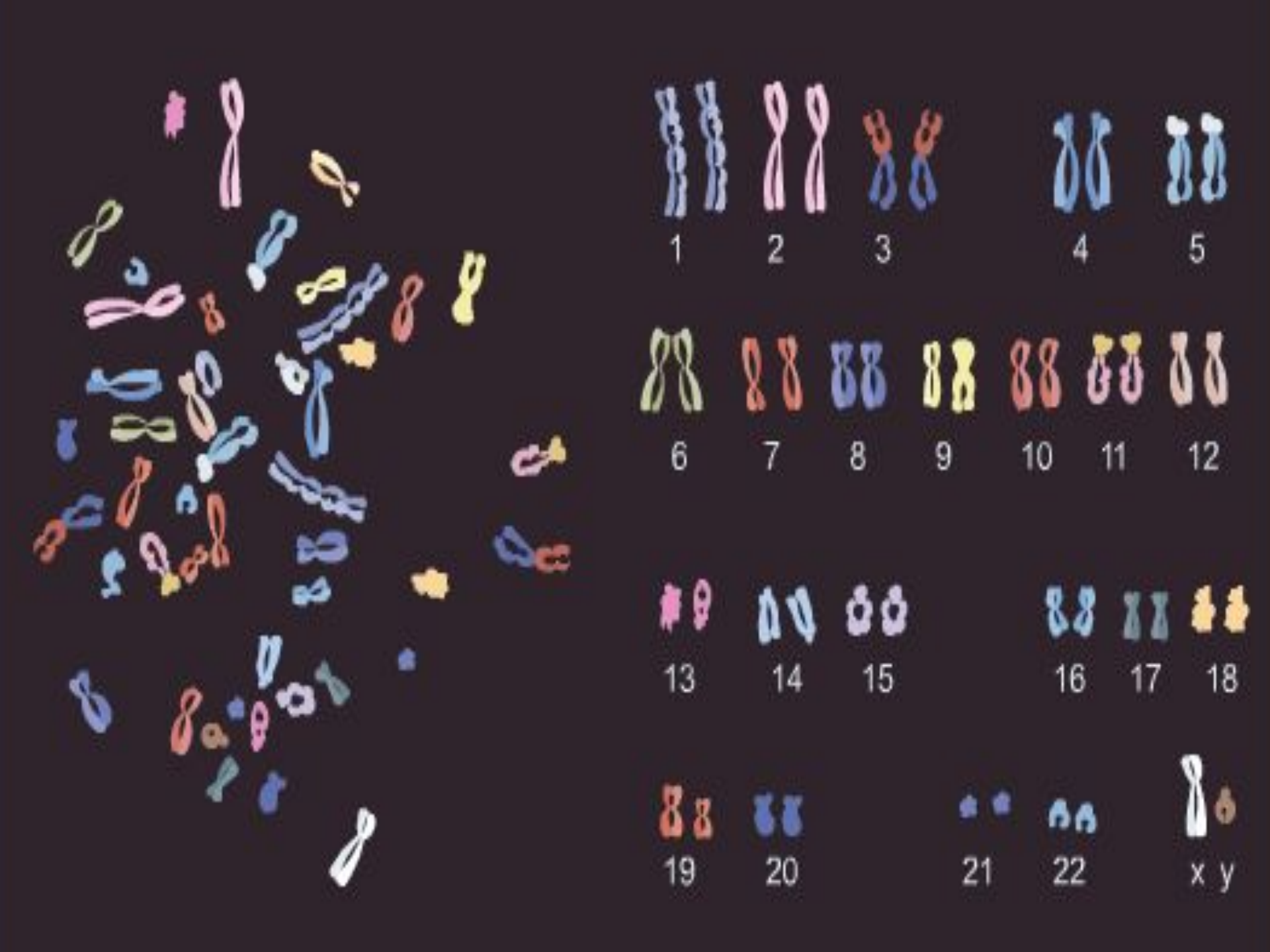


CHROMOSOME

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

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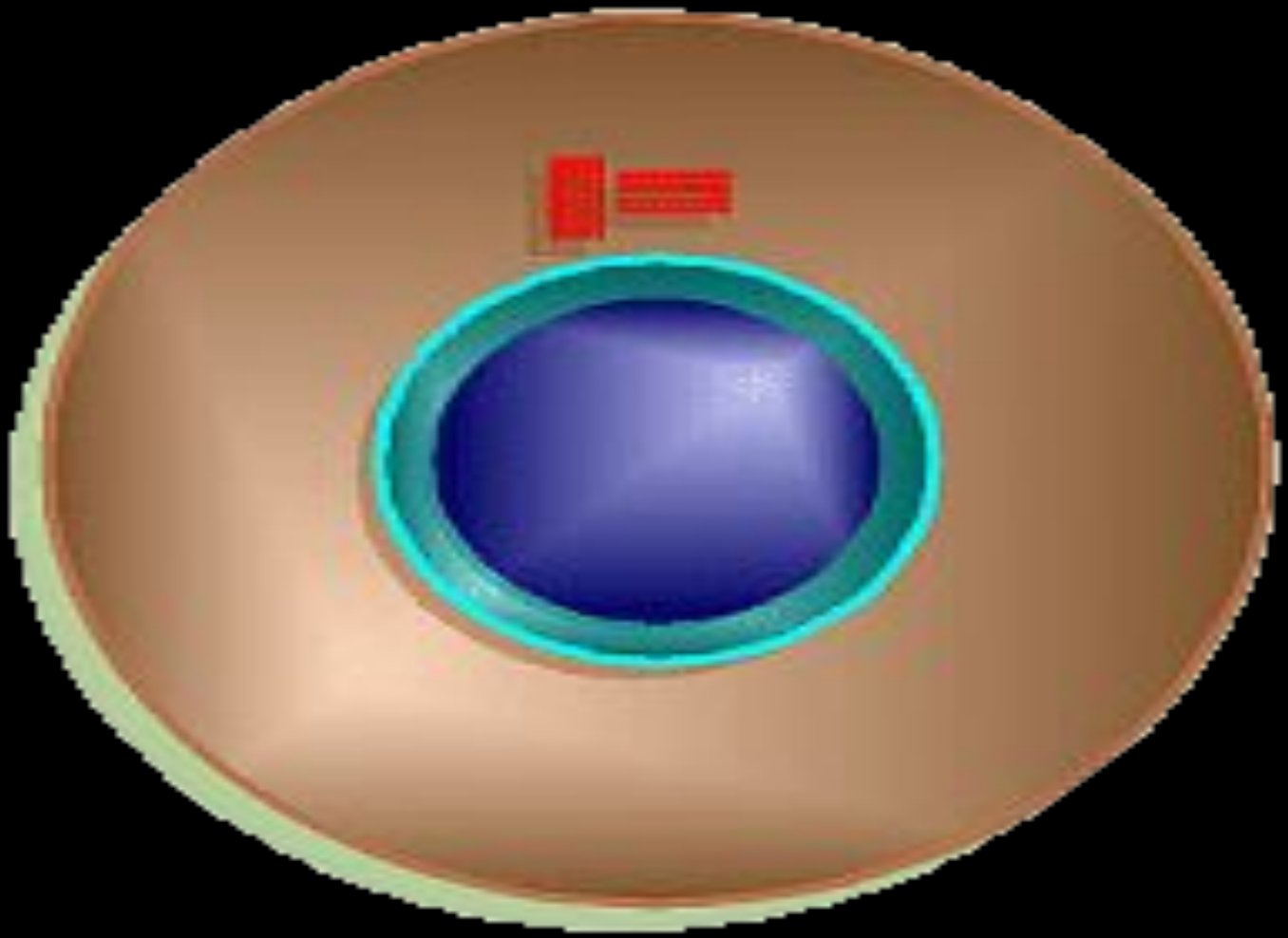
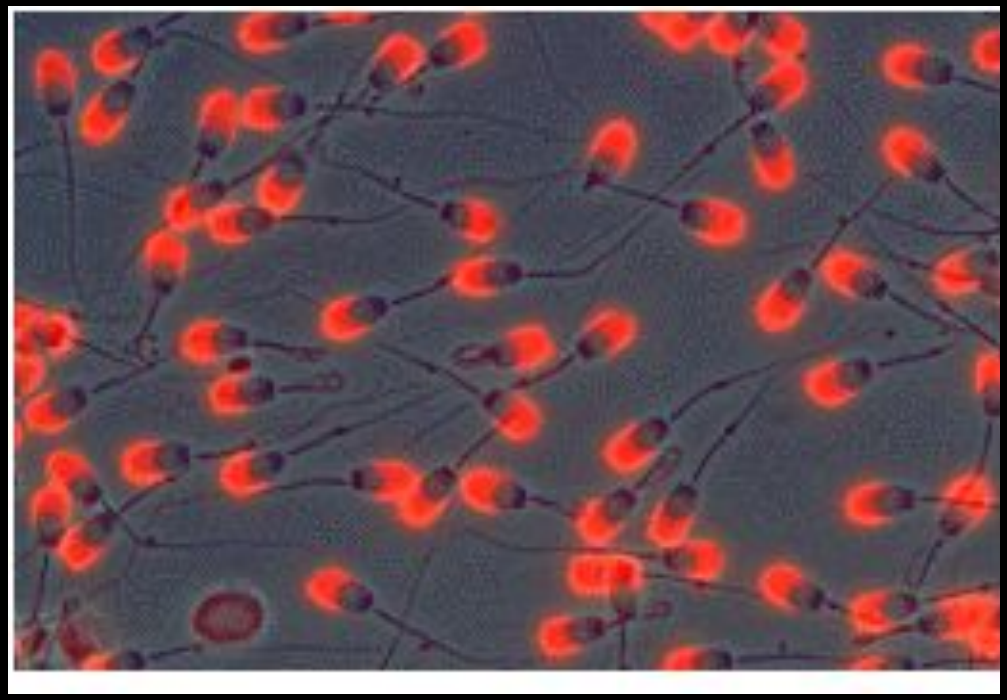
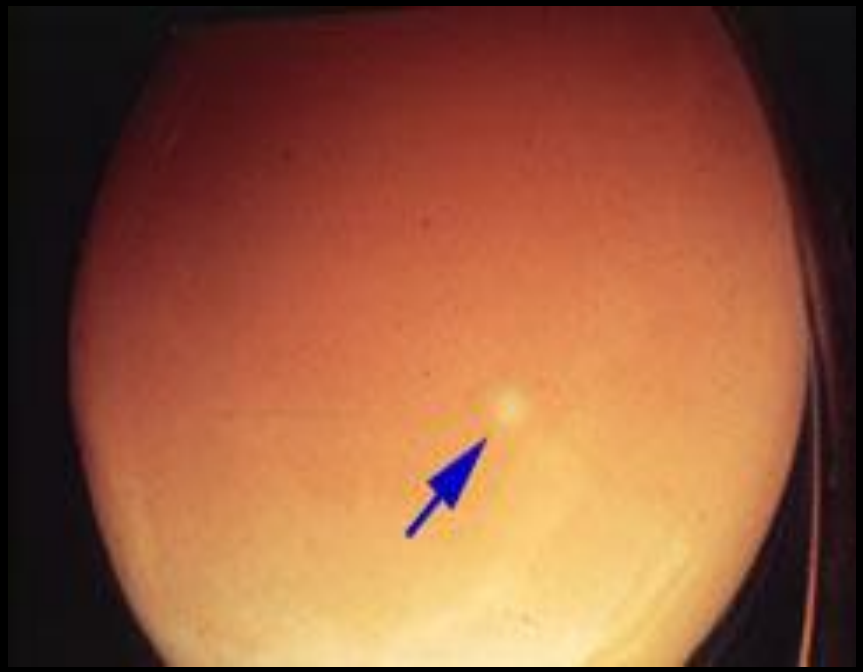
- **Meiosis** is a special cell division which takes place in reproductive organs such as gametes or spores of living things .



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



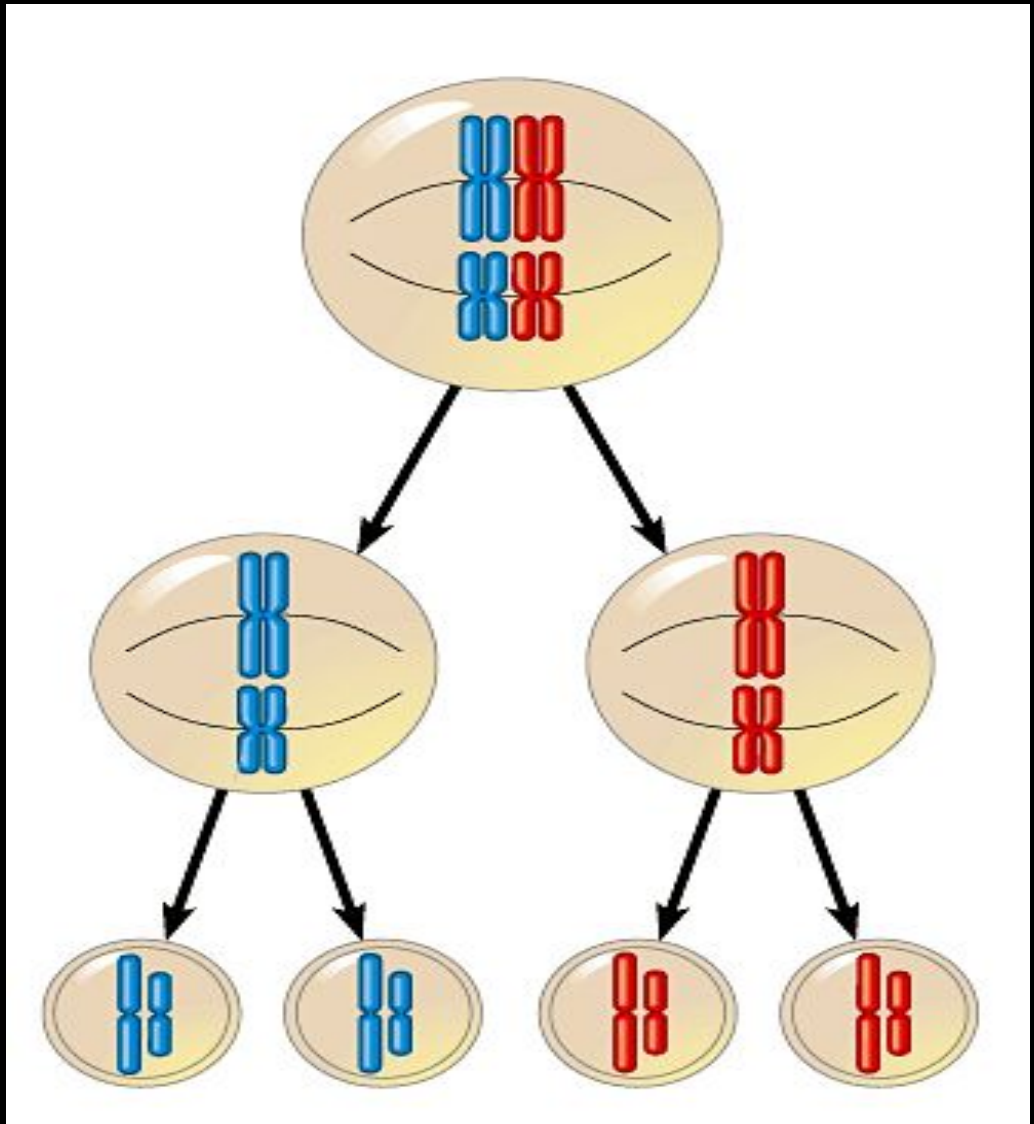


MEIOSIS

Meiosis I

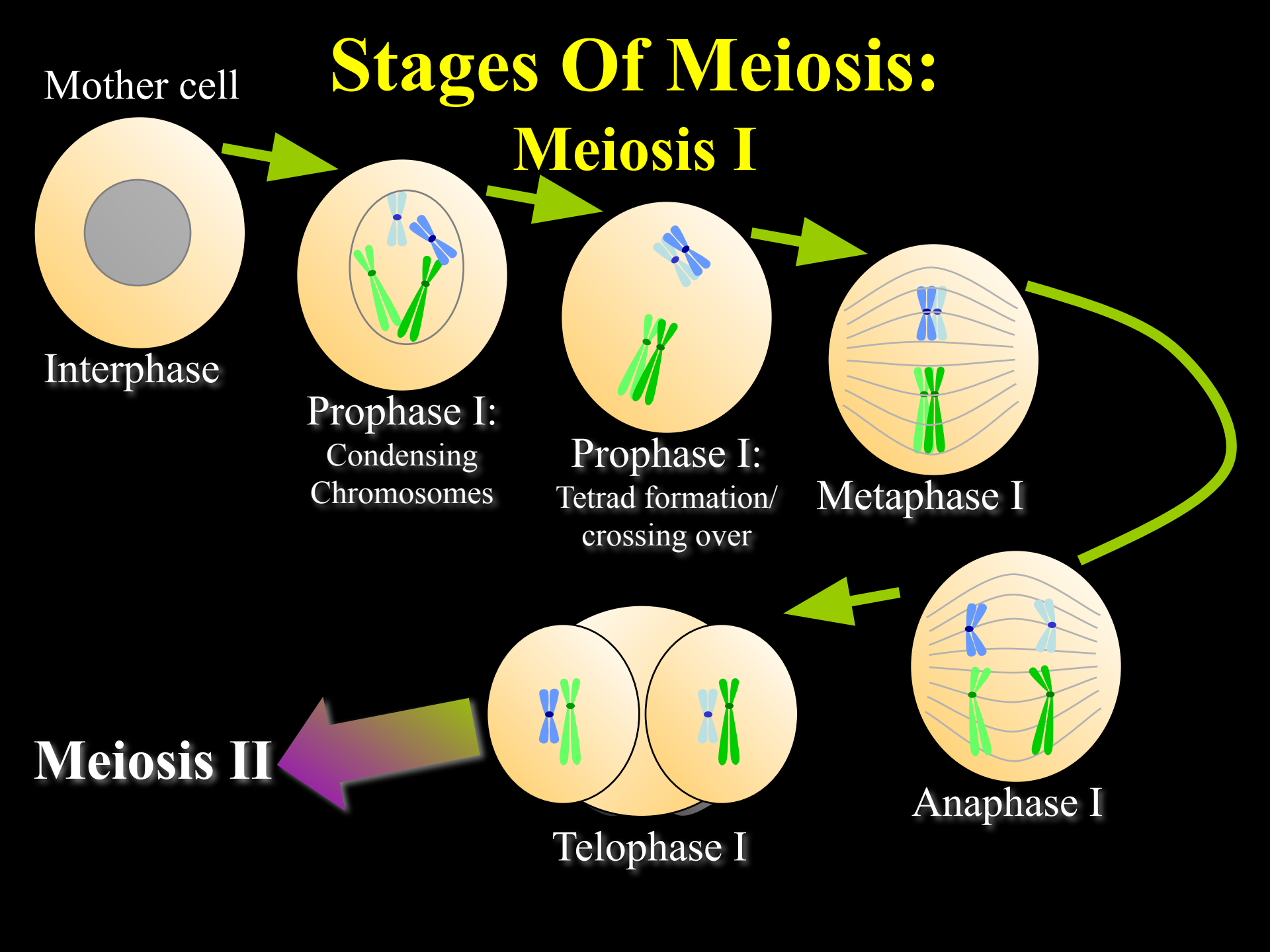
STAGES OF MEIOSIS

- The Meiosis consists of two cell divisions:
  - –MEIOSIS-I
  - –MEIOSIS-II



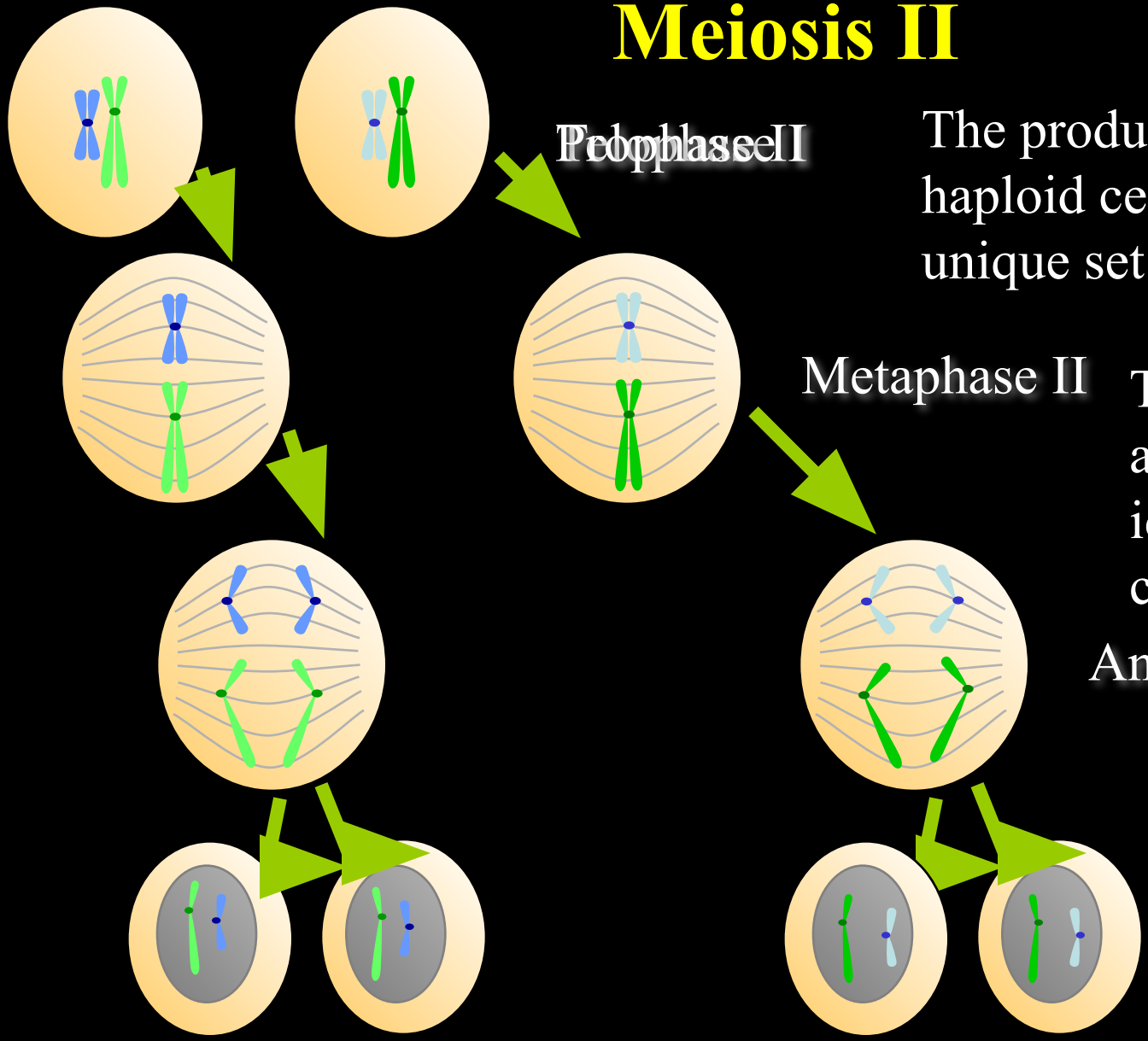
Stages Of Meiosis:

Meiosis I



Stages Of Meiosis:

Meiosis II



The products of meiosis are 4 haploid cells each with a unique set of chromosomes.

The products of mitos
are 2 diploid cells wit
identical
chromosomes.

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

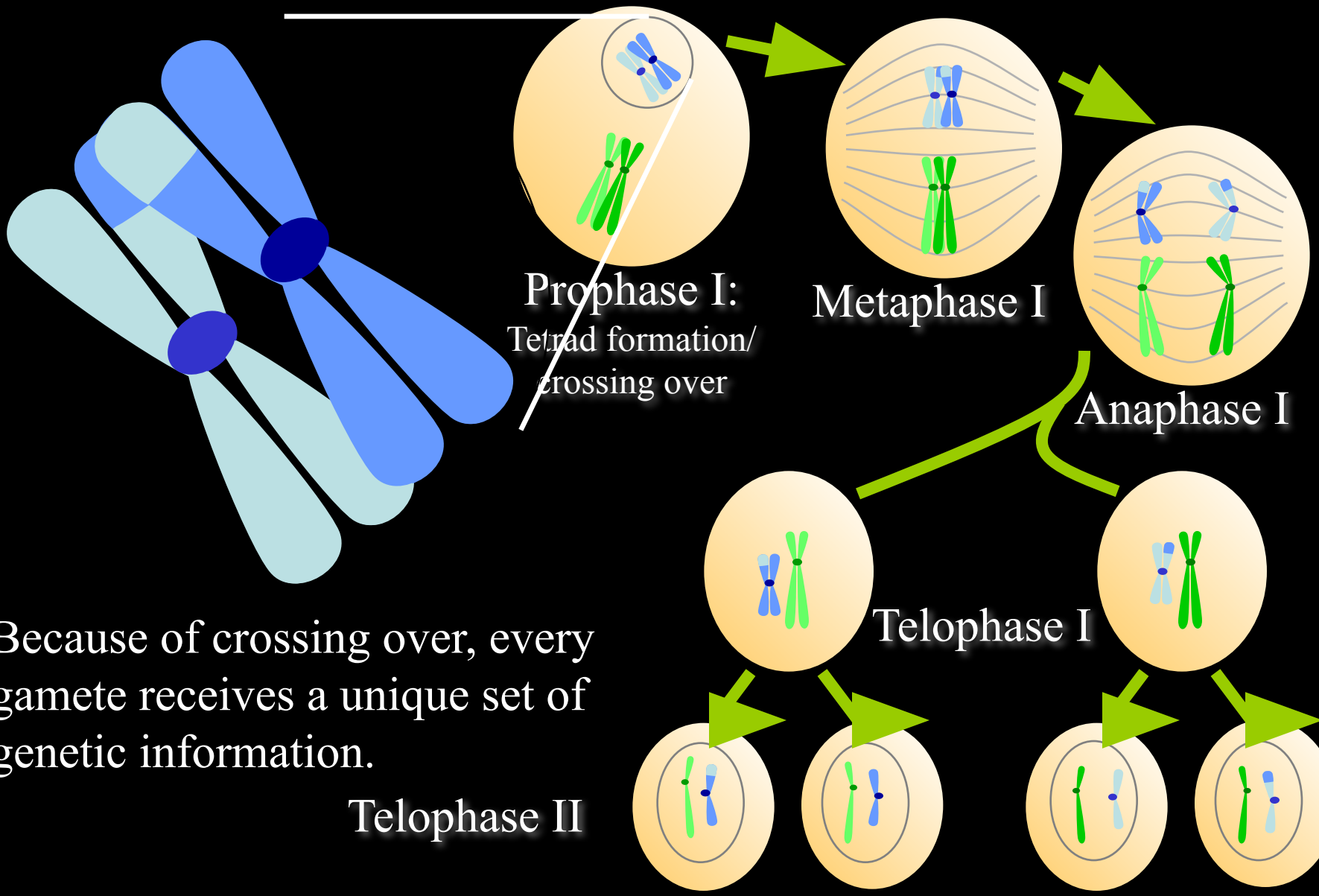
- Spindle fibers are formed by centrioles.
- Nuclear membrane and nucleolus disappear.
- DNA are shortened and thickened and to form chromosomes.
- Each chromosome lines up exactly with its homologous chromosome.
- Homologous chromosomes attach to their pairs and tetrads are formed.

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.

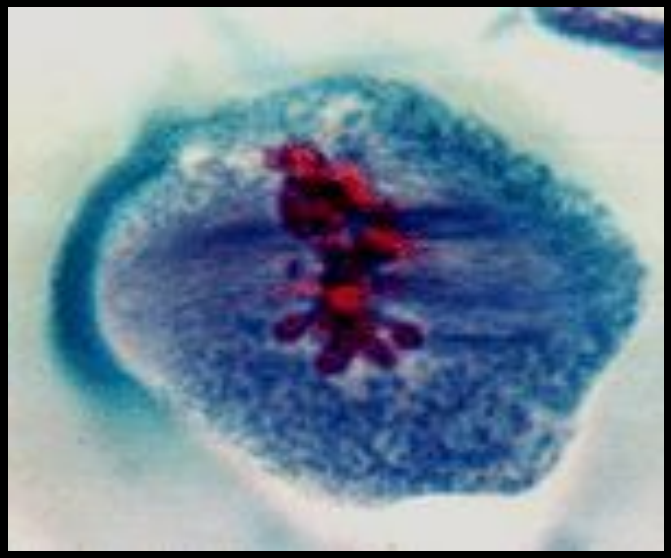
Crossing Over

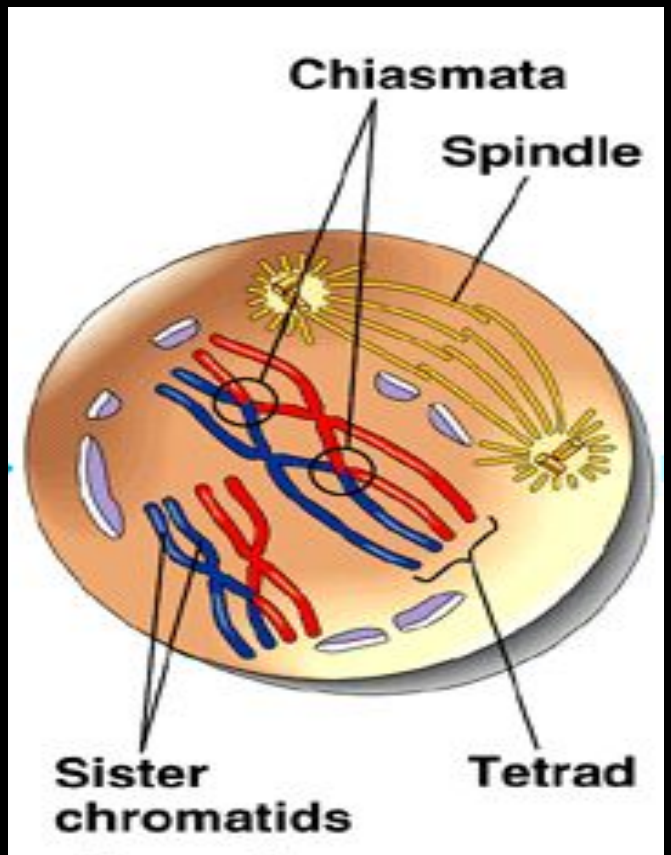


Because of crossing over, every gamete receives a unique set of genetic information.

CROSSING-OVER

CROSSING-OVER

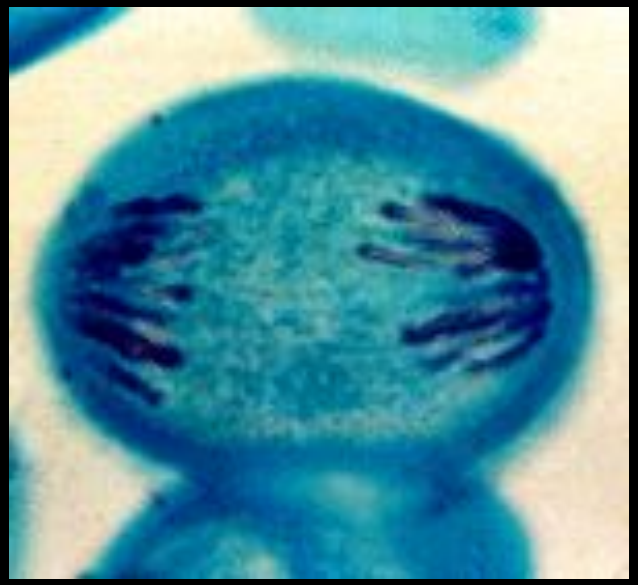


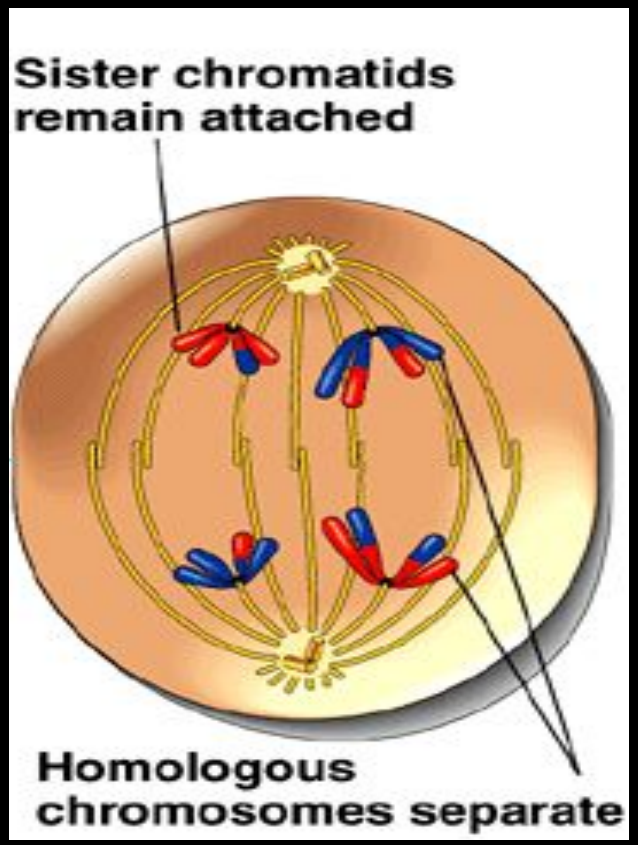


METAPHASE-I

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

METAPHASE 1

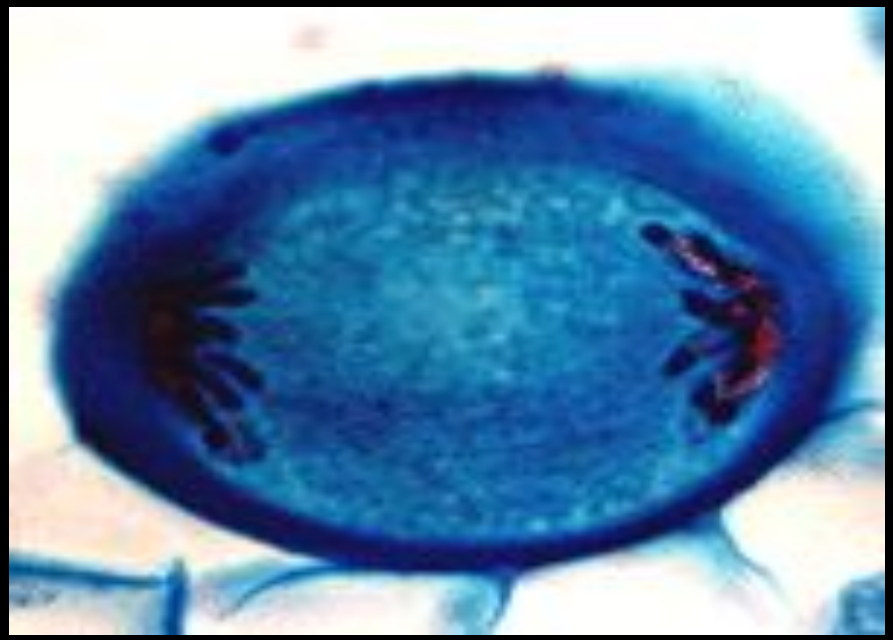




ANAPHASE-I

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

ANAPHASE 1



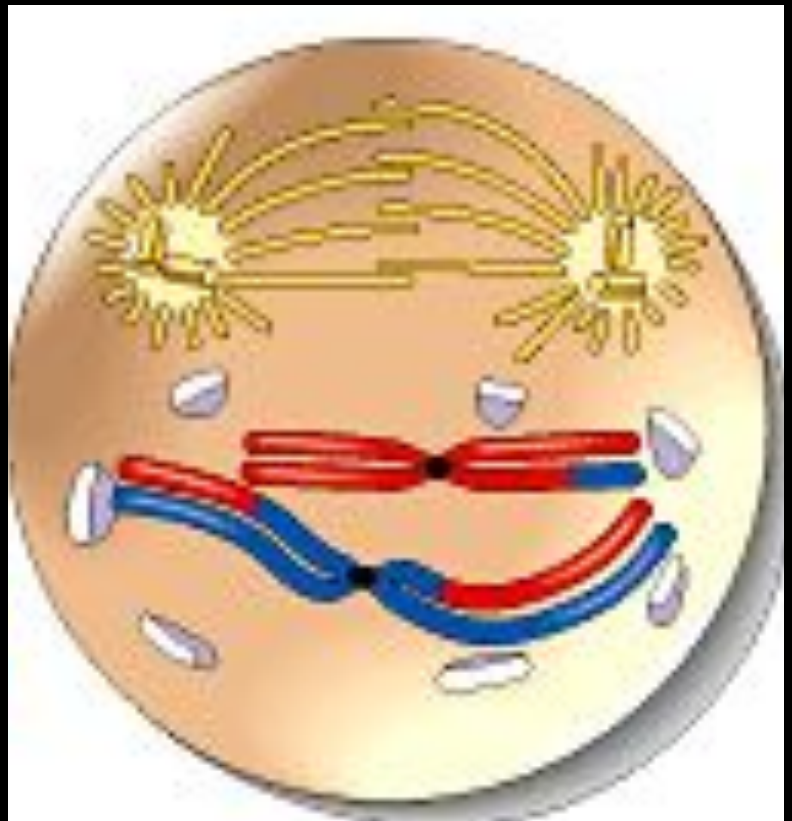
TELOPHASE-I

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

TELOPHASE 1

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

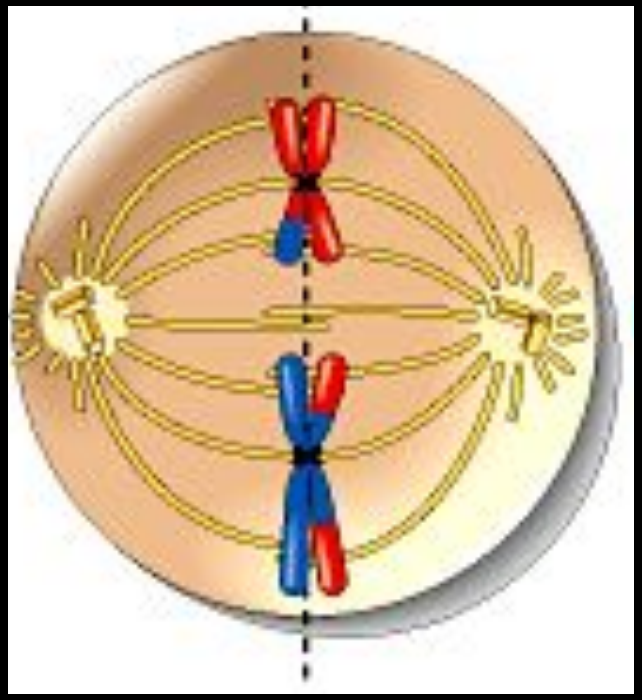
- **How does interkinesis differ from the mitotic interphase in terms of S phase?**
- **Interkinesis has no S phase**
  - **After meiosis I, each homologous chromosomes separate.**
  - **After meiosis II, each sister chromatids separate.**



PROPHASE-II

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

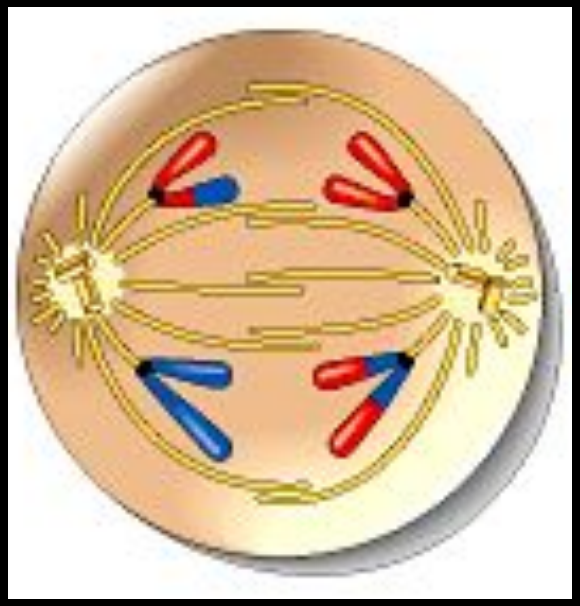
PROPHASE 2

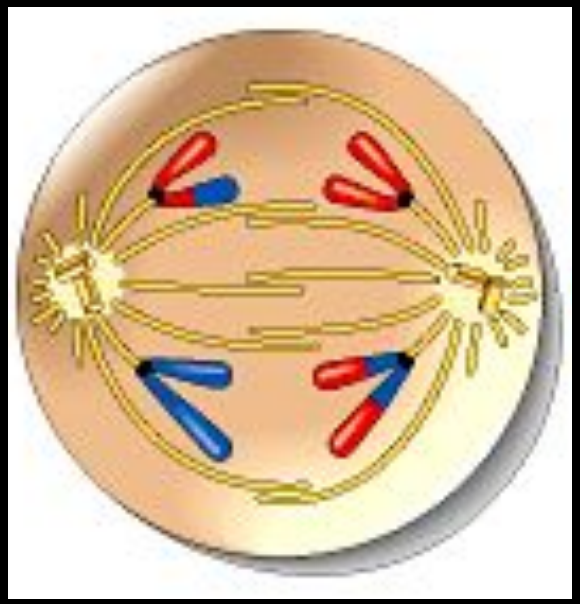


METAPHASE-II

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

METAPHASE 2

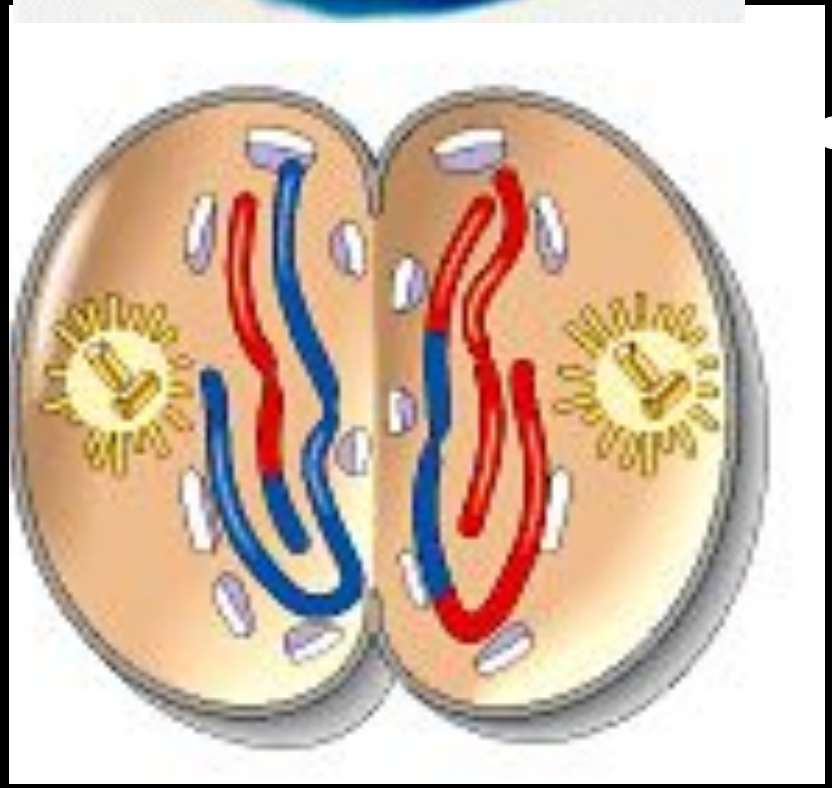




ANAPHASE-II

- The Centromers divide and the sister chromatids seperate.
- The chromatids move tovard 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