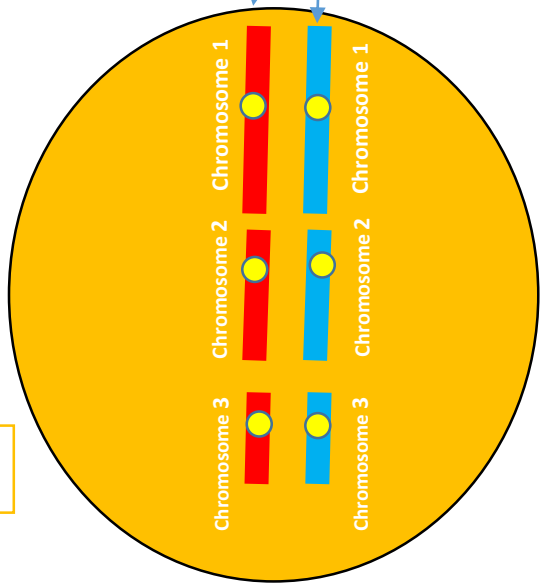
by Dr. Amjad Shatarat, 2021

Homologous chromosome

the maternal copy *the paternal copy*



diploid cell

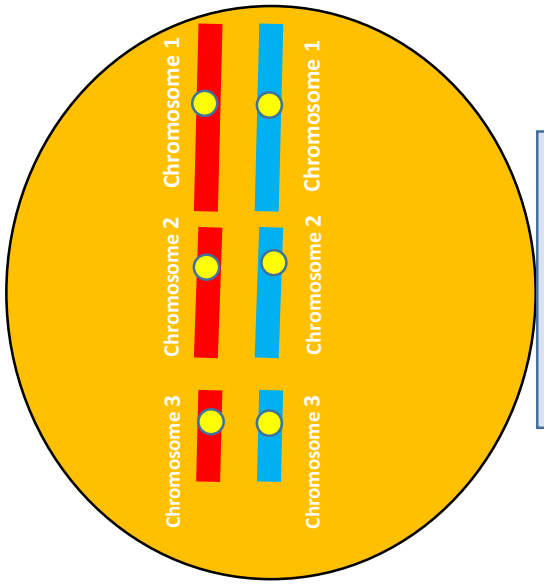
2n

2n, **Single** structured

This is an example of a none human somatic cell with 3 chromosomes only.

Notice the following

- *Each Chromosome has two copies; **the red one is the maternal** copy while **the blue one is the paternal copy***
- *This cell is 2n*



diploid cell

2n, **Single** structured

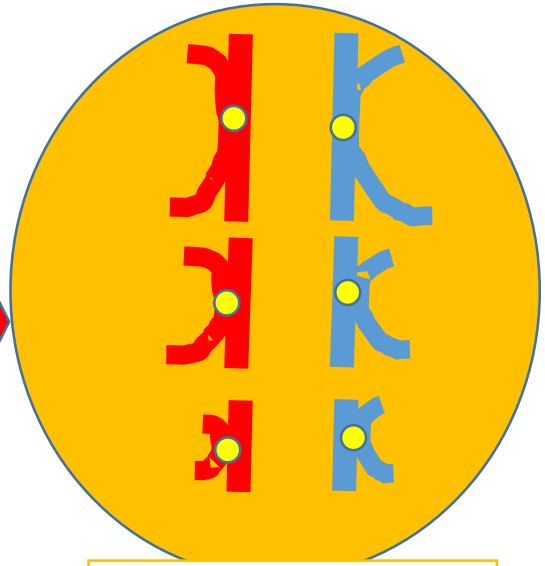
Interphase

1-G1 phase

2-S phase

3-G2 phase

Duplication of DNA



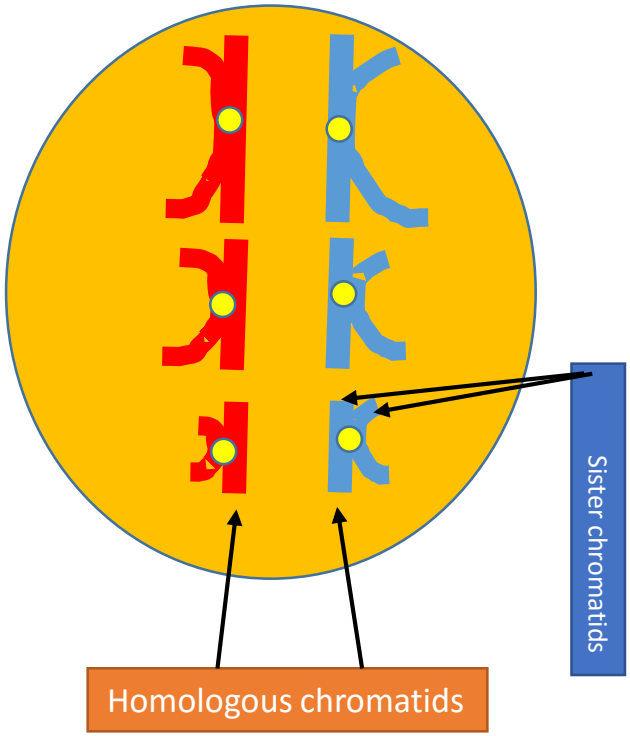
2n, **Double** structured

This is a cell that has duplicated its chromosomes

Chromosome number (1, 2 and 3) each has duplicated itself so it is now attached to the newly formed chromatid and together they are called sister chromatids

This cell is now ready for mitosis or meiosis

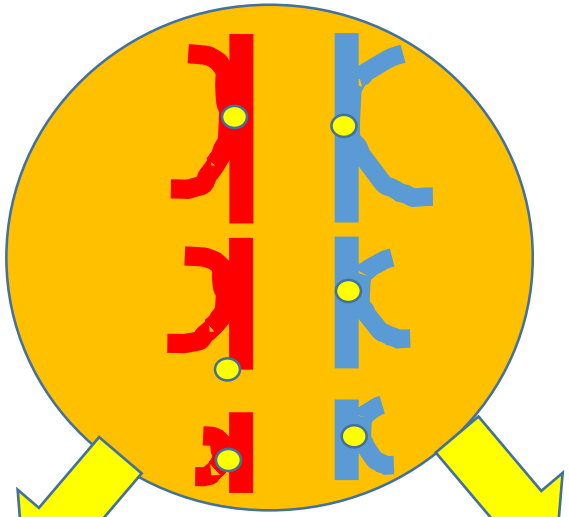
2n, **Double** structured



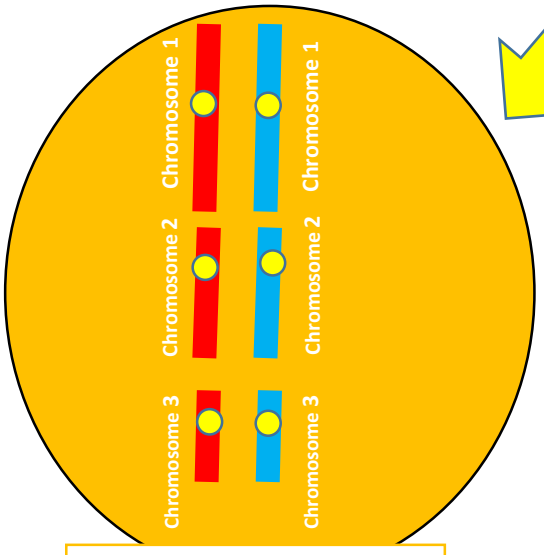
Prophase

Mitosis

Split the centromeres

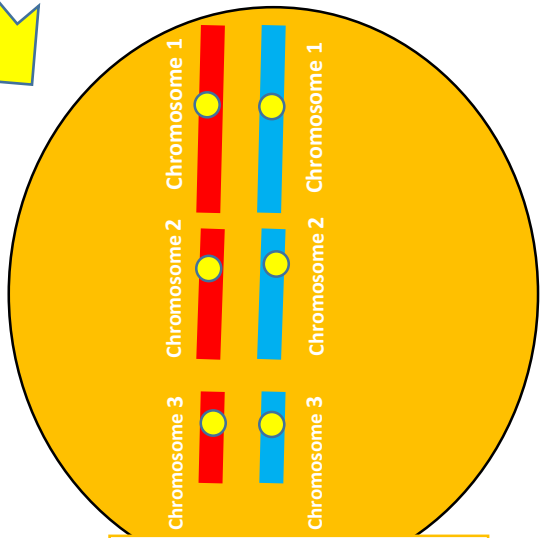


2n, **Double** structured



2n, **Single** structured

The new cells are similar to the original one



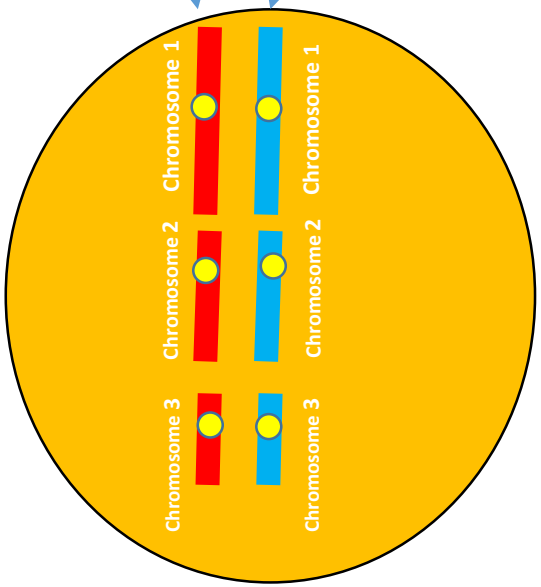
2n, **Single** structured

Look at the result of mitosis

Homologous chromosome

the maternal copy

the paternal copy



Diploid cell

2n

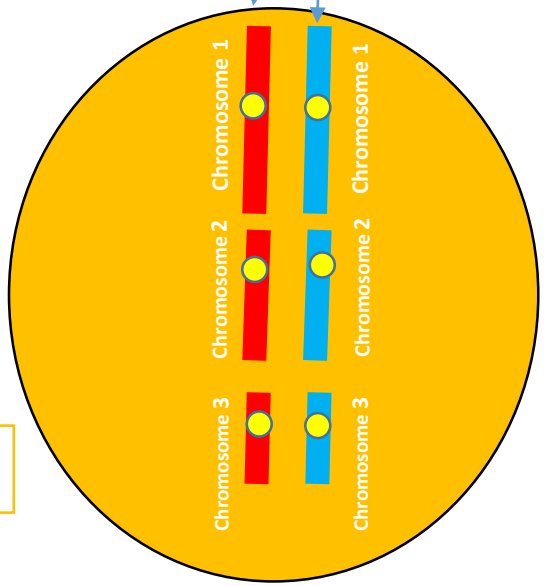
MITOSIS CONSERVES CHROMOSOMES NUMBER

Meiosis

Homologous chromosome

the maternal copy

the paternal copy



diploid cell

2n

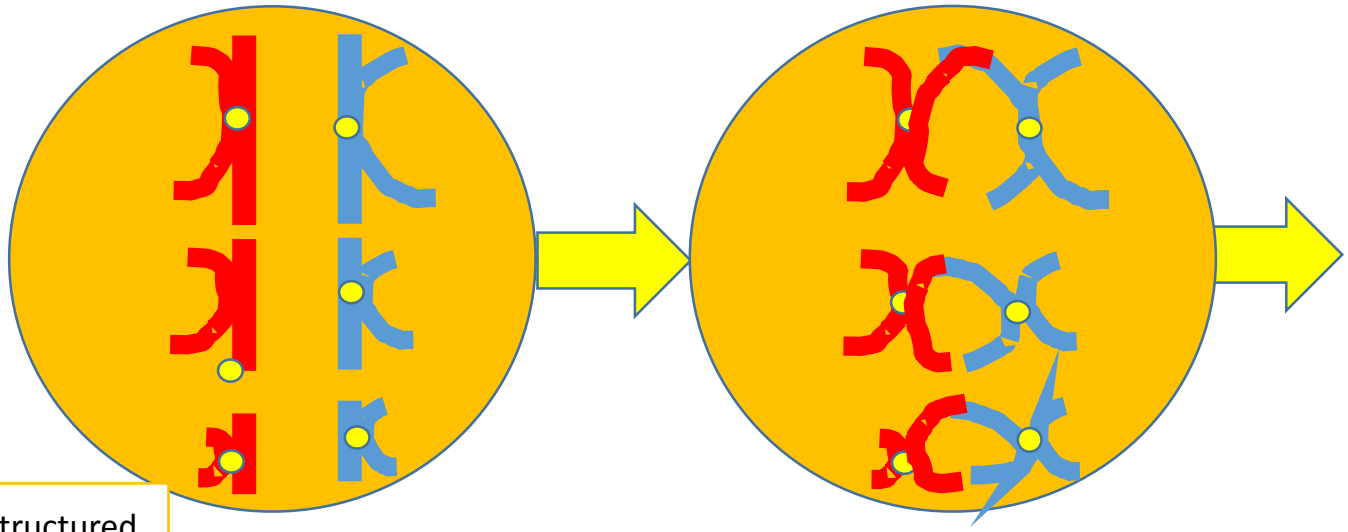
2n, **Single** structured

This is an example of a none human somatic cell with 3 chromosomes only.

Notice the following

- *Each Chromosome has two copies; **the red one is the maternal** copy while **the blue one is the paternal copy***
- *This cell is 2n*

Meiosis



2n, **Double** structured

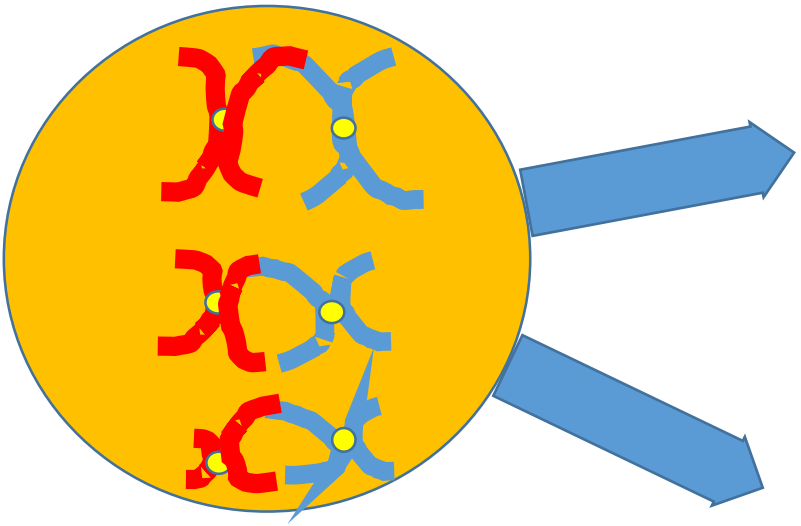
This cell could be in real life
A primary oocyte
Or
a primary spermatocyte
(with 23 double structured chromosomes)

Chromosomes come together and cross each other by certain segments of their bodies forming what we called CHIASMATA:

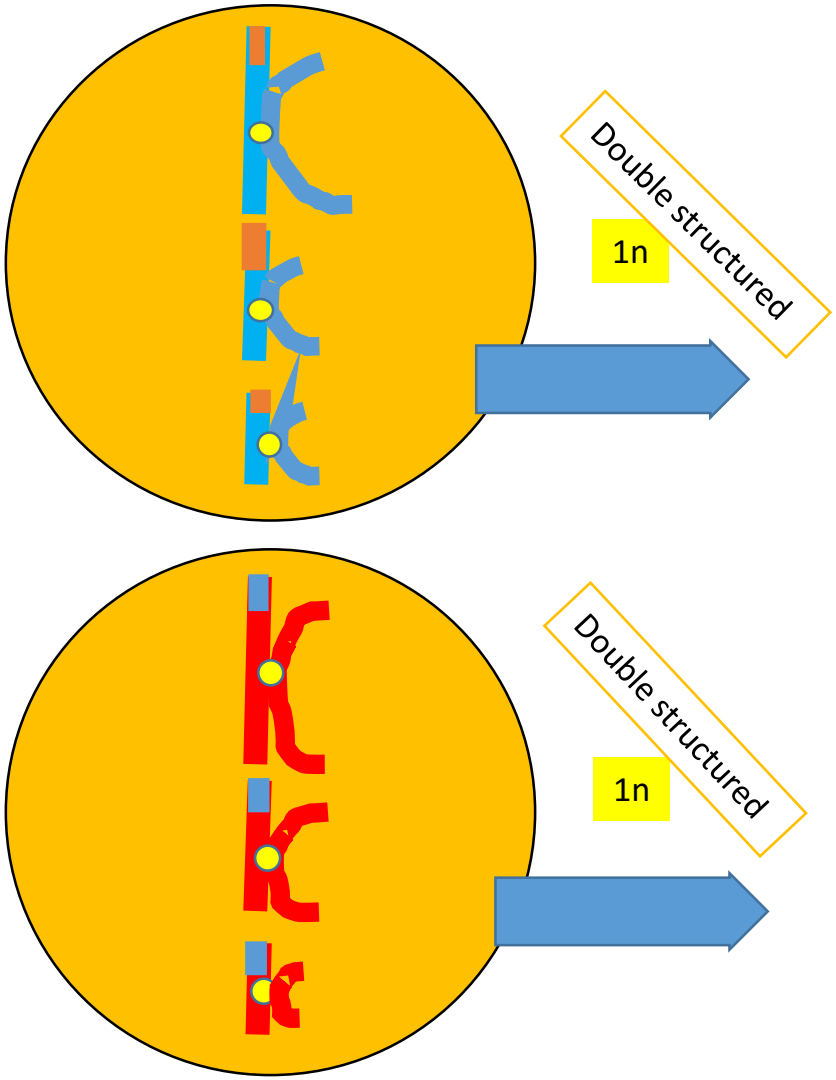
X- shaped structure

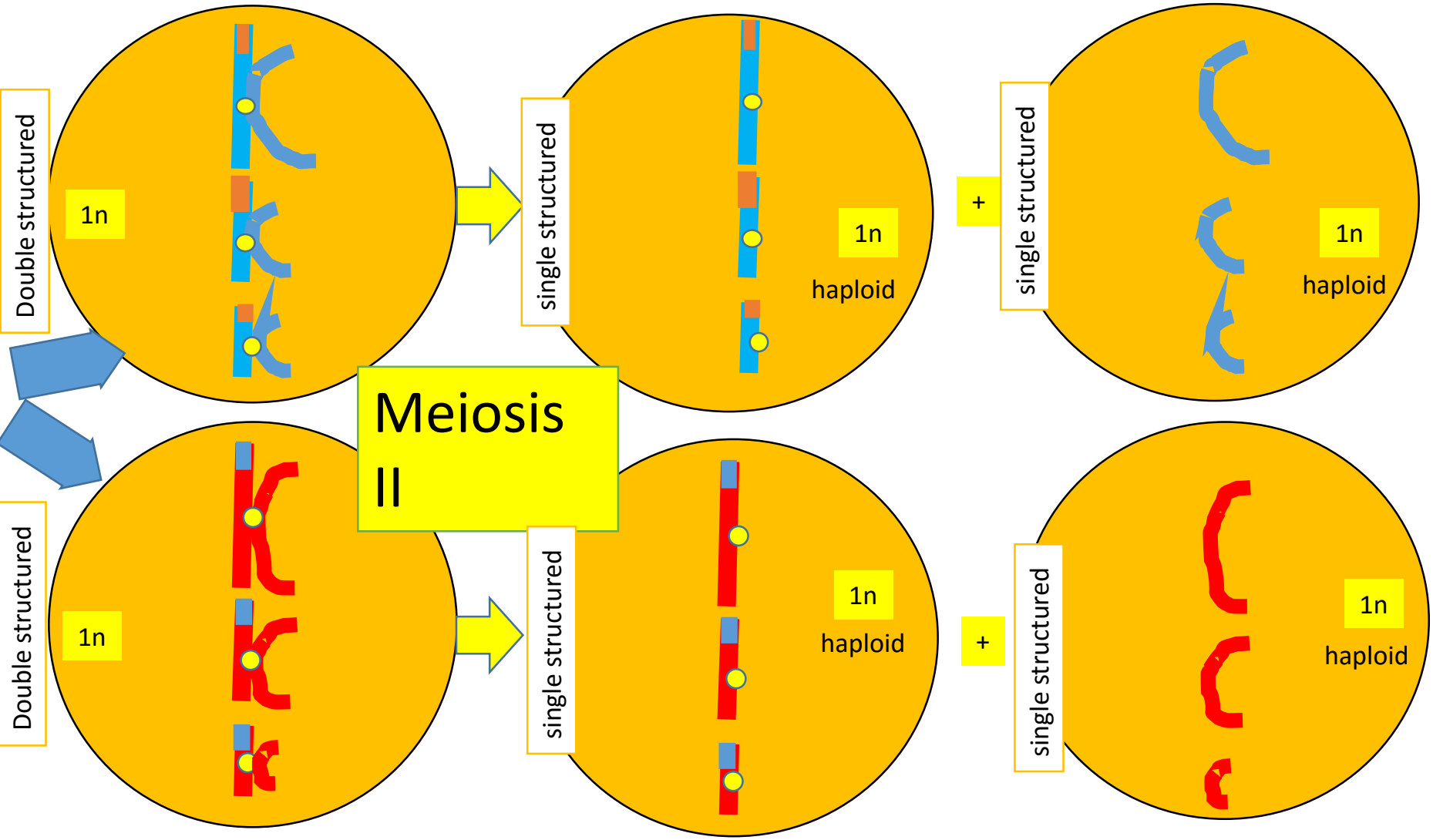
Formed by the junction of two chromatids of the for chromatids (tetrad)

Split the homologous chromatids



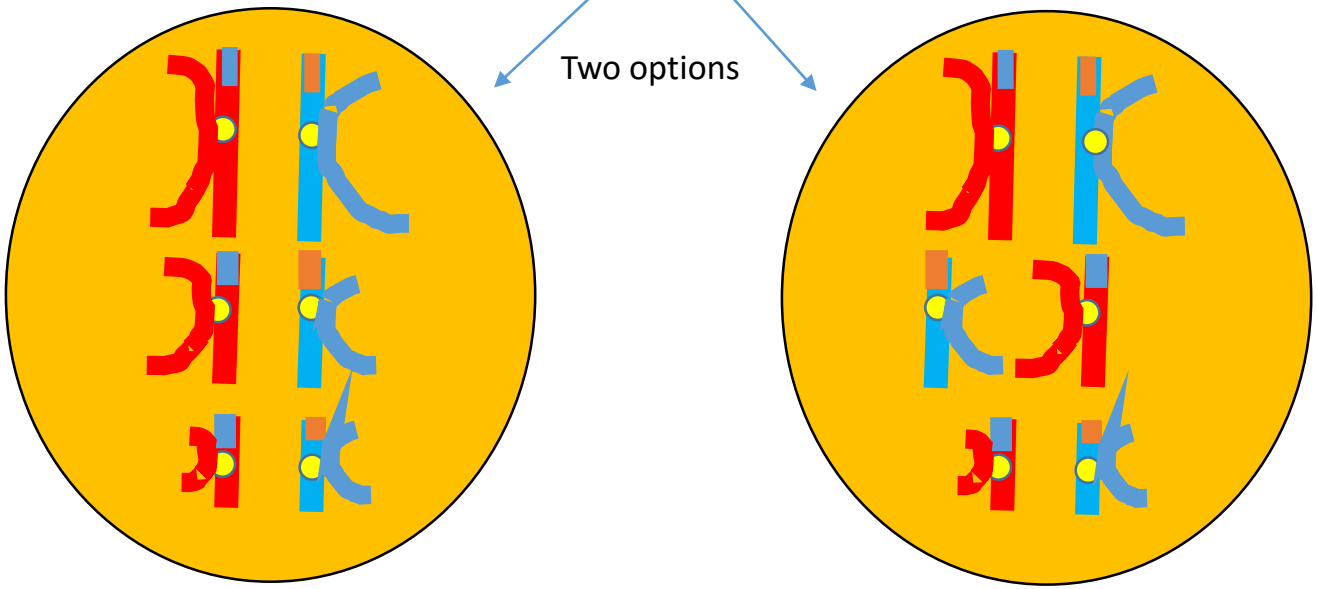
2n, **Double** structured



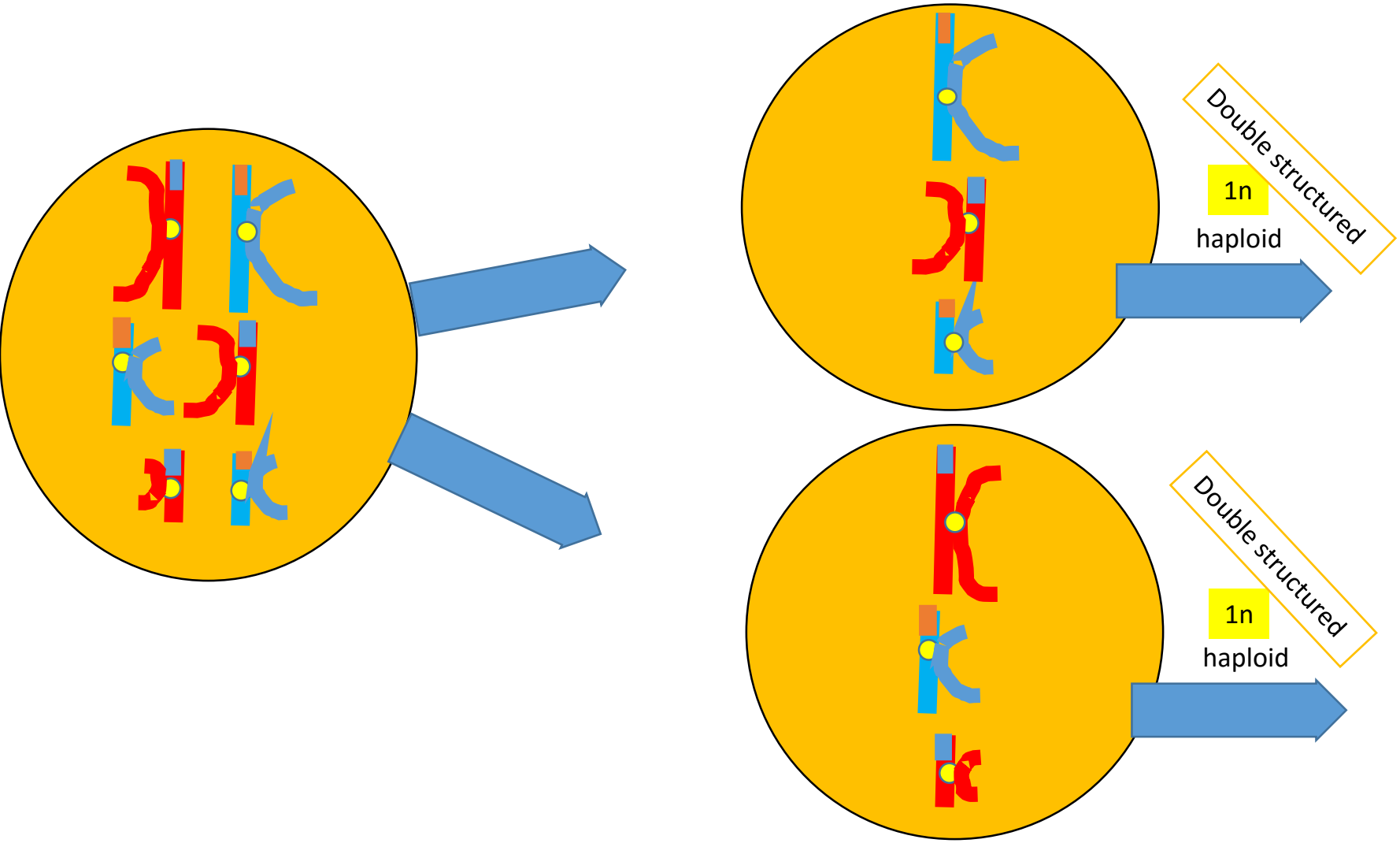

Double structured
1n
single structured
1n
haploid
+
single structured
1n
haploid
Meiosis
II
Double structured
1n
single structured
1n
haploid
+
single structured
1n
haploid

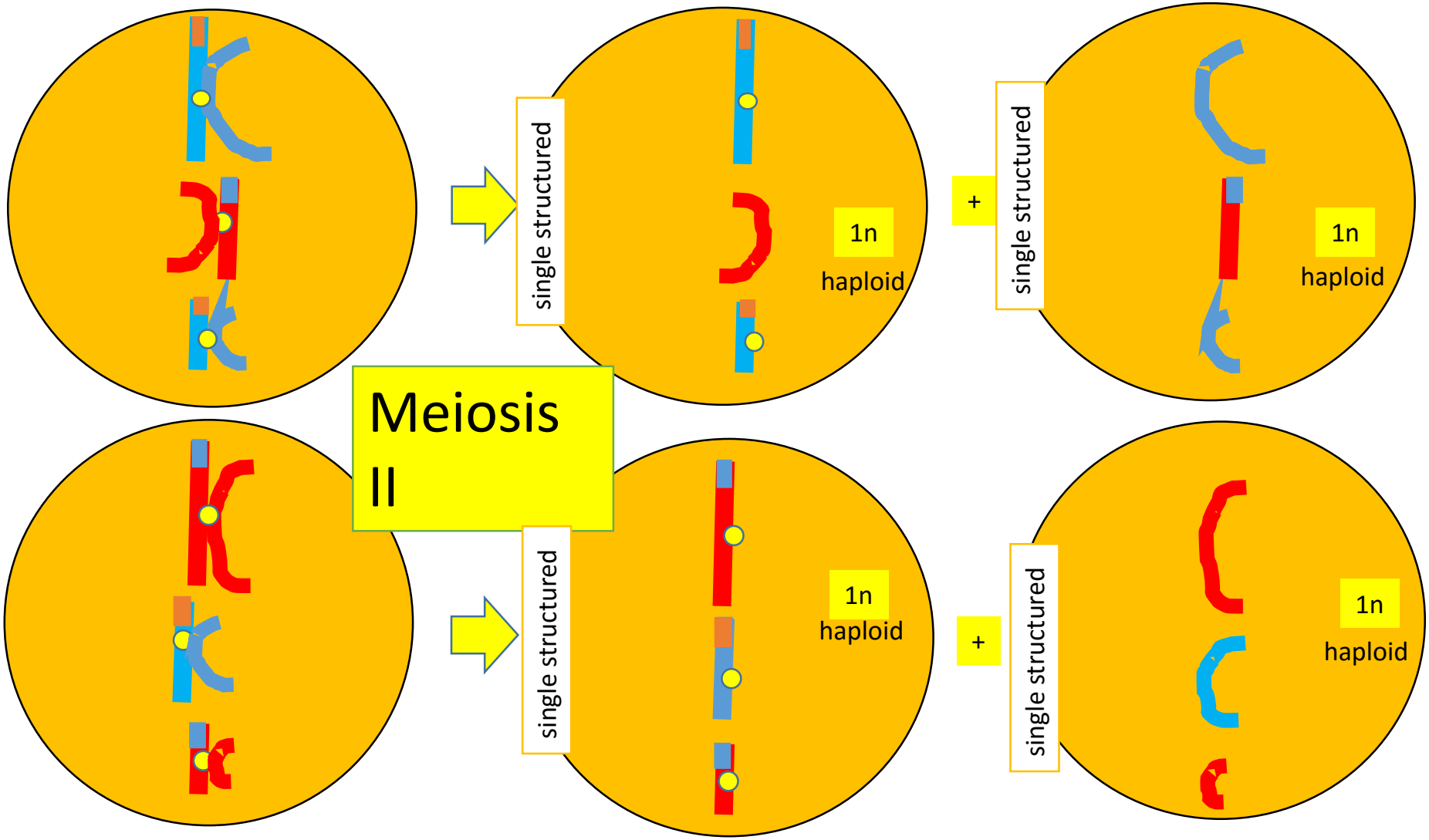
Independent assortment

Two options

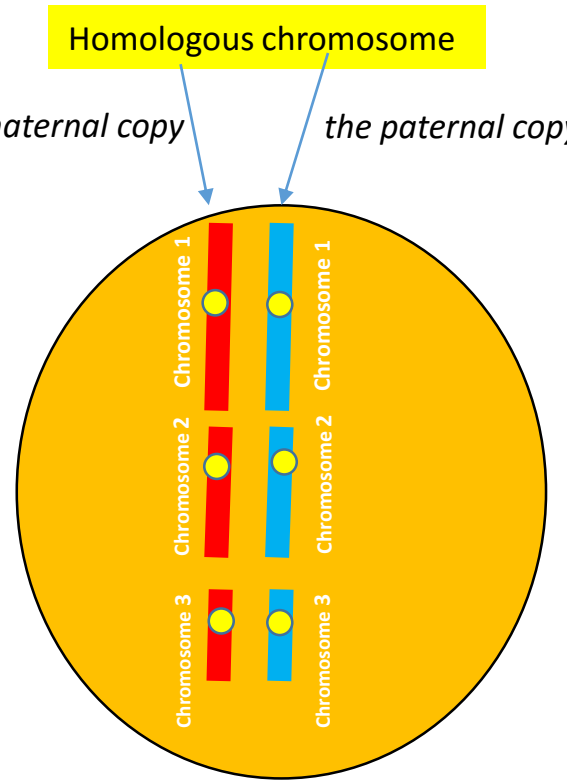


Meiosis I


Double structured
1n
haploid
Double structured
1n
haploid


Meiosis
II
single structured
1n
haploid
+
single structured
1n
haploid
single structured
1n
haploid
+
single structured
1n
haploid

Compare the result of meiosis with
The original cell



Original cell

Thank you