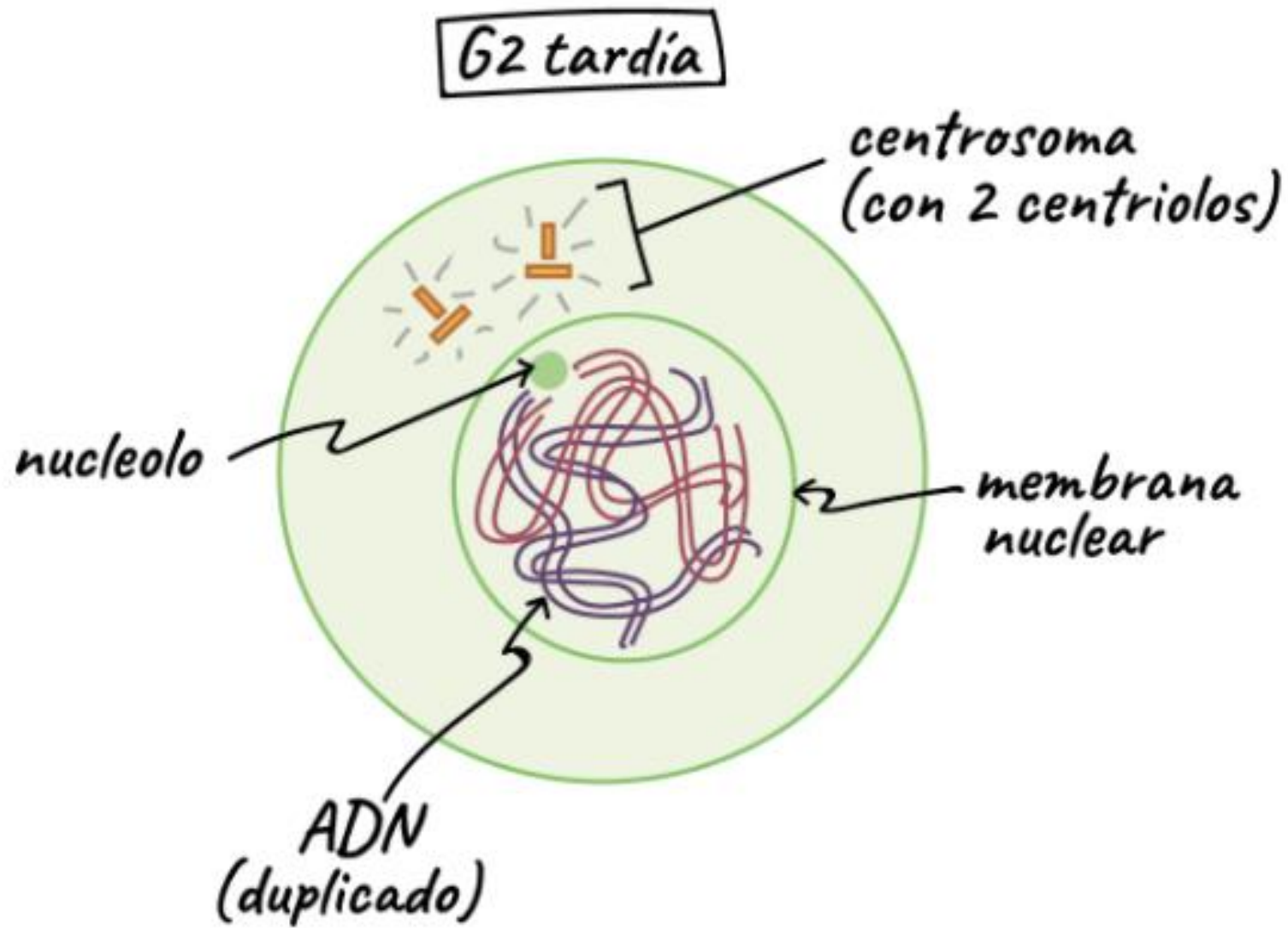


# MITOSIS y MEIOSIS

Biología 4º ESO

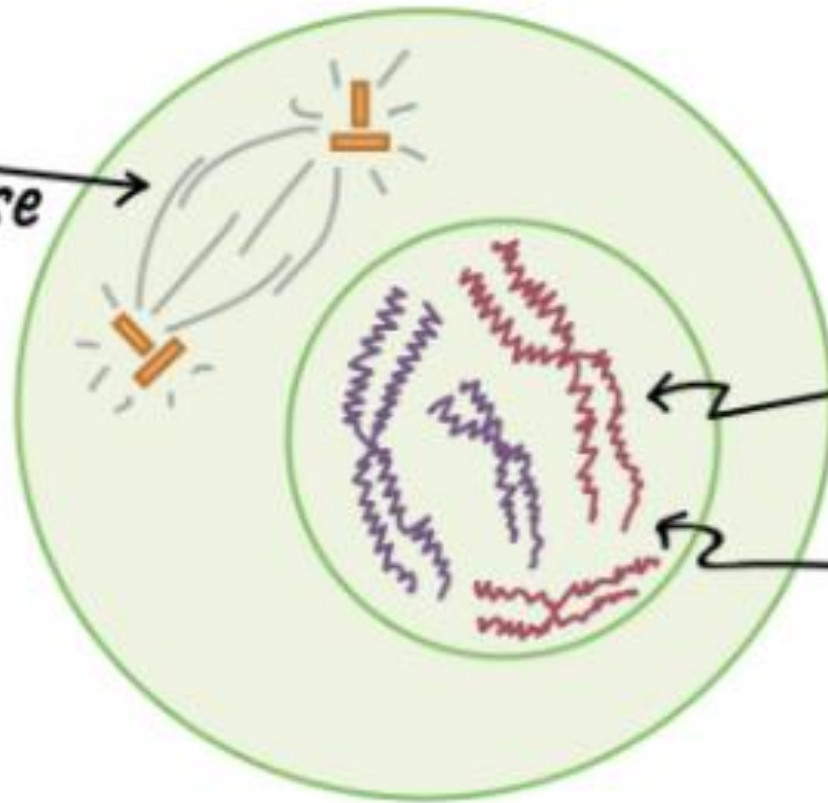






# PROFASE TEMPRANA

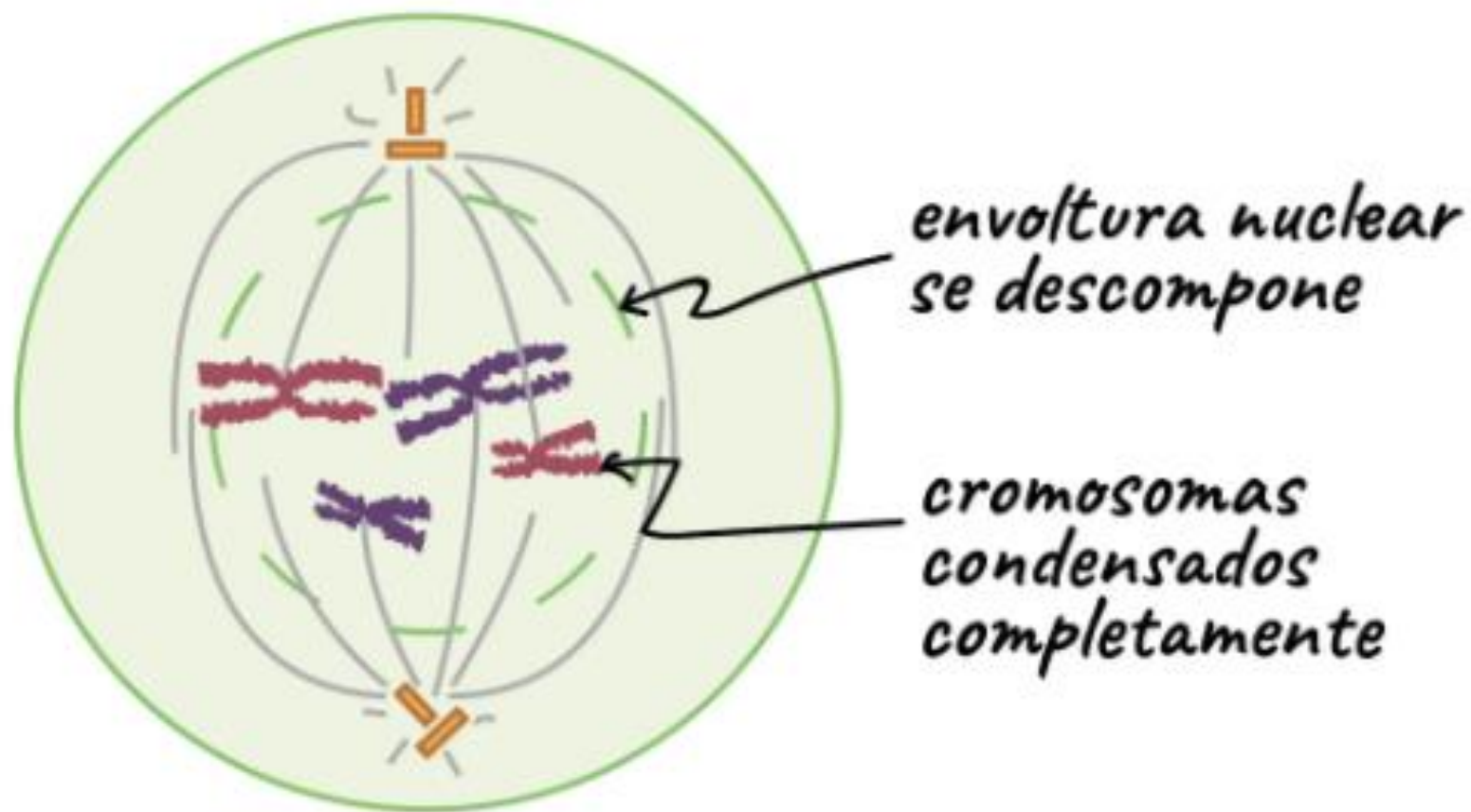
huso mitótico  
empieza a formarse



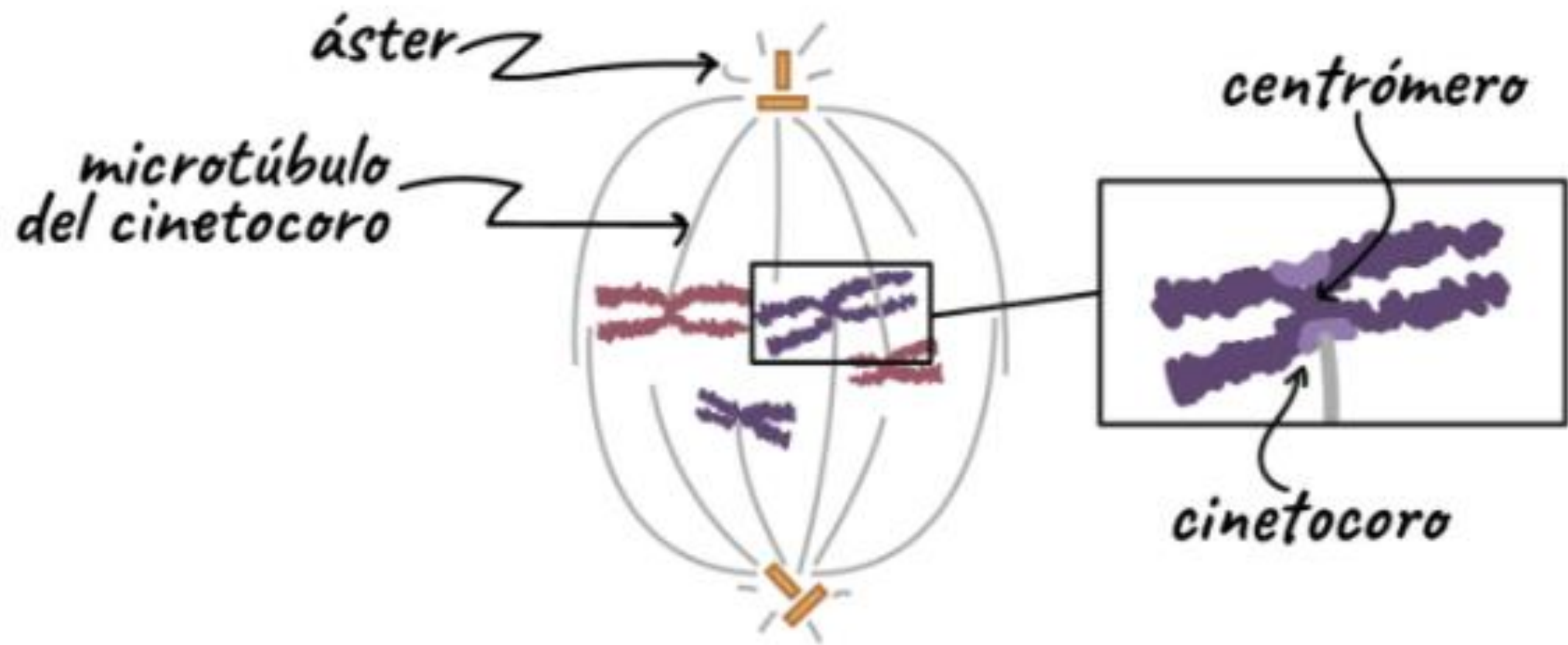
cromosomas comienzan  
a condensarse

¡nucleolo desaparece!

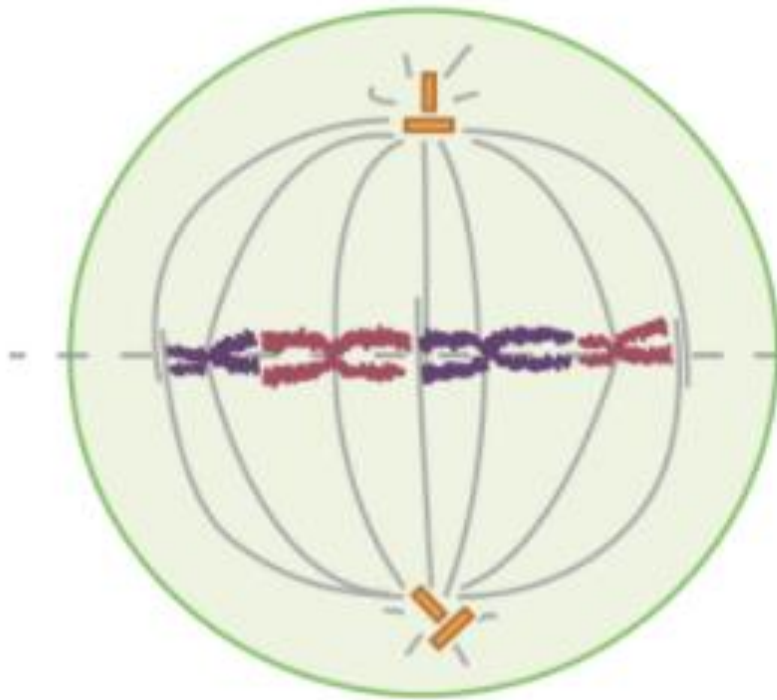
**PROFASE TARDÍA  
(PROMETAFASE)**



# ANATOMÍA DEL HUSO



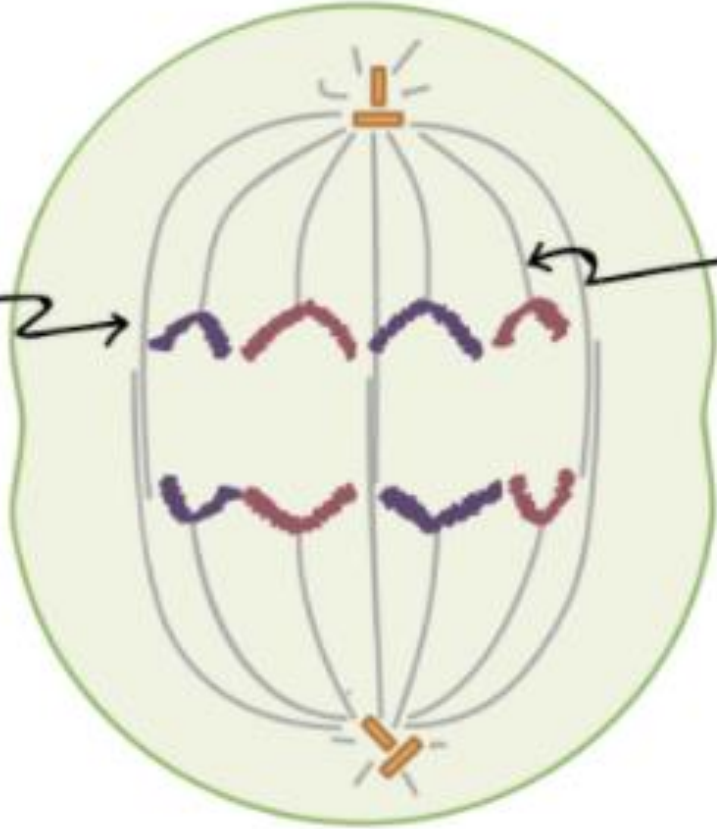
# METAFASE



← cromosomas se alinean en la placa metafásica

# ANAFASE

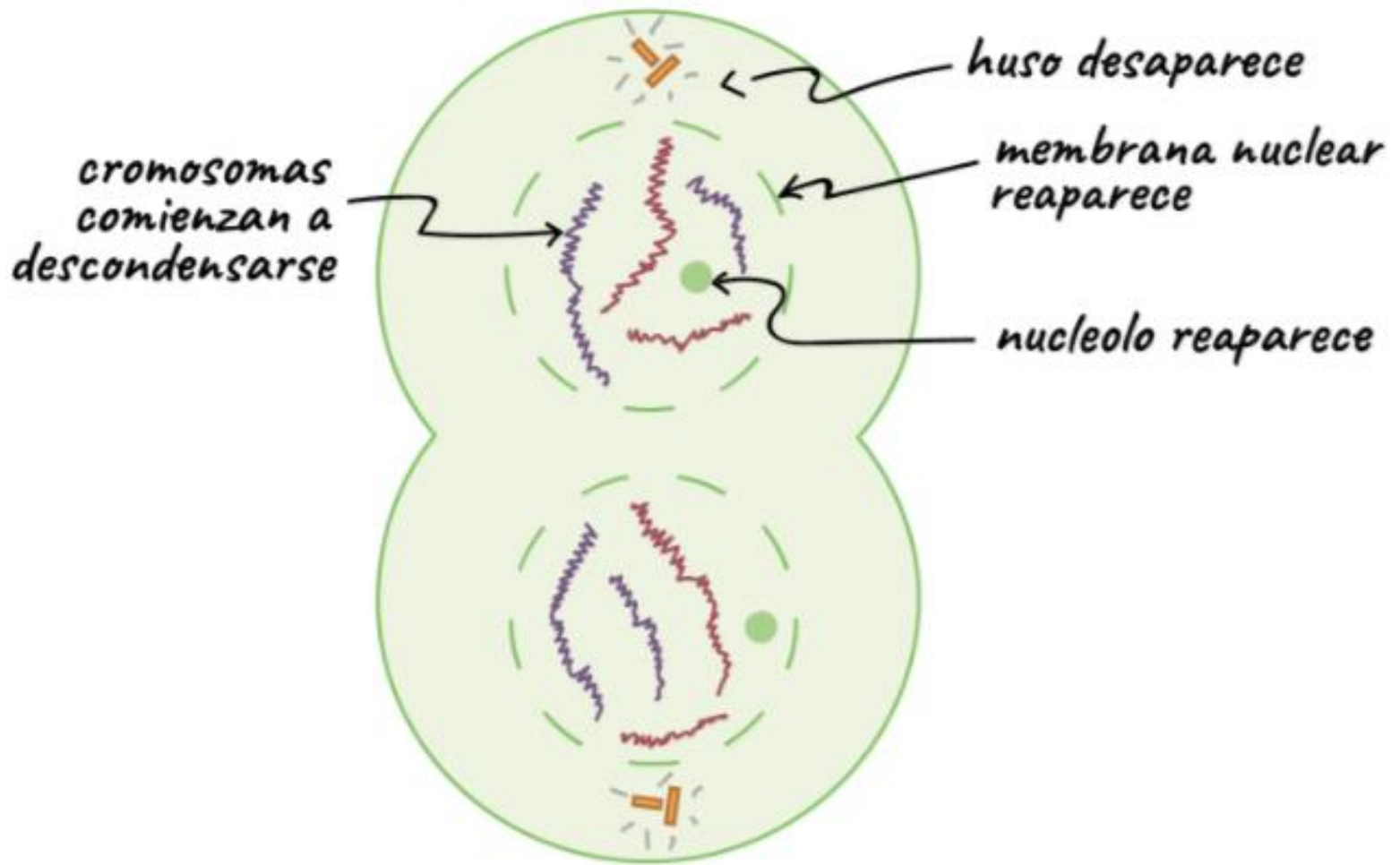
microtúbulos empujan los polos



microtúbulos cinetocoros jalan los cromosomas hacia los polos



# TELOFASE



huso desaparece

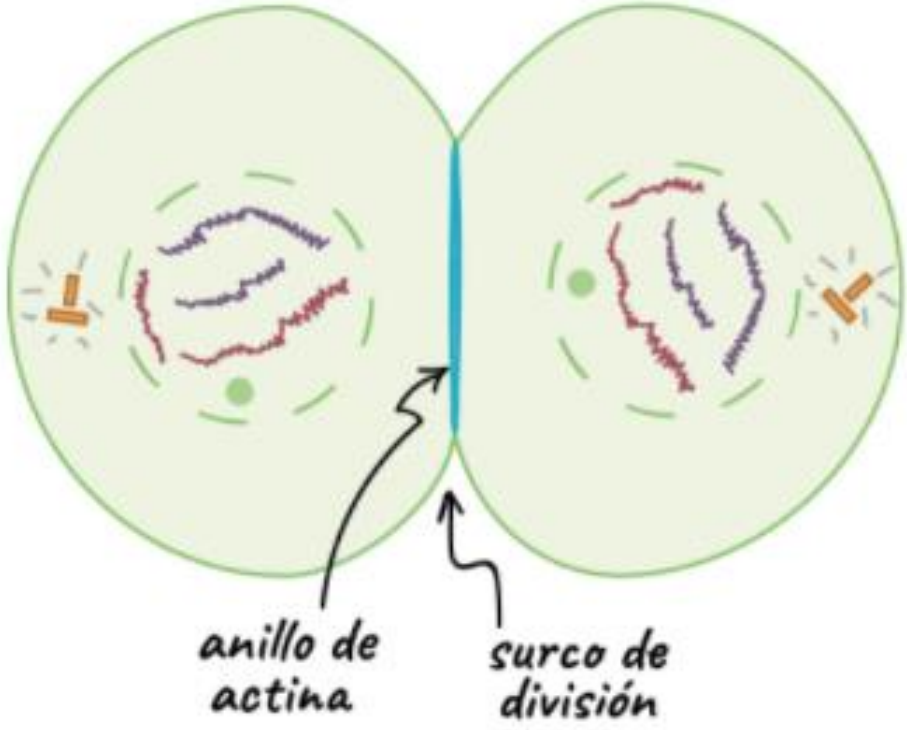
membrana nuclear reaparece

nucleolo reaparece

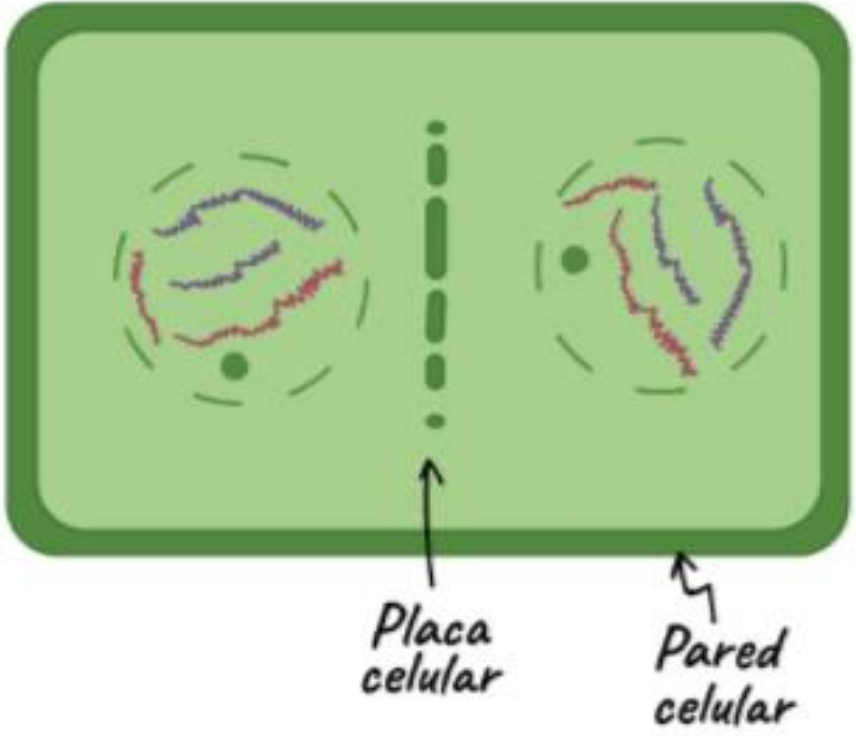
cromosomas comienzan a descondensarse

# CITOCINESIS

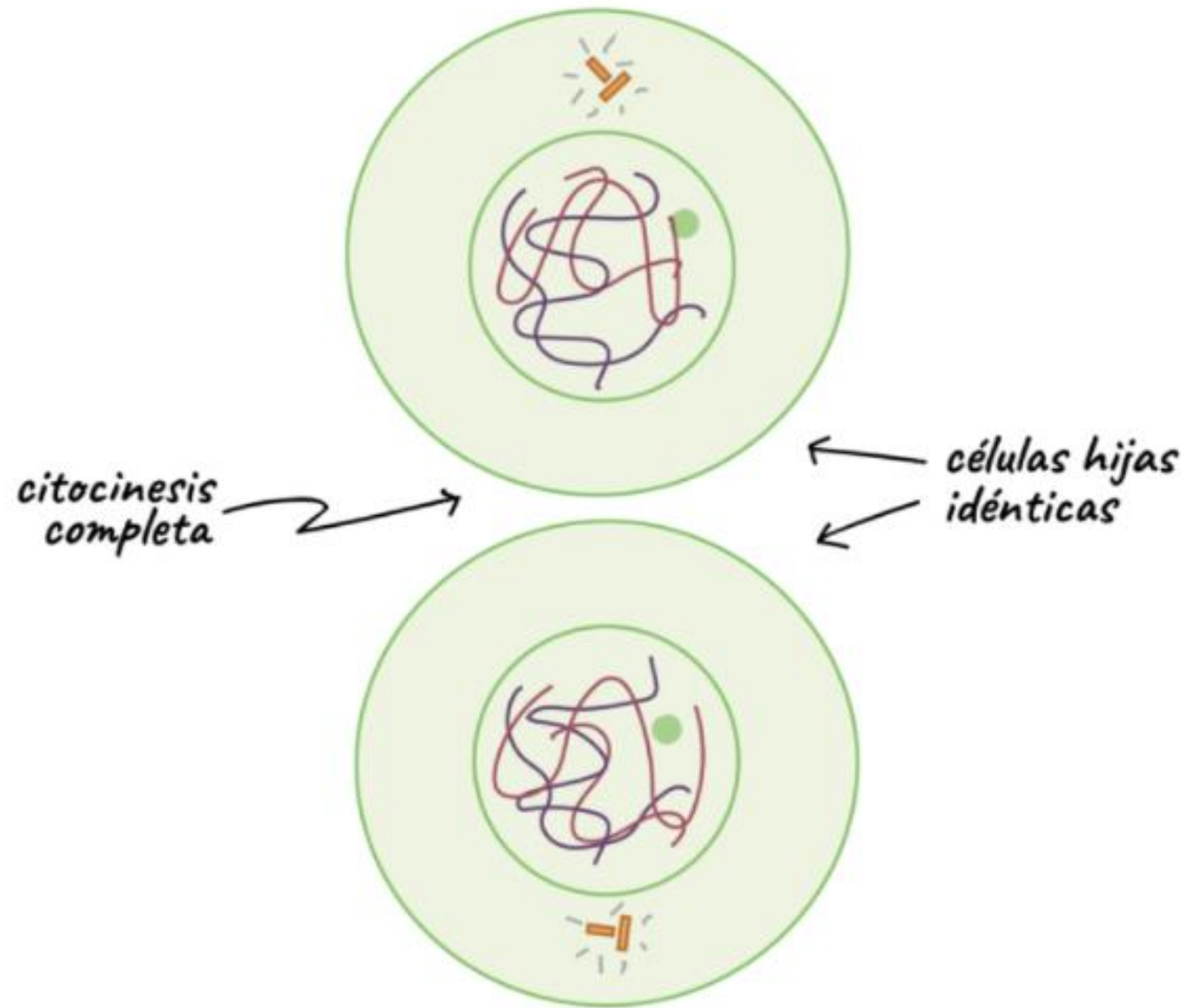
Célula animal



Célula vegetal



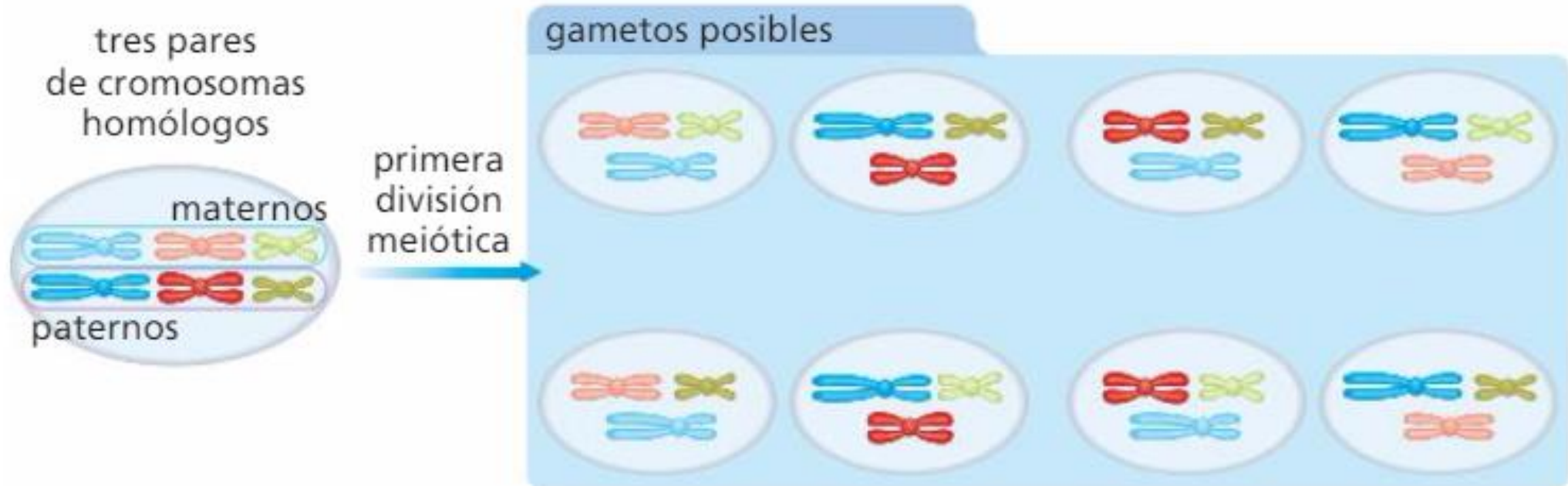
G1 TEMPRANA



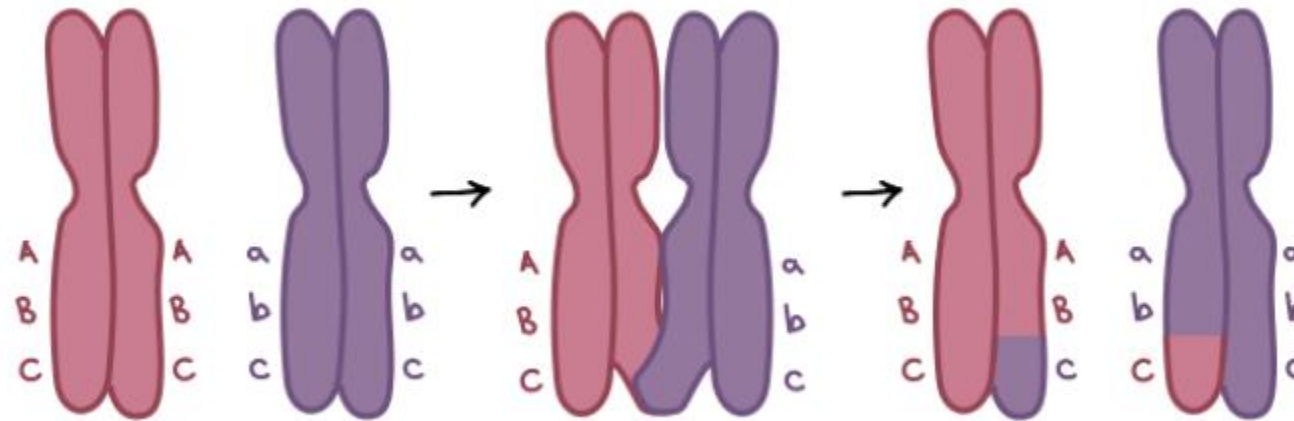
*citocinesis completa*

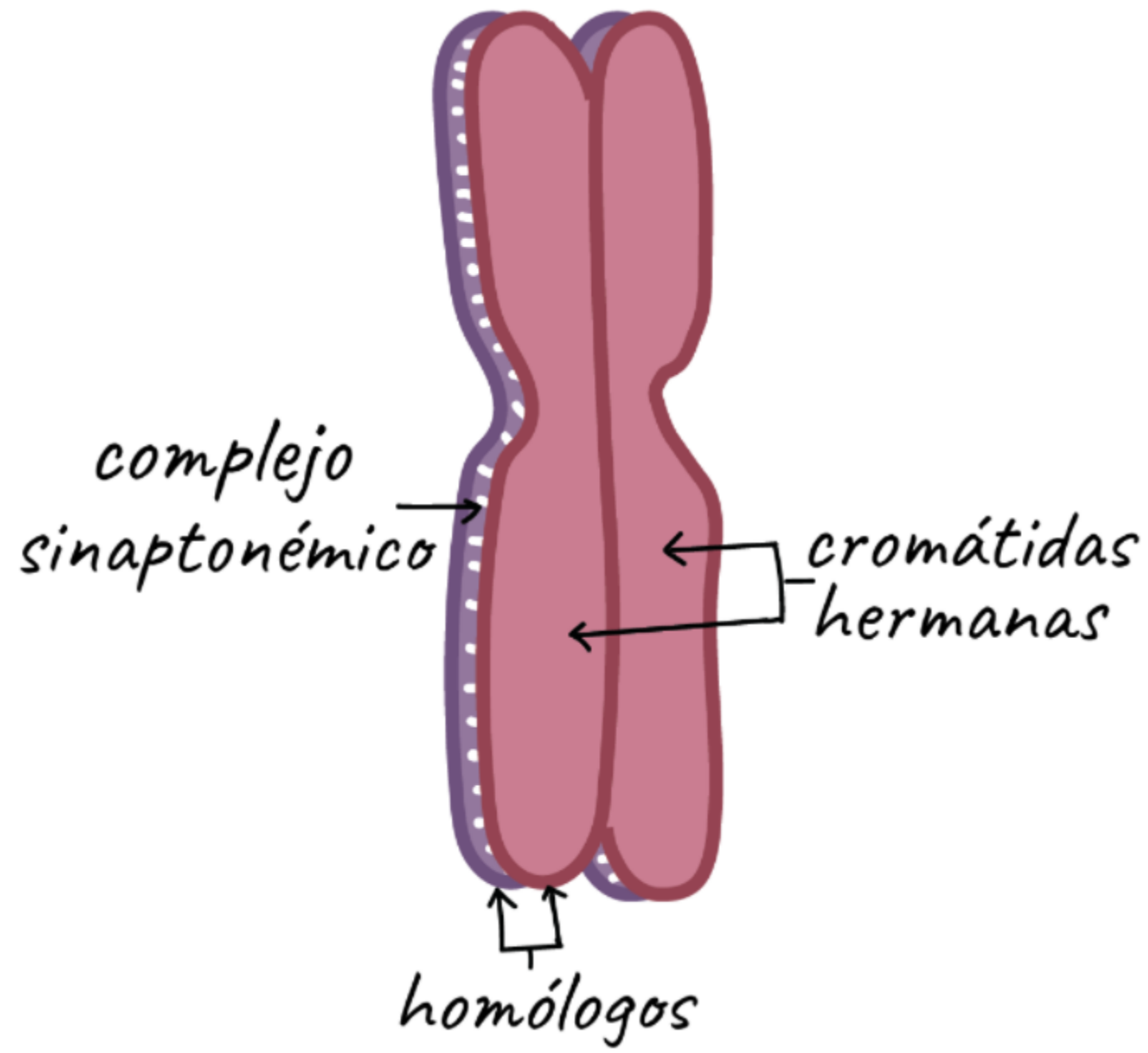
*células hijas idénticas*

# Meiosis.



**Meiosis:** emparejamiento de los cromosomas homólogos y **entrecruzamiento**.

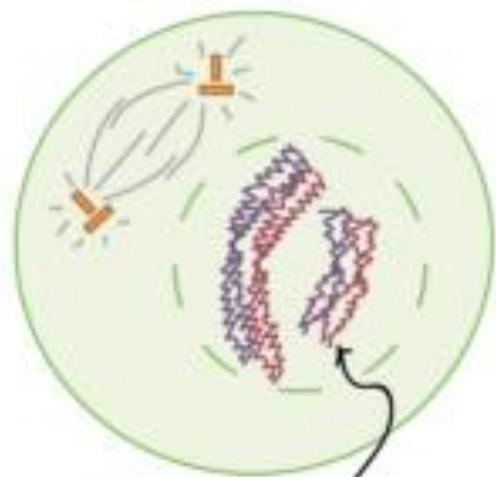




## FASES DE MEIOSIS I

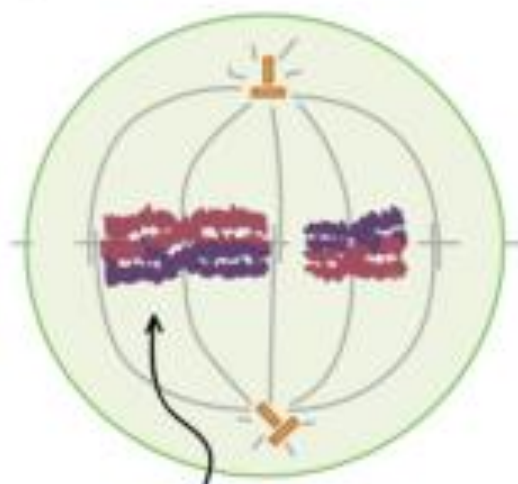
### Profase I

célula inicial es diploide ( $2n=4$ )



cromosomas homólogos forman pares e intercambian fragmentos (entrecruzamiento)

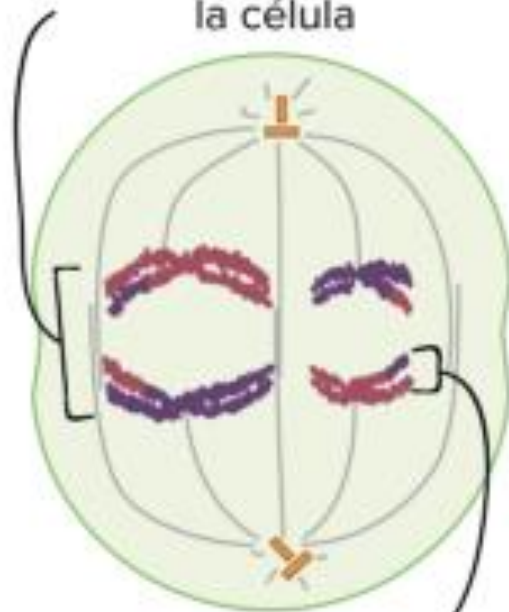
### Metafase I



pares homólogos se alinean en la placa metafásica

### Anafase I

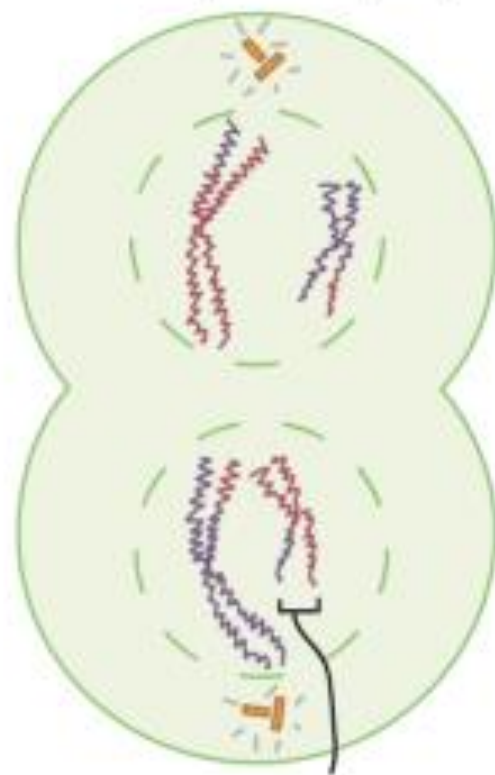
homólogos se separan a extremos opuestos de la célula



cromátidas hermanas se mantienen juntas

### Telofase I

células recién formadas son haploides ( $n=2$ )



cada cromosoma tiene dos (diferentes) cromátidas hermanas

FASES DE MEIOSIS II

Profase II

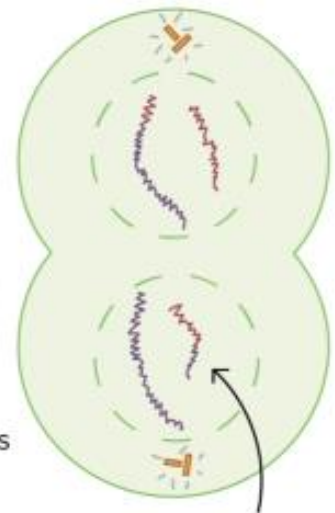
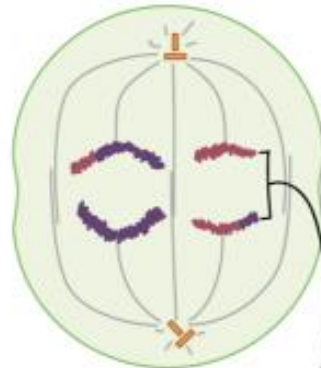
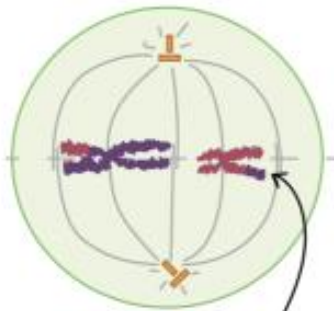
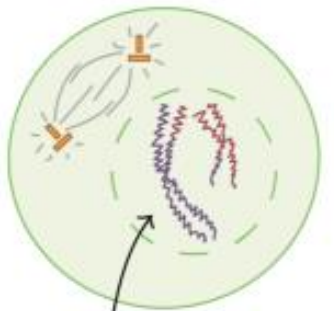
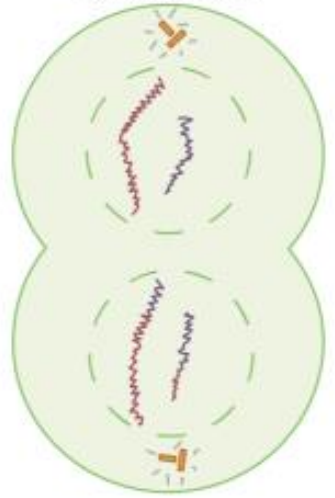
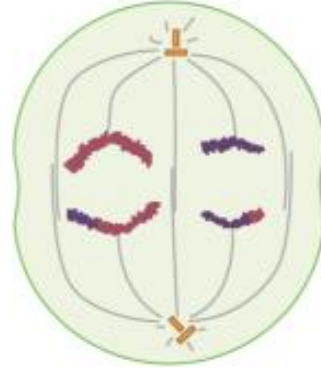
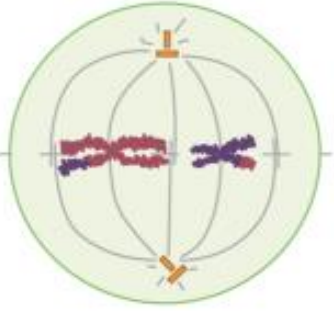
Metafase II

Anafase II

Telofase II

células iniciales son haploides hechas en meiosis I

gametos recién formados son haploides



cromosomas se condensan

cromosomas se alinean en la placa metafásica

cromátidas hermanas se separan a extremos opuestos de la célula

cada cromosoma tiene solo una cromátida