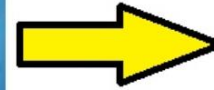
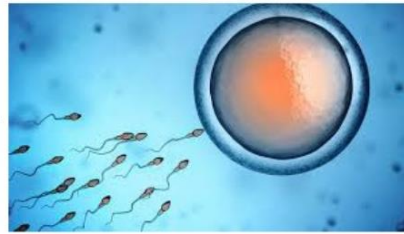
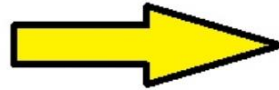
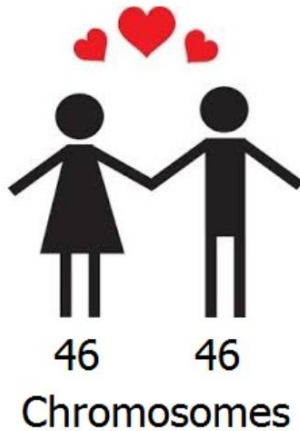


WELCOME BACK!

1/7/20

READ THE FOLLOWING QUESTION ... DO YOU KNOW THE ANSWER?



46
Chromosomes

How can two cells from an organism each with 46 chromosomes unite and have an offspring with 46 chromosomes?

MEIOSIS

The Basis of Heredity

REMEMBER MITOSIS . . .

- Cell division in somatic (body) cells
- One cell divides once into two IDENTICAL cells
- Mitosis is for growth and replacement
- Diploid Number of chromosomes = FULL count

MEIOSIS . . .

- Cell division in reproductive cells (ovaries, testes)
- One cell divides twice into four NON-IDENTICAL cells
- Meiosis is for reproduction, creates egg and sperm
- Haploid Number of chromosomes = HALF count

CELL REGULATION

- Somatic cells have a complete set of chromosomes ($2n$, diploid #) – go through mitosis
 - In humans $n=23$, so humans have 46 chromosomes (diploid # = 46)
- Reproductive cells have $\frac{1}{2}$ original set of chromosomes (n) – go through meiosis
 - In humans $n=23$, so egg & sperm have 23 chromosomes (haploid # = 23)

MEIOSIS IS SEXUAL REPRODUCTION

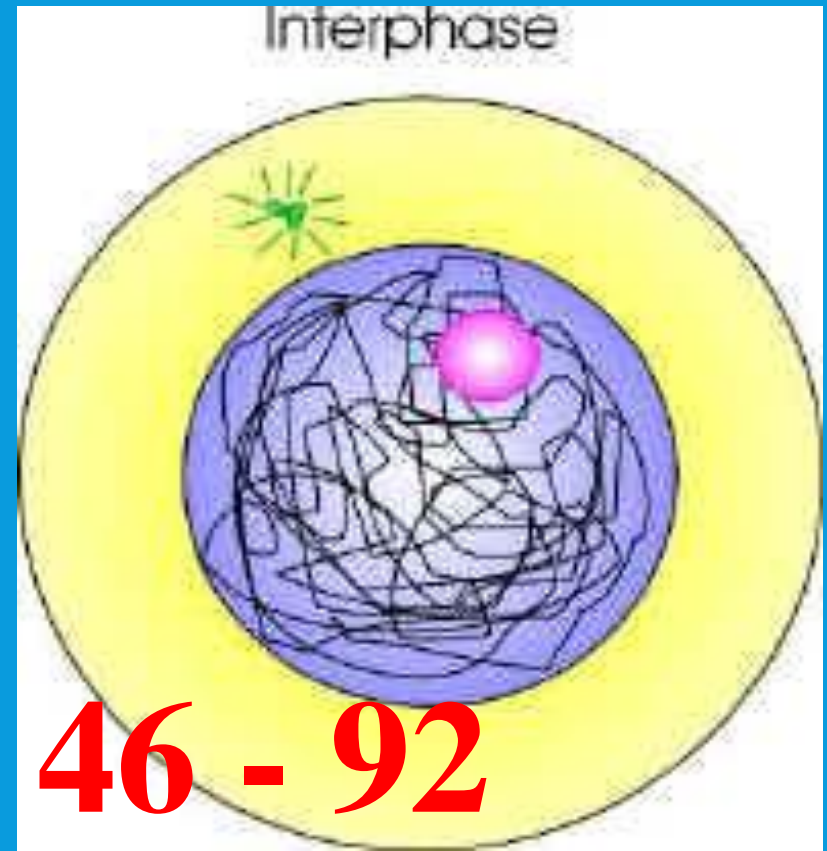
- Offspring is formed by union of two gametes (egg & sperm).
- Egg = n (23)
- Sperm = n (23)
- So, $n + n = 2n$, therefore $23+23=46$
- The new zygote is $2n$ (46 chromosomes) and develops into embryo

PHASES OF MEIOSIS

Fill out your chart with the information that follows.

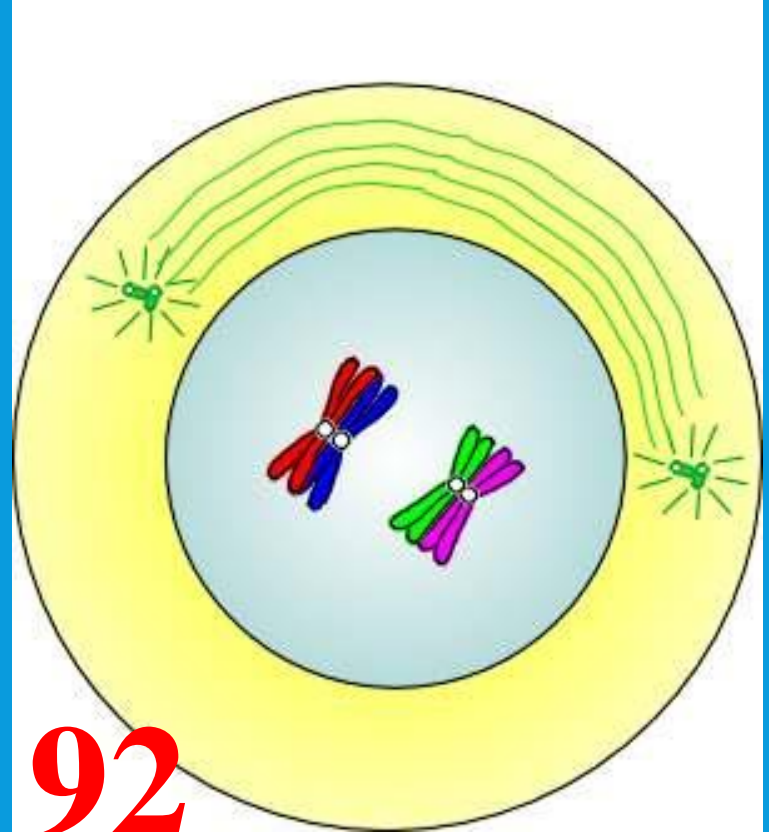
INTERPHASE I

- 46 Chromosomes
- replicate to 92
- One cell prepares to divide
- DNA replicates



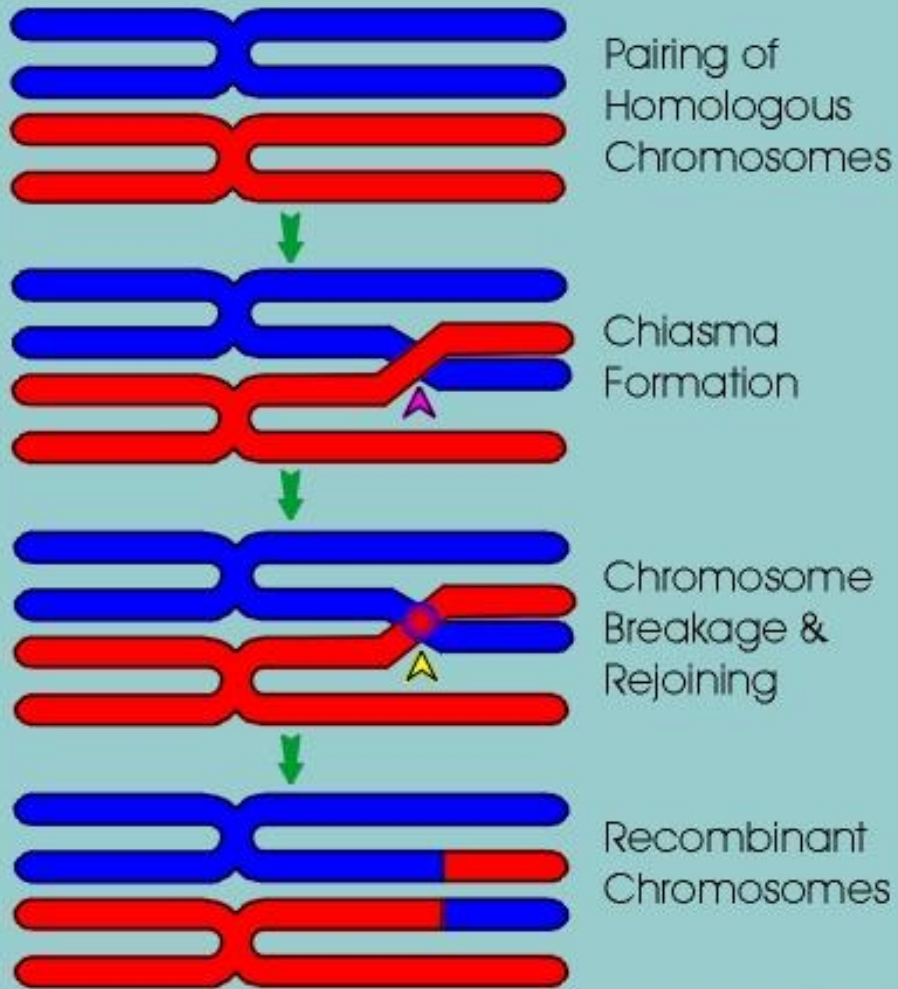
PROPHASE I

- Chromosomes visible as tetrads
- DNA is NOT identical – homologous chromosomes go through Crossing Over resulting in GENETIC VARIATION
- Nucleus disappears

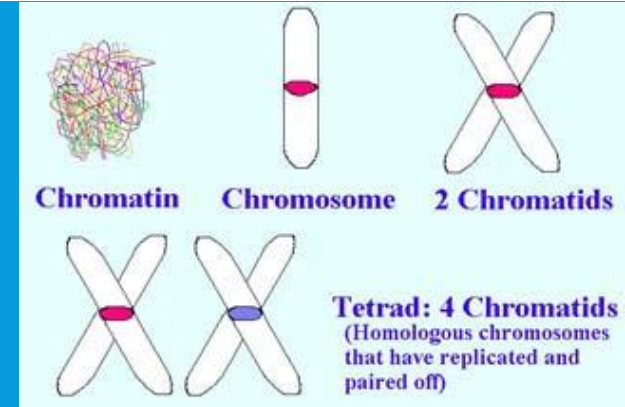


IN PROPHASE I . . .

CROSSING OVER



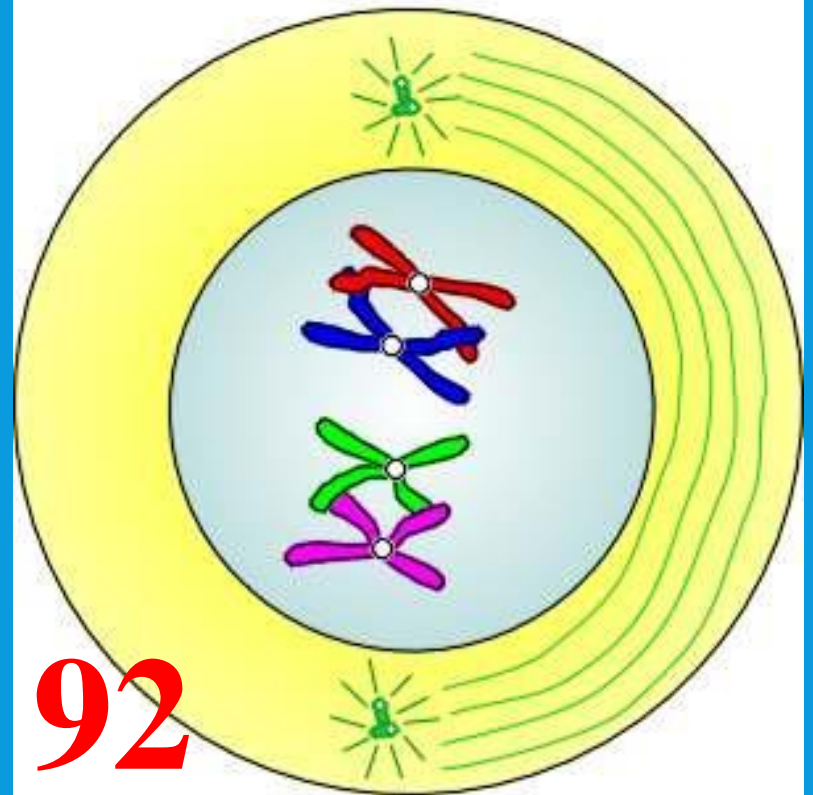
©Day



Crossing over leads to genetic variation!

METAPHASE I

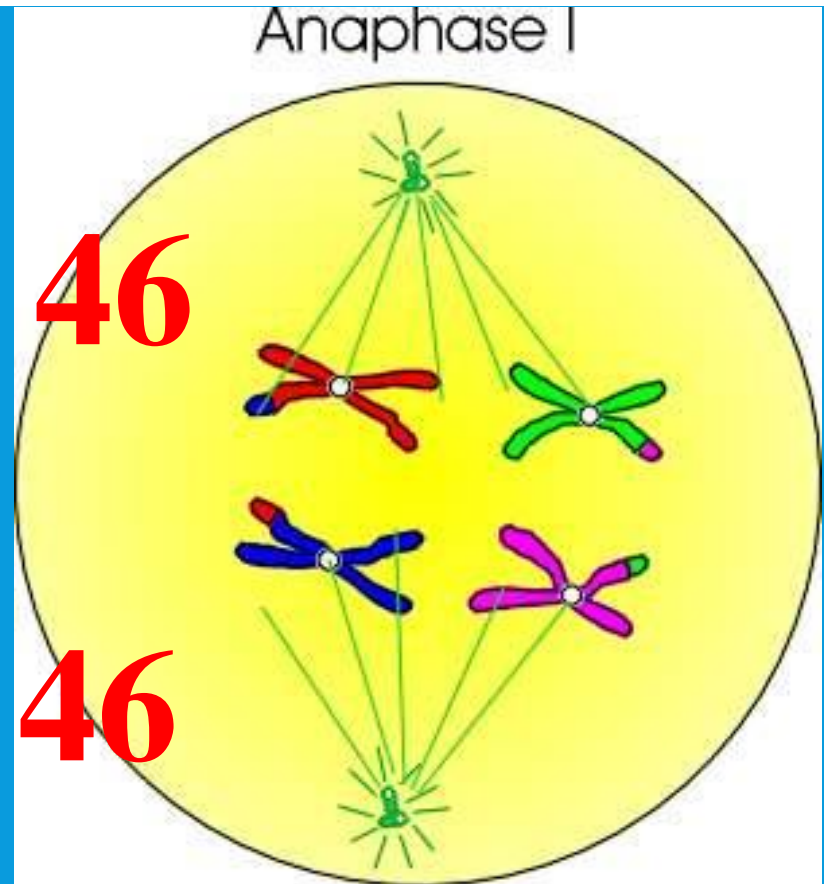
- Tetrads move to equator (line up in the middle)
- Spindle attaches



92

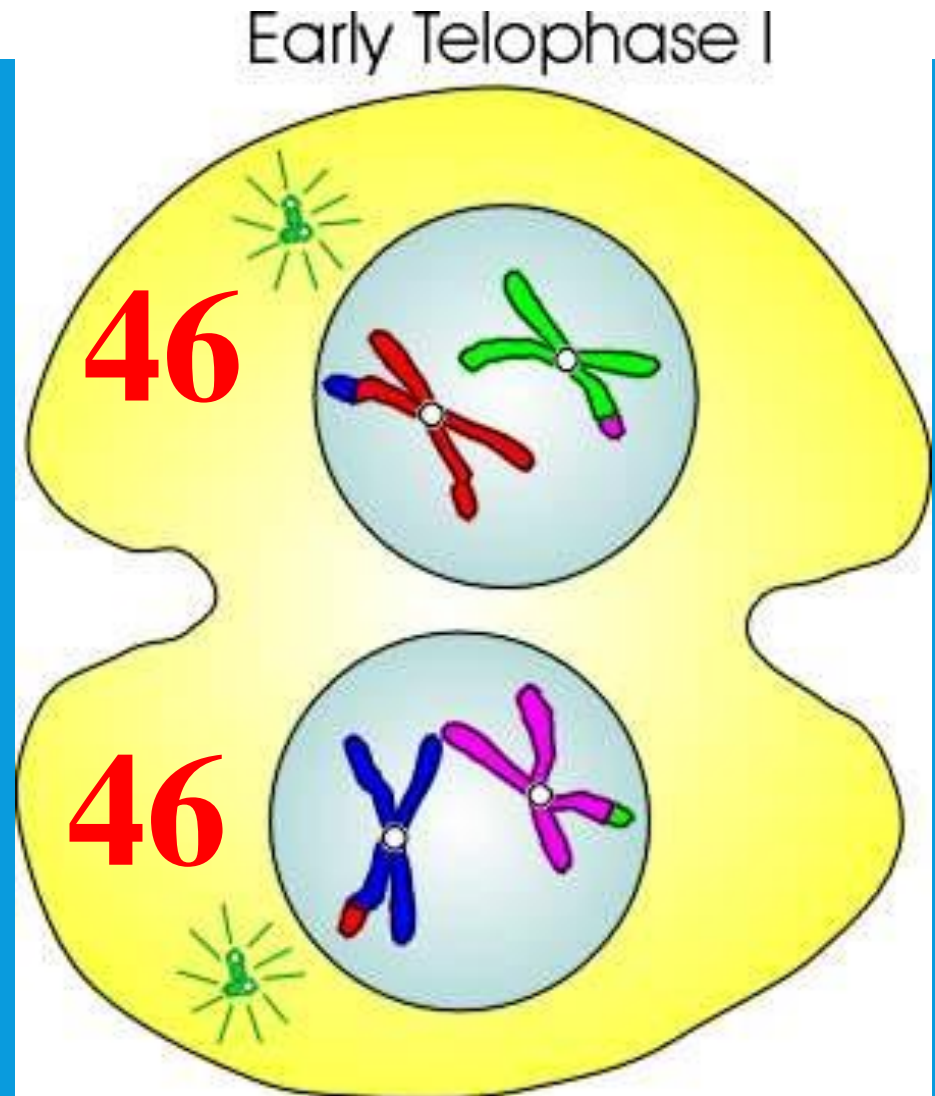
ANAPHASE I

- Tetrads split into dyads and move apart toward opposite poles



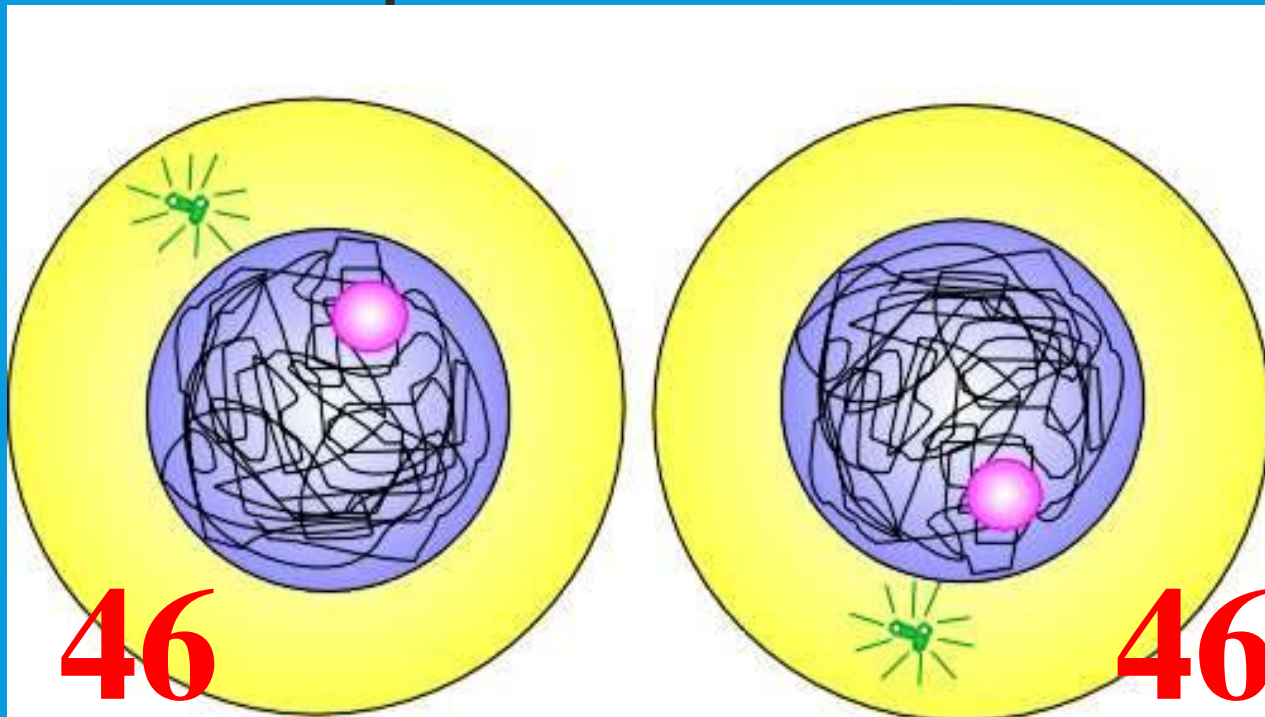
TELOPHASE I

- Two new cells are formed
- They are NOT identical



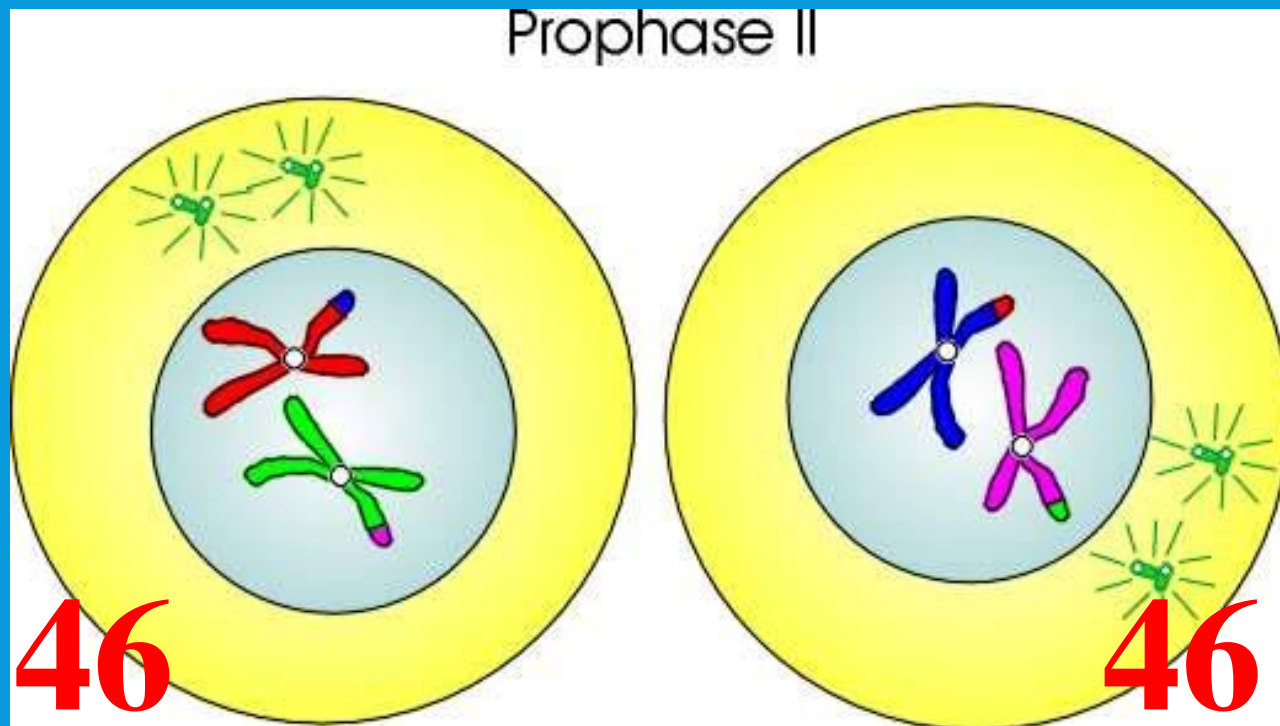
CYTOKINESIS

- No cell preparation
- No DNA replication



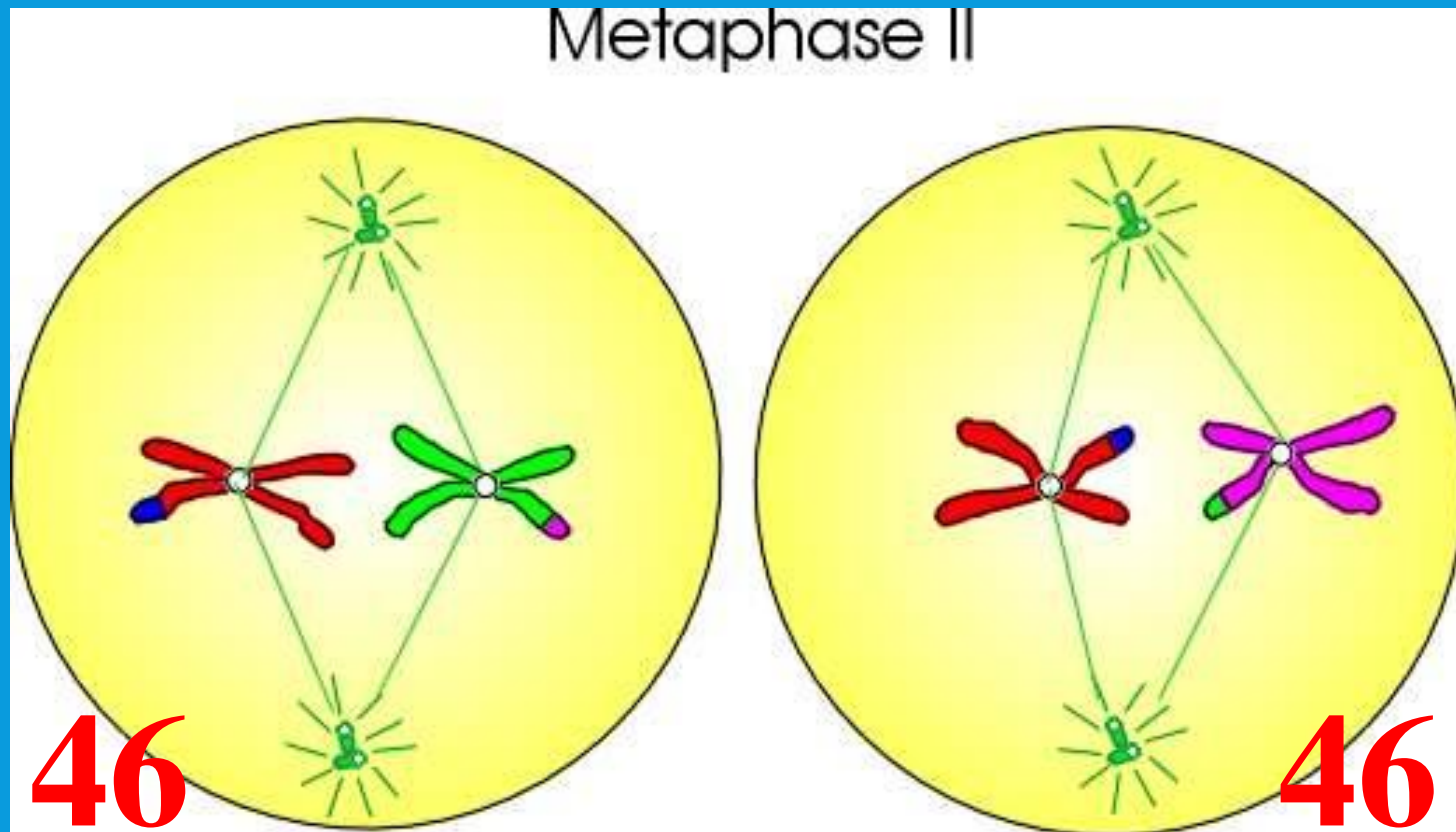
PROPHASE II

- Chromosomes visible as dyads
- NOT identical



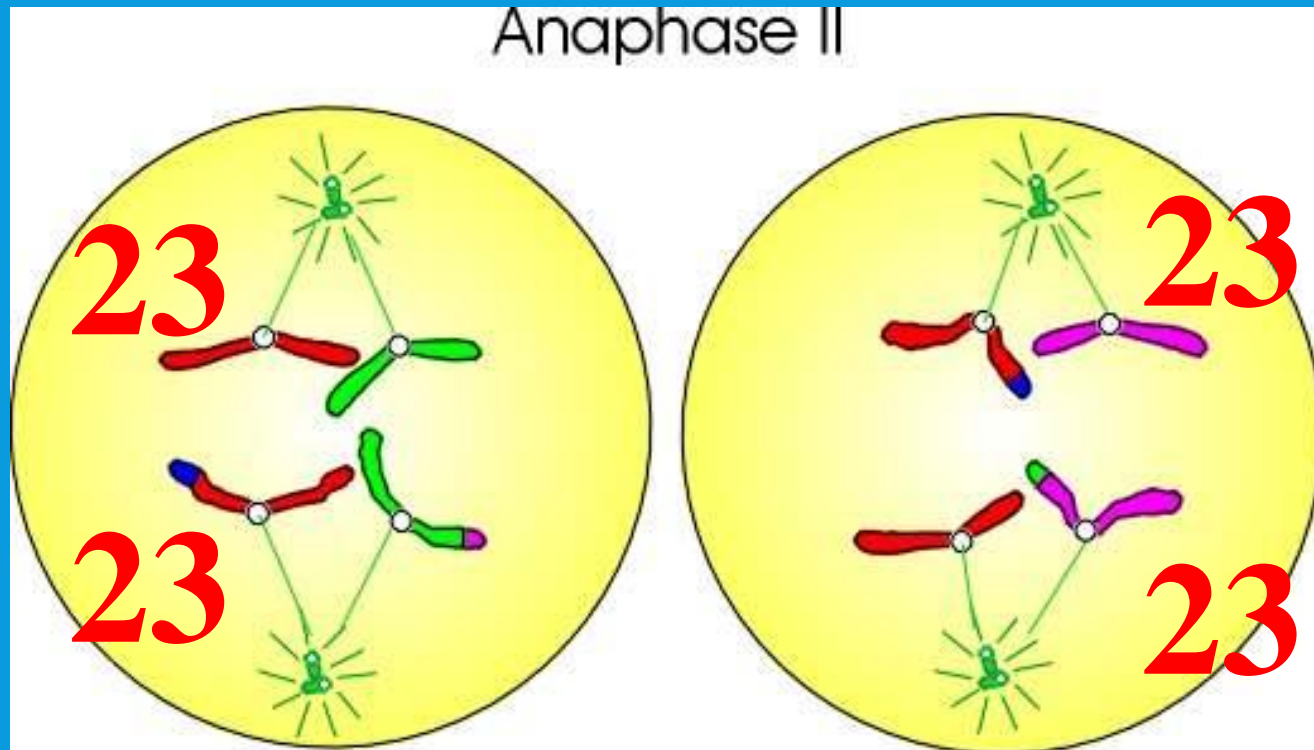
METAPHASE II

- Dyads line up at equator



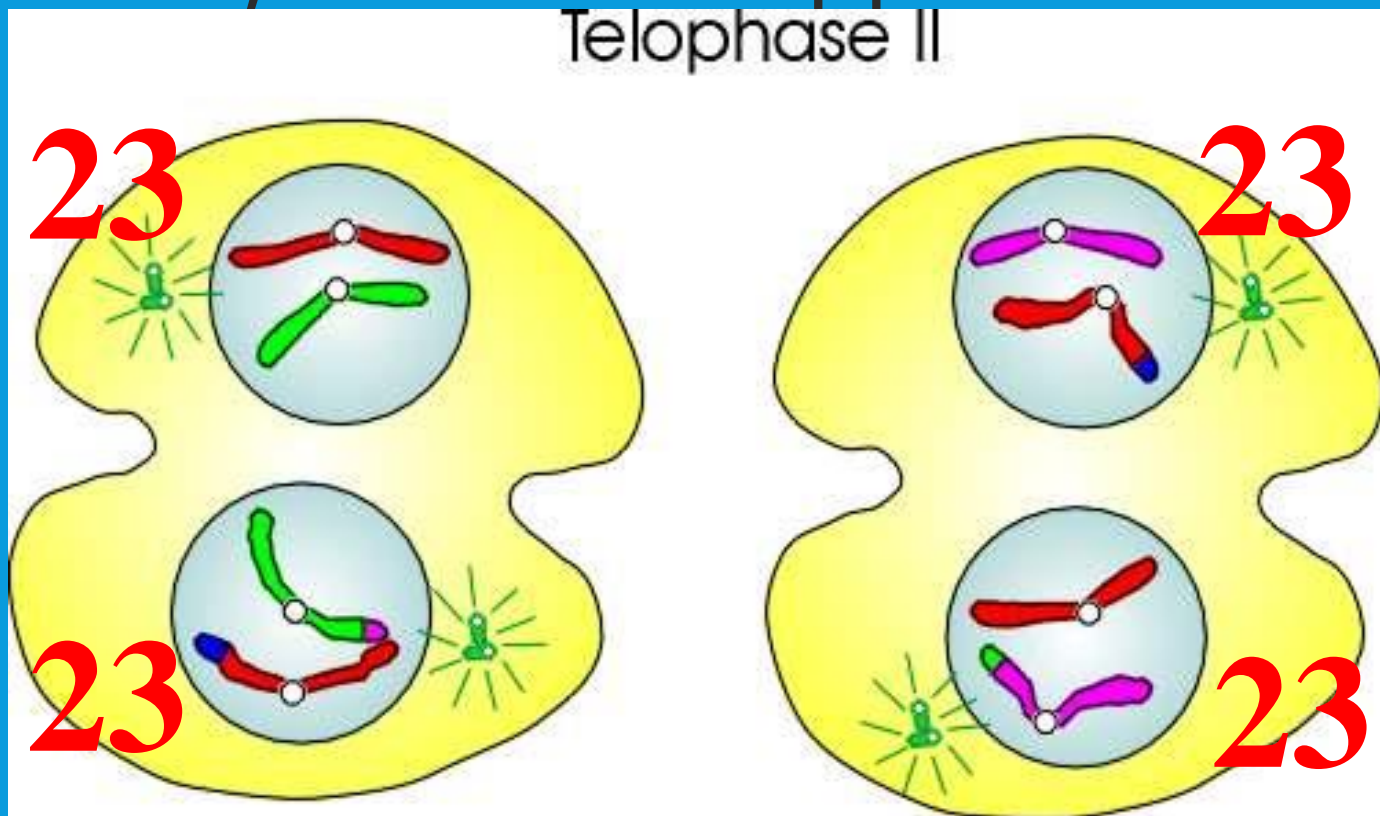
ANAPHASE II

- Dyads separate into single chromosomes and move to opposite poles



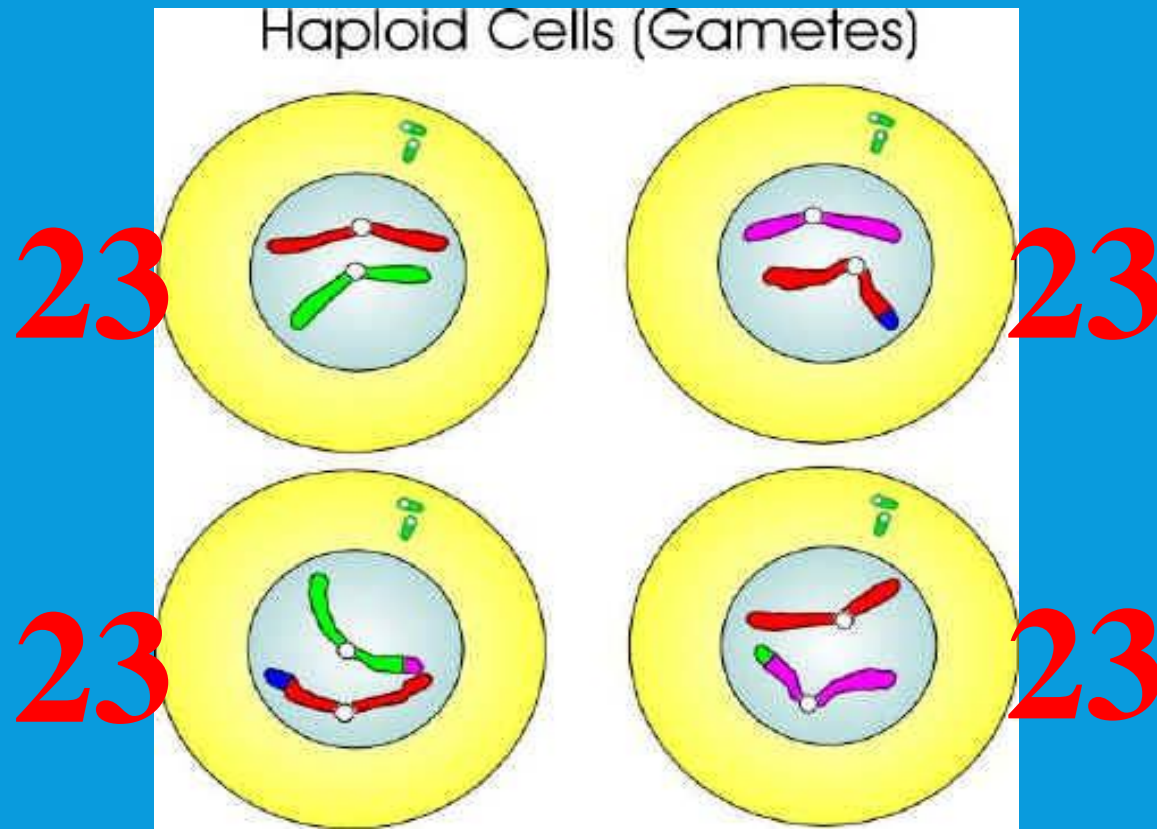
TELOPHASE II

- Four new haploid non-identical cells are formed, nucleus reappears



END RESULT OF MEIOSIS

- In males = 4 sperm (not identical)
- In females = 1 egg, 3 reabsorbed



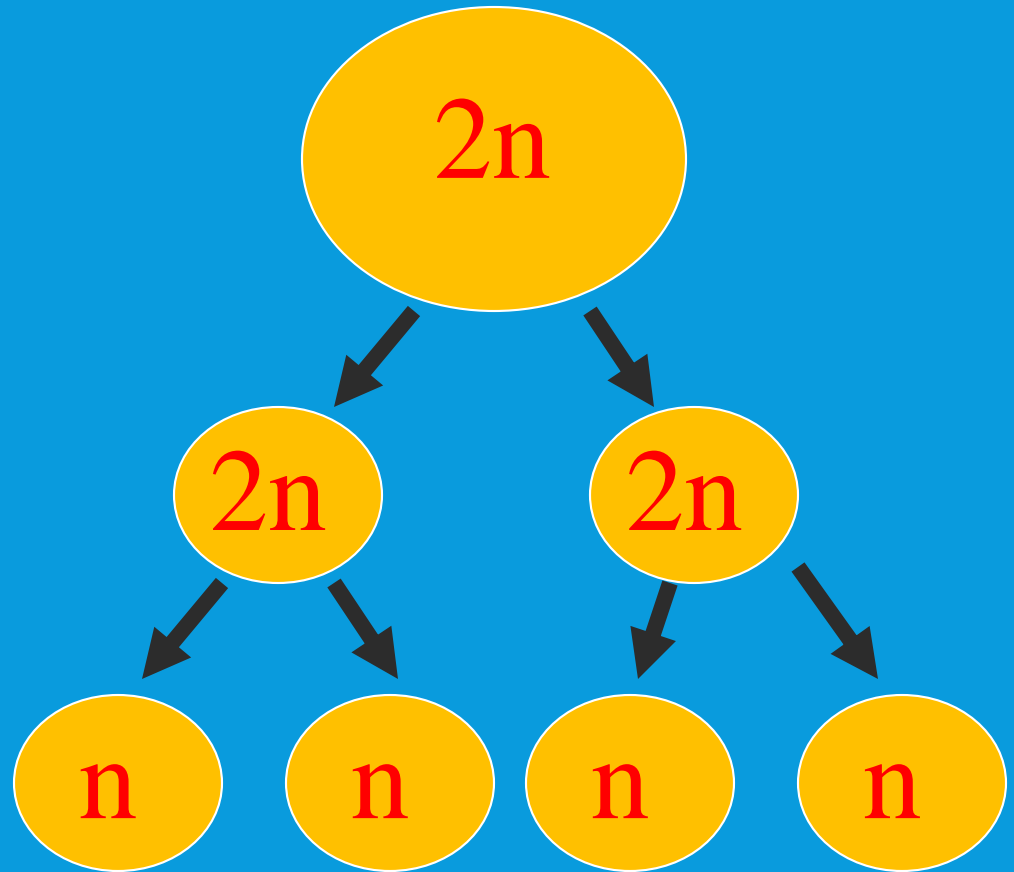
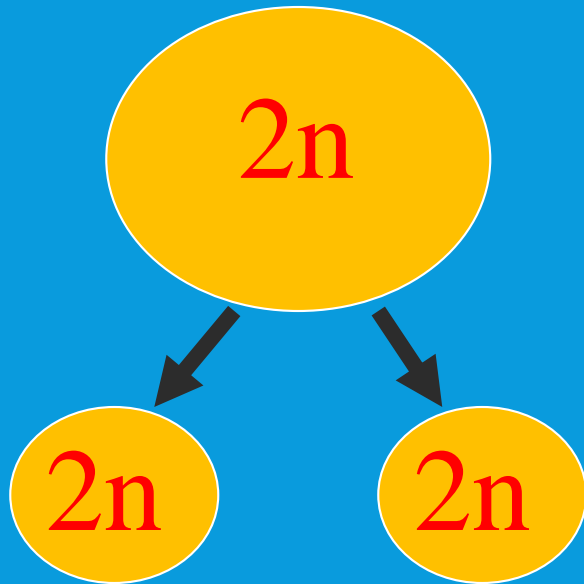
SEXUAL REPRODUCTION:



Results in zygote (fertilized egg cell)

MITOSIS

MEIOSIS

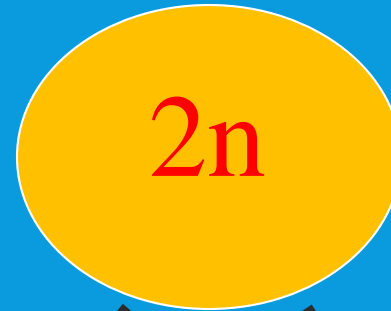
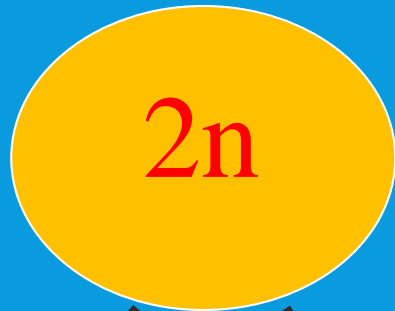


MITOSIS

MEIOSIS

Diploid

Diploid



Diploid

Diploid

Haploid Haploid Haploid Haploid