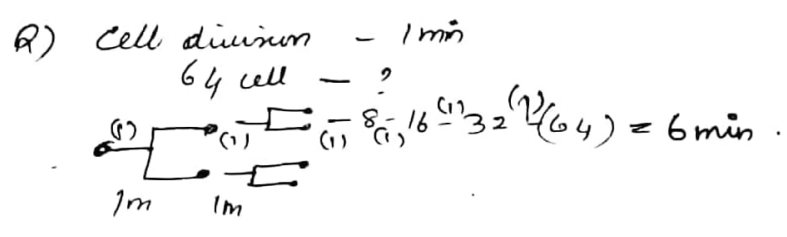
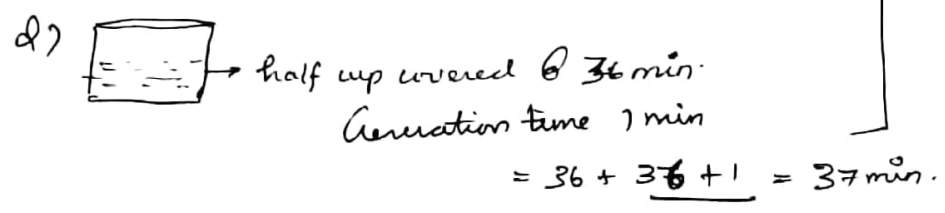


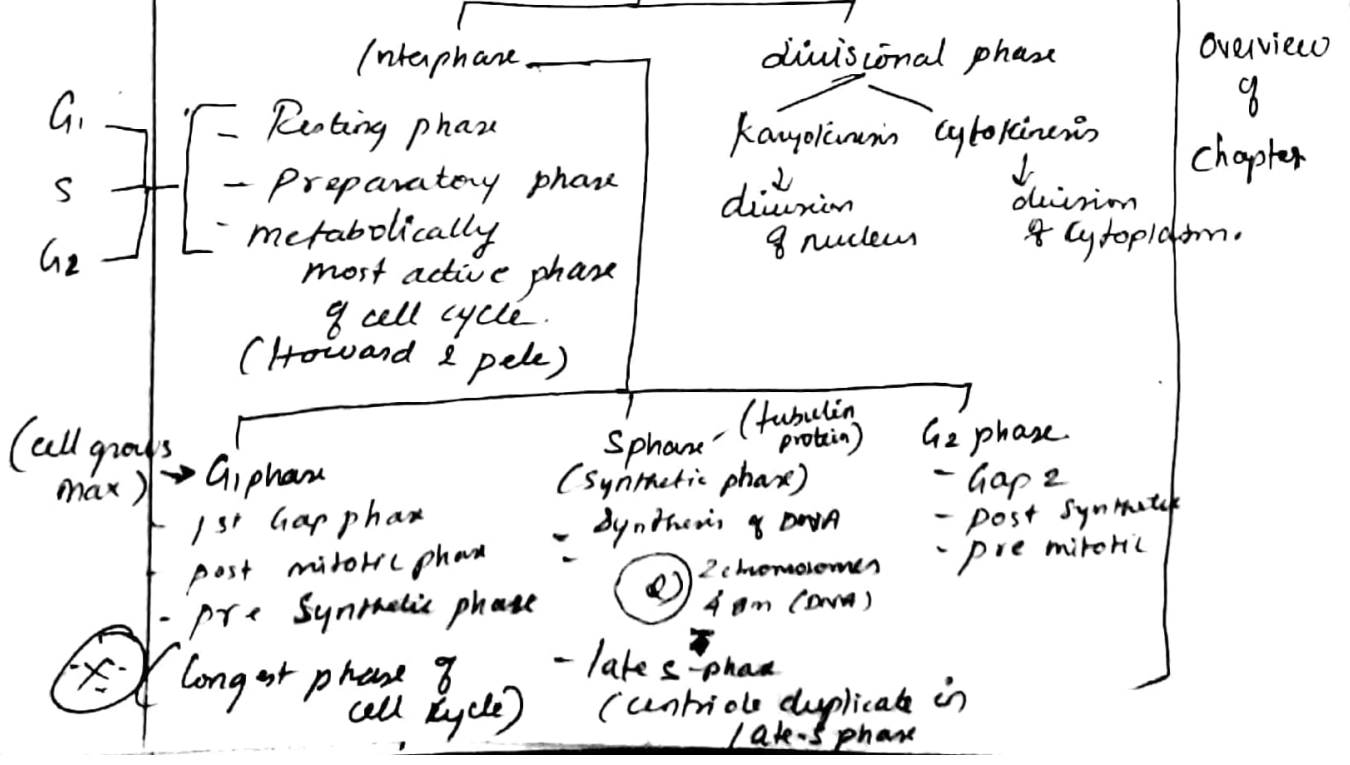
**\* Generation time:**



only for  
toppers



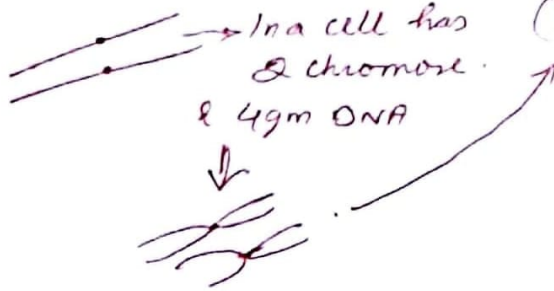
**Cell cycle.**



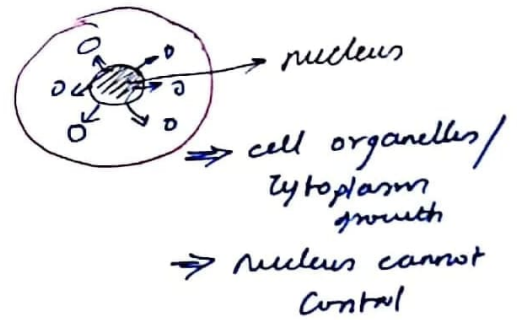
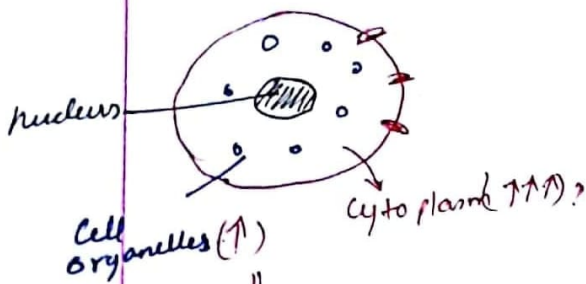
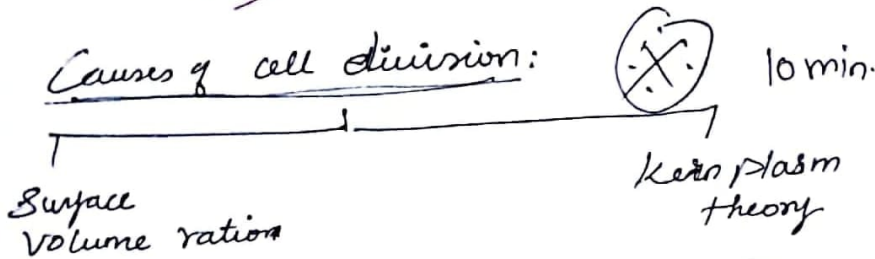
(\*) Sequence of events by which a cell duplicates its genome, syn. the other constituents of the cell & eventually divided into 2 daughter cells.

S phase.

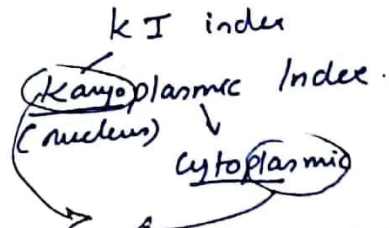
- Synthesis phase.
  - Synthesizing DNA.
- a) 4 ch - 4 gm  
 b) 4 ch = 8 gm  
 c) 2 ch - 2 gm  
 (d) 2 ch - 8 gm



Causes of cell division:



Nucleus cannot satisfy



$$\text{Karyoplasmic Index} = \frac{\text{Vol. of nucleus}}{\text{Vol. of cytoplasm}}$$

If k I value is low divide

If k I value is ~~low~~ not low no division.

Anaphase.

Pro-Chrom- condense. become visible

Pro-meta - continue

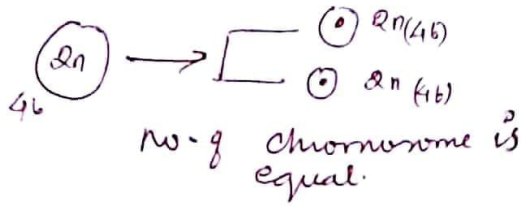
- kinetochore appears at centromere
- Mitotic Spindle microtubules attach to kinetochore

Metaphas - chr. lined up with metaphase plate

- sister chromatids attached to spindle fibre - opposite poles

# 30-45min ← Mitosis

- Equational cell division / somatic cell division



Q) ~~plant cell~~  
You want to do <sup>mitosis</sup> research for ~~mitosis~~ of plant cell?

Which part will you choose

Ans = root tip  
(body division)

Late prophase

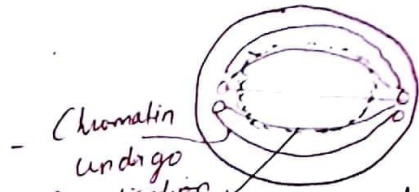
Karyokinesis - PMAT

Prophase - Early prophase



nuclear membrane starts disappearing

↓  
Nucleolus also disappears



undergo  
Spiralisation

- dehydration -

- thickness ↑

Size will increase & decrease respectively

nuclear memb. disappeared

- nuclear disappears

- cytoplasm will mix with nucleoplasm

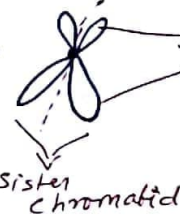
- viscosity increase

- Refractive index ↑

Chromatin

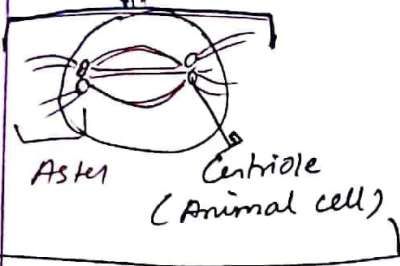
Chromosome

Chromatid



## Mitotic apparatus

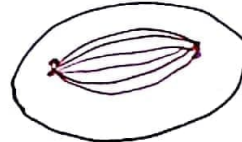
Mitotic apparatus



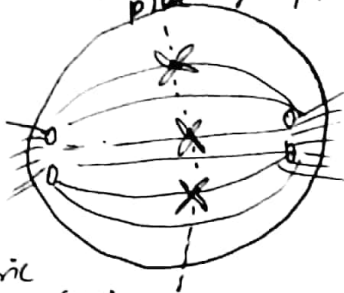
Amphitaster mitosis

Anaster mitosis.

absent of centriole



Equatorial / Metaphasic plate



- Centromere drives of chromosome
- Arms of sister chromatid are directed away from each other

Acentric chromosome (Absence of centromere)

In cytoplasm it may happen in any space

- Larger chromosomes are at periphery
- Smaller chromosomes are at center.
- Chromosomes are at thickest shape / structure

Kinetochores - Space where chrom fibres attach

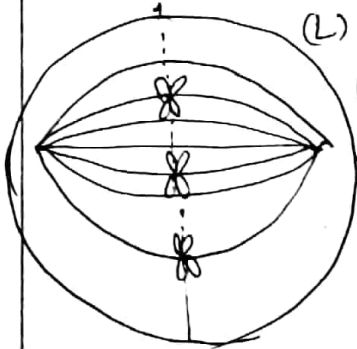


Best phase for studying of Structure of chromosome.

(Reverse of prophase)  
Telophase

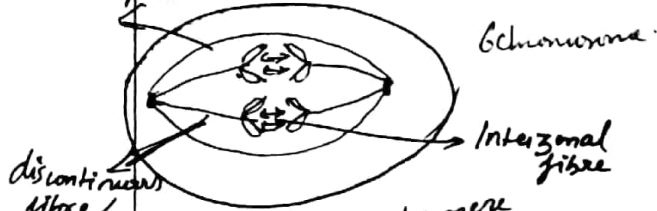
Anaphase:

- (V) } metacentric chromosome.
- (L) } - submetacentric
- (J) } - acrocentric
- (O) } - telocentric chromosomes



- nuclear envelope
- nuclear membrane
- hydration occurs
- new cell genera produce

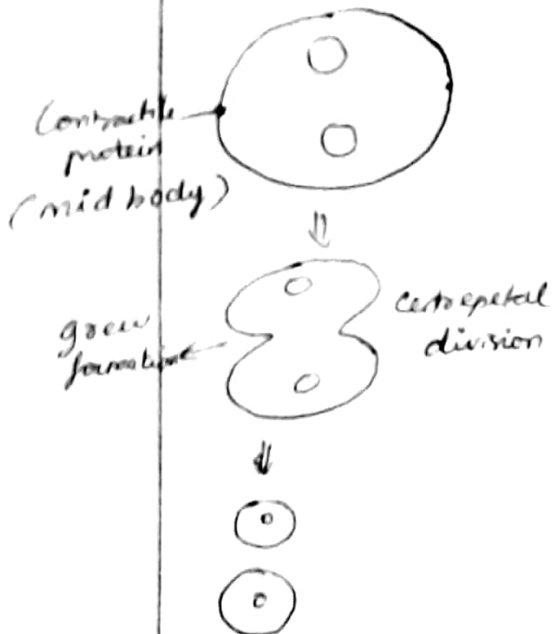
Continuous fibre



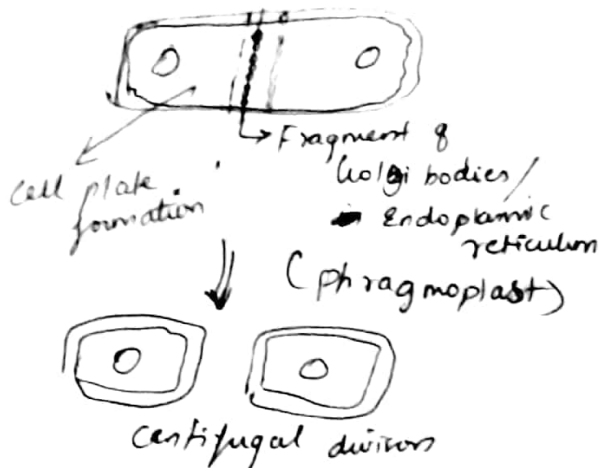
- 1) Splitting of centromere
- 2) Number of chromosome gets double
- 2)

# Cytokinesis

### Cytokinesis in animal cell



### Cytokinesis in plant cell



## Modifications of mitosis:

### Endomitosis

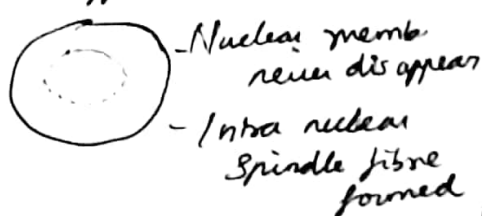
Chromosomes number double but karyokinesis fails

Failure of Telophase of cell cycle (N-ploidy) ploidy will increase

4N

8N

### Cryptomitosis

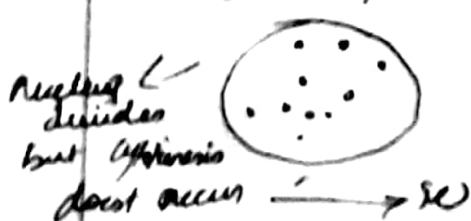


### Disomitosis



## # Free nuclear division

### Coenocytic cell



karyokinesis occurs but no cytokinesis

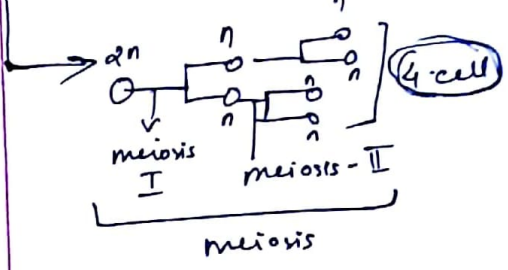
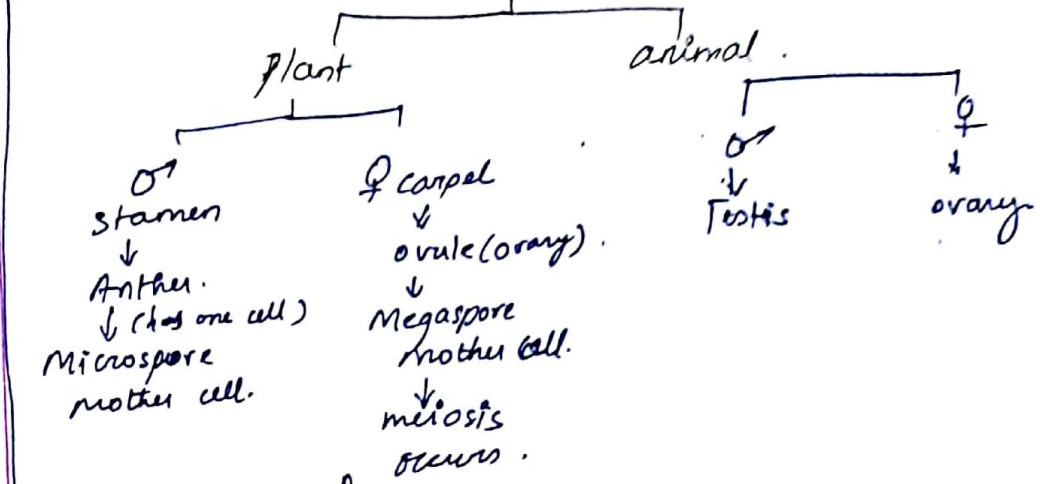
### Colchicine (M6)

\* Alkaloid from plant called Colchicum autumnale

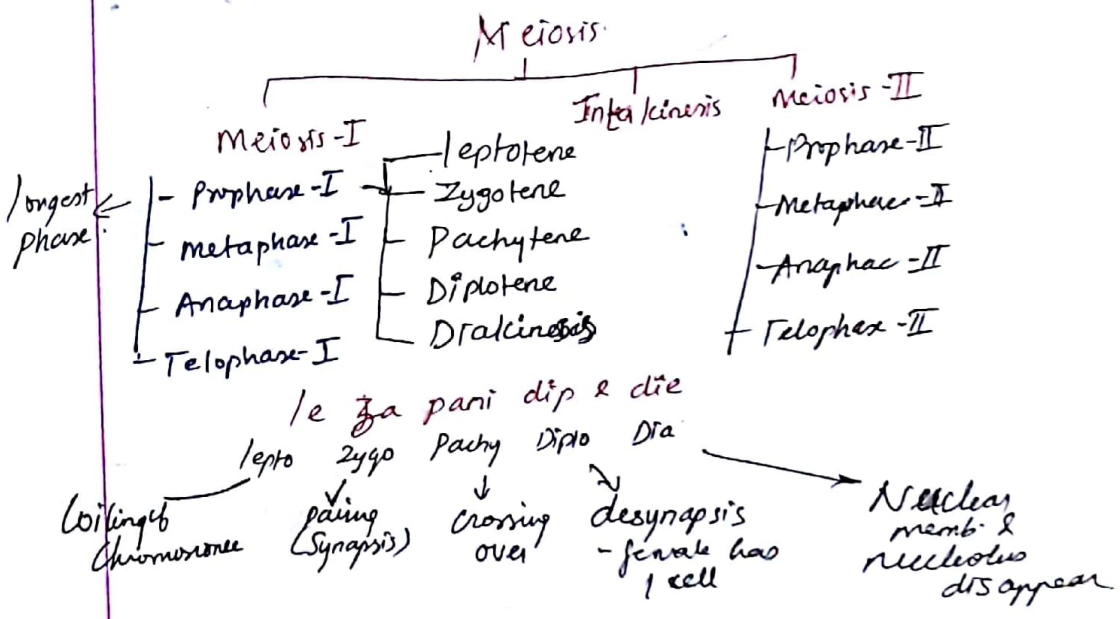
mitotic poison (beoz it breaks spindle fibre)

# Meiosis — 4 1/2 hr.

↳ Meocyte

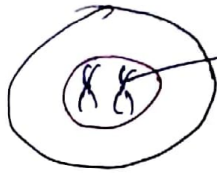


meiosis I	meiosis II
<ul style="list-style-type: none"> <li>- Reduction of number of chromosome</li> <li>- Called as Reductional cell division</li> <li>- also called as heterotypic cell division</li> </ul>	<ul style="list-style-type: none"> <li>- chromosome number is maintained</li> <li>- called as homotypic cell division</li> </ul>



1 meiosis

Leptotene:

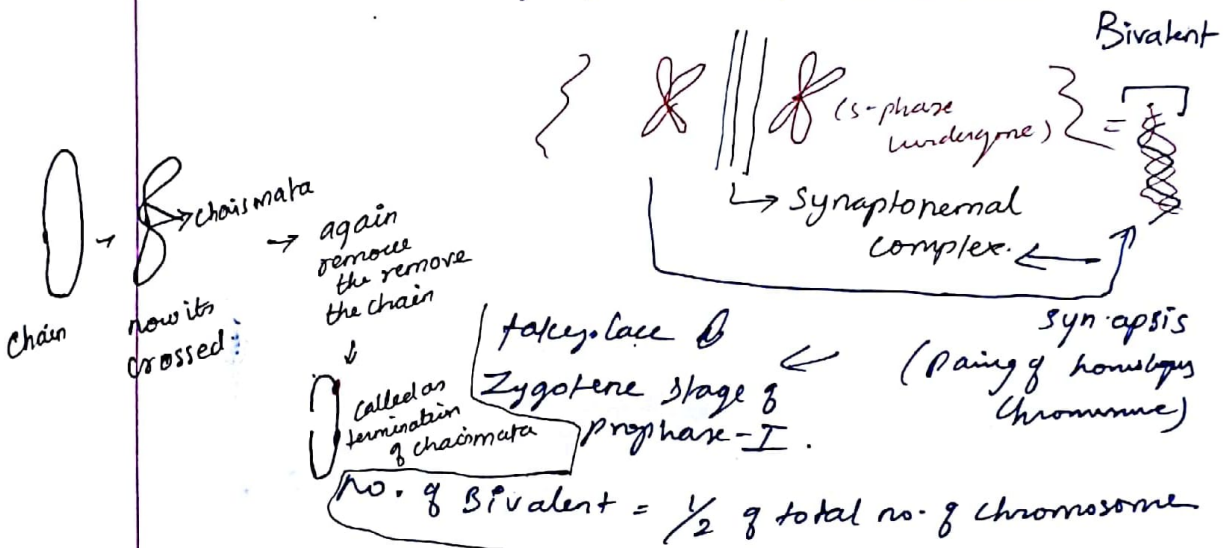


Chromatin longest  
thinnest.

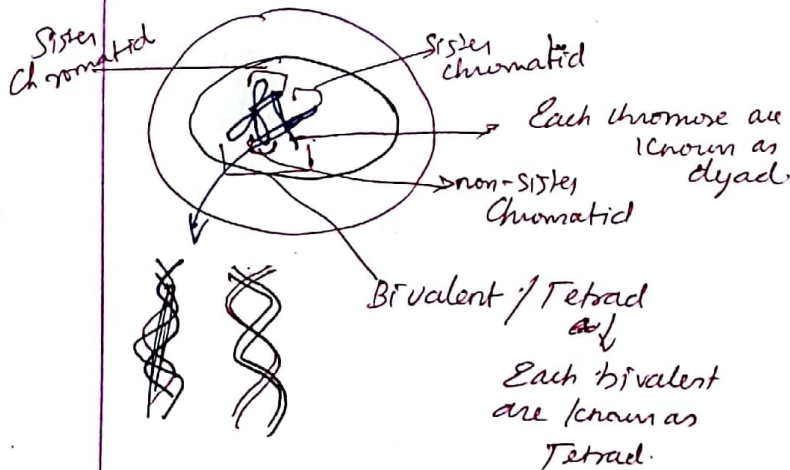
↓  
undergoes coiling &  
Condensation / dehydration

↳ Chromomere.

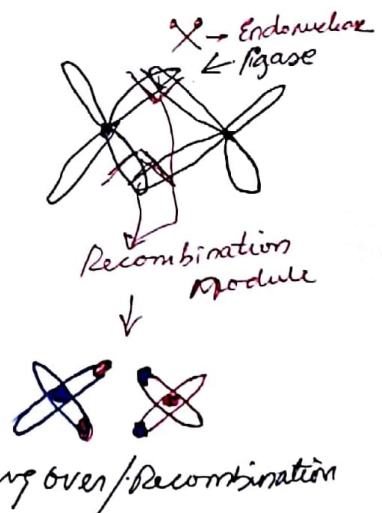
Zygotene: - Pairing of homologous chromosome



Pachytene: (crossing over)



Morgan & Castle



Bilateral Exchange of pairs of chromosomes between non-sister chromatid of homologous chromosomes.





# Diplotene:

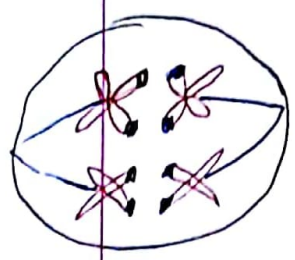
Desynapsis - unpairing of homologous chromosome  
 ↳ Synaptonemal complex start dissolving  
 - chiasmata (terminating)

# Diakinesis:

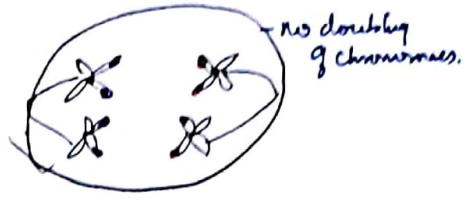


- 1) Nuclear memb. disappear
- 2) nucleolus disappears
- 3)

Metaphase - I

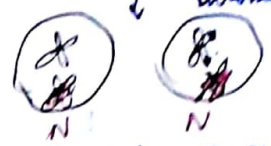


Anaphase - I  
 - No splitting of centromere



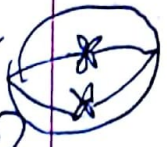
Telophase - I

called as reduction chromosome



No. of chromosomes are reduced

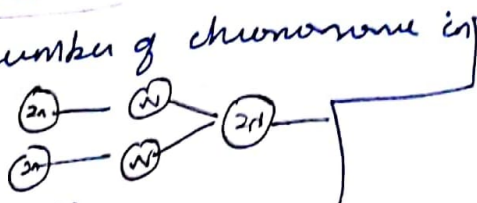
Flash back to (mitosis)



No. of chromosomes remains constant in (mitosis)

Significance of meiosis:

- It maintains number of chromosome in progeny.
- Variation → Evolution in a raw material for



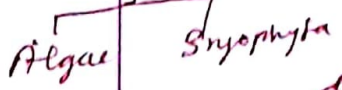
meiosis - I  
 ↓  
 cytokinesis (or) no cytokinesis → Plant cell plate formation

Types of meiosis

Zygotic meiosis / Initial meiosis



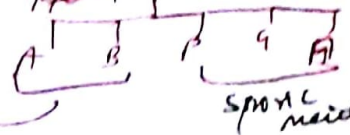
= thallophyte



Sporic meiosis / Intermediate meiosis

- during spore formation
- except thallophyte

Plant kingdom - except



Terminal meiosis / gametic meiosis

- Animals
- ① the time of gamete formation