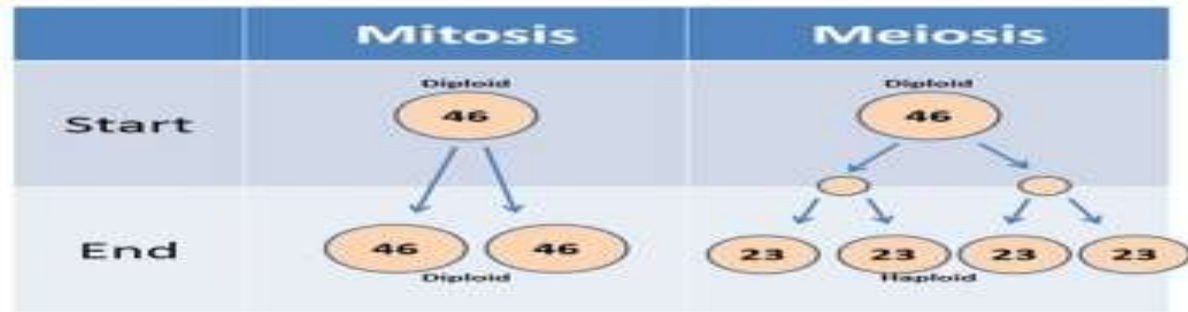


# MEIOSIS is for REPRODUCTION

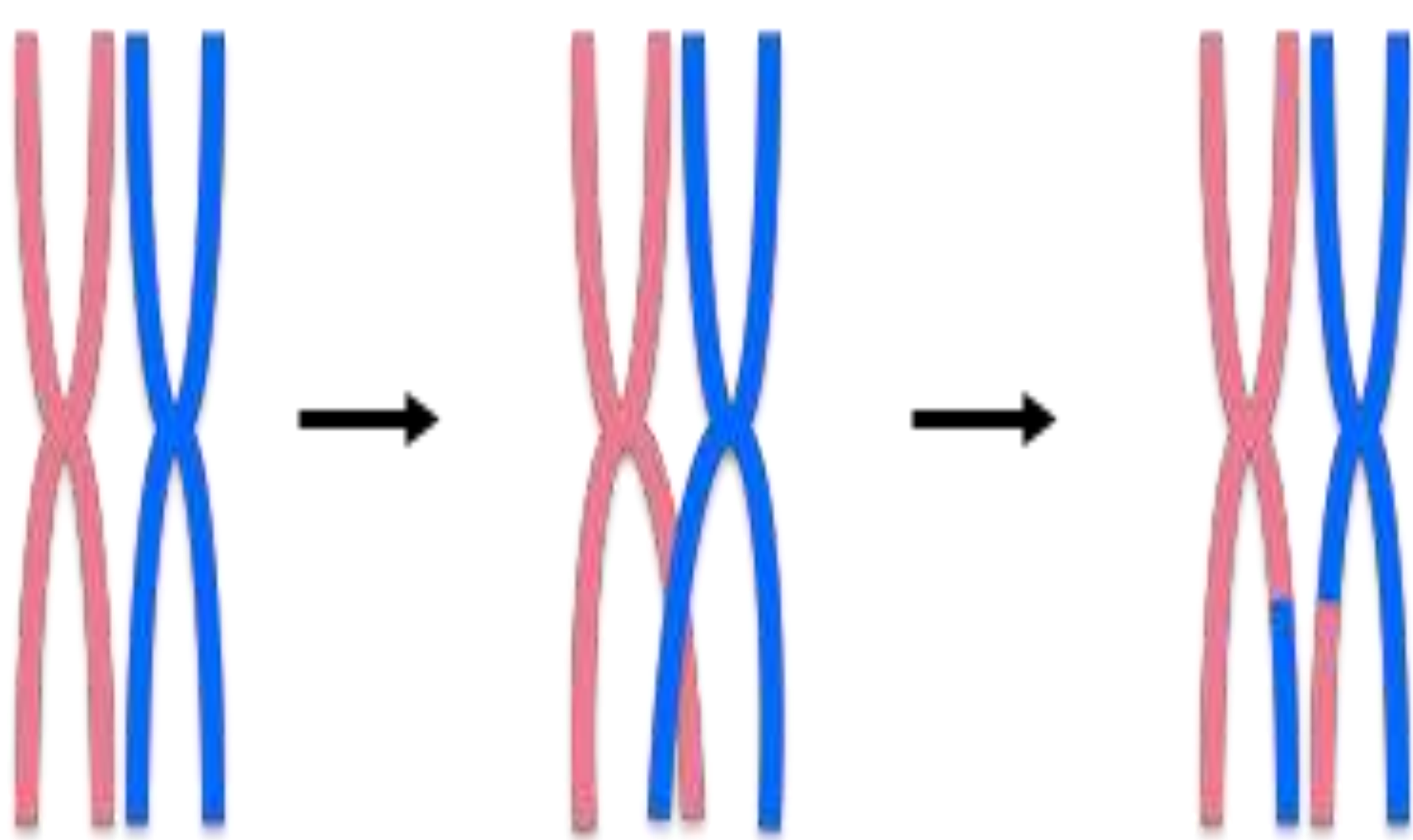


- **All** cells in each parent-to-be are DiPloid ( $2n$ ) – one plan ( $n$ ) from Gogo, one plan ( $n$ ): Mkhulu.
- Parental gametes must have **half** plans, because when sperm and ovum join, **one** cell is produced.
- Meiosis divides parents' ( $2n$ ) plans in their sex organs to get Ha'Ploid ( $n$ ) sperms (*HalfPloid*) in Dad, and HaPloid ( $n$ ) eggs/ova in Mom. So that when they have sex:  $(n) + (n) \rightarrow (2n)$  baby.
- So Meiosis only occurs in the sex organs, and it **only** makes *sperms* (in males) and *ova* (females).

# How MEIOSIS is Different



- Each cell needs to divide **twice** to make four **half**-cells.
- DNA Replication **only** happens in InterPhase 1.
- Crossing-Over occurs in ProPhase 1 so that no two sperms or ova are the same. (*Variations* in children.)
- Chromosomes are **randomly arranged** at the equator in MetaPhase 1 and in MetaPhase 2. (*Variations*.)
- The First Division of cells involves the separation of a pair of **full double chromosomes**.
- The Second Division of cells has **one** full double chromosome being split into two **single chromatids**.



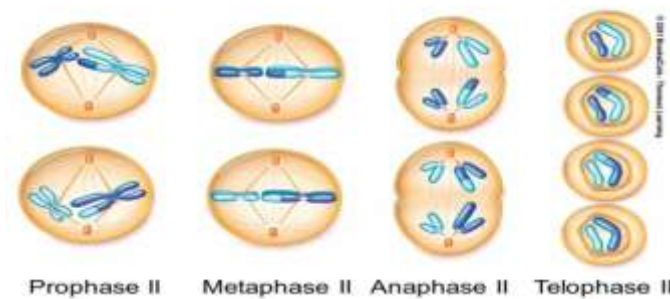
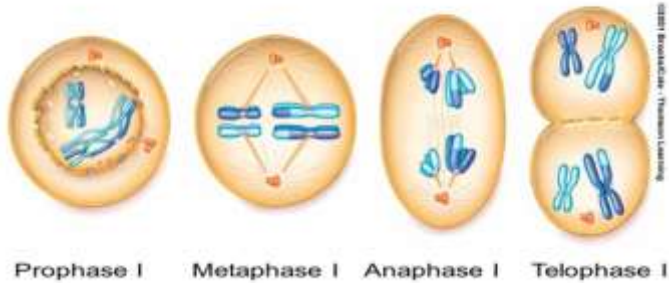
## CROSSING OVER of HOMOLOGOUS CHROMOSOMES

Sharing of Genetic Information – no two chromatids are the same

Meiosis I - Stages

Meiosis II - Stages

# MEIOTIC DIVISIONS



## FIRST DIVISION

## SECOND DIVISION

- InterPhase 1:  $2(n) \rightarrow 4(n)$   
DNA replication occurs.
- ProPhase 1: Crossing-Over.
- MetaPhase 1: Chromosome pairs meet randomly at the equator.
- AnaPhase 1: Full double chromosomes separate to the poles, pulled by spindle fibres.
- TeloPhase 1: Two complete plans in two different cells.
- $4(n) \rightarrow 2(n) + 2(n)$

- InterPhase 2: Resting period between the divisions.
- ProPhase 2: Preparing.
- MetaPhase 2: Chromosomes meet randomly at the equator.
- AnaPhase 2: Single chromatids separate to poles, pulled by spindle fibres.
- TeloPhase 2: Four half-plans in four half-cells.  $2(n) \rightarrow (n) + (n)$   
 $2(n) \rightarrow (n) + (n)$

